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ABSTRACT

For the past 200 years most, if not all Australian Tree Frogs have been treated as being in a single genus. For many years this was *Hyla* Laurenti, 1768, before the genus name *Litoria* Tschudi, 1838 was adopted by Cogger *et al*. (1983) and has been in general use by most herpetologists since, including Cogger (2014).

Tyler and Davies (1978) divided the putative genus *Litoria* into 37 “species groups” and this type of classification has been used by numerous authors since, including most recently Menzies (2006) for the New Guinea species and Anstis (2014) for the Australian ones.

By merging all previous molecular and morphological studies with systematic scientific methodology, including a review of all previous species and subspecies descriptions, including those of synonymised forms, all significant past papers on the group and inspection of thousands of specimens, this paper takes the logical next step of completing an overdue full family-wide reclassification of the Australiasian Tree Frogs in the Pelodryadidae.

Besides resurrecting dozens of old and available names for genera and species when applicable, this paper also formally names 12 tribes, 11 subtribes, 34 genera, 26 subgenera, 62 species and 12 subspecies for the first time in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

It remains self-evident that the species-level diversity of the group remains underestimated, especially in New Guinea. In the face of ongoing rapid, exponential human population growth in Australia and New Guinea, habitat destruction, introduced pests and pathogens, the survival threat to many species within the Pelodryadidae has never been greater. This increases the urgency to formally identify relevant taxa in order to be able to conserve them.

Keywords: Taxonomy; Tree Frog; Amphibia; nomenclature; Frog; Pelodryadidae; Australia; New Guinea; *Hyla*; *Litoria*; *Ranoidea*; *Cyclorana*; *Chirodryas*; *Nyctimystes*; *Dryopsophus*; *Pelodryas*; *Drymomantis*; *Euscelis*; *Mitrolysis*; *Brendanura*; *Coggerdonia*; *Colleeneremia*; *Llewellynura*; *Mahonabatrachus*; *Mosleyi*a; *Neophractops*; *Pengilleyia*; *Rawlinsonia*; *Saganura*; *Sandyrana;* new tribe; Adelynhoserhyleini; Coggerdoniani; Cycloranini; Daraninanurini; Fiacumminganurini; Maxinehoserranini; Nyctimystini; Kumanjayiwalkerini; Pelodryanini; Pustulataranini; Saganurini; Wowranaini; new subtribes; Leucodigiranina; Ranoideina; Gedyerananina; Dryopsophina; Drymomantina; Badiohylina; Audaxurina; Rawlinsonina; Shireenhoserhylina; Salmocularanina; Sandyranina; new genus; *Adelynhoserhylea*; *Jackyhoserhylea*; *Leucodigirana*; *Crottyrana*; *Gedyerana*; *Daraninanura*; *Fiacumminganurea*; *Maxinehoserranae*; *Angularanta*; *Bellarana*; *Fluvirana*; *Hopviridi*; *Incertanura*; *Inlustanura*; *Moechaeanura*; *Ornatanura*; *Nasuscuspis*; *Rotundaura*; *Variabilanura*; *Albogibba*; *Occultatahyla*; *Nigreosoculus*; *Badiohyla*; *Magnumoculus*; *Kumanjayiwalkerus*; *Audaxura*; *Brevicrusyla*; *Shireenhoserhylea*; *Summaviridis*; *Pustulatarana*; *Salmocularana*; *Paralitoria; Quasilitoria; Wowrana*; new subgenus; *Yikesanura*; *Paramitrolysis*; *Invisibiliaauris*; *Sandgroperanura*; *Amnisrana*; *Leucolatera*; *Ausverdarana*; *Vegrandihyla*; *Alliuma*; *Longuscrusanura*; *Naveosrana*; *Raucus*; *Scelerisqueanura*; *Aspercutis*; *Telaater*; *Sudesanura*; *Magnummanibus*; *Asperohyla*; *Ratiobrunneis*; *Webpede*; *Balatusrana*; *Emeraldhyla*; *Microlitoria*; *Ferelitoria*; *Vultusamolitoria*; *Parawowrana*; new species; *adelynhoserae*; *yikes*; *ernieswilei*; *jackyhoserae*; *flavoranae*; *leucodorsalinea*; *rosea*; *crottyi*; *sloppi*; *gedyei*; *cottoni*; *michaelsmythi*; *piloti*; *fiacummingae*; *timdalei*; *jarrodthomsoni*; *brettbarnetti*; *maxinehoserae*; *pierconi*; *chydaeus*; *communia*; *extentacrus*; *mukherjii*; *quaeinfernas*; *vulgarans*; *oxyeei*; *cuspis*; *fakfakensis*; *inluster*; *albatermacula*; *tritong*; *spica*; *leucopicturas*; *parscinereo*; *parsviridis*; *tomcottoni*; *ausviridis*; *celantur*; *northstradbrokensis*; *mondoensis*; *charlottae*; *doggettae*; *aspera*; *georgefloydi*; *ingens*; *kumanjayi; bogfrog*; *chunda*; *dunnyseat*; *watdat*; *wifi*; *ventrileuco*; *megaviridis*; *fukker*; *yehbwudda*; *chriswilliamsi*; *marionanstisae*; *pailsae*; *roypailsi*; *saxacola*; *mickpughi*; *mippughae*; new subspecies; *dorsaruber*; *occultatum*; *dumptrashensis*; *inornata*; *gippslandensis*; *leucopunctata*; *brunetus*; *toowoombaensis*; *tozerensis*; *davidtribei*; *dunphyi*; *serventyi*.

Presented herein is a revision of the Pelodryadidae.
A full list of recognized tribes, genera and species is presented at the end of this paper in alphabetical order, with page references for all descriptions and redescriptions of tribes, subtribes, genera and subgenera as well as for newly named species and subspecies.
The paper is published in three volumes, of *Australasian Journal of Herpetology,* being Issues 44-46, all published on 5 June 2020.

INTRODUCTION

For most of the past 200 years, most, if not all Australian and New Guinea Tree Frogs have been treated as being in a single genus.

For many years this was *Hyla* Laurenti, 1768, before the genus name *Litoria* Tschudi, 1838 was adopted by Cogger *et al.* (1983) and has been in general use by most herpetologists since, including Cogger (2014).

While a number of inveterate and obsessive name grabbers from the 1800's, including the usual suspects of Cope, Peters, Günther and Fitzinger put new genus names on several species and without a shred of scientific basis to do so, most of those names went into synonymy.

Because a number are objective synonyms of one another, this is where a lot must remain.

However two of the the more morphologically divergent species groups within the Australasian Tree Frog radiation were given different genus names, namely *Cyclorana* Steindachner, 1867 and *Nyctimystes* Stejneger, 1916 and both names have remained in use by herpetologists to the present day, including for example by Menzies (2006), Venderduys (2012), Anstis (2013), Cogger (2014) and Eipper and Rowland (2018).

In terms of the many dozens of other recognized species of Australasian Tree Frogs (being over 200 on most species lists as of 2020), almost all have been simply lumped into the genus *Litoria sensu* Cogger *et al.* (1983) by most authors since that date, without a shred of scientific justification.

As of 2020, this is the current state of play in terms of the taxonomy of Australian tree frogs so far as most of the Australian public is aware.

Unfortunately the same in fact applies to most of the "scientific community".

Tyler and Davies (1978) divided the putative genus *Litoria* into 37 "species groups".

This was a reasonable start to the dismemberment of the genus *Litoria* and from that point on the formal naming of these species groups should have been completed within a few short years.

After Tyler and Davies (1978), Wells and Wellington (1985) decided to place obvious phylogenetically related groups within this massive putative genus of ancient origins into obvious morphologically distinctive genera. Acting ethically, these authors resurrected seven names from synonymy and erected another 11 putative genera for obvious well-known species groups for the first time.

A group known as the Wolfgang Wüster gang of thieves (see Hoser 2007, Hoser 2015a-f and 2019a-b) have successfully harassed most publishing herpetologists to ignore the taxonomy of Wells and Wellington and to simply synonymise all genera into a greater *Litoria* (as per the doctrine of Kaiser *et al.* 2013).

However the unscientific edicts of Kaiser *et al.* were effectively ignored by Eipper and Rowland (2018). Instead they heeded the advice of Hoser (2007) and published an amended classification of Australian Tree Frogs that was essentially similar to that of Wells and Wellington (1985) by relying on recently published molecular phylogenies.

While relying on the published phylogenies of Duellman *et al.* (2016) and Bell *et al.* (2017) that they drew their conclusions from and using the available names, including many of those first proposed by Wells and Wellington (1985), the Eipper and Rowland (2018 taxonomy presented had obvious gaps and deficiencies, including genera they simply identified as "unnamed".

Further to that, generic assignments made in line with either Wells and Wellington (1985) or Duellman *et al.* (2016) at times simply did not correlate with the relevant published phylogenies.

While I note that the published phylogenies of Frost *et al.* (2006), Pyron *et al.* (2011), Duellman *et al.* (2016) and Bell *et al.* (2017) have clearly confirmed most of the Wells and Wellington classification as correct, but not all of it, these cited publications have highlighted a number of other well-defined and divergent lineages that by any reasonable analysis should be placed in their own, as yet unnamed genera.

With this in mind a review of the relevant species, including all species groups from Australia and New Guinea was conducted.

Specimens and literature were reviewed to find a superior taxonomy for the Australian and New Guinea Tree Frogs in order to get a genus level taxonomy and nomenclature that can be used by other herpetologists as a framework for further research.

Unnamed tribe and genus-level groupings identified in the process, have been formally named in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Obviously divergent forms are also formally named as new species for the first time. This being a total of 62 species and 12 new subspecies.

MATERIALS AND METHODS

These are inferred in both the abstract and introduction and self evident in the descriptions that follow.

An audit of all previously described species of Australasian Tree Frogs in the family Pelodryadidae Günther, 1858 was conducted.

In simple terms this included all species lumped in the genera *Litoria* Tschudi, 1838, *Cyclorana* Steindachner, 1867, *Nyctimystes* Stejneger, 1916, which has for most

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publishing authors in the past 50 years been the sum total of the family.

In the period post-dating Wells and Wellington (1985), in particular post-dating the paper of Duellman *et al.* (2016), it has been increasingly difficult for authors to justify the use of just three genus names for all the Pelodryadidae and some earlier names have been resurrected and used on online databases and publications.

However, as a rule, these published lists of names have not made sense as the species are often placed in genera in which the type species is not remotely related to the assigned species, giving further reason for a major in-depth review of the family, the results of which are published herein.

It has also been self evident that often the authors assigning species to their supposedly authoritative "genus and species list" clearly have no idea about classification and rules of nomenclature and invariably have assigned species to genera with little if any connection to the originally described type form.

Published species lists were checked against the relevant literature (e.g. Menzies 2006, Cogger *et al.* 2013, Tyler 1968, Anstis 2013, etc) and online databases such as "Amphibia Web" and "Amphibian Species of the World" hosted on the American Museum of Natural History website, with those listed species in this paper being treated as valid, either on the basis of prior descriptions in the scientific literature, or new descriptions herein.

When possible, specimens of all relevant species (named and until now unnamed) were examined both live in the wild and via museum collections and their records, including all State and Territory Museums on mainland Australia and some collections held outside of Australia as well. Furthermore photos and information with accurate locality data was also assessed, as was all relevant previously published scientific literature and the so-called grey literature in the form of popular mass-market books, internet sites, blogs, photo-sharing sites and the like.

Scrutinized in particular was taxonomic studies and phylogenies that uncovered relationships between species and species groups, although I note that a lot of this is self-evident to someone who has spent a lifetime working on these animals.

Not all type material was inspected, however I was generally able to ascertain relevant details from the published literature, including each and every original description which I read (including foreign language (non English) ones which I had translated).

Before a decision is made to name any new taxon at any level, including genus, subgenus, species or subspecies, reasonable steps must be taken to ensure that it is justified on all relevant grounds, including that it is morphologically, genetically and reproductively sufficiently diverged to warrant the erection of a new taxonomic grouping over and above what is already available and in common usage.

Key literature relevant to the taxonomic and nomenclatural conclusions within this paper include Ahl (1929, 1935), Andersson (1916), Anstis (2013), Anstis and Tyler (2005), Anstis *et al.* (1998, 2010, 2016a, 2016b), Barbour (1908, 1912, 1921), Barker and Grigg (1977), Barker *et al.* (1995), Bell *et al.* (2012, 2017), Bevelander (2014), Boettger (1895, 1900), Böhme (2014), Böhme and Bischoff (1984), Boulenger (1882, 1883, 1887a, 1887b, 1892, 1896, 1897a, 1897b, 1898, 1905, 1911, 1912, 1914, 1915), Brongersma (1953), Brown (1952), Burns (2004), Burns and Crayn (2006), Burt and Burt (1932), Capocaccia (1957), Clyne (1969), Cogger (1966, 1979, 2014), Cogger *et al.* (1983), Condit (1964), Cope (1866, 1867), Copland (1957, 1960, 1951, 1963a, 1963b), Courtice and Grigg (1975), Covacevich (1974), Coventry (1970), Czechura *et al.* (1987), Daan and Hillenius (1966), Daudin (1802, 1803), Davies *et al.* (1983, 1986), De la Riva *et al.* (2014), Dennis and Cunningham (2006), De Vis (1884), Donnellan and Mahony (2004), Donnellan *et al.* (1999), Doughty (2011), Doughty and Anstis (2007), Dubois (1984, 2005, 2007, 2018), Dubois and Frétey (2016), Dubois *et al.* (2019), Duellman (1977, 1993), Duellman and Trueb (1986), Duellman *et al.* (2016), Duméril (1853), Duméril, and Bibron (1841), Duméril and Duméril (1851), Eipper (2012), Eipper and Rowland (2018), Faivovitch *et al.* (2005), Fitzinger (1826, 1860), Fletcher (1898), Forcart (1953), Frost (2013), Frost *et al.* (2006), Fry (1912, 1913, 1915), Gadow (1901), Gassó Miracle *et al.* (2007), Gillespie (2001, 2002, 2004, 2010, 2011, 2012), Gillespie and Hollis (1996), Gillespie *et al.* (2015), Goldman *et al.* (1969), Gray (1841, 1842, 1848), Guibé (1948), Günther (1858, 1863a, 1863b, 1864, 1867, 1873, 1876, 1897), Günther (2003, 2006a, 2006b, 2006c, 2008, 2014), Günther (2003, 2004a, 2004b, 2006a, 2006b, 2006c, 2008, 2014), Günther and Richards (2000, 2005), Hiaso and Richards (2006), Hoser (1989, 2013b, 2014, 2015g, 2018a, 2018b, 2018c, 2018d, 2018e, 2020a, 2020b, 2020c, 2020d, 2020e), Hoskin (2007), Hosmer (1964), Hunter (2012), Hunter and Smith (2013), Hunter *et al.* (2011), Ingram and Corben (1990), Ingram *et al.* (1992, 1993), James (1998) James and Moritz (2000), Johnston and Richards (1994), Keferstein (1867), Kraus (2007, 2009, 2010, 2012a, 2012b, 2013a, 2013b, 2018), Kraus and Allison (2004a, 2004b, 2009), Krell and Marshall (2017), Lamb (1911), Laurance *et al.* (1996), Lesson (1829), Leunis (1844), Liem (1974a, 1974b), Liem and Ingram (1977), Lönnberg (1900), Loveridge (1945, 1948, 1950), Macleay (1879), Mahony (2001), Main (1965), Martin *et al.* (1978), McDonald (1997), McDonald *et al.* (2016), McDowell (1969), Méhely (1897), Menzies (1969, 1972, 1976, 1993, 2006, 2014a, 2014b), Menzies and Johnston (2015), Menzies and Tippett (1976), Menzies and Tyler (2004), Menzies and Zug (1979), Menzies and Zweifel (1974, 1976), Menzies *et al.* (2009), Merrem (1820), Mertens (1922, 1930, 1964, 1967), Meyer (1874, 1887), Meyer and Agnew (2013), Minister for the Environment, Commonwealth Government of Australia (2017), Moore (1961), Murray and Hose (2005), Nieden (1923), Noble (1931), Obst (1977), Ogilby (1890, 1907), Oken (1816), Oliver and Richards (2007), Oliver *et al.* (2007, 2008, 2019a, 2019b,), Parker (1936, 1938, 1940), Péron (1807), Peters (1863, 1867, 1869, 1871, 1873a, 1873b, 1874, 1877, 1878, 1880, 1882), Peters and Doria (1878), Pyron and Wiens (2011), Ramsay (1878), Regan (2002), Rensch (1936), Reynolds (2007), Richards (1992, 2001, 2002, 2005, 2007a, 2007b), Richards and

Alford (2005), Richards and Iskander (2001, 2006), Richards and Johnston (1993), Richards and Oliver (2006a, 2006b), Richards *et al.* (2006, 2009), Ride *et al.* (1999), Robinson (1993), Rosauer *et al.* (2009), Rowley and Cutajar (2018), Savage (1986), Schneider (1799), Scott (1942), Shaw (1802), Shea and Kraus (2007), Shea and Sadlier (1999), Sonnini de Manoncourt and Latreille (1801), Spencer (1896, 1901), Steindachner (1867), Stejneger (1916), Straughan (1969), Stuart *et al.* (2008), Thomson *et al.* (1996), Tschudi (1838), Tyler (1962, 1963a, 1963b, 1964a, 1964b, 1964c, 1965, 1967 1968a, 1968b, 1968c, 1969, 1971, 1985, 1992), Tyler and Anstis (1975, 1983), Tyler and Davies (1977, 1978, 1979, 1983, 1985, 1986), Tyler and Dobson (1973), Tyler and Knight (2009), Tyler and Martin (1977), Tyler and Parker (1972, 1974), Tyler *et al.* (1972, 1977, 1978a, 1978b, 1981, 1982, 1986, 1994), Van Beurden and McDonald (1980), Vanderduys (2012), Van Kampen (1906, 1909, 1919, 1923), Van Tuijl (1995), Vogt (1912), Wagler (1830), Wandolleck (1910, 1911), Watson *et al.* (1971, 1991), Weijola (2020), Wells and Wellington (1985), Werner (1898, 1901), White *et al.* (1994), White (1970), Wichmann (1912), Wiens *et al.* (2010), Withers (1993, 1995, 1998), Woodruff (1972), Zweifel (1956, 1958, 1960, 1980, 1983) and sources cited therein (duplicitous references not necessarily included).

As already mentioned, live and dead specimens as well as available bone specimens, were examined as was other relevant material, including past climate data for the relevant regions, sea level depths, and other relevant information, the latter being importany aids in establishing divergences between relevant forms and/or likely gene flow between populations currently disjunct.

It goes without saying that at the present time, even after publication of this paper there remain numerous undescribed species within the Australia and New Guinea areas.

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in breach of undertakings to the court (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper.

This is in view of the conservation significance attached to the formal recognition of unnamed taxa at all levels and on the basis that further delays may in fact put these presently unnamed or potentially improperly assigned taxa at greater risk of extinction as outlined by Hoser (2019a, 2019b).

This comment is made noting the extensive increase in human population in Australia and New Guinea, with a conservative forecast of a four-fold increase in human population in the next 100 years (from 25 million to 100 million) in Australia and an even more dramatic increase in New Guinea (both sides) and the general environmental destruction across the continental region as documented by Hoser (1991), including low density areas without a large permanent human population.

I also note the abysmal environmental record of various Australian National, State and Local governments in the relevant part of the Australasian region over the past 200 years as detailed by Hoser (1989, 1991, 1993 and 1996).

RESULTS

The published phylogenies of Frost *et al.* (2006), Pyron *et al.* (2011), Duellman *et al.* (2016) and Bell *et al.* (2017), clearly indicated that Australasian Tree Frogs should be placed in their own family as done by Wells and Wellington (1985) and as done in the title of this paper.

I note that Pyron *et al.* (2011) referred to the relevant group of genera as "Pelodryadinae", which is almost the same thing and clearly indicates that the thinking of Wells and Wellington (1985), some 35 years ago, was not out of whack with the peer reviewed scientific reality or consensus as is often claimed by the Wolfgang Wüster gang of thieves, including via their war cry blog Kaiser *et al.* (2013).

The published phylogenies also indicated a large number of divergent lineages, which in the main coincided with the treatment by Wells and Wellington (1985).

However the coincidence was not exact.

Two of the Wells and Wellington generic placements were not justified on the basis of the phylogeny of Pyron and Weins (2011), but see below.

Furthermore other unnamed lineages beyond those identified or named by Wells and Wellington (1985) were clearly apparent.

The phylogenies of Frost *et al.* (2006), Pyron *et al.* (2011), Duellman *et al.* (2016) and Bell *et al.* (2017) also had significant differences in parts (e.g. for the putative species "*Litoria inermis*"), which immediately drew attention to potential errors in their analysing of material.

Before assigning species to generic groups, it was important to cross-check the phylogenies with the frogs themselves to ensure that they matched and that divergences in published phylogenies reflected the physical differences as well.

Before mentioning generic assignments for relevant species groups, I note that Cogger *et al.* (1983) had published a synonyms list to that date and Wells and Wellington added 12 more names to the collection, all bar one of which were confirmed by myself as properly applied to unnamed species groups as determined herein based on the phylogeny of Pyron and Weins (2011) combined with that of Duellman *et al.* (2016).

I note that Wells and Wellington published at a time when mtDNA and the like were not available to herpetologists to more accurately determine relationships between putative taxa.

As an arbitrary line, I recognized as genera, all phylogenetic groups that could reasonably be estimated to have diverged from nearest common ancestors, well over ten million years back.

This was all 12 of 12 Wells and Wellington groups and 8 previously named genera, as well as those newly named herein (see below).

Because one of the genera named by Wells and Wellington (1985) was a duplicate name for another earlier name, which they overlooked, the Wells and Wellington name is simply synonymised.

When the divergence date number is close to 10 MYA, I have opted for subgenus-level division if the relevant species are morphologically divergent from one another, but in most cases not split the relevant genus.

It explains for example, why the species *Hyla moorei*

Copeland, 1957 is formally partly removed from *Ranoidea* Tschudi, 1838, type species *Ranoidea jacksionensis* Tschudi, 1838 = *Rana aurea* Lesson, 1831 and placed in the subgenus *Sandgroperanura subgen. nov.*.

Burns (2004) and Burns and Crayn (2006) used molecular data to find that the two taxa diverged from one another 10 to 10.8 MYA and Duellman *et al.* (2016) found a divergence of 12.0 MYA for the same groups.

While two generic groupings of Wells and Wellington (1985) associated with the genus *Cyclorana* Steindachner, 1867, type species *Alytes australis* Gray, 1842, were not strongly supported by the phylogeny of Pyron and Weins (2011) as being worthy of genus-level separation, that of Deullman *et al.* (2016), with date calibrations placed both the relevant groups as diverging 11 and 12 MYA from nearest common ancestors and so they are also recognized herein as full genera.

However the genus *Brendanura* Wells and Wellington, 1985, type species *Chiroleptes alboguttatus* Günther, 1867 was named in error as it is in fact an objective junior synonym of *Mitrolysis* Cope, 1889, with the same type species, so the earlier name is used instead.

To make things abundantly clear, there is no cirsumtance within the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), that the name *Brendanura* Wells and Wellington, 1985 can or should be used.

In summary the twenty extant genera (by name) in date order of priority recognized herein are as follows:

Litoria Tschudi, 1838, type species *L. freycineti* Tschudi, 1838.

Ranoidea Tschudi, 1838, type species *Ranoidea jacksionensis* Tschudi, 1838 = *Rana aurea* Lesson, 1831.

Dryopsophus Fitzinger, 1843, type species "*Hyla citropa* Peron" = *Hyla citropa* Dümeril and Bibron, 1841.

Euscelis Fitzinger, 1843, type species *Hyla lesueurii* Dümeril and Bibron, 1841.

Pelodryas Günther, 1858, type species *Rana caerulea* White, 1790.

Cyclorana Steindachner, 1867, type species *Alytes australis* Gray, 1842.

Chirodryas Keferstein, 1867, type species *Chirodryas raniformis* Keferstein, 1867.

Drymomantis Peters, 1882, type species *Drymomantis fallax* Peters, 1882.

Mitrolysis Cope, 1889, type species *Chiroleptes alboguttatus* Günther, 1867.

Nyctimystes Stejneger, 1916, type species *Nyctimantis papua* Boulenger, 1897.

Coggerdonia Wells and Wellington, 1985, type species *Hyla adelaidensis* Gray, 1841.

Colleeneremia Wells and Wellington, 1985, type species *Hyla rubella*, Gray, 1842.

Llewellynura Wells and Wellington, 1985, type species *Hyla dorsalis microbelos* Cogger, 1966.

Mahonabatrachus Wells and Wellington, 1985, type species *Hyla meriana* Tyler, 1969.

Mosleyia Wells and Wellington, 1985, type species *Hyla nannotis* Andersson, 1916.

Neophractops Wells and Wellington, 1985, type species *Chiroleptes platycephalus* Günther, 1873.

Pengilleyia Wells and Wellington, 1985, type species *Litoria tyleri* Martin, Watson, Gartside, Littlejohn and Loftus-Hills, 1979.

Rawlinsonia Wells and Wellington, 1985, type species *Hyla ewingi* Duméril and Bibron, 1841.

Sagunura Wells and Wellington, 1985, type species *Hyla burrowsi* Scott, 1942.

Sandyrana Wells and Wellington, 1985, type species *Hyla infrafrenata* Günther, 1867.

I note in passing that just two of the genera erected by Wells and Wellington in 1985 were even close to the 10 MYA divergence minimum I have arbitrarily set as defining generic assignments.

These are *Neophractops* Wells and Wellington, 1985, type species *Chiroleptes platycephalus* Günther, 1873 and *Brendanura* Wells and Wellington, 1985, type species *Chiroleptes alboguttatus* Günther, 1867, both previously synonymised with *Cyclorana* Steindachner, 1867.

The genus *Euscelis* Fitzinger, 1843 was not recognized by Wells and Wellington (1985), those species being placed by them within *Litoria*.

(Other Wells and Wellington, 1985 genera were shown by Duellman *et al.* (2016) to have diverged from nearest other named genera well over 10 MYA).

The species composition of these above genera is generally as put by Wells and Wellington (1985) and Eipper and Rowland (2018), allowing for newly described forms, except where otherwise indicated in this paper and the synonymies as indicated.

The species groups that are placed in each newly erected genus are often indicated in the original descriptions themselves even without reference to this paper, although all genera are formally defined or redefined herein for the pre-existing named groups.

This was absolutely necessary as, with very few exceptions, these genera have been wholly redefined as per previous concepts in use, including those of Wells and Wellington.

The published phylogenies, including for example Frost *et al.* (2006), Pyron *et al.* (2011), Duellman *et al.* (2016) and Bell *et al.* (2017), wholly corroborate the division of tribes, subtribes, genera and subgenera within this paper and provide an added basis for divisions on the basis of calibrated divergence dates.

Divergent forms formally named as new species herein for the first time are also placed in the relevant proper genus at the same time.

In other words, for the first time ever and in a single paper, this paper formally describes each and every tribe, subtribe, genus and subgenus within the Pelodryadidae.

In terms of the final taxonomic determinations, from which all relevant nomenclature follows, I note the following important points.

Species recognized herein are in the main widely recognized and acknowledged and reflect those taxa seen in the most recent regional field guides such as Cogger (2014), Anstis (2013), Eipper and Rowland (2018) or Menzies (2006), save for more recently

described and named forms which are also included herein.

The justification and basis for naming the new species and subspecies is either self evident or alternatively explained within the relevant descriptions.

I need to note that some of the newly named forms within this paper are separated from other species with minimal morphological divergence, which on the surface may appear unjustified.

I also note that a number of species resurrected from synonymy without specific comment in this paper, appear to have been resurrected from synonymy from forms they are also often morphologically similar or near identical to.

In both these situations, when they occur in this paper, an added and critically important basis for the recognition of these taxa is that in every case the relevant populations are split across biogeographical barriers of known antiquity, confirming the taxonomically distinct nature of each population and warranting species-level division. One such example that arises in this paper on a number of occasions are species pairs split across the central cordillera of New Guinea, which have evidently diverged from one another for millions of years.

Although the nature and antiquity of the relevant biogeographical barriers may not be spelt out in the relevant descriptions in this paper or resurrection of taxa from synonymy in the species lists herein, they are self evident when distributions of the relevant taxa are mapped out.

The preceding is important as it needs to be made known that all taxonomic decisions herein have been made with a body of evidence supporting them and also been subjected to peer review from no less than four other experts in the field of amphibian herpetology.

Each and every species within this paper has been scrutinized in detail and with the benefit of all relevant published material before being determined as valid and at what level of classification, as well as their genus-level assignment based on previously published phylogenies and the morphological evidence from the species themselves.

RELEVANT NUMBERS

Species were determined as being such based on the usual criteria of reproductive isolation from nearest living common ancestor and on the basis that this isolation is ancient.

When the duration of such isolation couldn't be established with certainty of being more than 1.5 MYA, or reasonably assumed not to be, then obviously divergent taxa were conservatively identified as subspecies.

Genera were arranged based on common morphology and divergence.

As a rule, groups of species diverged well over 10 MYA were placed in their own genera, this being in line with similar divisions for other groups of reptiles and frogs in recent reclassifications.

Species groups that were morphologically divergent, but with divergence around the 10 MYA mark were generally placed in subgenera.

At the higher level, tribes were generally determined to exist for genera that diverged from one another more than 25 MYA and subtribes those genera that diverged from one another more than 20 MYA.

These somewhat arbitrary divisions are more conservative (ancient) than adopted by a number of other recent authors, but even with this extreme conservatism, I was able to split the Pelodryadidae into 12 tribes and 11 subtribes.

The use of tribes in classification is important as it keeps relevant species groups contained and is a superior means of dealing with large groups of like genera within a speciose family such as Pelodryadidae.

The order of treatment of taxa in this paper is alphabetical, but by use of the tribe level of classification, closely related genera and species are dealt with together in effectively monophyletic groups.

The use of tribes to divide specious families such as the Pelodryadidae would be a major improvement in popular books and field guides as it would greatly assist in putting accounts of like species together and not interrupted by accounts for wholly dissimilar taxa.

Besides resurrecting dozens of old and available names for genera and species when applicable, this paper also formally names 12 tribes, 11 subtribes, 34 genera, 26 subgenera, 62 species and 12 subspecies for the first time in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

FORMAL DESIGNATION OF A LECTOTYPE IN ACCORDANCE WITH THE *INTERNATIONAL CODE OF ZOOLOGICAL NOMENCLATURE.*

Chiroleptes alboguttatus Günther, 1867 was originally described with two syntypes being from Bowen and Cape York in Queensland.

These specimens are themselves morphologically divergent and so as to remove confusion as to which taxon or specimen the name *Chiroleptes alboguttatus* Günther, 1867 should be applied to, I herein make the Cape York specimen (BMNH 1947.2.20.6-7) as the lectotype.

The syntype from Bowen in Queensland (BMNH 1947.2.18.50-51) herein ceases to have nomenclatural status.

This action is taken in accordance with paragraph 6, and Article 74, including all of 74.1 and 74.73, of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), including this being an "express statement of the taxonomic purpose of the designation", this being to remove potential doubt as to which subspecies or species should retain the name *alboguttatus* Günther, 1867 on the basis of divergence, either morphological or molecular between the two syntype specimens.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

Several people including anonymous peer reviewers who revised the manuscript prior to publication are also thanked as are relevant staff at museums who made specimens and records available in line with international obligations.

In terms of the following formal descriptions of tribes, subtribes, genera, subgenera, species or subspecies, spellings should not be altered in any way for any

purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the *International Commission of Zoological Nomenclature.*

In the unlikely event two newly named tribes, subtribes, genera, subgenera, species or subspecies are deemed to be the same by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

Some material in descriptions for taxa may be repeated for other taxa or groups in this paper and this is necessary to ensure each fully complies with the provisions of the *International Code of Zoological Nomenclature* (Fourth edition) (Ride *et al.* 1999) as amended online since.

In terms of the subtribe or subgenus descriptions, there is usually no corresponding description for the nominate subtribe or subgenus (the nominate one being identified in the relevant description/s).

However these must be assumed as identified and by way of reverse diagnosis of the opposing subtribe/s or subgenus/genera (within those descriptions), thereby making the nominate subtribe or subgenus name also available, and as of the date of publication of this paper (5 June 2020) for nomenclatural purposes in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

That is the nominate subtribes are formally named in this paper, even when not expressly done so in the relevant part.

The same applies with regards to subgenera and nominate subgenera.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 22 May 2020, unless otherwise stated (some downloads are later than 22 May 2020) and were accurate in terms of the context cited herein as of that date.

Unless otherwise stated explicitly, colour descriptions for frogs apply to living adult specimens of generally good health, as seen in normal daytime conditions and not under any form of stress by means such as excessive cool, heat, dehydration or abnormal skin reaction to chemical or other input.

A general reference to “colour” is unless otherwise stated, referring to the dorsal and obvious colouration of the frog on the usually visible surfaces.

Unless otherwise stated, the following applies. Size measurements and ratios quoted herein are for normal adults of normal adult size. Where one number only is given, this is the average measurement. Where two numbers are given in the form of a range, this means “known range” based on previously measured and recorded specimens.

While numerous texts and references were consulted prior to publication of this paper, the criteria used to separate the relevant species has already been spelt out and/or is done so within each formal description and does not rely on material within publications not explicitly cited herein.

Each newly named tribe, subtribe, genus, subgenus, species or subspecies is readily and consistently separable from other similar taxon or group as indicated and that which until now the relevant newly named group or form have been treated as being within.

Delays in recognition of these unique taxa could jeopardise the long-term survival of these taxa as outlined by Hoser (2019a, 2019b) and sources cited therein.

Therefore attempts by taxonomic vandals like the Wolfgang Wüster gang via Kaiser (2012a, 2012b, 2013, 2014a, 2014b) and Kaiser *et al.* (2013) (as frequently amended) to unlawfully suppress the recognition of these taxa on the basis they have a personal dislike for the person who formally named it should be resisted (Dubois *et al.* 2019).

Claims by the Wüster gang against this paper and the descriptions herein will no doubt be no different to those the gang have made previously, all of which were discredited long ago as outlined by Dubois *et al.* (2019), Hoser, (2007, 2009, 2012a, 2012b, 2013a, 2015a-f, 2019a, 2019b) and sources cited therein.

The order of treatment of all the Pelodryadidae within this paper is as follows.

Species are dealt with in clades corresponding to tribes as outlined above.

Under each tribe or subtribe heading are the genus and subgenus descriptions, followed by any relevant species-level descriptions.

Each tribe is dealt with alphabetically herein as are the groups within each.

Each is designated herein as “new”.

However there have been some family level classifications in the past and the following names have been used and are therefore available:

Pelodryadidae Günther, 1858

Cycloraninae Parker, 1940

Nyctimystinae Laurent, 1975

Because tribe is taken as being family-level classification, these three authors may be taken as name authorities for the three relevant tribes formally assigned for the first time as tribes within this paper.

At the end of the genus and species level descriptions the 12 tribes and 11 subtribes are formally described and named. Zoobank numbers for tribes and subtribes are placed with their full descriptions and not in the earlier text of this paper.

The diagnostic information for the tribes wholly reflects that of component genera and this means that persons only interested in species or genus-level classification need not read the formal tribe descriptions, but can ascertain tribe placement from the relevant accounts earlier in the paper.

After the references cited list is a full species list for the Pelodryadidae.

Acronyms used in descriptions in this paper, unless otherwise stated, are as follows:

(SV) (S-V): Snout to vent length. The distance between the anterior tip of the snout and the superior margin of the cloacal aperture.

(HL): Head length. Distance between the tip of the snout and the posterior margin of the tympanum, including the

tympanic annulus.

(HW): Head width. The greatest width of the head, usually recorded at a level with the tympana.

(E-N): Eye to naris distance. The distance between the anterior margin of the eye and the posterior margin of the naris.

(IN): Internarial span: The minimum distance separating the nares.

(ED): Eye diameter: The distance between the anterior and posterior corners.

(TD): Tympanum diameter. In the vast majority of specimens of most species the tympanum is circular and the horizontal diameter, measured to the outer margins of the tympanic annulus, is taken as the standard measurement.

(TL): Tibia length. The length of the tibia measured from the convex surface of the knee to the tibio-tarsal joint, with the knee held in the flexed position.

(RL/SVL): Rostral length/snout-vent length.

(HW/SVL): Head width measured as transverse distance between tympanum/snout-vent length from vent to tip of snout.

(EYE/SVL) (E/SV); Horizontal eye diameter/snout-vent length from vent to tip of snout.

(TL/SVL) (TL/SV): Tibia length/snout-vent length from vent to tip of snout.

(TYM/SVL): Horizontal tympanum diameter/snout-vent length from vent to tip of snout.

(4TD/SVL): Transverse diameter of toe four disc/snout-vent length from vent to tip of snout.

(3FD/SVL): Transverse diameter of finger three disc/ snout-vent length from vent to tip.

CONSERVATION OF RELEVANT SPECIES AND GENERA

In terms of the conservation outlook for the relevant species and genera, the outlook is generally not good, as detailed in Hoser (1991), the comments being as relevant in 2020 as they were in 1991, if not more so.

With a few exceptions, most species of frogs are regarded as being in serious decline and at risk of extinction, with primary blame being placed on the Australian government, State governments and likewise for Papua New Guinea and Indonesia.

In particular via the actions of the State wildlife departments and their steadfast refusal to enact proper captive breeding programs for the relevant taxa in any meaningful way, this means that many species face an inevitable path towards extinction, due to this direct action and other human caused threats.

The long term overpopulation of the Australia with feral humans (Saunders, 2019) does not auger well for the long term survival of many of the relevant species in Australia!

In line with the Australian Federal Government's "Big Australia" policy, that being to increase the human population of 25 million (2020), from 13 million in around 1970, to over 100 million within 100 years "so that we can tell China what to do", as stated by the former Prime Minister, Kevin Rudd in 2019 (Zaczek 2019), the human pressure on the relevant ecosystems has increased in line with the human populations nearby and will clearly continue to do so.

The conservation situation for frogs in New Guinea and offshore islands is even more dire and again gives justification and urgency for the naming of hitherto unnamed species in the Australasian region.

According to the website https://www.worldometers.info Papua New Guinea claimed a population of nearly 9 million people in 2020.

This is up from just over 2 million in 1955, more than a 4 fold rise in 65 years.

In that time Papua New Guinea has been converted from largely untouched jungle to mainly heavily cleared and or generally vandalized habitat, with an ever decreasing amount of native wildlife.

The pace of habitat destruction is getting faster, year on year.

The destruction on the Indoensian side of New Guinea is of similar scale, but at the moment coming from a lower population base.

In 1990 there were 385,509 people in the Indonesian province of Irian Jaya. This has nearly tripled in 30 years to be about 1 million in 2020.

Transnational companies clearing land for agriculture and deforestation to satisfy insatiable global demand makes up for any lack of local people doing environmental damage just in their quest to stay alive and satisfy daily needs.

In any event, 1 million people in 2020 is likely to multiply to at least 4 million in 65 years and 16 million in 130 years and 72 million people in less than 200 years!

And this assumes no mass immigration from other even more overpopulated parts of the planet!

All in a land area of just 126,093 square kilometres.

The ecological disaster evolving on the island of New Guinea over just a few human life spans is a disaster of biblical proportions.

Even in 2020, in some areas near Port Moresby, Papua New Guinea, streams that 30 years ago were pristine and full of a diverse array of frogs are now nothing more than open sewers taking run off from the homes of increasing numbers of people living in third-world poverty and squalor.

Humans are literally an ecological plague in both Australia and New Guinea and the non-stop population explosion must be arrested with urgency.

The globalisation of trade has also globalized the spread of pathogens that has already had devastating effects on amphibian populations worldwide including in particular in New South Wales and Queensland, Australia (Hoser 1991, Anstis 2013).

Some species with the Pelodryadidae have gone from abundant and at "no extinction risk" to "rare" or "critically endangered" within two decades due to a deadly fungus and such calamities are more likely as the human impact increases.

Put simply, all other "conservation" efforts pale into insignificance when tallied against the benefits of stopping human population growth.

In the material that follows, there is generally no mention of conservation aspects relevant to the given species or genera, but all the preceding is invariably relevant.

ADELYNHOSERHYLEINI TRIBE NOV.

ADEYLNHOSERHYLEA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:67AA47F1-D600-47B8-8096-E4D768EFBF8B

Type species: *Adelynhoserhylea adelynhoserae sp. nov.*

Diagnosis: Species of tree frogs within the genus *Adelynhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. A conspicuous serrated ridge along the forearm and another along the hind edge of the foot. The morphologically similar genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion is readily separated from *Adelynhoserhylea gen. nov.* by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along the outer edge of the fore and hind-limbs, this always being either reduced or absent.

Frogs within the subgenus *Yikesanura subgen. nov.* are readily separated from other species in the nominate subgenus *Adelynhoserhylea subgen. nov.* by having a large triangular skin flap on each heel and a call that is a series of short growls, as opposed to a small skin flap in the form of a tubercle or short spine on each heel and a call that ranges from a series of soft ticks to a faster-paced series of “tocs” in the nominate subgenus.

According to Duellman *et al.* (2016), the species within this genus diverged from their nearest living relatives in the genus *Jackyhoserhylea gen. nov.* 20.2 MYA. According to Duellman *et al.* (2016), the subgenus *Yikesanura subgen. nov.* diverged from their nearest living relatives in the nominate subgenus *Adelynhoserhylea subgen. nov.* 17 MYA.

Distribution: Frogs of the genus *Adelynhoserhylea gen. nov.* are confined to New Guinea and Cape York, Queensland, Australia.

Etymology: *Adelynhoserhylea gen. nov.* is named in honour of Adelyn Hoser, the eldest daughter of this author in recognition of over 21 years of services with Australia’s best reptiles shows, educating others about Australian wildlife and their conservation.

The latter part of the genus name reflects that the species are tree frogs.

Content: *Adelynhoserhylea adelynhoserae sp. nov.* (type species); *A. eucnemis* (Lönnberg, 1900); *A. exophthalmia* (Tyler, Davies and Aplin, 1986); *A. myola* (Hoskin, 2007); *A. serrata* (Andersson, 1916); *A. yikes sp. nov.*.

YIKESANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:3BD043A9-2198-403E-8694-873EEAC963B9

Type species: *Adelynhoserhylea yikes sp. nov.*

Diagnosis: The subgenus *Yikesanura subgen. nov.* includes all species within the group of species associated with the putative taxon originally described as *Hyla eucnemis* Lönnberg, 1900.

These include the *Adelynhoserhylea eucnemis* (Lönnberg, 1900) species complex as well as the Australian species formally named within this paper as *A. yikes sp. nov.* being until now treated as Australian populations of *A. eucnemis.*

Frogs within the subgenus *Yikesanura subgen. nov.* are readily separated from other species in the nominate subgenus *Adelynhoserhylea gen. nov.* by having a large triangular skin flap on each heel and a call that is a series of short growls, as opposed to a small skin flap in the form of a tubercle or short spine on each heel and a call that ranges from a series of soft ticks to a faster-paced series of “tocs” in the nominate subgenus.

Species of tree frogs within the genus *Adelynhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. A conspicuous serrated ridge along the forearm and another along the hind edge of the foot. The morphologically similar genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion is readily separated from *Adelynhoserhylea subgen. nov.* by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along the outer edge of the fore and hind-limbs, this always being either reduced or absent.

Distribution: Frogs of the subgenus *Yikesanura subgen. nov.* are confined to New Guinea and Cape York, Australia.

Etymology: When visiting an extended family of Muluridji, the native Aboriginal tribe from the Mount Carbine area of far north Queensland, Australia in 2017, I showed them a specimen of the species named herein as *Adelynhoserhylea* (*Yikesanura*) *yikes sp. nov.* and all the females in the group yelled out “Yikes” and backed away in fear.

Hence the subgenus and species (*yikes sp. nov.*) names.

Content: *Adelynhoserhylea* (*Yikesanura*) *yikes sp. nov.* (type species); *A.* (*Yikesanura*) *eucnemis* (Lönnberg, 1900).

ADELYNHOSERHYLEA* (*ADELYNHOSERHYLEA*) *ADELYNHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:4954BEF5-386D-49BB-B558-924C5113DE68

Holotype: A preserved male specimen in the South Australian Museum, Adelaide, South Australia, Australia, specimen number R41068 collected at Mount Lewis, in far North Queensland, Australia, Latitude -16.58 S., Longitude 145.28 E.

This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, as follows:

1/ Specimen number J25175 collected at Mount Finnigan National Park, Queensland, Australia, Latitude -15.8194 S. Longitude 145.2806 E.

2/ Specimen number J27274 collected at Horans Gully, Mount Finnigan, Queensland, Australia, Latitude -15.8333 S., Longitude 145.2667 E.

3/ Specimen number J87041 collected at Little Stony

Creek, Grey Range, Queensland, Australia, Latitude -15.854 S., Longitude 145.211 E.

Diagnosis: Until now the species *Adelynhoserhylea adelynhoserae sp. nov.* has been treated as a northern population of *A. serrata* (Andersson, 1916). Richards *et al.* (2010) confirmed the presence of two species within "*Litoria serrata*" as recognized by them. The division of the north and south wet tropics populations is across the well-known Black Mountain corridor or barrier (or Gap) as detailed in Hoser (2020c).

The type locality/ies of *A. serrata* is Carrington (Malanda) and Atherton, both in the southern wet tropics of North Queensland. There are no available names for the north wet tropics population which is why it is formally named herein.

A. adelynhoserae sp. nov. would key out as "*Litoria serrata*" in both Anstis (2013) and Cogger (2014). The species *A. adelynhoserae sp. nov.* is readily separated from *A. serrata* by a significantly greater preponderance of green on the body as compared to *A. serrata* which is generally a reddish-brown frog, even when green markings are taken into consideration.

The two species are readily separated as follows:

Green pigment reaches the tip of the snout in *A. adelynhoserae sp. nov.* but not in *A. serrata.*

By day, adult *A. adelynhoserae sp. nov.* have a well-defined dark stripe running from the eye (very narrow at start, before abruptly widening), through the entire tympanum and towards the axilla of the forelimb. By contrast in *A. serrata* the line is usually absent, or if present ill defined or indistinct.

Adult *A. serrata* invariably have a distinct and noticeable blueish green upper iris area, which while present in *A. adelynhoserae sp. nov.* is somewhat indistinct in most, but not all specimens.

Scattered tubercles on the upper forearms of *A. serrata* are somewhat pointed or jagged, versus slightly blunted in *A. adelynhoserae sp. nov.*. The lower iris of *A. serrata* is orange, versus brown in *A. adelynhoserae sp. nov.*. The tip of the snout of *A. serrata* is either dark or heavily peppered, versus light or not heavily peppered in *A. adelynhoserae sp. nov.*. Dark markings or cross bands occupy less than half the surface area of the upper surface of the rear hind leg below the knee in *A. adelynhoserae sp. nov.* versus more than half in *A. serrata.*

The lower flanks of *A. serrata* are yellowish in colour, versus whitish in *A. adelynhoserae sp. nov.*.

Both *A. serrata* and *A. adelynhoserae sp. nov.* are readily separated from the other species in the genus *Adelynhoserhylea gen. nov.* by the call of the males which is a slow to barely medium paced "tic", versus a very fast paced series of "tics" or "tocs" or series of short growls as in all the other species.

Species of tree frogs within the genus *Adelynhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. A conspicuous serrated ridge along the forearm and another along the hind edge of the foot. The morphologically similar genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion is readily separated from *Adelynhoserhylea gen. nov.* by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along the outer edge of the fore and hind-limbs, this always being either reduced or absent.

Frogs within the subgenus *Yikesanura subgen. nov.* are readily separated from other species in the nominate subgenus *Adelynhoserhylea subgen. nov.* by having a large triangular skin flap on each heel and a call that is a series of short growls, as opposed to a small skin flap in the form of a tubercle or short spine on each heel and a call that ranges from a series of soft ticks to a faster-paced series of "tocs" in the nominate subgenus.

A photos of *A. serrata* in life can be found in Vanderduys (2012) on page 70 at bottom right, with a photo of *A. adelynhoserae sp. nov.* on the same page on the left.

Photos of both species in life can also be seen in Anstis (2013) at page 306 with *A. serrata* on top right and *A. adelynhoserae sp. nov.* in the other two images.

Dozens of images of both taxa can be found online at: http://www.flickr.com

Distribution: *A. adelynhoserae sp. nov.* is an endemic from the northern wet tropics of far north Queensland, Australia, in a region of coastal ranges between Mount Lewis Lat. -16.583 S., Longitude 145.283 E. in the south and Endeavour River, Cape York Peninsula, Latitude -15.47 S., Longitude 145.25 E. in the north.

A. serrata is therefore restricted to mountainous areas between Cairns in the North and Mount Spec, Paluma Range in the south.

Etymology: The newly named species *A. adelynhoserae sp. nov.* is named in honour of Adelyn Hoser, the eldest daughter of this author in recognition of over 21 years of services with Australia's best reptiles shows, educating others about Australian wildlife and their conservation.

ADELYNHOSERHYLEA* (*YIKESANURA*) *YIKES SP. NOV.

LSIDurn:lsid:zoobank.org:act:DB7788A3-73F9-4A65-9EDE-12AA33B90B36

Holotype: A preserved male specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J67706 collected at the Upper Peach Creek in the McIlwraith Range on Cape York, Queensland, Australia, Latitude -13.73 S. Longitude 143.3361 E.

This government-owned facility allows access to its holdings.

Paratypes: Thirteen preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J60905, J67703, J67714, J70581, J70588, J70599, J70600, J74444, J74447, J74452, J74454, J74457 and J86917 all from within 10 km of the type locality, being the Upper Peach Creek in the McIlwraith Range on Cape York, Queensland, Australia, Latitude -13.73 S. Longitude 143.3361 E.

Diagnosis: Until now the species *Adelynhoserhylea* (*Yikesanura*) *yikes sp. nov.* has been treated as an Australian population of the species *A. eucnemis* (Lönnberg, 1900) with a type locality in New Guinea,

known in most texts as "*Litoria eucnemis*" (e.g. Cogger 2014, Anstis 2013), or alternatively as "*Ranoidea eucnemis* " (e.g. at https://amphibiansoftheworld.amnh.org/Amphibia/Anura/Pelodryadidae/Pelodryadinae/Ranoidea/Ranoidea-eucnemis) or "*Dryopsophus eucnemis*" (Duellman *et al*. 2016).

With a divergence of more than 20 MYA from all three above-named genera, based on the results of Duellman *et al*. 2016, it is clear that a separate genus was warranted for this putative taxon and nearest relatives and hence the formal erection of *Adelynhoserhylea gen. nov.*.

A. yikes sp. nov. would key out as *A. eucnemis* in both Cogger (2014) and Anstis (2013) and is morphologically very similar to that species.

A. yikes sp. nov. is however readily separated from *A. eucnemis* by having an iris that is dominantly orange in colour, versus yellow-gold in *A. eucnemis.* The flared skin folds or tubercles on the lower hind feet and rear of front limbs are extremely large and prominent in *A. eucnemis* versus only moderately so in *A. yikes sp. nov.*. The webbing between the first and second toe reaches the disc in *A. yikes sp. nov.* but not quite so in *A. eucnemis.* While colour of both species varies significantly, Australian *A. yikes sp. nov.* are invariably a mainly a yellow to yellow brown colour dorsally, whereas *A. eucnemis* from New Guinea is dominantly a green colouration on top with brown or beige spots, blotches, flecks or peppering.

A. yikes sp. nov. is depicted in life in photos in Vanderduys (2012) on page 39, bottom left, Anstis (2013) on page 195 (all photos), Cogger (2014) on page 163 (both images) and Eipper (2018) on page 129 (top image).

A. eucnemis is depicted in life in Menzies (1976) plate 5 at bottom right, Menzies (2016) colour photo 48 and Richards *et al*. (2010), Figure 4A.

A. eucnemis (Lönnberg, 1900) is believed to be a species complex. *Hyla rhacophorus* Van Kampen, 1909, Type locality: "Etna Bai", Papua, New Guinea, Indonesia, and *Nyctimystes loveridgei* Neill, 1954 Type locality: "small stream near Taburi, a native village about 2 miles southeast of Rouna Fall, [Southeast Peninsula,] Papua [New Guinea]" are available names for two populations. However the molecular results of Richards *et al*. (2010) were ambiguous and so both are tentatively treated as synonyms herein.

A. yikes sp. nov. and *A. eucnemis*, consisting the subgenus *Yikesanura subgen. nov.* are readily separated from other species in the nominate subgenus *Adelynhoserhylea gen. nov.* by having a large triangular skin flap on each heel and a call that is a series of short growls, as opposed to a small skin flap in the form of a tubercle or short spine on each heel and a call that ranges from a series of soft ticks to a faster-paced series of "tocs" in the nominate subgenus.

Species of tree frogs within the genus *Adelynhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. A conspicuous serrated ridge along the forearm and another along the hind edge of the foot. The morphologically similar genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion is readily separated from *Adelynhoserhylea subgen. nov.* by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along the outer edge of the fore and hind-limbs, this always being either reduced or absent.

Distribution: As far is is known, this taxon is restricted to isolated pockets on Cape York Peninsula, far north Queensland, Australia.

Etymology: As for the subgenus *Yikesanura subgen. nov.*.

JACKYHOSERHYLEA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:D57B03A7-9A0C-4BCD-B47E-D31BC69567FA

Type species: *Hyla genimaculata* Horst, 1883.

Diagnosis: The genus *Jackyhoserhylea gen. nov*. includes all the frogs in the *Hyla genimaculata* Horst, 1883 species complex.

The putative species *Hyla genimaculata* Horst, 1883, has been treated by most authors since as being within the genus *Litoria* Tschudi, 1838 (e.g. Anstis 2013, Cogger 2014), although also sometimes placed within *Ranoidea* Tschudi, 1838 (e.g. https://amphibiansoftheworld.amnh.org/Amphibia/Anura/Pelodryadidae/Pelodryadinae/Ranoidea/Ranoidea-genimaculata), or even *Dryopsophus* Fitzinger, 1843 (e.g. Duellman *et al.* 2016).

It is in fact so divergent from the types of each of those genera, that there is no logical alternative but to place the taxon within a separate genus.

According to Duellman *et al.* (2016), this putative species has a 20.2 MYA divergence from its nearest relatives (being *Adelynhoserhylea gen. nov.*) and due to significant morphological divergence, it makes sense for it to be placed within a newly erected genus as done herein.

That the putative species is composite has been known for many years (e.g. Richards *et al.* 2010) and this paper formally names two of them for the first time, meaning this newly erected genus currently has three species, although this number may well expand.

Species of tree frogs within the genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers only partly webbed and not with conspicuous webbing that would reach at least as far as the base of the penultimate phalanx of the fourth finger. The serrated ridge along the forearm and another along the hind edge of the foot is either reduced or absent, body length (head to end of back) is less than 52 mm.

The genus *Jackyhoserhylea gen. nov.* is readily separated from the morphologically similar genus *Adelynhoserhylea gen. nov.* by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along

the outer edge of the fore and hind-limbs, this always being either reduced or absent.

Species of tree frogs within the genus *Adelynhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. A conspicuous serrated ridge along the forearm and another along the hind edge of the foot body length less than 72 mm.

Frogs within the subgenus *Yikesanura subgen. nov.* are readily separated from other species in the nominate subgenus *Adelynhoserhylea subgen. nov.* by having a large triangular skin flap on each heel and a call that is a series of short growls, as opposed to a small skin flap in the form of a tubercle or short spine on each heel and a call that ranges from a series of soft ticks to a faster-paced series of “tocs” in the nominate subgenus.

In further detail, all three species, *J. ernieswilei sp. nov*., *J. jackyhoserae sp. nov*. and *J. genimaculata* being the entirety of the genus *Jackyhoserhylea gen. nov.* are further separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

A very high E-N/IN ratio (1.250-1.585), crenulated dermal folds on the posterior surfaces of the forearms and tarsus and a very small, triangular dermal appendage on the heel. Adult males have a snout to vent length of 30-41 mm and adult females 40-52 mm.

The head is flattened and longer than broad (HL/HW 1.055-1.103), its length more than one-third of the snout to vent length (HL/S-V 0.350-0.404).

The snout is high; when viewed from above and in profile it is truncate or very slightly rounded. The nostrils are lateral, their distance from the end of the snout considerably less than that from the eye.

The distance between the eye and the naris is greater than the internarial span (E-N/IN 1.250-1.585). The canthus rostralis is prominent and slightly curved. The eye is large, its diameter slightly greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to from one-quarter to almost two-thirds of the eye diameter. The vomerine teeth are in two oval series situated between and extending slightly below the level of the choanae. The tongue is small and broadly cordiform, with a slightly indented posterior border.

The fingers are long and slender with very narrow lateral fringes. In decreasing order of length 3>4>2>1. The webbing on the fourth finger reaches the sub-articular tubercle at the base of the penultimate phalanx. The terminal discs are moderate to conspicuous.

The hind limbs are long and slender with a TL/S-V ratio of 0.516-0.613. Toes in decreasing order of length 4>5=or>3>2>1. The fourth and first toes are webbed to the sub-articular tubercles at the base of the penultimate phalanx, and the remainder are webbed to the base of the terminal discs.

The skin on the dorsal surfaces is smooth or very finely tubercular.

There is a very narrow supra-tympanic fold extending from the eye to a point above the insertion of the forelimbs. The upper margin of the tympanic annulus is occasionally hidden beneath this fold. On the posterior surfaces of the

forearm and tarsus are single rows of triangular dermal appendages. These are acutely pointed on the forearm and obtusely pointed on the tarsus. There is a very small triangular dermal appendage on the heel, and a few prominent tubercles around the anus. The throat is tubercular, and the chest, abdomen and the lower surface of the thighs granular.

Males possess a sub-gular vocal sac and there is a small nuptial pad on the inner surface of the first finger.

According to Duellman *et al*. (2016), the species within this genus (*Jackyhoserhylea gen. nov.*) diverged from their nearest living relatives in the genus *Adelynhoserhylea gen. nov.* 20.2 MYA. According to Duellman *et al*. (2016), the subgenus *Yikesanura subgen. nov.* diverged from their nearest living relatives in the nominate subgenus *Adelynhoserhylea subgen. nov.* 17 MYA.

Distribution: New Guinea, including north and south of the central cordillera as well as on nearby offshore islands, at least as far west as Pulau Gebe, the type locality for *J. genimaculata* (Horst, 1883).

Etymology: *Jackyhoserhylea gen. nov.* is named in honour of Jacky Hoser, the youngest daughter of this author in recognition of over 18 years of services with Australia’s best reptiles shows, educating others about Australian wildlife and their conservation.

Content: *Jackyhoserhylea genimaculata* (Horst, 1883); *J. ernieswilei sp. nov*.; *J. jackyhoserae sp. nov*..

JACKYHOSERHYLEA ERNIESWILEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:A0559864-890B-498E-B844-3DB810C95C97

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138, United States of America, specimen number MCZ Herp A-109000 collected from Weiana, Gold Province, Papua New Guinea, Latitude -6.7626811 S., Longitude 144.875 E.

This facility allows access to its holdings.

Paratypes: Seven preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138, United States of America, specimen number MCZ Herp A-109001- A-109007 collected from Weiana, Gulf Province, Papua New Guinea, Latitude -6.7626811 S., Longitude 144.875 E.

Diagnosis: *Jackyhoserhylea jackyhoserae sp. nov*. from Madang and *J. ernieswilei sp. nov*. from the Huon Peninsula south-east and including the Gulf Province of Papua New Guinea, south of the central cordillera have until now been treated as populations of *Jackyhoserhylea genimaculata* (Horst, 1883), with a type locality of Pulau Gebe and a range extending east through nearby islands along the northern side of New Guinea in Irian Jaya to north-west Papua New Guinea.

All three morphologically similar frogs would have been identified as *Hyla genimaculata* as defined and diagnosed by Tyler (1968).

The three species are however separated from one another as follows:

J. genimaculata is a light brownish to beige coloured frog with minimal obvious markings on the body or head. The flanks and nearby underbelly are bright yellowish in colour and this often runs onto the limbs. The serrated edges at the back of the forearm and feet are moderate. Upper iris is yellow and lower iris is orange.

J. jackyhoserae sp. nov. is a frog with a mottled dorsum being a mix of yellowish and brown, again with flanks and nearby underbelly being bright yellowish in colour and often running onto the limbs. The serrated edges at the back of the forearm and feet are reduced as compared to *J. genimaculata.* The iris is generally orange top and bottom with a slight blue tinge at the very edge of top and bottom.

J. ernieswilei sp. nov. has green and brown on the dorsum which becomes yellow on the flanks and whitish below. There are scattered tiny tubercles on the dorsal surface, including most of the time a distinct small pointed one on top of either eye. The top of the iris is yellow and the bottom brown. The serrated edges at the back of the forearm and feet are expanded and the folds tend to merge.

J. jackyhoserae sp. nov. is separate to the other two species in that the front toe pads are much wider than the digits, versus only marginally so in each of the other species.

All three species, *J. ernieswilei sp. nov*., *J. jackyhoserae sp. nov*. and *J. genimaculata* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

A very high E-N/IN ratio (1.250-1.585), crenulated dermal folds on the posterior surfaces of the forearms and tarsus and a very small, triangular dermal appendage on the heel. Adult males have a snout to vent length of 30-41 mm and adult females 40-52 mm.

The head is flattened and longer than broad (HL/HW 1.055-1.103), its length more than one-third of the snout to vent length (HL/S-V 0.350-0.404). The snout is high; when viewed from above and in

profile it is truncate or very slightly rounded. The nostrils are lateral, their distance from the end of the snout considerably less than that from the eye.

The distance between the eye and the naris is greater than the internarial span (E-N/IN 1.250-1.585). The canthus rostralis is prominent and slightly curved. The eye is large, its diameter slightly greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to from one-quarter to almost two-thirds of the eye diameter. The vomerine teeth are in two oval series situated between and extending slightly below the level of the choanae. The tongue is small and broadly cordiform, with a slightly indented posterior border.

The fingers are long and slender with very narrow lateral fringes. In decreasing order of length 3>4>2>1. The webbing on the fourth finger reaches the sub-articular tubercle at the base of the penultimate phalanx. The terminal discs are moderate to conspicuous.

The hind limbs are long and slender with a TL/S-V ratio of 0.516-0.613. Toes in decreasing order of length 4>5=or>3>2>1. The fourth and first toes are webbed to the sub-articular tubercles at the base of the penultimate phalanx and the remainder are webbed to the base of the terminal discs.

The skin on the dorsal surfaces is smooth or very finely tubercular. There is a very narrow supra-tympanic fold extending from the eye to a point above the insertion of the forelimbs. The upper margin of the tympanic annulus is occasionally hidden beneath this fold. On the posterior surfaces of the

forearm and tarsus are single rows of triangular dermal appendages. These are acutely pointed on the forearm and obtusely pointed on the tarsus. There is a very small triangular dermal appendage on the heel and a few prominent tubercles around the anus. The throat is tubercular and the chest, abdomen and the lower surface of the thighs granular.

Males possess a sub-gular vocal sac and there is a small nuptial pad on the inner surface of the first finger.

But in summary, species of tree frogs within the genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers only partly webbed and not with conspicuous webbing that would reach at least as far as the base of the penultimate phalanx of the fourth finger. The serrated ridge along the forearm and another along the hind edge of the foot is either reduced or absent, body length (head to end of back) is less than 52 mm.

The genus *Jackyhoserhylea gen. nov.* is readily separated from the morphologically similar genus *Adelynhoserhylea gen. nov.* by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along the outer edge of the fore and hind-limbs, this always being either reduced or absent.

Distribution: *J. ernieswilei sp. nov*. is a species from the Gulf Province of Papua New Guinea and appears to be found elsewhere south of central cordillera of New Guinea as well as north of the cordillera in south-east Papua New Guinea east of the Huon Peninsula.

Etymology: Named in honour of Ernest Swile of Cape Town in South Africa in recognition for his services to wildlife conservation through assisting this author's team in our research activities on African wildlife, in particular with the venomous snakes including Cobras and Vipers.

JACKYHOSERHYLEA JACKYHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:75774B36-DF46-4163-A80B-3D76E6D651D7

Holotype: A preserved male specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM 12422 (also in register as 12233) collected from 1km south west of Markham Point, on the Lae to Wau Road, Madang Province, Papua New Guinea.

This facility allows access to its holdings.

Diagnosis: *Jackyhoserhylea jackyhoserae sp. nov*. from Madang and *J. ernieswilei sp. nov*. from the Huon Peninsula south-east and including the Gulf Province of Papua New Guinea, south of the central cordillera have

until now been treated as populations of *Jackyhoserhylea genimaculata* (Horst, 1883), with a type locality of Pulau Gebe and a range extending east through nearby islands along the northern side of New Guinea in Irian Jaya to north-west Papua New Guinea.

All three morphologically similar frogs would have been identified as *Hyla genimaculata* as defined and diagnosed by Tyler (1968).

The three species are however separated from one another as follows:

J. genimaculata is a light brownish to beige coloured frog with minimal obvious markings on the body or head. The flanks and nearby underbelly are bright yellowish in colour and this often runs onto the limbs. The serrated edges at the back of the forearm and feet are moderate. Upper iris is yellow and lower iris is orange.

J. jackyhoserae sp. nov. is a frog with a mottled dorsum being a mix of yellowish and brown, again with flanks and nearby underbelly being bright yellowish in colour and often running onto the limbs. The serrated edges at the back of the forearm and feet are reduced as compared to *J. genimaculata.* The iris is generally orange top and bottom with a slight blue tonge at the very edge of top and bottom.

J. ernieswilei sp. nov. has green and brown on the dorsum which becomes yellow on the flanks and whitish below. There are scattered tiny tubercles on the dorsal surface, including most of the time a distinct small pointed one on top of either eye. The top of the iris is yellow and the bottom brown. The serrated edges at the back of the forearm and feet are expanded and the folds tend to merge.

J. jackyhoserae sp. nov. is separate to the other two species in that the front toe pads are much wider than the digits, versus only marginally so in each of the other species.

All three species, *J. ernieswilei sp. nov*., *J. jackyhoserae sp. nov*. and *J. genimaculata* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

A very high E-N/IN ratio (1.250-1.585), crenulated dermal folds on the posterior surfaces of the forearms and tarsus and a very small, triangular dermal appendage on the heel. Adult males have a snout to vent length of 30-41 mm and adult females 40-52 mm.

The head is flattened and longer than broad (HL/HW 1.055-1.103), its length more than one-third of the snout to vent length (HL/S-V 0.350-0.404). The snout is high; when viewed from above and in

profile it is truncate or very slightly rounded. The nostrils are lateral, their distance from the end of the snout considerably less than that from the eye.

The distance between the eye and the naris is greater than the internarial span (E-N/IN 1.250-1.585). The canthus rostralis is prominent and slightly curved. The eye is large, its diameter slightly greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to from one-quarter to almost two-thirds of the eye diameter. The vomerine teeth are in two oval series situated between and extending slightly below the level of the choanae. The tongue is small and broadly cordiform, with a slightly indented posterior border.

The fingers are long and slender with very narrow lateral fringes. In decreasing order of length 3>4>2> 1. The webbing on the fourth finger reaches the sub-articular tubercle at the base of the penultimate phalanx. The terminal discs are moderate to conspicuous.

The hind limbs are long and slender with a TL/S-V ratio of 0.516-0.613. Toes in decreasing order of length 4>5=or>3>2>1. The fourth and first toes are webbed to the sub-articular tubercles at the base of the penultimate phalanx, and the remainder are webbed to the base of the terminal discs.

The skin on the dorsal surfaces is smooth or very finely tubercular. There is a very narrow supra-tympanic fold extending from the eye to a point above the insertion of the forelimbs. The upper margin of the tympanic annulus is occasionally hidden beneath this fold. On the posterior surfaces of the

forearm and tarsus are single rows of triangular dermal appendages. These are acutely pointed on the forearm and obtusely pointed on the tarsus. There is a very small triangular dermal appendage on the heel, and a few prominent tubercles around the anus. The throat is tubercular, and the chest, abdomen and the lower surface of the thighs granular.

Males possess a sub-gular vocal sac and there is a small nuptial pad on the inner surface of the first finger.

But in summary, species of tree frogs within the genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present. Fingers only partly webbed and not with conspicuous webbing that would reach at least as far as the base of the penultimate phalanx of the fourth finger. The serrated ridge along the forearm and another along the hind edge of the foot is either reduced or absent, body length (head to end of back) is less than 52 mm.

The genus *Jackyhoserhylea gen. nov.* is readily separated from the morphologically similar genus *Adelynhoserhylea gen. nov.* by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along the outer edge of the fore and hind-limbs, this always being either reduced or absent.

Distribution: *Jackyhoserhylea jackyhoserae sp. nov*. is currently known only from Northern Papua New Guinea in the general region of Madang, generally west of the Huon Peninsula.

Etymology: The species *Jackyhoserhylea jackyhoserae sp. nov*. is named in honour of Jacky Hoser, the youngest daughter of this author in recognition of over 19 years of services with Australia's best reptiles shows, educating others about Australian wildlife and their conservation.

LEUCODIGIRANINA SUBTRIBE NOV.

LEUCODIGIRANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:919C4E4C-C489-44FE-9D13-E880D94935C1

Type species: *Litoria andiirrmalin* McDonald, 1997.

Diagnosis: The monotypic species compring the entirety

of the genus *Leucodigirana gen. nov.* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Brown to golden brown across most of the dorsum, the body and limbs with numerous scattered dark or light brown spots and blotches, among which are usually smaller pale brown or cream spots and blotches. Venter is white and lower flanks greyish-white, often with brown under the throat. Axilla and groin are flesh coloured. Hind side of thighs is mottled with pale and dark brown. Skin is smooth to leathery above and granular on the venter. Vomerine teeth are present and between the choanae. There is no pectoral fold. There is no enlarged tubercle or crenulated ridge along the hind edge of the forearm. Finger and toe discs are large. Fingers lack webbing and toes are nearly completely webbed, with webbing reaching the base of the penultimate phalanx of the fourth toe. There is a prominent inner metatarsal tubercle and no outer one. Heel of adpressed hind limb goes well beyond the eye. Tympanum is large and obvious, with a well-developed supratympanic fold. Above this, there is a semidistinct beige coloured stripe, extending to form broken blotches along a line running along the margin of the upper flank. This is not however in the form of a distinct, well marked whitish stripe. There is also no pale line along the posterior edge of the upper jaw, although this region of the head is usually a light bluey, purplish grey in colour. Second finger is much longer than the first, the tip of the first finger goes no further than the base of the disc of the second finger when they are pressed togeather. Males get to 80 mm in body length and females 100 mm.

Duellman *et al.* (2016) found that the type species for this monotypic genus diverged from its nearest living relative 23.5 MYA. Being morphologicaly divergent from the nearest living relatives in the genus *Euscelis* Fitzinger, 1843, the case for the erection of the new genus *Leucodigirana gen. nov.* was compelling.

Distribution: Known only from the type locality, being the Melville Range at Cape Melville, Cape York Peninsula, far north Queensland.

Etymology: The name *leucodigirana* literally means white toed frog, in reference to the usual character state of adults, in particular with reference to the discs which are a distinctive white colour.

“Rana” means frog.

Content: *Leucodigirana andiirrmalin* (McDonald, 1997) (monotypic).

***EUSCELIS* FITZINGER, 1843**

Type species: *Hyla lesueurii* Dümeril and Bibron, 1841.

Diagnosis: The genus *Euscelis* Fitzinger, 1843 is separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Colouration is a pale fawn to dark brown above, usually immaculate, or with darker markings, ranging from flecks to blotches and including one that forms a transverse bar between the eyes; the tympanum has a pale rim; dorsal surface generally smooth or sometimes leathery, with one species having slight warts; webbing may reach the disc of the fifth toe, but usually not, and generally extending no more than halfway along the penultimate phalanx; discs on fingers and toes are small and inconspicuous and barely wider than digits; fingers unwebbed; second finger slightly longer than first; anterior head stripe is present, usually narrow but always continuous, but sometimes ill-defined, not interrupted by a vertical bar in front of the eye; posterior head stripe is narrow, no more than half as wide as and not enclosing the tympanum; there is a moderate inner metatarsal tubercle and a small outer metatarsal tubercle is present; vomerine teeth present; groin is yellow and heavily blotched with black. Whistish ventrally with granular skin. No dorsolateral skin fold.

Duellman *et al.* (2016) found that the nearest living relative of this genus diverged from these species 23.5 MYA.

Distribution: Wetter parts of the east coast of south-east Australia, extending, from Victoria, through New South Wales and south east Queensland and then to the wet tropics of north-east Queensland.

Content: *Euscelis lesueurii* (Dümeril and Bibron, 1841) (type species); *E. booroolongensis* (Moore, 1961); *E. jungguy* (Donnellan and Mahony, 2004); *E. wilcoxi* (Günther, 1864).

EUSCELIS BOOROOLONGENSIS DORSARUBER SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:5C0EDE3D-FB06-4EA1-8E38-D696B86423DC

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D73149, collected from Killimicat Creek, New South Wales, Australia, Latitude -35.2 S., Longitude 148.33 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D73109 and D73123, both collected from Bombowlee Creek, New South Wales, Australia, Latitude -35.27 S., Longitude 148.33 E.

Diagnosis: The species *E. booroolongensis* (Moore, 1961), with a type locality of Ebor, on the eastern edge of the New England Tableland, New South Wales, Australia, is found from the New England region of New South Wales, south along the Great Dividing Range and nearby slopes to north-east Victoria. Within this range, specimens are known from three general areas, each separated by well known biogeographical barriers. The populations are as follows:

1/ The nominate form, found in the New Engand Region of New South Wales, generally bounded in the south by the Hunter Valley and north to near the Queensland, New South Wales border, and:

2/ A second population in the general region south of the Hunter Valler intrusion, including elevated areas west of Sydney, New South Wales, generally west of the Great Divide in a region bounded by Kandos in the north, Orange in the West, Blackheath in the east and Taralga in the south, herein identified as the subspecies *E. booroolongensis occultatum subsp. nov.* and:

3/ The third population is found in a region generally east and west of the Australian Capital Territory, generally south of Tarago, New South Wales, into Victoria on the western side of the Great Dividing Range, herein identified as *E. booroolongensis dorsaruber subsp. nov.*.

All three populations would be keyed as *E. booroolongensis* using the key in Cogger (2014), as "*Litoria booroolongensis*" but are sufficiently morphologically divergent to be formally identified as subspecies as done herein.

E. booroolongensis dorsaruber subsp. nov. is the most distinctive of the three subspecies and is readily separated from the other two by the following suite of characters: A strongly dark reddish-brown dorsal colouration, which is in stark contrast to the other two subspecies. *E. booroolongensis occultatum subsp. nov.* is only slightly reddish in colour, being generally greyish with an orange tinge, while *E. booroolongensis booroolongensis* is strongly yellowish. *E. booroolongensis dorsaruber subsp. nov.* is also separated from the other two subspecies by having a significant amount of dark pigment in the form of blotches, spots or thick peppering on the upper surface of the lower forearms, versus minimal in the other two subspecies.

Both *E. booroolongensis booroolongensis* and *E. booroolongensis occultatum subsp. nov.* have a strong yellow colour or tinge in the armpits and groin, versus white or only slightly yellow in *E. booroolongensis dorsaruber subsp. nov.*.

The black peppering or other markings on the back of *E. booroolongensis dorsaruber subsp. nov.* is distinct versus slight or semi-distinct in both *E. booroolongensis booroolongensis* and *E. booroolongensis occultatum subsp. nov.*

E. booroolongensis occultatum subsp. nov. is separated from the other two subspecies by lacking the strong reddish-brown hue of *E. booroolongensis dorsaruber subsp. nov.* or the strong yellow hue of *E. booroolongensis booroolongensis.*

The orange dorsal warts on both *E. booroolongensis occultatum subsp. nov.* and *E. booroolongensis booroolongensis* strongly contrast with the lighter colour of the back, which is not the case in *E. booroolongensis dorsaruber subsp. nov.*.

E. booroolongensis booroolongensis is readily separated from both other subspecies by having a lower iris that is almost black, versus not so in the other two subspecies, as well as a having a strongly yellowish hue through the dorsal colouration, dorsal warts of contrasting colour to the skin on the back; a prominent orange bar between the front part of the eyes, and minimal dark pigment on the upper surfaces of the lower forearms, or if present, it is invariably very faded and indistinct.

E. booroolongensis booroolongensis in life is depicted in Anstis (2013) on page 154 left, Cogger (2014) at page 152 and online at:
https://www.flickr.com/photos/23031163@N03/24027547442/

E. booroolongensis occultatum subsp. nov. in life is depicted in Anstis (2013) on page 154 right and in Hansen and Crosby (2016) on pages 166, 167 and 168, and online at:
https://www.flickr.com/photos/mattsummerville/16396285454/

Images of *E. booroolongensis dorsaruber subsp. nov.* can be found online at:
https://www.flickr.com/photos/88708273@N03/49657691666/
and
https://www.flickr.com/photos/137559394@N07/45899029804/
and
https://www.flickr.com/photos/euprepiosaur/16184175046/
and
https://www.flickr.com/photos/137559394@N07/46570626562/

Distribution: *E. booroolongensis dorsaruber subsp. nov.* is found in a region generally east and west of the Australian Capital Territory, generally south of Tarago, New South Wales, into Victoria on the western side of the Great Dividing Range.

Etymology: The name "*dorsaruber*" is derived from Latin and effectively means red dorsum, in reflection of the strong dark reddish-brown colouration of the relevant frogs.

EUSCELIS BOOROOLONGENSIS OCCULTATUM SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:A4BA98D3-7CBC-4499-A19A-41CCD36B7C27

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia specimen number R.85580, collected 2 miles from the Hampton-Jenolan Caves Road on the Oberon Road, about 8 km (5 miles) east of Oberon, New South Wales, Australia, Latitude -33.700 S., Longitude 150.016 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia specimen number R.85579, collected 2 miles from the Hampton-Jenolan Caves Road on the Oberon Road, about 8 km (5 miles) east of Oberon, New South Wales, Australia, Latitude -33.700 S., Longitude 150.016 E.

Diagnosis: The species *E. booroolongensis* (Moore, 1961), with a type locality of Ebor, on the eastern edge of the New England Tableland, New South Wales, Australia, is found from the New England region of New South Wales, south along the Great Dividing Range and nearby slopes to north-east Victoria. Within this range, specimens are known from three general areas, each separated by well known biogeographical barriers. The populations are as follows:

1/ The nominate form, found in the New Engand Region of New South Wales, generally bounded in the south by the Hunter Valley and north to near the Queensland, New South Wales border, and:

2/ A second population in the general region south of the Hunter Valler intrusion, including elevated areas west of Sydney, New South Wales, generally west of the Great Divide in a region bounded by Kandos in the north, Orange in the West, Blackheath in the east and Taralga in the south, herein identified as the subspecies *E. booroolongensis occultatum subsp. nov.* and:

3/ The third population is found in a region generally east and west of the Australian Capital Territory, generally south of Tarago, New South Wales, into Victoria on the

western side of the Great Dividing Range, herein identified as *E. booroolongensis dorsaruber subsp. nov.*.

All three populations would be keyed as *E. booroolongensis* using the key in Cogger (2014), as "*Litoria booroolongensis*" but are sufficiently morphologically divergent to be formally identified as subspecies as done herein.

E. booroolongensis dorsaruber subsp. nov. is the most distinctive of the three subspecies and is readily separated from the other two by the following suite of characters: A strongly dark reddish-brown dorsal colouration, which is in stark contrast to the other two subspecies. *E. booroolongensis occultatum subsp. nov.* is only slightly reddish in colour, being generally greyish with an orange tinge, while *E. booroolongensis booroolongensis* is strongly yellowish. *E. booroolongensis dorsaruber subsp. nov.* is also separated from the other two subspecies by having a significant amount of dark pigment in the form of blotches, spots or thick peppering on the upper surface of the lower forearms, versus minimal in the other two subspecies.

Both *E. booroolongensis booroolongensis* and *E. booroolongensis occultatum subsp. nov.* have a strong yellow colour or tinge in the armpits and groin, versus white or only slightly yellow in *E. booroolongensis dorsaruber subsp. nov.*.

The black peppering or other markings on the back of *E. booroolongensis dorsaruber subsp. nov.* is distinct versus slight or semi-distinct in both *E. booroolongensis booroolongensis* and *E. booroolongensis occultatum subsp. nov.*

E. booroolongensis occultatum subsp. nov. is separated from the other two subspecies by lacking the strong reddish-brown hue of *E. booroolongensis dorsaruber subsp. nov.* or the strong yellow hue of *E. booroolongensis booroolongensis.*

The orange dorsal warts on both *E. booroolongensis occultatum subsp. nov.* and *E. booroolongensis booroolongensis* strongly contrast with the lighter colour of the back, which is not the case in *E. booroolongensis dorsaruber subsp. nov.*.

E. booroolongensis booroolongensis is readily separated from both other subspecies by having a lower iris that is almost black, versus not so in the other two subspecies, as well as a strongly yellowish hue through the dorsal colouration, dorsal warts of contrasting colour to the skin on the back; a prominent orange bar between the front part of the eyes, and minimal dark pigment on the upper surfaces of the lower forearms, or if present, it is invariably very faded and indistinct.

E. booroolongensis booroolongensis in life is depicted in Anstis (2013) on page 154 left, Cogger (2014) at page 152 and online at:
https://www.flickr.com/photos/23031163@N03/24027547442/

E. booroolongensis occultatum subsp. nov. in life is depicted in Anstis (2013) on page 154 right and in Hansen and Crosby (2016) on pages 166, 167 and 168, and online at:
https://www.flickr.com/photos/mattsummerville/16396285454/

Images of *E. booroolongensis dorsaruber subsp. nov.* can be found online at:
https://www.flickr.com/photos/88708273@N03/49657691666/
and
https://www.flickr.com/photos/137559394@N07/45899029804/
and
https://www.flickr.com/photos/euprepiosaur/16184175046/
and
https://www.flickr.com/photos/137559394@N07/46570626562/

Distribution: *E. booroolongensis occultatum subsp. nov.* occurs in the general region south of the Hunter Valler intrusion, including elevated areas west of Sydney, New South Wales, generally west of the Great Divide in a region bounded by Kandos in the north, Orange in the West, Blackheath in the east and Taralga in the south.

Etymology: The name "*occultatum*" is derived from Latin and effectively means hidden and in as much as this form has been hidden in terms of taxonomy until now, the name is appropriate.

COGGERDONIANI TRIBE NOV.

GENUS *COGGERDONIA* WELLS AND WELLINGTON, 1985.

Type species: *Hyla adelaidensis* Gray, 1841.

Diagnosis: Living frogs in the genus *Coggerdonia* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: A slender frog being light brown, fawn or light green above, with dark brown patches or flecks arranged in distinct longitudinal lines. There is a dark brown to black stripe running from the tip of the snout below the canthus to the eye, somewhat triangular in shape as it widens towards the eye and then remaining broad as it extends across the tympanum and beyond along the flank to the rear of the body. This dark coloured stripe is bordered on the lower edge with a well-defined line of white, also running from the upper lip. Sometimes this stripe will break up into a series of adjacent spots. The hind parts of the thighs are dark brown with orange or reddish spots. Belly is whitish to light brown. Skin is smooth above and coarsely granular below, except under the throat, which is also smooth. Vomerine teeth are prominent between and behind the choanae. There is a distinct pectoral fold. Finger and toe discs are small and not much wider than the digits. Fingers have basal webbing only and toes are about three quarters webbed. Inner metatarsal tubercle is large and there is no outer one. Tympanum is large and distinct and the second finger is longer than the first. Adult size 50 to 60 mm (derived from Cogger, 2014).

According to Duellman *et al.* (2016), the single living member of this genus diverged from its nearest living relatives 30.8 MYA.

Distribution: Wetter parts of south-western Western Australia, Australia.

Content: *Coggerdonia adelaidensis* (Gray, 1841) (monotypic).

CYCLORANININI TRIBE NOV.

GENUS *CYCLORANA* STEINDACHNER, 1867

Type species: *Cyclorana novaehollandiae* Steindachner, 1867.

Diagnosis: The genus concept of *Cyclorana* Steindachner, 1867 herein is narrower than that of most extant publications (e.g. Cogger 2014), but wholly in line with the taxonomy formally proposed by Wells and Wellington (1985). While a bunch of liars, thieves and ratbags, known as the Wolfgang Wüster gang will claim my doing so is purely out of friendship to Wells and Wellington and in the absence of scientific evidence, the reverse is in fact the case.

The evidence for accepting and using the Wells and Wellington taxonomy is effectively compelling.

Duellman *et al.* (2016) found that the species within *Cyclorana* as defined by Wells and Wellington (1985) diverged from their nearest living relatives 13.4 MYA, these being those species placed within each of the genera *Neophractops* Wells and Wellington (1985), with type species *Chiroleptes platycephalus* Günther, 1873 and *Mitrolysis* Cope, 1889 with type species *Chiroleptes alboguttatus* Günther, 1867.

As this is genus-level divergence, it makes sense to divide the relevant species accordingly and using existing available names.

The latter genus *Mitrolysis* Cope, 1889 was inadvertently renamed by Wells and Wellington (1985) as *Brendananura* with the same type species and so it is an objective junior synonym. Hence the latter name is effectively unavailable according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al*. 1999).

One divergent taxon within *Mitrolysis* is also herein placed in a new subgenus *Paramitrolysis subgen. nov.*.

Species within the genera *Cyclorana*, *Mitrolysis* and *Neophractops* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: They are heavily built, often rotund, frogs; Inner metatarsal tubercle is shovel-shaped; no fronto-parietal foramen in adults; vomerine teeth are present and largely between the choanae; tongue large and oval-shaped; Pupil horizontal; tympanum distinct in all but one species group (*Invisibiliaauris subgen. nov*.); phlanges are simple and tips with tiny discs or none at all; first finger opposed to remainder and toes are webbed.

The genus *Cyclorana* is readily separated from the genera *Mitrolysis* and *Neophractops* by having a marked, straight dorsolateral skin fold and a very stout build; toes one third webbed; hind side of thighs lacking white spots.

The genus *Neophractops* is readily separated from the genera *Mitrolysis* and *Cyclorana* by having no definite straight dorsolateral skin fold and toes that are three quarters webbed.

The genus *Mitrolysis* is separated from the genera *Cyclorana* and *Neophractops* by one or other of:

1/ Having no definite straight dorsolateral skin fold and toes that are less than half webbed, or:

2/ Having a marked, straight dorsolateral skin fold and a very slender build; toes half webbed; hind side of thighs has numerous white spots.

The subgenus *Paramitrolysis subgen. nov.* with the type species of *Cyclorana verrucosa* Tyler and Martin, 1977 is readily separated from the nominate subgenus (of *Mitrolysis*) by having the following unique combination of characters: A blunt snout with nostril distinctly nearer to the tip than to the eye; a blackish stripe on the side of the head from the snout through the eye and distinct tympanum to the forelimb; a dorsum with numerous skin folds or large tubercles, with either: 1/ Many being white-tipped, highlighted by being surrounded by dark blackish pigment as well as a dorsal colouration dominated by brilliant dark lime green or large patches of brilliant dark lime green, or 2/ A dorsum with numerous skin folds or large tubercles not marked in any way and a dorsal colouration of beige, overlain with scattered and faded light olive green patches or blotches in irregular fashion.

Duellman *et al.* (2016) found the species in the subgenus *Paramitrolysis subgen. nov.* to have diverged from nearest congeners outside the subgenus by 12 MYA.

The subgenus *Invisibiliaauris subgen. nov*. with the type species *Cyclorana cryptotis* Tyler and Martin, 1977 is readily separated from the other two subgenera by having a hidden ear, being covered by skin, in stark contrast to the other subgenera which have an obvious and exposed tympanum.

Duellman *et al.* (2016) found that species within *Invisibiliaauris subgen. nov*. diverged from their nearest living relatives (within the nominate subgenus *Mitrolysis*) 11.2 MYA.

Distribution: Most of the top half of continental Australia.

Content: *Cyclorana novaehollandiae* Steindachner, 1867 (type species); *C. australis* (Gray, 1842).

GENUS *MITROLYSIS* COPE, 1889.

Type species: *Chiroleptes alboguttatus* Günther, 1867.

Diagnosis: Species within the genera *Cyclorana*, *Mitrolysis* and *Neophractops* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: They are heavily built, often rotund, frogs; Inner metatarsal tubercle is shovel-shaped; no fronto-parietal foramen in adults; vomerine teeth are present and largely between the choanae; tongue large and oval-shaped; Pupil horizontal; tympanum distinct in all but one species group

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(*Invisibiliaauris subgen. nov.*); phlanges are simple and tips with tiny discs or none at all; first finger opposed to remainder and toes are webbed.

The genus *Cyclorana* is readily separated from the genera *Mitrolysis* and *Neophractops* by having a marked, straight dorsolateral skin fold and a very stout build; toes one third webbed; hind side of thighs lacking white spots.

The genus *Neophractops* is readily separated from the genera *Mitrolysis* and *Cyclorana* by having no definite straight dorsolateral skin fold and toes that are three quarters webbed.

The genus *Mitrolysis* is separated from the genera *Cyclorana* and *Neophractops* by one or other of:

1/ Having no definite straight dorsolateral skin fold and toes that are less than half webbed, or:

2/ Having a marked, straight dorsolateral skin fold and a very slender build; toes half webbed; hind side of thighs has numerous white spots.

The subgenus *Paramitrolysis subgen. nov.* with the type species of *Cyclorana verrucosa* Tyler and Martin, 1977 is readily separated from the nominate subgenus (of *Mitrolysis*) by having the following unique combination of characters: A blunt snout with nostril distinctly nearer to the tip than to the eye; a blackish stripe on the side of the head from the snout through the eye and distinct tympanum to the forelimb; a dorsum with numerous skin folds or large tubercles, with either: 1/ Many being white-tipped, highlighted by being surrounded by dark blackish pigment as well as a dorsal colouration dominated by brilliant dark lime green or large patches of brilliant dark lime green, or 2/ A dorsum with numerous skin folds or large tubercles not marked in any way and a dorsal colouration of beige, overlain with scattered and faded light olive green patches or blotches in irregular fashion.

Duellman *et al.* (2016) found the species in the subgenus *Paramitrolysis subgen. nov.* to have diverged from nearest congeners outside the subgenus by 12 MYA.

The subgenus *Invisibiliaauris subgen. nov*. with the type species *Cyclorana cryptotis* Tyler and Martin, 1977 is readily separated from the other two subgenera by having a hidden ear, being covered by skin, in stark contrast to the other subgenera which have an obvious and exposed tympanum. Duellman *et al.* (2016) found that species within *Invisibiliaauris subgen. nov*. diverged from their nearest living relatives (within nominate subgenus *Mitrolysis*) 11.2 MYA.

Distribution: Most parts of the top third of Australia.

Content: *Mitrolysis alboguttata* (Günther, 1867) (type species); *M. brevipes* (Peters, 1871); *M. cryptotis* (Tyler and Martin, 1977); *M. cultripes* (Parker, 1940); *M. longipes* (Tyler and Martin, 1977); *M. maculosa* (Tyler and Martin, 1977); *M. maini* (Tyler and Martin, 1977); *M. manya* (van Buerden and Macdonald, 1980); *M. vagitus* (Tyler, Davies and Martin, 1981); *M. verrucosa* (Tyler and Martin, 1977).

MITROLYSIS* (*MITROLYSIS*) *ALBOGUTTATA DUMPTRASHENSIS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:2A17B806-9DFA-4BC0-B4BA-7E2231EC4756

Holotype: A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.54762, collected by Richard W. Wells under trash at the rubbish dump (tip) at Collarenebri, New South Wales, Australia, Latitude -29.550 S., Longitude 148.583 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.33294 collected from Wee Waa, New South Wales, Australia, Latitude -30.20 S., Longitude 149.333 E.

Diagnosis: The subspecies *Mitrolysis alboguttata dumptrashensis subsp. nov*. is a morphologically distinct southern form of the species originally described as *Chiroleptes alboguttatus* Günther, 1867.

Chiroleptes alboguttatus Günther, 1867 was originally described with two syntypes being from Bowen and Cape York in Queensland.

While it is contended that neither of the syntypes Günther, 1867 of are of the subspecies *Mitrolysis alboguttata dumptrashensis subsp. nov.*, they are themselves both morphologically divergent and so to remove confusion as to which taxon or specimen the name *Chiroleptes alboguttatus* Günther, 1867 should be applied to, I herein make the Cape York specimen (BMNH 1947.2.20.6-7) as the lectotype.

The syntype from Bowen in Queensland (BMNH 1947.2.18.50-51) herein ceases to have nomenclatural status.

This is done in accordance with paragraph 6, and Article 74, including all of 74.1 and 74.73, of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), including this being an “express statement of the taxonomic purpose of the designation”, this being to remove potential doubt as to which subspecies or species should retain the name *alboguttatus* Günther, 1867 on the basis of divergence, either morphological or molecular between the two syntype specimens.

Occurring generally in a region encompassing areas drained by the upper Darling River basin, *Mitrolysis alboguttata dumptrashensis subsp. nov*. is readily separated from the nominate form of

M. alboguttata on the basis of colour and morphology.

Adult *M. alboguttata dumptrashensis subsp. nov.* are generally beige in colour with a general absence of dark blackish markings on the body save for those on the warts, bumps and prominent folds arranged both longitudinally down the dorsum and also irregularly scattered. By contrast *M. alboguttata alboguttata* has considerable amounts of dark pigment scattered across the dorsum giving a colouration that is “Blackish ashy above, indistinctly marbled with black” as stated by Günther (1867) in his original description. Furthermore the dorsum of *M. alboguttata alboguttata* is fairly smooth and without the massive folds and numerous warts and bumps seen in *M. alboguttata dumptrashensis subsp. nov.*. This black marbling or peppering on the upper body in the nominate subspecies is not seen in *M. alboguttata dumptrashensis subsp. nov*..

A second colour difference between the two froms is that of the vertebral stripe running from snout to rear. In *M. alboguttata alboguttata* it is generally very thin and whitish or occasionally light yellow in colour. By contrast,

in *M. alboguttata dumptrashensis subsp. nov.* it is either green or yellowish green and of moderate thickness as opposed to being thin.

Many adult specimens of *M. alboguttata dumptrashensis subsp. nov*. have large amounts of green on various parts of the body, but this is not consistent among all specimens of the subspecies.

The significant difference between the two subspecies in the degree and intensity of the skin folds and warts on the upper body is noteworthy and implies significant divergence between the two forms.

Nominate *M. alboguttata alboguttata* is “smooth above; hinder lower parts very finely granulated” as stated by Günther (1867) in his original description. As already noted this is not the case in *M. alboguttata dumptrashensis subsp. nov*. and based on morphological divergence alone, a strong case would be made for species-level recognition.

However in the absence of detail about specimens that occur within the region the two subspecies may meet and whether or not there is interbreeding between the two forms and any significant hybridisation / introgression, I have formally identified the divergent southern form as a subspecies instead of species.

In terms of the coastal Queensland specimens of *M. alboguttata alboguttata* from the region of Mackay and north, all are of the smoother skinned form as opposed to the more warty specimens of *M. alboguttata dumptrashensis subsp. nov*., and all have the dark ash coloured mottling on the dorsum as noted by Günther (1867) in his original description of two specimens from this general region. However what becomes immediately apparent when inspecting specimens is that those from the wet tropics zone commencing north of Townsville, have considerably greater amounts of dark pigment on the body as compared to those from further south (including Bowen, in Queensland), indicating divergence between these populations as well.

It was on this basis that the lectoptype was selected from the two divergent syntypes of Günther (1867) in his original description.

Colour photos of specimens of *Mitrolysis alboguttata dumptrashensis subsp. nov*. in life can be found on page 134 of Cogger (2014) on bottom left and Anstis (2013) page 87 at top left.

Colour photos of specimens of *M. alboguttata alboguttata* in life can be found in Anstis (2013) page 87 at top right.

Distribution: The subspecies *Mitrolysis alboguttata dumptrashensis subsp. nov.* is found in north-west New South Wales and south-west Queensland, generally in the region encompassed by the upper Darling River system, in a region extending north to between Augathella and Blackhall in central Queensland, after which the nominate form of the species occurs in a more-or-less continuous distribution to include most of the rest of Queensland, including most of Cape York, Queensland and extending across the lower Gulf of Carpentaria to be found in the adjoining section of the Northern Territory.

Etymology: Named after the collection site and locality for the holotype, being under a piece of trash at the council rubbish dump at Collarenebri, New South Wales, Australia.

PARAMITROLYSIS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:BB3D6237-CDCC-428F-BE99-78F8DA0F3981

Type species: *Cyclorana verrucosa* Tyler and Martin, 1977.

Diagnosis: The subgenus *Paramitrolysis subgen. nov.* with the type species of *Cyclorana verrucosa* Tyler and Martin, 1977 is readily separated from the nominate subgenus (of *Mitrolysis*) by having the following unique combination of characters: A blunt snout with nostril distinctly nearer to the tip than to the eye; a blackish stripe on the side of the head from the snout through the eye and distinct tympanum to the forelimb; a dorsum with numerous skin folds or large tubercles, with either:

1/ Many being white-tipped, highlighted by being surrounded by dark blackish pigment as well as a dorsal colouration dominated by brilliant dark lime green or large patches of brilliant dark lime green, or:

2/ A dorsum with numerous skin folds or large tubercles not marked in any way and a dorsal colouration of beige, overlain with scattered and faded light olive green patches or blotches in irregular fashion.

Duellman *et al.* (2016) found the species in the subgenus *Paramitrolysis subgen. nov.* to have diverged from nearest congeners outside the subgenus by 12 MYA.

The subgenus *Invisibiliaauris subgen. nov*. with the type species *Cyclorana cryptotis* Tyler and Martin, 1977 is readily separated from the other two subgenera by having a hidden ear, being covered by skin, in stark contrast to the other subgenera which have an obvious and exposed tympanum.

Duellman *et al.* (2016) found that species within *Invisibiliaauris subgen. nov*. diverged from their nearest living relatives (within the nominate subgenus *Mitrolysis*) 11.2 MYA.

Species within the genera *Cyclorana*, *Mitrolysis* and *Neophractops* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: They are heavily built, often rotund, frogs; Inner metatarsal tubercle is shovel-shaped; no fronto-parietal foramen in adults; vomerine teeth are present and largely between the choanae; tongue large and oval-shaped; Pupil horizontal; tympanum distinct in all but one species group (*Invisibiliaauris subgen. nov.*); phlanges are simple and tips with tiny discs or none at all; first finger opposed to remainder and toes are webbed.

The genus *Cyclorana* is readily separated from the genera *Mitrolysis* and *Neophractops* by having a marked, straight dorsolateral skin fold and a very stout build; toes one third webbed; hind side of thighs lacking white spots.

The genus *Neophractops* is readily separated from the genera *Mitrolysis* and *Cyclorana* by having no definite straight dorsolateral skin fold and toes that are three quarters webbed.

The genus *Mitrolysis* is separated from the genera *Cyclorana* and *Neophractops* by one or other of:

1/ Having no definite straight dorsolateral skin fold and toes that are less than half webbed, or:

2/ Having a marked, straight dorsolateral skin fold and a very slender build; toes half webbed; hind side of thighs

has numerous white spots.

Duellman *et al.* (2016) found that the species within *Cyclorana* as defined by Wells and Wellington (1985) diverged from their nearest living relatives 13.4 MYA, these being those species placed within each of the genera *Neophractops* Wells and Wellington (1985), with type species *Chiroleptes platycephalus* Günther, 1873 and *Mitrolysis* Cope, 1889 with type species *Chiroleptes alboguttatus* Günther, 1867.

Distribution: Northern New South Wales and southern Queensland in inland areas usually away from the coast and ranges.

Content: *Mitrolysis* (*Paramitrolysis*) *verrucosa* (Tyler and Martin, 1977).

Etymology: As a prefefix, "para" means beyond or distinct from. As the species in this subgenus are distinct from those in the nominate subgenus, the name is appropriate and hence "*Paramitrolysis*".

MITROLYSIS* (*PARAMITROLYSIS*) *VERRUCOSA INORNATA SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:9500B2FF-61B1-4A02-9058-D628E2DE0DE7

Holotype: A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number: R.5149 collected at Wilcannia, New South Wales, Latitude -31.5590 S., Longitude 143.3785 E.

This facility allows access to its holdings.

Paratypes: Two preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ 3585 and MCZ 3586 collected at Wilcannia, New South Wales, Latitude -31.5590 S., Longitude 143.3785 E.

Diagnosis: *Mitrolysis verrucosa inornata subsp. nov*. has until now been treated as a western population of *M. verrucosa* (Tyler and Martin, 1977), which it would key as in both Cogger (2014) and Anstis (2013).

However Anstis (2013) flagged that this taxon was not the same as nominate *M. verrucosa verrucosa*, referring to it as "Form 2".

Anstis (2013) also hypothesised that *Mitrolysis verrucosa inornata subsp. nov*. may be a rough-skinned form of *M. cultripes* (Parker, 1940) or alternatively be an intermediate between *M. verrucosa* and *M. cultripes* (Parker, 1940) and therefore an undescribed species.

The results of Duellman *et al.* (2016) effectively scuttled the first of these propositions by finding that *M. cultripes* was not closely related to *M. verrucosa*, having diverged some 11.2 MYA, meaning that the "Form 2" of Anstis was either a hitherto unnamed species or perhaps just a subspecies of *M. verrucosa*. Hence this formal description here of this subspecies, this level of distinction being based on the molecular results of Anstis *et al*. (2016b) showing both forms as broadly conspecific.

M. verrucosa verrucosa is readily separated from *M. verrucosa inornata subsp. nov*. by having a dorsum with numerous skin folds or large tubercles many being white-tipped, highlighted by being surrounded by dark blackish pigment as well as a dorsal colouration dominated by brilliant dark lime green or large patches of brilliant dark lime green.

Mitrolysis verrucosa inornata subsp. nov. is readily separated from *M. verrucosa verrucosa* by having a dorsum with numerous skin folds or large tubercles not marked in any way and a dorsal colouration of beige, overlain with scattered and faded light olive green patches or blotches in irregular fashion, as opposed to that described for *M. verrucosa verrucosa* above.

The colouration of *M. verrucosa verrucosa* is brilliant, intense and well defined, versus dull and ill-defined in *M. verrucosa inornata subsp. nov*..

An image of *M. verrucosa verrucosa* in life can be found in Cogger (2014) at page 142, or Anstis (2013) on page 118 (two photos on right), Vandersuys (2012) on page 75, or Eipper and Rowland (2018) at page 113 bottom.

Images of *Mitrolysis verrucosa inornata subsp. nov*. both adult and tadpole, can be found on page 119 of Anstis (2013).

Distribution: *Mitrolysis verrucosa inornata subsp. nov*. is found in the general region of north-west New South Wales, generally west of Dubbo and Moree, including areas associated with the Macquarie, Bogan and Darling River systems and potentially into Queensland north-west of this zone.

M. verrucosa verrucosa (Tyler and Martin, 1977) is found in the north-east of New South Wales, west of the coastal ranges to about Warialda, extending north-west of here into southern Queensland, west at least as far as Roma and north to at least Kilcummin.

Etymology: Named in reflection of the relatively inornate colouration of this subspecies.

INVISIBILIAAURIS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:04A5DE6A-5C22-4F0C-AC9A-DA14819EE4E8

Type species: *Cyclorana cryptotis* Tyler and Martin, 1977.

Diagnosis: The subgenus *Invisibiliaauris subgen. nov*. with the type species *Cyclorana cryptotis* Tyler and Martin, 1977 is readily separated from the other two subgenera of *Mitrolysis* Cope, 1889 and the genera *Cyclorana* Steindachner, 1867 and *Neophractops* Wells and Wellington, 1985 by having a hidden ear, being covered by skin, in stark contrast to the other subgenera and morphologically similar genera which have an obvious and exposed tympanum.

Duellman *et al.* (2016) found that species within *Invisibiliaauris subgen. nov*. diverged from their nearest living relatives (within the subgenus genus *Mitrolysis*) 11.2 MYA.

Species within the genera *Cyclorana* Steindachner, 1867, *Mitrolysis* and *Neophractops* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

They are heavily built, often rotund, frogs; Inner metatarsal tubercle is shovel-shaped; no fronto-parietal foramen in adults; vomerine teeth are present and largely between the choanae; tongue large and oval-shaped; Pupil horizontal; tympanum distinct in all but one species group (*Invisibiliaauris subgen. nov.*); phlanges are simple and tips with tiny discs or none at all; first finger opposed to remainder and toes are webbed.

The genus *Cyclorana* is readily separated from the genera *Mitrolysis* and *Neophractops* by having a marked, straight dorsolateral skin fold and a very stout build; toes one third webbed; hind side of thighs lacking white spots.

The genus *Neophractops* is readily separated from the genera *Mitrolysis* and *Cyclorana* by having no definite straight dorsolateral skin fold and toes that are three quarters webbed.

The genus *Mitrolysis* is separated from the genera *Cyclorana* and *Neophractops* by one or other of:

1/ Having no definite straight dorsolateral skin fold and toes that are less than half webbed, or:

2/ Having a marked, straight dorsolateral skin fold and a very slender build; toes half webbed; hind side of thighs has numerous white spots.

The subgenus *Paramitrolysis subgen. nov.* with the type species of *Cyclorana verrucosa* Tyler and Martin, 1977 is readily separated from the nominate subgenus (of *Mitrolysis*) by having the following unique combination of characters: A blunt snout with nostril distinctly nearer to the tip than to the eye; a blackish stripe on the side of the head from the snout through the eye and distinct tympanum to the forelimb; a dorsum with numerous skin folds or large tubercles, with either:

1/ Many being white-tipped, highlighted by being surrounded by dark blackish pigment as well as a dorsal colouration dominated by brilliant dark lime green or large patches of brilliant dark lime green, or:

2/ A dorsum with numerous skin folds or large tubercles not marked in any way and a dorsal colouration of beige, overlain with scattered and faded light olive green patches or blotches in irregular fashion.

Duellman *et al.* (2016) found the species in the subgenus *Paramitrolysis subgen. nov.* to have diverged from nearest congeners outside the subgenus by 12 MYA.

Distribution: The drier tropics of Australia from near Derby in Western Australia, across the Kimberley Division of Western Australia, through the top end of the Northern Territory, to the edge of the arid zone and across the Gulf of Carpentaria to the east side of drier parts of Cape York in north Queensland.

Etymology: The subgenus name *Invisibiliaauris* is taken directly from the Latin words meaning invisible ear, in reflection of this character state in all relevant species, being unique to species within the entire genus *Mitrolysis* Cope, 1889.

Content: *Mitrolysis* (*Invisibiliaauris*) *cryptotis* (Tyler and Martin, 1977) (type species); *M.* (*Invisibiliaauris*) *flavoranae sp. nov.*; *M.* (*Invisibiliaauris*) *leucodorsalinea sp. nov.*.

MITROLYSIS* (*INVISIBILIAAURIS*) *FLAVORANAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:4D2AF343-E2E0-45C6-8DF2-EC0B74D31B97

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R17962, collected from near Derby (10-18 km south of the town), Western Australia, Australia, Latitude -17.38 S., Longitude 123.68 E. This government-owned facility allows access to its holdings.

Paratypes: Nine preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R17957, R17963, R17964, R17965, R17967, R17968, R17970, R29118 and R29121, from the same location as the holotype.

Diagnosis: The morphologically variable putative species *Mitrolysis cryptotis* (Tyler and Martin, 1977) with a type locality of Daly Waters in the Northern Territory, has been found across the drier parts of the tropical north of Australia in an area stretching from near Derby in Western Australia in the west, across to drier parts of Cape York in far north Queensland. Populations in the Kimberley division of Western Australia and those from Cape York and south-eastern parts of the Gulf of Carpentaria are morphologically divergent from the nominate form and are therefore formally named as new species herein.

All can be readily separated on the basis of colouration.

M. cryptotis from the Northern Territory is coloured as follows. “The dorsal surface is pale grey suffused with irregular darker markings” (Tyler and Martin (1977). The markings are a rich purplish-orange-brown colour. Some specimens of this species (including Tyler’s holotype) have a semi-distinct narrow white and broken mid-dorsal stripe running from snout to rear. There is a dark purplish coloured stripe running from the front of the snout, through the eye and beyond to the pit of the forearm. The stripe is distinct anterior to the eye and indistinct and mottled after the eye. The lower flanks are whitish with purple marbling. The iris is orange on top and purple below.

M. flavoranae sp. nov. from the Kimberley District of Western Australia is separated from *M. cryptotis* and *M. leucodorsalinea sp. nov.* by being a dominantly yellowish coloured frog, as in the over-riding dorsal colouration, with the irregular darker markings on the body being either brown (southern Kimberley) or orange (north-east Kimberley) and arranged more-or-less in the linear manner running down the body or flanks. Some specimens of this species have a semi-distinct narrow white and broken mid-dorsal stripe running from snout to rear.

There is a brown coloured stripe running from the front of the snout, through the eye and beyond to the pit of the forearm. The stripe is indistinct and broken both anterior to the eye posterior to it.

The iris is yellow on top and brown below.

M. leucodorsalinea sp. nov. from Cape York and the eastern Gulf of Carpentaria in Queensland is separated from *M. cryptotis* and *M. flavoranae sp. nov.* by having a prominent and well defined narrow white and broken mid-dorsal stripe running from snout to rear. While the dorsal surface of all three species in the subgenus *Invisibiliaauris subgen. nov.* is covered with numerous densely aggregated and flattened tubercles, these are significantly larger and more prominent in *M. leucodorsalinea sp. nov.*. Furthermore in *M. leucodorsalinea sp. nov.*, the largest tubercular protrusions on the anterior part of the dorsal surface invariably have yellowish-white tips. In this species, these tubercles tend to merge on the anterior dorsal surface to form small folds running down the dorsum in a linear manner. The elongate (rectangular) folds seen in this

species are not seen in the other two, which instead have more-or-less rounded tubercles only. The dorsal colouration is an indistinct pattern of beige, brown and yellow (tricolour), with a heavy overlay of orange across most, but not all of the dorsum. The stripe from snout to eye is brownish-grey in colour and prominent, but indistinct and broken between the eye and the top of the forearm. The iris is purple-grey below and orange on top.

All of *M. cryptotis* (Tyler and Martin, 1977), *M. flavoranae sp. nov.* and *M. leucodorsalinea sp. nov.* being the entirety of the subgenus *Invisibiliaauris subgen. nov*. can be readily separated from all other species within the genus *Mitrolysis* Cope, 1889, and the morphologically similar genera *Cyclorana* Steindachner, 1867 and *Neophractops* Wells and Wellington, 1985 by having a hidden ear, being covered by skin, in stark contrast to the other subgenera and morphologically similar genera which have an obvious and exposed tympanum.

M. cryptotis in life can be seen online at: https://www.flickr.com/photos/88708273@N03/49490850576/

M. flavoranae sp. nov. in life can be seen in Anstis (2013) on page 94 (top right).

M. leucodorsalinea sp. nov. in life can be seen in Vanderduys (2012) on page 33 (2 images).

Distribution: *M. flavoranae sp. nov.* is believed to be confined to the Kimberley District of Western Australia.

Etymology: Taken from Latin the species name "*flavoranae*" literally means "yellow frog".

MITROLYSIS* (*INVISIBILIAAURIS*) *LEUCODORSALINEA SP. NOV.

LSIDurn:lsid:zoobank.org:act:386ACE8F-667B-4FD8-A1BD-B3134BD85BB6

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.149848 collected from 8.2km west of Wakooka Outstation, Cape York, North Queensland, Australia, Latitude -14.583 S., Longitude 144.4978 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J66538 collected from 8.2km west of Wakooka Outstation, Cape York, North Queensland, Australia, Latitude -14.583 S., Longitude 144.4978 E.

Diagnosis: The morphologically variable putative species *Mitrolysis cryptotis* (Tyler and Martin, 1977) with a type locality of Daly Waters in the Northern Territory, has been found across the drier parts of the tropical north of Australia in an area stretching from near Derby in Western Australia in the west, across to drier parts of Cape York in far north Queensland. Populations in the Kimberley division of Western Australia and those from Cape York and south-eastern parts of the Gulf of Carpentaria are morphologically divergent from the nominate form and are therefore formally named as new species herein.

All can be readily separated on the basis of colouration.

M. cryptotis from the Northern Territory is coloured as follows. "The dorsal surface is pale grey suffused with irregular darker markings" (Tyler and Martin (1977). The markings are a rich purplish-orange-brown colour. Some specimens of this species (including Tyler's holotype) have a semi-distinct narrow white and broken mid-dorsal stripe running from snout to rear. There is a dark purplish coloured stripe running from the front of the snout, through the eye and beyond to the pit of the forearm. The stripe is distinct anterior to the eye and indistinct and mottled after the eye. The lower flanks are whitish with purple marbling. The iris is orange on top and purple below.

M. flavoranae sp. nov. from the Kimberley District of Western Australia is separated from *M. cryptotis* and *M. leucodorsalinea sp. nov.* by being a dominantly yellowish coloured frog, as in the over-riding dorsal colouration, with the irregular darker markings on the body being either brown (southern Kimberley) or orange (north-east Kimberley) and arranged more-or-less in the linear manner running down the body or flanks. Some specimens of this species have a semi-distinct narrow white and broken mid-dorsal stripe running from snout to rear.

There is a brown coloured stripe running from the front of the snout, through the eye and beyond to the pit of the forearm. The stripe is indistinct and broken both anterior to the eye posterior to it.

The iris is yellow on top and brown below.

M. leucodorsalinea sp. nov. from Cape York and the eastern Gulf of Carpentaria in Queensland is separated from *M. cryptotis* and *M. flavoranae sp. nov.* by having a prominent and well defined narrow white and broken mid-dorsal stripe running from snout to rear. While the dorsal surface of all three species in the subgenus *Invisibiliaauris subgen. nov.* is covered with numerous densely aggregated and flattened tubercles, these are significantly larger and more prominent in *M. leucodorsalinea sp. nov.*. Furthermore in *M. leucodorsalinea sp. nov.*, the largest tubercular protrusions on the anterior part of the dorsal surface invariably have yellowish-white tips. In this species, these tubercles tend to merge on the anterior dorsal surface to form small folds running down the dorsum in a linear manner. The elongate (rectangular) folds seen in this species are not seen in the other two, which instead have more-or-less rounded tubercles only. The dorsal colouration is an indistinct pattern of beige, brown and yellow (tricolour), with a heavy overlay of orange across most, but not all of the dorsum. The stripe from snout to eye is brownish-grey in colour and prominent, but indistinct and broken between the eye and the top of the forearm. The iris is purple-grey below and orange on top.

All of *M. cryptotis* (Tyler and Martin, 1977), *M. flavoranae sp. nov.* and *M. leucodorsalinea sp. nov.* being the entirety of the subgenus *Invisibiliaauris subgen. nov*. can be readily separated from all other species within the genus *Mitrolysis* Cope, 1889, and the morphologically similar genera *Cyclorana* Steindachner, 1867 and *Neophractops* Wells and Wellington, 1985 by having a hidden ear, being covered by skin, in stark contrast to the other subgenera and morphologically similar genera which have an obvious and exposed tympanum.

M. cryptotis in life can be seen online at: https://www.flickr.com/photos/88708273@N03/49490850576/

M. flavoranae sp. nov. in life can be seen in Anstis (2013) on page 94 (top right).
M. leucodorsalinea sp. nov. in life can be seen in Vanderduys (2012) on page 33 (2 images).

Distribution: *M. leucodorsalinea sp. nov.* is believed to be confined to Cape York and the eastern Gulf of Carpentaria in Queensland.

Etymology: Taken from Latin the species name "*leucodorsalinea*" literally means "white-mid dorsal line" in reflection of the trait of this species.

GENUS *NEOPHRACTOPS* WELLS AND WELLINGTON, 1985.

Type species: *Chiroleptes platycephalus* Günther, 1873.

Diagnosis: The genus *Neophractops* Wells and Wellington, 1985 is readily separated from the genera *Mitrolysis* and *Cyclorana* by having no definite straight dorsolateral skin fold and toes that are three quarters webbed.

Species within the genera *Cyclorana*, *Mitrolysis* and *Neophractops* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: They are heavily built, often rotund, frogs; Inner metatarsal tubercle is shovel-shaped; no fronto-parietal foramen in adults; vomerine teeth are present and largely between the choanae; tongue large and oval-shaped; Pupil horizontal; tympanum distinct in all but one species group (*Invisibiliaauris subgen. nov*.); phlanges are simple and tips with tiny discs or none at all; first finger opposed to remainder and toes are webbed.

The genus *Cyclorana* is readily separated from the genera *Mitrolysis* and *Neophractops* by having a marked, straight dorsolateral skin fold and a very stout build; toes one third webbed; hind side of thighs lacking white spots.

The genus *Mitrolysis* is separated from the genera *Cyclorana* and *Neophractops* by one or other of:

1/ Having no definite straight dorsolateral skin fold and toes that are less than half webbed, or:

2/ Having a marked, straight dorsolateral skin fold and a very slender build; toes half webbed; hind side of thighs has numerous white spots.

The subgenus *Paramitrolysis subgen. nov.* with the type species of *Cyclorana verrucosa* Tyler and Martin, 1977 is readily separated from the nominate subgenus (of *Mitrolysis*) by having the following unique combination of characters: A blunt snout with nostril distinctly nearer to the tip than to the eye; a blackish stripe on the side of the head from the snout through the eye and distinct tympanum to the forelimb; a dorsum with numerous skin folds or large tubercles, with either: 1/ Many being white-tipped, highlighted by being surrounded by dark blackish pigment as well as a dorsal colouration dominated by brilliant dark lime green or large patches of brilliant dark lime green, or 2/ A dorsum with numerous skin folds or large tubercles not marked in any way and a dorsal colouration of beige, overlain with scattered and faded light olive green patches or blotches in irregular fashion.

Duellman *et al.* (2016) found the species in the subgenus *Paramitrolysis subgen. nov.* to have diverged from nearest living congeners outside the subgenus by 11.2 MYA.

Duellman *et al.* (2016) found that the species in the *Neophractops* to have diverged from nearest living species 13.4 MYA.

Until recently all populations of the type species for this genus, namely *N. platycephalus*, across Australia have been treated as a single species. Having caught and inspected specimens of this putative species in all mainland states that they occur, I learnt decades ago that this was clearly not the case. The The Western Australian form was recently described and named as "*Clyclorana occidentalis* Anstis, Price, Roberts, Catalano, Hines, Doughty and Donnellan 2016".

An unnamed form from northern Australia is formally named in this paper.

The type form is from Bourke in north-west New South Wales. *Cyclorana slevini* Loveridge, 1950, was resurrected from synonymy by Wells and Wellington (1985) in the mistaken belief that the type for *Chiroletes platycephalus* was from central Australia. They stated this belief in their paper, believing that the Central Australian population was specifically distinct from the western New South Wales / southern Queensland one. While their taxonomy was in fact correct, their nomenclature was not.

Cyclorana slevini is therefore relegated back to the synonym of *N. platycephalus* and the name is unavailable for any other unnamed populations of the putative species.

Distribution: Arid parts of all mainland Australian states (including the Northern Territory), excluding Victoria.

Content: *Neophractops platycephala* (Günther, 1873) (type species); *N. occidentalis* (Anstis, Price, Roberts, Catalano, Hines, Doughty and Donnellan, 2016); *N. rosea sp. nov.*.

NEOPHRACTOPS ROSEA SP. NOV.

LSIDurn:lsid:zoobank.org:act:7A3777FD-71F4-4FE4-A7A1-BFBA40F6800E

Holotype: A preserved specimen at the Northern Territory Art Gallery and Museum, Darwin, Northern Territory, Australia, specimen number R09674 collected from 8 km south of Dunmarra, Northern Territory, Australia, Latitude -16.75 S., Longitude 133.75 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Northern Territory Art Gallery and Museum, Darwin, Northern Territory, Australia, specimen number R09715 collected at number 26 bore at Alroy Downs Station, Northern Territory, Australia, Latitude -19.1 S., Longitude 136.067 E.

2/ A preserved specimen at the Northern Territory Art Gallery and Museum, Darwin, Northern Territory, Australia, specimen number R30140 collected from Morphett Creek, Northern Territory, Australia, Latitude -18.883 S., Longitude 134.083 E.

Diagnosis: Until recently, all three species *Neophractops platycephala* (Günther, 1873), *N. rosea sp. nov.* and *N. occidentalis* (Anstis, Price, Roberts, Catalano, Hines, Doughty and Donnellan 2016) have been treated as populations of the same putative species *N. platycephala.*

However, it was no secret among herpetologists that

more than one species had been lumped under the single name. As far back as 1985, Wells and Wellington (1985), who at the time had conducted considerable fieldwork on frogs across all Australian states wrote “We believe that this is a species complex”.
The same view was echoed by Tyler (1992) and again by Anstis (2013) who on pages 112 to 115 provided detailed descriptions of each of three identified forms, including colour photos of adults, tadpoles and newly metamorphosed frogs.

These three obvious species were identified as follows:

1/ “Eastern form” from inland New South Wales, Queensland, Southern Northern Territory and north-east South Australia. This is in fact the nominate form of *Neophractops platycephala*, placed by Anstis in the genus *Cyclorana* Steindachner, 1867.

2/ “Northern Form”, herein formally named *Neophractops rosea sp. nov.* from the Northern Territory in a zone between the Barkly Tableland in the east and the Northern Territory / Western Australian border in the west, in a zone bound by the tropical savannahs to the north and the arid deserts to the south.

3/ “Central to Western Form”, formally named by Anstis, Price, Roberts, Catalano, Hines, Doughty and Donnellan, 2016 as *Neophractops occidentalis* from most of Western Australia except for the northern third and far south, with a distribution extending into the far south-west of the Northern Territory.

Because it was untenable that the relevant forms were unnamed, they are formally diagnosed herein.
Anstis (2013) provides excellent photos on pages 112 and 113 of typical adults of each species (one photo of each), which clearly show obvious differences between the three species and as lead author does much the same in Anstis *et al.* (2016).
Anstis (2013) on page 115 provides comparative photos of typical metamorphosed frogs of each species (one photo of each), which clearly show obvious differences between the three species.
Anstis (2013) on page 114 provides comparative photos of typical large tadpoles of each species (one photo of each), which clearly show obvious differences between the three species.

Adult *N. platycephala* are are separated from the other two species as follows: It is dorsally a greenish-grey frog with either a general hue of that colour, or alternatively indistinct blotches, flecks or markings incorporating both colours to give a greenish-grey appearance. On the sides of the back are a limited number of well spaced and tiny raised and pointed tubercles arranged in a somewhat linear manner. The limbs are greyish or greenish in colour with closely spaced distinct small purple flecks. The iris is orangeish yellow.

Adult *N. rosea sp. nov.* are are separated from the other two species as follows: The frog is grey infused with pink in dorsal colour, sometimes ranging to be an immaculate grey-pink with broad pink areas, including indistinct stripes from nostril to eye and then through ear, past upper armpit to the upper flank, with or without diffuse slightly darker flecks or mottling on the dorsum. The iris is a light yellow colour. On the dorsum, but mainly the sides are a number of raised warts of irregular but rounded shape, of moderate to large size.

Adult *N. occidentalis* are are separated from the other two species as follows: The frog is of a uniform yellowish to dark brown colour, with marbling on the mid to lower flanks. Warts on the upper surface are numerous and merge to form a series of elongated skin folds, arranged in an indistinct but linear manner down the dorsum. The iris is orangeish yellow on top and bluey-purple to aqua below. The upper surfaces of the limbs have darker marbling on the otherwise brown skin, versus flecks or spots on light coloured limbs on the other two species.

The skin fold above the tympanum is prominent in *N. occidentalis* but only moderately so in the other two species.

Adult females of *N. platycephala* and *N. rosea sp. nov.* grow to 72 mm total length, versus 110 mm for *N. occidentalis.* This makes adult female *N. occidentalis* on average more than double the weight of the other two species.

Photos of *N. platycephala* in life can be found in Eipper (2012) on page 81 and Robinson (1993) on page 76.

A photo of *N. rosea sp. nov.* in life can be found in Eipper and Rowland (2018) page 112, top photo.

A photo of *N. occidentalis* in life can be found in Tyler, Smith and Johnstone (1994) on plate 7, image 1.

Distribution: *N. rosea sp. nov.* is found in the Northern Territory, in a zone between the Barkly Tableland in the east and the Northern Territory / Western Australian border in the west, in a zone bound by the tropical savannahs to the north and the arid deserts to the south.

Etymology: The species name “rosea” comes from the Latin word for pink, noting that specimens of this species usually have a pinkish hue.

CROTTYANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:65B73B1E-867E-46CE-89E7-255574B1B615

Type species: *Crottyanura crottyi sp. nov*. (this paper).

Diagnosis: Until now, the best known species in this genus (*Crottyanura gen. nov.*), originally described as *Chiroleptes dahlii* Boulenger, 1896, has been generally known as *Litoria dahlii.* However the molecular phylogenies of Pyron and Weins (2011) and Duellman *et al.* (2016), have clearly shown that species not to be closely related to any other Australasian Tree Frogs (Pelodryadidae).

In the absence of any available generic name for the species, it was necessary to erect a new genus for the species as is done here.
However it has long been known to me that putative *Chiroleptes dahlii* Boulenger, 1896 is in fact composed of two related but different species.

These two taxa from northern Australia are morphologically divergent, geographically allopatric, divided by a biogeographic barrier of known antiquity and therefore are two separate species by any reasonable interpretation.
The type species for this new genus is the newly named species *Crottyanurua crottyi sp. nov.*.

The genus *Crottyanura gen. nov.* consists of two species, namely *C. dahlii* (Boulenger, 1896), with a type locality of Daly River, Northern Territory and found in the general

region of the type locality, being the western half of the top end of the Northern Territory and into immediately adjacent north-west Western Australia, as well as the newly named species *Crottyanurua crottyi sp. nov*. from the eastern side of the Gulf of Carpentaria and the western side of Cape York in Queensland.

Both species are readily separated from other Australasian Tree Frogs (Pelodryadidae) by the following diagnosis.

Ranoidea Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the resurrected genus *Chirodryas* Keferstein, 1867 and the two tropical species *Chiroleptes dahlii* Boulenger, 1896, and *Crottyanurua crottyi sp. nov*. herein placed in the new genus *Crottyanura gen. nov.*.

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold.

In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles. By contrast subgenus *Sandgroperanura subgen. nov*. has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

The build of *Crottyanura gen. nov.* while solid, is slender when compared to both *Ranoidea* and *Chirodryas.* The species in *Crottyanura gen. nov.* are further diagnosed by being olive green with brownish tinge above and a distinctive light mid-vertebral line (in *C dahlii* but not often in *C. crottyi sp. nov*.); having the hind side of the thighs mottled, marbled or spotted with white (in *C dahlii* but not in *C. crotty sp. nov*.); a finely granular dorsum; smooth white-coloured venter; no dorsolateral skin fold; fully webbed toes; no outer metatarsal tubercle and inner metatarsal tubercle is not shovel-shaped.

It should be noted that the phylogeny for the Bell Frog frog group of species by Burns and Crayn (2006) used *C. crotty sp. nov*. as their samples for *C. dahlii.*

Duellman *et al*. (2016) found their sample of putative *C. dahlii* had an 18 MYA divergence from its nearest living relative, that being the species within the genus *Cyclorana sensu lato* and not the so-called Bell frogs in the genera *Ranoidea* and *Chirodryas*, which they found had a 22 MYA divergence.

In terms of divergences of the populations of each species within this genus, this can be inferred in the absence of molecular data.

The populations are in separate drainage systems which remained disconnected even in times of glacial minima. It is noted that extant distributions and museum collection locations of both species are strongly correlated with river drainages, this being connected with the riverine swamp and floodplain dwelling nature of the relevant species.

C. dahlii with a centre of distribution around the Daly and Victoria River systems occupies a zone that drained west of the western Australian Papuan landbridge in the last glacial minima, thereby preventing eastern mixture of populations from the Gulf of Carpentaria that occupied watersheds that drained into the Arafura Sea, thereby confirming ancient divergence of each group.

Distribution: *C. dahlii* (Boulenger, 1896), with a type locality of Daly River, Northern Territory is found in the general region of the type locality, being the western half of the top end of the Northern Territory and into immediately adjacent north-west Western Australia. The newly named species *Crottyanurua crottyi sp. nov*. occurs on the eastern side of the Gulf of Carpentaria within Queensland and the western side of Cape York in far north Queensland, Australia.

Etymology: "Crotty", was the abbreviated name of a now deceased Great Dane cross Rottweiller dog that protected this author's scientific research facility for nearly 13 years. It is appropriate that a genus and species (formally described below) are formally named in his honour. His full name was "*Crotalus*", being the generic name for a group of large venomous North American Pit Viper snakes with a rattle on the tail.

Content: *Crottyanura crottyi sp. nov.* (type species); *C. dahlii* (Boulenger, 1896).

CROTTYANURA CROTTYI SP. NOV.

LSIDurn:lsid:zoobank.org:act:12A08B9C-7BFD-44EA-B630-2E352B503950

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R67895 collected from near Normanton, Queensland, Australia, Latitude -17.6611 S., Longitude 141.1039 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ Two preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R67892 and R67894 collected from near Normanton, Queensland, Australia, Latitude -17.6611 S., Longitude 141.1039 E.

2/ A preserved specimen at the Queensland Museum,

Brisbane, Queensland, Australia, specimen number J66143, collected from Rutland Plains, Frenchs Lagoon, Cape York, Queensland, Australia, Latitude -15.8 S., Longitude 141.5 E.

Diagnosis: It is astounding that the species *Crottyanura crottyi sp. nov.* has been unquestionably treated by all Australian herpetologists as an eastern population of *C. dahlii* (Boulenger, 1896). Any comparative inspection of specimens from both widely separated areas of distribution of the two species (north western NT for *C. dahlii* and the eastern Gulf of Carpentaria region of Queensland for *Crottyanura crottyi sp. nov.*) clearly shows two separate species are involved. Hence the formal naming of *C. crottyi sp. nov.* herein.

The species *C. dahlii* has a dorsal pattern reminiscent of *Ranoidea aurea* (Lesson 1829) from south-east Australia. In *C. dahlii* the dorsal colour is greenish with well-defined largeish brown blotches covering the back and thighs. There is invariably a reasonably thick and well defined mid-dorsal stripe running from snout to rear. The hind side of the thighs is prominently spotted, mottled or marbled with white which invariably has a well defined dark coloured outer edge bordering the white parts.

By contrast *C. crottyi sp. nov*. has a dorsal colouration of well defined green markings over a light grey to beige background, the green markings being of small size, jagged and irregular edged and close spaced, giving a very different view to that seen in *C. dahlii*. Most specimens of *C. crottyi sp. nov*. lack any mid-dorsal line runing down the midline from snout to rear and those that have such a line, have one that is indistinct and not white, but rather simply green, brown or greyish, in line with the dominant dorsal colouration. The hind side of the thighs are not prominently spotted, mottled or marbled with white which invariably have a well defined dark coloured outer edge bordering the white parts.

The upper surfaces of the hind limbs in *C. crottyi sp. nov*. have well defined dark patches, flecks or spots that contrast and are obvious on an otherwise light coloured background. There are no similar markings and configuration on the upper surfaces of the hind limbs in *C. dahlii*.

Photos of *C. dahlii* in life can be found in Anstis (2013) on pages 180-182 and Cogger (2014) on page 160 bottom left.

Photos of *C. crottyi sp. nov*. in life can be found in Vanderduys (2012) on page 35.

The genus *Crottyanura gen. nov.* consists of two species, namely *C. dahlii* (Boulenger, 1896), with a type locality of Daly River, Northern Territory and found in the general region of the type locality, being the western half of the top end of the Northern Territory and into immediately adjacent north-west Western Australia, as well as the newly named species *Crottyanurua crottyi sp. nov*. from the eastern side of the Gulf of Carpentaria and the western side of Cape York in Queensland.

Both species are readily separated from other Australasian Tree Frogs (Pelodryadidae) by the following diagnosis.

Ranoidea Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the resurected genus *Chirodryas* Keferstein, 1867 and the two tropical species *Chiroleptes dahlii* Boulenger, 1896, and *Crottyanurua crottyi sp. nov*. herein placed in the new genus *Crottyanura gen. nov.*.

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold.

In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles. By contrast subgenus *Sandgroperanura subgen. nov*. has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

The build of *Crottyanura gen. nov.* while solid, is slender when compared to both *Ranoidea* and *Chirodryas.* The species in *Crottyanura gen. nov.* are further diagnosed by being olive green with brownish tinge above and a distinctive light mid-vertebral line (in *C dahlii* but not often in *C. crottyi sp. nov.*); having the hind side of the thighs mottled, marbled or spotted with white (in *C dahlii* but not in *C. crotty sp. nov.*); a finely granular dorsum; smooth white-coloured venter; no dorsolateral skin fold; fully webbed toes; no outer metatarsal tubercle and inner metatarsal tubercle is not shovel-shaped.

Distribution: The newly named species *Crottyanurua crottyi sp. nov*. occurs on the eastern side of the Gulf of Carpentaria within Queensland and the western side of Cape York in far north Queensland, Australia. *C. dahlii* (Boulenger, 1896), with a type locality of Daly River, Northern Territory is found in the general region of the type locality, being the western half of the top end of the Northern Territory and into immediately adjacent north-west Western Australia.

Etymology: “Crotty”, was the abbreviated name of a now deceased Great Dane cross Rottweiller dog that

protected this author's scientific research facility for nearly 13 years. It is appropriate that a genus and species (formally described above) are formally named in his honour.

His full name was "*Crotalus*", being the generic name for a group of large venomous North American Pit Viper snakes with a rattle on the tail.

RANOIDEINA SUBTRIBE NOV.

***RANOIDEA* TSCHUDI, 1838**

Type species: *Ranoidea jacksionensis* Tschudi, 1838 = *Rana aurea* Lesson, 1831.

Diagnosis: *Ranoidea* Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the genus *Chirodryas* Keferstein, 1867 and the two tropical species *Chiroleptes dahlii* Boulenger, 1896, and *Crottyanurua crottyi sp. nov.* herein placed in the new genus *Crottyanura gen. nov.*.

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold. In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles.

By contrast subgenus *Sandgroperanura subgen. nov.* has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

Distribution: Coastal New South Wales (Australia) and immediately adjacent parts of north-east Victoria (subgenus *Ranoidea*), or wetter parts of south-west Australia (subgenus *Sandgroperanura subgen. nov.*).

Content: *Ranoidea aurea* (Lesson, 1831) (type species); *R. cyclorhyncha* (Boulenger, 1892); *R. moorei* (Copland, 1957).

SANDGROPERANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:B5658E8E-49A5-450A-B908-EA91ED60ACF6

Type species: *Hyla aurea cyclorhynchus* Boulenger, 1882.

Diagnosis: The two subgenera within *Ranoidea* Tschudi, 1838 are separated as follows: Nominate subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles.

By contrast subgenus *Sandgroperanura subgen. nov.* has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

Duellman *et al.* (2016) found that the two recognized species in this subgenus, from Western Australia diverged from one another 1.1 MYA.

They also found that these two species diverged from their nearest living congener, *R. aurea* from eastern Australia some 12 MYA, confirming that genus level recognition of the two divergent, western Australian taxa is warranted.

Ranoidea Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the resurrected genus *Chirodryas* Keferstein, 1867 and the two tropical species *Chiroleptes dahlii* Boulenger, 1896, and *Crottyanurua crottyi sp. nov.* herein placed in the new genus *Crottyanura gen. nov.*.

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold. In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

Distribution: *Sandgroperanura subgen. nov.* occurs in wetter parts of south-west Australia. The nominate subgenus *Ranoidea* is found in coastal New South Wales (Australia) and immediately adjacent parts of north-east Victoria.

Etymology: Named in reflection of where the frogs live, as in south-western Australia, being a generally sandy region, where the local people are referred to as “sand gropers” in reflection of their alleged habits of groping in the sand. The “anura” part of the name refers to the genus being of frogs.

Content: *Sandgroperanura cyclorhyncha* (Boulenger, 1892) (type species); *S. moorei* (Copland, 1957).

***CHIRODRYAS* KEFERSTEIN, 1867**

Type species: *Chirodryas raniformis* Keferstein, 1867.

Diagnosis: *Ranoidea* Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the resurrected genus *Chirodryas* Keferstein, 1867 and the two tropical species *Chiroleptes dahlii* Boulenger, 1896, and *Crottyanurua crottyi sp. nov*. herein placed in the new genus *Crottyanura gen. nov.*.

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold. In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles. By contrast subgenus *Sandgroperanura subgen. nov*. has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

Duellman *et al.* (2016) found that the species within *Chirodryas* diverged from their nearest living relatives (*Ranoidea*) some 15.3 MYA supporting the contention that genus-level division and recognition is warranted.

Distribution: The three species within *Chirodryas* are all confined to Victoria, Tasmania, far south-east South Australia and cooler parts of eastern New South Wales (NSW), in NSW generally in higher altitude areas away from the coast and immediately adjacent ranges.

Content: *Chirodryas raniformis* (Keferstein, 1867) (type species); *C. castanea* (Steindachner, 1867); *C. sloppi sp. nov.*.

CHIRODRYAS SLOPPI SP. NOV.

LSIDurn:lsid:zoobank.org:act:9D4BD424-D271-4B67-AA83-4E344AD05D9F

Holotype: A preserved female specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D19286, collected 16 km south of Boorowa, New South Wales, Australia, Latitude -34.6 S., Longitude 148.73 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D19494, collected 11.2 km south of Tumut, New South Wales, Latitude -35.4 S., Longitude 148.22 E.

Diagnosis: Until now, *Chirodryas sloppi sp. nov.* has been treated as a southern population of *C. castanea* (Steindachner, 1867), with an unknown type locality, but of the same form and colouration as “*Litoria flavipunctata* Courtice and Grigg, 1975”, with a type locality of Guyra in the New England region of New South Wales (NSW), Australia, as detailed by Thomson *et al.* (1996).

Thomson *et al.* (1996) established that *C. castanea* (Steindachner, 1867) and “*Litoria flavipunctata* Courtice and Grigg, 1975” are one and the same species.

They also established that the southern NSW and Australian Capital Territory (ACT) population of putative *C. castanea* are significantly different morphologically and on this basis, the species is herein formally described as a new species.

Herein identified as *Chirodryas sloppi sp. nov.* it would until now have been identified as *C. castanea* using the relevant keys in Cogger (2014) or Anstis (2013).

The three species of “Bell Frog” within the genus *Chirodryas* Keferstein, 1867 are separated from morphologically similar species by having large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The species *Chirodryas sloppi sp. nov.* and *C. castanea* are both separated from congener *C. raniformis* (Keferstein, 1867) and the sometimes sympatric and morphologically similar species *Ranoidea aurea* (Lesson, 1831) by having a black and yellow marbled pattern present on the ventral surface of the legs; toes fully webbed; warty dorsum; large black-ringed yellow spots in the inguinal region and a series of yellow spots on the hind edge of the thigh.

By contrast congener *C. raniformis* is diagnosed by having the ventral surface of the thighs immaculate and cream coloured; toes slightly less than fully webbed; warty dorsum; no large yellow spots in the inguinal region and if spots are present on the posterior of the thigh, they tend to be randomly arranged.

The sometimes sympatric and morphologically similar species *Ranoidea aurea* (Lesson, 1831) is in turn separate from all species in *Chirodryas* by having expanded toe discs; toes half to three-quarter webbed;

no warts on the dorsum or if so, they are small and pimple like only and spots are absent from the inguinal region, vent and posterior edge of the thigh.

Chirodryas sloppi sp. nov. from the New South Wales (NSW) southern highlands and adjacent western slopes region is separated from *C. castanea* from the New England Tableland region of NSW as follows.

Although the black and yellow marbling on the ventral surface of the thigh is present in both species, the extent and definition of these markings is different. In *C. castanea* the marbling extends to the

latero-ventral surface; whilst in *C. sloppi sp. nov.* it stops at the inguinal area. Furthermore, the intensity or definition of this patterning is sharp and clear in *C. castanea* and not in *C. sloppi sp. nov..*

C. sloppi sp. nov. lacks white or yellow spots on the feet as seen in *C. castanea.*

C. sloppi sp. nov. is generally a deep emerald-green colour when compared to the lime green colouration of *C. castanea.*

Most adult *C. sloppi sp. nov.* have a distinctive vertebral stripe.

C. sloppi sp. nov. in life are depicted on page 155 of Cogger (2014), Anstis (2013) on page 164 (two photos) and Eipper and Rowland (2018) on page 121 (top).

O. castanea in life are depicted in Barker and Grigg (1977) on page 83 (top) and Tyler (1992) on page 19 (top).

In habit, I have observed specimens usually alone in fast flowing stream environments in grazing country. They are usually detected by day as they make a “plop” sound as they jump into the water as one approaches, having been resting in the open on a perch of some sort. Typically the frog remains underwater until the threat passes (or it is caught).

At night in heavy rain in warmer months, specimens are found crossing roads. On such nights, this species is not found in the large numbers of other sympatric forms of frog.

Ranoidea Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the resurrected genus *Chirodryas* Keferstein, 1867 and the two tropical species *Chiroleptes dahlii* Boulenger, 1896, and *Crottyanurua crottyi sp. nov.* herein placed in the new genus *Crottyanura gen. nov..*

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold. In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles. By contrast subgenus *Sandgroperanura subgen. nov*. has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

Duellman *et al.* (2016) found that the species within *Chirodryas* diverged from their nearest living relatives (*Ranoidea*) some 15.3 MYA supporting the contention that genus-level division and recognition is warranted.

Distribution: *C. sloppi sp. nov.* is found in the Southern Tablelands region of New South Wales, Australia and immediately adjacent colder parts of the western slopes, in a region generally bound by Holbrook, in southern New South Wales in the south-west, Mount Clear, south of Canberra in the ACT in the south-east, Oberon / Jenolan Caves, NSW in the north-east and Orange, NSW in the northwest. The species *O. castanea* (Steindachner, 1867) is found in the New England region of NSW, specifically known from an area bounded by Armidale in the south, Cobbadah in the west, Inverell in the north-west and between Guyra and Glen Innes in the north-east, with the vast majority of records being from within 30 km of Guyra.

Etymology: Slop (AKA Slopp) was the name of the author’s Great Dane dog (aged 8 in 2020) that protected this author’s scientific research facility from thieves for 8 years.

It is appropriate that a species (formally described above) is formally named in his honour.

GEDYERANINA SUBTRIBE NOV.

GEDYERANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:BF631A5E-E1A7-4E2C-BCBC-B4C35564AC57

Type species: *Gedyerana gedyei sp. nov.*

Diagnosis: The genus *Gedyerana gen. nov.* includes the species originally described as *Hyla dayi* Günther, 1897 and a closely related species herein formally described as *Gedyerana gedyei sp. nov..*

Until now, both had been treated as the same putative species, known in most texts as *Nyctimystes dayi* (Günther, 1897) as seen in Cogger (2014) or alternatively “*Litoria dayi*” in recent texts such as Anstis (2013) and Eipper and Rowland (2018).

Numerous molecular phylogenies, including that of Duellman *et al.* (2016) found this putative species to have

diverged from the type species of the genus *Nyctimystes* Stejneger, 1916, type species *Nyctimantis papua* Boulenger, 1897, 41 MYA.

With a divergence of that magnitude, clearly "*Hyla dayi*" needs to be assigned to a separate genus.

Mosleyia Wells and Wellington, 1985 is the closest match according to Duellman *et al.* (2016), but having a divergence of 21 MYA and with species that are very morphologically divergent. The next nearest match is 26.1 MYA for several other generic groupings.

With a minimum divergence of 21 MYA from nearest available genus group, it is clear that a new genus needed to be erected for this species group and hence the erection of *Gedyerana gen. nov.* herein.

Gedyerana gen. nov. is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by being the only Australasian Tree Frog species having a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines and a horizontally elliptical pupil. All other species within this region with a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines have a vertically elliptical pupil, including species within *Nyctimystes* Stejneger, 1916 *sensu lato*, as defined by other authors including Cogger (2014) at page 197 under the heading "genus *Nyctimystes* Stejneger, 1916".

Both species within the genus *Gedyerana gen. nov.* would be diagnosed as either "*Litoria dayi*" in Anstis (2013) or "*Nyctimystes dayi*" in Cogger (2014).

These frogs have large protruding eyes, with a dark iris, a broad head and a slender body. Males get to about 45 mm in body length, but females are considerably larger and get to about 60 mm in length. Their tadpoles have large sucker mouths. Dorsal colour ranges from grey, brown, yellow, orange or red, with or without mottling, spots or flecks and with or without discrete white or cream blotches or ocelli on the upper surfaces. Snout is moderately rounded or acuminate (tending to be pointed) and the genus occurs in rainforest stream habitats.

Distribution: *Gedyerana gen. nov.* is endemic to the wet tropics region of far North Queensland. For more detail see the description of *Gedyerana gedyei sp. nov.* in this paper.

Etymology: The genus is named in honour of Andrew Gedye of Cairns, Queensland, Australia, in recognition of his services to herpetology in Australia, in particular through his breeding of rare and threatened species of pythons and elapids (snakes).

Content: *Gedyerana gedyei sp. nov.* (type species); *G. dayi* (Günther, 1897).

GEDYERANA GEDYEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:EEBA7E33-3788-4440-AAC7-49D7FBE245CA

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J136323 collected from Cape Tribulation, North Queensland, Australia, Latitude -16.0878 S., Longitude 145.4548 E.

This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J136326-9 collected from Cape Tribulation, North Queensland, Australia, Latitude -16.0878 S., Longitude 145.4548 E.

Diagnosis: Until now *Gedyerana gedyei sp. nov.* has been treated as a northern population of *G. dayi* (Günther, 1897), known in most texts under the genus names of *Nyctimystes* Stejneger, 1916 type species *Nyctimantis papua* Boulenger, 1897, or *Litoria* Tschudi, 1838 type species *Litoria freycineti* Tschudi, 1838. The two species are herein treated as the entire content of the genus *Gedyerana gen. nov.*.

Both species within the genus *Gedyerana gen. nov.* would be diagnosed as either "*Litoria dayi*" in Anstis (2013) or "*Nyctimystes dayi*" in Cogger (2014).

These frogs have large protruding eyes, with a dark iris, a broad head and a slender body. Males get to about 45 mm in body length, but females are considerably larger and get to about 60 mm in length.

Their tadpoles have large sucker mouths. Dorsal colour ranges from grey, brown, yellow, orange or red, with or without mottling, spots or flecks and with or without discrete white or cream blotches or ocelli on the upper surfaces. Snout is moderately rounded or acuminate (tending to be pointed) and the genus occurs in rainforest stream habitats.

Both species within *Gedyerana gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by being the only Australasian Tree Frog species having a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines and a horizontally elliptical pupil. All other species within this region with a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines have a vertically elliptical pupil, including species within *Nyctimystes* Stejneger, 1916 *sensu lato*, as defined by other authors including Cogger (2014) at page 197 under the heading "genus *Nyctimystes* Stejneger, 1916".

Gedyerana gedyei sp. nov. is readily separated from *G. dayi* by having a snout that is acuminate (tending to be pointed) and a dorsal colouration being generally creamish, light yellow or light grey, versus having a snout being moderately rounded and a dorsal colouration being generally brown, orange or reddish in *G. dayi.*

Gedyerana gedyei sp. nov. tend to lack the white dorsal spots and ocelli that are commonly seen in specimens of *G. dayi.* Spotting or marks on *G. gedyei sp. nov.* if present tend to be dark or blackish in colour.

There are a number of available synonyms for putative *G. dayi*, being as follows:

Hyla dayi Gunther 1897 with a type locality of Bartle Frere Mountains, North East Queensland.

Hyla tympanocryptis Andersson (1916) from Malanda on the Atherton Tableland near Mount Bartle Frere, North East Queensland.

Nyctimystes hosmeri Tyler, 1964 from Tully Falls on the southern edge of the Atherton Tablelands, North East Queensland.

Nyctimystes vestigea Tyler, 1964 from Mount Bartle Frere, North East Queensland.

All names and specimens apply to frogs from the

southern wet tropics, in a region south of the so-called Black Mountain Corridor (or Gap) as detailed in Hoser (2020c).

As there was no available name in the literature for the northern specimens of putative "*Hyla dayi*" the species *Gedyerana gedyei sp. nov.* had to be erected based on material from north of the Black Mountain Corridor (or Gap) as detailed in Hoser (2020c).

Gedyerana gedyei sp. nov. in life, and showing the diagnostic features outlined above, can be found online at:
https://www.flickr.com/photos/outstarwild/49663732508/
and
https://www.flickr.com/photos/akashsherping/36614786851/
and
https://www.flickr.com/photos/126237772@N07/36120089595/
and
https://www.flickr.com/photos/shaneblackfnq/14996849032/
and
https://www.flickr.com/photos/shaneblackfnq/15494532365/

G. dayi in life is depicted in Barker and Grigg (1977) on page 43 (both images) and page 84 bottom, Vanderduys (2012) on page 36 (all images), Anstis (2013) on pages 186-188 (all images) and Cogger (2014) on page 197 (both images) and online at:
https://www.flickr.com/photos/edwardevans/48935973742/
and
https://www.flickr.com/photos/edwardevans/31847701407/

Distribution: *Gedyerana gedyei sp. nov.* is found in the northern wet tropics of far north Queensland.

More specifically it is known from within a region bound by Bushy Creek, near Julatten, Latitude -16.6 S., Longitude 145.3333 E. in the south, O'Keefe Creek, on Big Tableland, Latitude -15.7 S., Longitude 145.25 E. in the north and on the Windsor Tableland, Latitude -16.2083 S., Longitude 144.8778 E. in the west, based on holdings within the Queensland Museum, Brisbane, Australia.

G. dayi is found in the southern wet tropics of far north Queensland.

More specifically this is, Mount Spec, (north of Townsville), Latitude -18.95 S., Longitude 146.1833 E, in the south, Upper Barron River, immediately west of Cairns, Latitude -17.00 S., Longitude 145.4333 E. in the north and Charmillan Creek, Tully Falls Road, 13 km south of Ravenshoe, Latitude -17.7 S., Longitude 145.5167 E. in the west.

Etymology: The new species is named in honour of Andrew Gedye of Cairns, Queensland, Australia, in recognition of his services to herpetology in Australia, in particular through his breeding of rare and threatened species of pythons and elapids (snakes).

***MOSLEYIA* WELLS AND WELLINGTON, 1985.**

Type species: *Hyla nannotis* Andersson, 1916.

Diagnosis: Duellman *et al.* (2016) found that the species within the genus *Mosleyia* Wells and Wellington, 1985 as defined by Wells and Wellington (1985), a diagnosis adopted wholly within this paper, diverged from their nearest living relative 21 MYA, that species group being the genus *Gedyerana gen. nov*. formally described elsewhere in this paper.

The genus *Mosleyia* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by one or other of the two unique suites of characters:

1/ Vomerine teeth prominent and largely between the choanae. No pectoral fold; A series of small enlarged tubercles along the hind edge of the forearm forming a low but distinct crenulated ridge; fingers with strong basal webbing; toes nearly fully webbed; a prominent inner metatarsal tubercle and a small outer one. Heel of adpressed hind limb reaches to eye or beyond; first finger much smaller and shorter than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; tympanum indistinct; no pale stripe along the supratympanic ridge or along posterior edge of upper jaw; adult snout-vent length 65 mm; dorsal pattern is mostly grey or dull green, almost blackish and consists of a series of relatively narrow dark lines and spots forming a fine, continuous reticulum over the back, head and limbs. The flanks have a bluish metal sheen. White below, commonly with brown on the throat; axilla and groin flesh coloured; hind side of thighs are dark brown. Skin leathery, finely granular, or with numerous small scattered warts. Granular below (*M. nannotis* (Andersson, 1916), *M. cottoni sp. nov*. *M. lorica* (Davies and McDonald, 1979)) (nominate subgenus), or:

2/ Vomerine teeth conspicuous in two rows on a line with the hind edge of the choanae; with or without pectoral fold; fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth or with at most a few, low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs more or less uniform and without black and yellow markings or marbling; colour brown to blackish above, never green, with or without a broad, darker vertebral patch and other contrasting markings; a dark dorsal patch, if present, is inconspicuous and commencing from a line joining the centre of each eye; tympanum covered by skin (adult size is 35-50 mm body length) (*M. michaelsmythi sp. nov.*; *M. nyakalensis* (Liem, 1974); *M. pilloti sp. nov.*; *M. rheocola* (Liem, 1974)) (subgenus *Amnisrana subgen. nov.*).

According to Duellman *et al*. (2016) species within the subgenus *Amnisrana subgen. nov*. diverged from those in the subgenus *Mosleyia* 12.1 MYA.

Due to the significant morphological divergence between the often sympatric forms, subgenus level recognition of the latter group was deemed essential.

Distribution: Restricted to the wet tropics of North-east Queensland, Australia.

Content: *Mosleyia nannotis* (Andersson, 1916) (type species); *M. cottoni sp. nov.*; *M. lorica* (Davies and McDonald, 1979); *M. michaelsmythi sp. nov.*; *M. pilloti sp. nov.*; *M. nyakalensis* (Liem, 1974); *M. rheocola* (Liem, 1974).

Hoser 2020 - Australasian Journal of Herpetology 44-46:1-192.

AMNISRANA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:06568884-50B6-4A86-8282-DF689642F1F6

Type species: *Litoria rheocolus* Liem, 1974.

Diagnosis: Duellman *et al.* (2016) found that the species within the genus *Mosleyia* Wells and Wellington, 1985 as defined by Wells and Wellington (1985), a diagnosis adopted wholly within this formal description, diverged from their nearest living relative 21 MYA, that species group being the genus *Gedyerana gen. nov.* formally described elsewhere in this paper.

The genus *Mosleyia* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by one or other of the two unique suites of characters:

1/ Vomerine teeth conspicuous in two rows on a line with the hind edge of the choanae; with or without pectoral fold; fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth or with at most a few, low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs more or less uniform and without black and yellow markings or marbling; colour brown to blackish above, never green, with or without a broad, darker vertebral patch and other contrasting markings; a dark dorsal patch, if present, is inconspicuous and commencing from a line joining the centre of each eye; tympanum covered by skin (adult size is 35-50 mm body length) (*M. michaelsmythi sp. nov.*; *M. nyakalensis* (Liem, 1974); *M. pilloti sp. nov.*; *M. rheocola* (Liem, 1974)) (subgenus *Amnisrana subgen. nov.*) (this being a formal diagnosis for this subgenus), or:

2/ Vomerine teeth prominent and largely between the choanae. No pectoral fold; A series of small enlarged tubercles along the hind edge of the forearm forming a low but distinct crenulated ridge; fingers with strong basal webbing; toes nearly fully webbed; a prominent inner metatarsal tubercle and a small outer one. Heel of adpressed hind limb reaches to eye or beyond; first finger much smaller and shorter than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; tympanum indistinct; no pale stripe along the supratympanic ridge or along posterior edge of upper jaw; adult snout-vent length 65 mm; dorsal pattern is mostly grey or dull green, almost blackish and consists of a series of relatively narrow dark lines and spots forming a fine, continuous reticulum over the back, head and limbs. The flanks have a bluish metal sheen. White below, commonly with brown on the throat; axilla and groin flesh coloured; hind side of thighs are dark brown. Skin leathery, finely granular, or with numerous small scattered warts. Granular below (*M. nannotis* (Andersson, 1916), *M. cottoni sp. nov.* and *M. lorica* (Davies and McDonald, 1979)) (nominate subgenus).

According to Duellman *et al.* (2016) species within the subgenus *Amnisrana subgen. nov.* diverged from those in the subgenus *Mosleyia* 12.1 MYA.

Due to the significant morphological divergence between the often sympatric forms, subgenus level recognition of the latter group was deemed eminently sensible.

Distribution: Restricted to the wet tropics of North-east Queensland, Australia.

Etymology: "Amnis" in Latin means stream and "Rana" means frog, hence the genus name *Amnisrana* or "stream frog".

Content: *M.* (*Amnisrana*) *rheocola* (Liem, 1974) (type species); *M.* (*Amnisrana*) *michaelsmythi sp. nov.*; *M.* (*Amnisrana*) *pilloti sp. nov.*; *M.* (*Amnisrana*) *nyakalensis* (Liem, 1974).

MOSLEYIA* (*MOSLEYIA*) *COTTONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:EFC50F6C-85A5-4FB6-98BA-C1B7DC0F712F

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J5570, collected from Mount Spurgeon, North Queensland, Australia, Latitude 16.4327 S., Longitude 145.2042 E.

This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J17861-3 collected from Parrot Creek, 50 km south of Cooktown, North Queensland, Australia, Latitude -15.8 S., Longitude 145.25 E.

Diagnosis: Until now, *Mosleyia cottoni sp. nov.* has been treated as a northern outlier population of *Mosleyia nannotis* (Andersson, 1916), more commonly known as "*Litoria nannotis*" as defined by Liem (1974), Anstis (2013) and Cogger (2014).

The two species are readily separated as follows: Tympanum is distinct in *M. cottoni sp. nov.*, as opposed to barely visible in *M. nannotis*.

The toes of *M. nannotis* are light in colour, but with obvious dark centres, versus light in colour and without obvious dark centres in *M. cottoni sp. nov.*.

Colouration of specimens varies considerably both between and within localities and sub-populations and with sex, age and time of day so it is difficult to quantify differences, save for the general observation that dorsal pattern in the form of indistinct mottling, specks and flecks is more dense and intense in *M. nannotis* than in *M. cottoni sp. nov.*.

Both these species within the nominate subgenus *Mosleyia*, Wells and Wellington, 1985, are separated from the four species in the other subgenus (*Amnisrana subgen. nov.*) by the following suite of characters: Snout is shorter than the eye diameter; snout bluntly rounded but the head in general is not; loreal region strongly concave; prepollex enlarged; nuptial pad large with coarse spinules; single outer metacarpal tubercle; adults grow to more than 40 mm in body length. IN/EN ratio less than 0-970; web on first toe does not extend beyond the proximal subarticular tubercle; ventral surfaces of posterior portion of body are not cream with a reddish brown or pinkish red tinge and an absence of a dense large black nupital spines around the base of the thumb.

The third species in the subgenus *Mosleyia*, *M. lorica* (Davies and McDonald, 1979) is separated from the other two species by its far smaller adult size (37 mm in body length or less, vs 65 mm in body length in the other two species) and the fact that males have dense large black nupital spines around the base of the thumb.

The genus *Mosleyia* is readily separated from all other

Australasian Tree Frogs (Pelodryadidae) by one or other of the two unique suites of characters:

1/ Vomerine teeth prominent and largely between the choanae. No pectoral fold; A series of small enlarged tubercles along the hind edge of the forearm forming a low but distinct crenulated ridge; fingers with strong basal webbing; toes nearly fully webbed; a prominent inner metatarsal tubercle and a small outer one. Heel of adpressed hind limb reaches to eye or beyond; first finger much smaller and shorter than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; tympanum indistinct; no pale stripe along the supratympanic ridge or along posterior edge of upper jaw; adult snout-vent length 65 mm; dorsal pattern is mostly grey or dull green, almost blackish and consists of a series of relatively narrow dark lines and spots forming a fine, continuous reticulum over the back, head and limbs. The flanks have a bluish metal sheen. White below, commonly with brown on the throat; axilla and groin flesh coloured; hind side of thighs are dark brown. Skin leathery, finely granular, or with numerous small scattered warts. Granular below (*M. nannotis* (Andersson, 1916), *M. cottoni sp. nov*. and *M. lorica* (Davies and McDonald, 1979)) (nominate subgenus), or:

2/ Vomerine teeth conspicuous in two rows on a line with the hind edge of the choanae; with or without pectoral fold; fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth or with at most a few, low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs more or less uniform and without black and yellow markings or marbling; colour brown to blackish above, never green, with or without a broad, darker vertebral patch and other contrasting markings; a dark dorsal patch, if present, is inconspicuous and commencing from a line joining the centre of each eye; tympanum covered by skin (adult size is 35-50 mm body length) (*M. michaelsmythi sp. nov*.; *M. nyakalensis* (Liem, 1974); *M. pilloti sp. nov*.; *M. rheocola* (Liem, 1974)) (subgenus *Amnisrana subgen. nov*.).

According to Duellman *et al*. (2016) species within the subgenus *Amnisrana subgen. nov*. diverged from those in the subgenus *Mosleyia* 12.1 MYA. Due to the significant morphological divergence between the often sympatric forms, subgenus level recognition of the latter group was deemed essential.

M. cottoni sp. nov. in life is depicted in Anstis (2013) on page 253 at top right and P. 245 at top left.

M. nannotis in life is depicted in Vanderduys (2012) on page 56 (two images) and Cogger (2014) on page 176 at bottom.

Distribution: *M. cottoni sp. nov.* is restricted to the northern wet tropics of North-east Queensland, Australia in a region bound by Hunter Creek, Brookland Nature Reserve (adjacent to Mount Lewis), about 60 km north of Cairns, Latitude -16.6205 S., Longitude 145.3064 E, and Mungumby Creek, about 25 km south of Cooktown in Far North Queensland, Latitude -15.700 S., Longitude 145.250 E, bounded to the east by the Pacific Ocean, dry habitats to the west and drier lowlands immediately north and south.

Etymology: Named in honour of Thomas Cotton, formerly of Ringwood, Victoria who for many years played an important role in the wildlife conservation efforts of the team this author works with.

This includes in fieldwork across Australia as well as a displayer of reptiles with Snakebusters: Australia's best reptiles shows, being the only hands-on reptile exhibitions in Australia that let people hold the animals.

MOSLEYIA* (*AMNISRANA*) *MICHAELSMYTHI SP. NOV.

LSIDurn:lsid:zoobank.org:act:B04C0456-EFB5-4246-9559-BD26BF63FE44

Holotype: A preserved male specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J29447 collected 16.7 km from the Mossman-Mount Molloy Road on the Mount Lewis Road, far north Queensland, Australia, Latitude -16.5833 S., Longitude 145.25 E.

This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J29455 and J29446 collected 16.7 km from the Mossman-Mount Molloy Road on the Mount Lewis Road, far north Queensland, Australia, Latitude -16.5833 S., Longitude 145.25 E and specimen number J52942 collected from Mount Lewis, Queensland, Australia, Latitude -16.5736 S., Longitude 145.2633 E.

Diagnosis: Until now, *Mosleyia michaelsmythi sp. nov.* has been treated as a northern outlier population of *Mosleyia nyakalensis* (Liem, 1974), more commonly known as "*Litoria nyakalensis*" as defined by Liem (1974), Anstis (2013) and Cogger (2014).

The two species are readily separated as follows: In life adult *M. nyakalensis* are a uniform slate colour to greyish brown dorsally, sometimes with irregular dark markings in the form of spots of mottling. By contrast *M. michaelsmythi sp. nov.* is a markedly lighter coloured frog being cream, yellow or beige dorsally, sometimes with irregular dark markings in the form of spots or mottling. *M. nyakalensis* of both sexes has a brown iris. By contrast *M. michaelsmythi sp. nov.* males have an orangeish-red iris in males and in females it is beige on top and greyish below.

In *M. nyakalensis* the ventral surfaces of the posterior portion of body is cream with reddish brown overlay, versus pinkish-red in *M. michaelsmythi sp. nov..*

In *M. nyakalensis* on the fingers, the web extends to one-third down the length of the proximal phalanx on outer margin of the third finger, but does not extend this far in *M. michaelsmythi sp. nov..*

M. michaelsmythi sp. nov. in life is depicted in Anstis (2013) on pages 266 and 267 (all photos), including adults of both sexes and also tadpoles. A photo of this species in life is also seen in Vanderduys (2012) on page 60.

Both *M. michaelsmythi sp. nov.* and *M. nyakalensis* are separated from all other species in the genus *Mosleyia* Wells and Wellington, 1985 by the following unique suite of characters: Head rounded; IN/EN ratio more than 0-970; web on first toe on or just beyond the proximal subarticular tubercle; ventral surfaces of posterior portion

of body cream with reddish brown overlay or pinkish-red and an absence of dense large black nupital spines around the base of the thumb.

The genus *Mosleyia* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by one or other of the two unique suites of characters:

1/ Vomerine teeth conspicuous in two rows on a line with the hind edge of the choanae; with or without pectoral fold; fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth or with at most a few, low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs more or less uniform and without black and yellow markings or marbling; colour brown to blackish above, never green, with or without a broad, darker vertebral patch and other contrasting markings; a dark dorsal patch, if present, is inconspicuous and commencing from a line joining the centre of each eye; tympanum covered by skin (adult size is 35-50 mm body length) (*M. michaelsmythi sp. nov.*; *M. nyakalensis* (Liem, 1974); *M. pilloti sp. nov.*; *M. rheocola* (Liem, 1974)) (subgenus *Amnisrana subgen. nov.*) (this being a formal diagnosis for this subgenus), or:

2/ Vomerine teeth prominent and largely between the choanae. No pectoral fold; A series of small enlarged tubercles along the hind edge of the forearm forming a low but distinct crenulated ridge; fingers with strong basal webbing; toes nearly fully webbed; a prominent inner metatarsal tubercle and a small outer one. Heel of adpressed hind limb reaches to eye or beyond; first finger much smaller and shorter than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; tympanum indistinct; no pale stripe along the supratympanic ridge or along posterior edge of upper jaw; adult snout-vent length 65 mm; dorsal pattern is mostly grey or dull green, almost blackish and consists of a series of relatively narrow dark lines and spots forming a fine, continuous reticulum over the back, head and limbs. The flanks have a bluish metal sheen. White below, commonly with brown on the throat; axilla and groin flesh coloured; hind side of thighs are dark brown. Skin leathery, finely granular, or with numerous small scattered warts. Granular below (*M. nannotis* (Andersson, 1916), *M. cottoni sp. nov.* and *M. lorica* (Davies and McDonald, 1979)) (nominate subgenus).

According to Duellman *et al.* (2016) species within the subgenus *Amnisrana subgen. nov.* diverged from those in the subgenus *Mosleyia* 12.1 MYA.

Distribution: *Mosleyia michaelsmythi sp. nov.* is restricted to the northern wet tropics region of Australia with a range extending north from the southern side of Mount Lewis, far north Queensland, Latitude -16.5903 S., Longitude 145.2750 E. and south of Mungumby Creek, 25 km south of Cooktown, far north Queensland, Latitude -15.72 S., Longitude 145.25 E.

Conservation: Neither *M. michaelsmythi sp. nov.* or *M. nannotis* have been seen alive in the wild since about 1990 (Hero and Fickling, 1994) and the two species may already be extinct.

The reckless Queensland Government policy of prohibiting the establishment of captive breeding populations to safeguard the two species (at the time treated as a single species) can be blamed for the presumed extinction of the two species, as similarly noted in comments in Hoser (1991).

The cause of decline is believed to be an introduced pathogen in the form of a fungus (Anstis 2013).

Etymology: Named in honour of Michael Smyth, formerly of Ringwood, Victoria who for many years played an important role in the wildlife conservation efforts of the team this author works with. This includes in fieldwork across Australia as well as a displayer of reptiles with Snakebusters: Australia's best reptiles shows, being the only hands-on reptile exhibitions in Australia that let people hold the animals.

MOSLEYIA* (*AMNISRANA*) *PILLOTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:4EC060C6-0B7C-476E-AC25-BC7E2FCF85AC

Holotype: A preserved female specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J22643 collected from Cape Tribulation, North Queensland, Australia, Latitude -16.0878 S., Longitude 145.4548 E.

This government-owned facility allows access to its holdings.

Paratypes: Two preserved female specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J22644 collected from the type locality above and specimen number J22645 collected from Shiptons Flat, 50 km south of Cooktown, North Queensland, Australia, Latitude -15.8000 S., Longitude 145.2500 E.

Diagnosis: Until now, *Mosleyia pilloti sp. nov.* has been treated as a northern outlier population of *Mosleyia rheocola* (Liem, 1974), more commonly known as "*Litoria rheocola*" as defined by Liem (1974), Anstis (2013) and Cogger (2014).

The two species are readily separated as follows: Resting male *M. rheocola* show an obvious pale crescent shaped mark on the upper flank. This is either abent or very indistinct in *M. pilloti sp. nov.*.

While both species posess small scattered spinose tubercles on the dorsum and uppel limbs, these are prominent in *M. pilloti sp. nov.* versus reduced and blunted in form in *M. rheocola.*Tubercles on the lower flanks of *M. rheocola* are numerous, obvious and raised, versus not so in *M. pilloti sp. nov.*.

As mid-sized pre-metamophosing tadpoles, *M. pilloti sp. nov.* have a dorsum that is light grey in colour, with bold and distinctive dark brownish-black markings. At the same life stage *M. rheocola* tadpoles are with a yellowish dorsum which has a thick peppering of orange and brown, especially posterior to the eyes and anterior to the tail. Comparative photos of tadpoles of both species are in Anstis (2013) on page 295 with *M. pilloti sp. nov.* identified as "Carbine Tableland, Qld" and *M. rheocola* identified as "Henrietta Creek, Palmerston National Park, Qld".

Both *M. piloti* and *M. rheocola* are separated from all other species in the genus *Mosleyia* Wells and Wellington, 1985 by the following unique suite of characters: Head not rounded; IN/EN ratio less than 0-970; web on first toe not beyond proximal subarticular

tubercle; webbing on outer margin of third finger reaches base of penultimate phalanx; ventral surfaces of posterior portion of body not cream with reddish brown or pinkish red tinge; snout longer than eye diameter; snout bluntly rounded; loreal region not strongly concave; prepollex normal and not enlarged; nuptial pad small, spinules fine and not large with coarse spinules; forearm of males normal, not robust; single outer metacarpal tubercle on base of palm and an elongated inner metacarpal tubercle on the proximo-ventral inner surface of the metacarpal of first finger; Fingers moderately webbed: between first and second fingers free of web; web present between second and third and third and fourth fingers; adult less than 40 mm in body length.

The genus *Mosleyia* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by one or other of the two unique suites of characters:

1/ Vomerine teeth conspicuous in two rows on a line with the hind edge of the choanae; with or without pectoral fold; fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth or with at most a few, low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs more or less uniform and without black and yellow markings or marbling; colour brown to blackish above, never green, with or without a broad, darker vertebral patch and other contrasting markings; a dark dorsal patch, if present, is inconspicuous and commencing from a line joining the centre of each eye; tympanum covered by skin (adult size is 35-50 mm body length) (*M. michaelsmythi sp. nov.*; *M. nyakalensis* (Liem, 1974); *M. pilloti sp. nov.*; *M. rheocola* (Liem, 1974)) (subgenus *Amnisrana subgen. nov.*) (this being a formal diagnosis for this subgenus), or:

2/ Vomerine teeth prominent and largely between the choanae. No pectoral fold; A series of small enlarged tubercles along the hind edge of the forearm forming a low but distinct crenulated ridge; fingers with strong basal webbing; toes nearly fully webbed; a prominent inner metatarsal tubercle and a small outer one. Heel of adpressed hind limb reaches to eye or beyond; first finger much smaller and shorter than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; tympanum indistinct; no pale stripe along the supratympanic ridge or along posterior edge of upper jaw; adult snout-vent length 65 mm; dorsal pattern is mostly grey or dull green, almost blackish and consists of a series of relatively narrow dark lines and spots forming a fine, continuous reticulum over the back, head and limbs. The flanks have a bluish metal sheen. White below, commonly with brown on the throat; axilla and groin flesh coloured; hind side of thighs are dark brown. Skin leathery, finely granular, or with numerous small scattered warts. Granular below (*M. nannotis* (Andersson, 1916), *M. cottoni sp. nov.* and *M. lorica* (Davies and McDonald, 1979)) (nominate subgenus).

According to Duellman *et al.* (2016) species within the subgenus *Amnisrana subgen. nov.* diverged from those in the subgenus *Mosleyia* 12.1 MYA.

Mosleyia pilloti sp. nov. in life is depicted in Vanderduys (2012) on page 67, bottom right as well as Anstis (2013) on page 294 middle and bottom right and in Cogger (2014) on page 186 at top right.

M. rheocola in life is depicted in Vanderduys (2012) on page 67, bottom left and Anstis (2013) on page 294 top right.

Distribution: *Mosleyia pilloti sp. nov.* is restricted to the northern wet tropics region of Australia with a range extending north of Port Douglas, far north Queensland Latitude 16.4836 S., Longitude 145.4653 E. and south of Cooktown in far North Queensland (northern limit of range being near the small village of Rossville, Latitude 15.7005 S., Longitude 145.2542 E.).

Conservation: A major decline in numbers in the late 1980's appears to have reversed in some (mainly lower elevation) areas. However the species must be deemed at high risk of extinction.

Refer to the relevant comments in Hoser (1991, 2019a, 2019b).

Etymology: Named in honour of Christian Pillot, formerly of Ringwood, Victoria who for many years played an important role in the wildlife conservation efforts of the team this author works with. This includes in fieldwork across Australia as well as a displayer of reptiles with Snakebusters: Australia's best reptiles shows, being the only hands-on reptile exhibitions in Australia that let people hold the animals.

DARANINANURINI TRIBE NOV.

DARANINANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:E6C1197B-B538-443D-996F-9AA74B74A1BE

Type species: *Litoria brevipalmata* Tyler, Martin and Watson, 1972.

Diagnosis: The genus *Daraninanura gen. nov.* monotypic for the type species *D. brevipalmata* (Tyler, Martin and Watson, 1972) is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Rich brown to chocolate brown above, occasionally with scattered small black flecks. There is a wide canthal stripe running from snout to eye, continuing past the eye as a wide black band, almost over-writing the standard (for frogs) sized tympanum, continuing to the flank and sometimes bordered above with white or yellow. The upper lip has a narrow white or yellow stripe, narrowly edged below with brown, which continues as a glandular stripe from the angle of the mouth to the base of the forearm. The lower flanks are yellowish with scattered black spots, flecks or peppering. Groin is green or blue green. There are no red or orange spots on the hind side of the thighs. There is a dark stripe along the front edge of the hindlimb. Venter is white to light yellow. Top of iris is silver to gold in colour. Skin is smooth to slightly leathery above and coarsely granular below. Snout is rounded in shape. Vomerine teeth are prominent between the choanae. There is no pectoral fold. Finger and toe discs are of medium size, fingers are unwebbed and toes about one third webbed. There is a prominent inner metatarsal tubercle and an indistinct small outer tubercle. The second finger is longer than the first, the first finger being so short that when pressed together with the second, it reaches no further than the base of the disc of the second.

Duellman *et al.* (2016) found the type and only species in

the genus *Daraninanura gen. nov.* to have diverged from its nearest living relative 35.1 MYA, necessitating the transfer of this species to a new genus and the genus to a new tribe as done within this paper.

Photos of *Daraninanura brevipalmata* (Tyler, Martin and Watson, 1972), can be found in Cogger (2014) on page 153 (two images), Vanderduys (2012) on page 27, Eipper and Rowland (2018) on page 119 at top and Anstis (2013) on pages 156 (right side), 157 and 158.

Distribution: Known only from wet sclerophyll forests of the north coast of New South Wales, north from about Gosford and into the wetter parts of south-east Queensland, Australia.

Etymology: Named in honour of Dara Nin of Ringwood, Victoria, Australia, who for many years has been a member of the team doing Reptile Parties and Reptile Shows, with Snakebusters: Australia's best reptiles shows. He has helped to educate Australians about wildlife and wildlife conservation, with Australia's only hands on reptile shows that let people hold the animals.

Content: *Daraninanura brevipalmata* (Tyler, Martin and Watson, 1972) (monotypic).

FIACUMMINGANURINI TRIBE NOV.

FIACUMMINGANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:91ADD2D0-9D5C-4882-90B7-277A74B6E7B5

Type species: *Fiacumminganura fiacummingae sp. nov*. (this paper).

Diagnosis: Until now the single putative species within this genus, has been known under various names.

It was originally described as *Hyla maculata* Spencer, 1901, later transferred to the genus *Litoria* Tschudi, 1838 by Cogger *et al.* (1983). Dubois (1984) assigned a replacement name *Litoria spenceri* to the same taxon, as the species name *maculata* had been earlier applied to a different species (preoccupied by *Hyla maculata* Gray, 1830). The putative taxon "*Litoria spenceri*", has been kept in that genus by most authors since. See for example Tyler (1992), Anstis (2013), Cogger (2014) and Eipper and Rowland (2018).

Contrary to this has been a realisation by many herpetologists that the continued placement of morphologically and genetically divergent species within the single putative genus *Litoria* is untenable.

Ranoidea spenceri (Dubois, 1984) (Dubois and Frétey, 2016), was one such attempt to place this divergent taxon in another genus. Duellman *et al.* (2016) placed putative "*Litoria spenceri*" within the genus *Dryopsophus* Fitzinger, 1843, with the type spcies *Hyla citropa* Dümeril and Bibron, 1841.

In line with Pyron and Weins (2011), Duellman *et al.* (2016) found that the divergent "*Litoria spenceri*" was most closely related to the species group including *Dryopsophus citropa*. However there was still a 22.3 MYA divergence between the two groups of species.

Hence the erection of a new genus to accommodate putative "*Litoria spenceri*" as done herein.

Investigations have also shown that putative "*Litoria spenceri*" in fact consists of three divergent species and the two unnamed forms are formally named herein, one of them being assigned the type species for this new genus named *Fiacumminganurea gen. nov.*.

The three morphologically similar species within *Fiacumminganurea gen. nov*. are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: A colouration that is grey to green above, with irregular darker mottling, marbling or flecks, the latter often forming irregular cross-bands on the limbs.

Ventral surface white or yellow or white becoming yellow towards the rear. Lower and concealed surface of limbs are yellowish. Skin is somewhat leathery, with a few tiny whitish tubercles on the back becoming numerous on the sides. Skin below is granular. Small but prominent vomerine teeth are located mostly behind the choanae. A pectoral fold is indistinct. Finger and toes discs are moderate, being only a little wider than the digits. Fingers with distinct basal webbing and the toes are fully webbed. There is a small but prominent inner metatarsal tubercle, no outer one. Tympanum is indistinct. Second finger is larger than the first; adult size to 45 mm in lenth.

The tadpole is free-swimming, elongated and flattened, and reaches a total length of 40 mm prior to metamorphosis. The body is dark brown to black above, with fine silver chromatophores extending onto the flanks. Darker spots may be present on the dorsal surface, while the ventral surface is darkly pigmented. The tail fin and muscle are covered with fine melanophores. The tail is moderately thick and has a rounded tip. The eyes are dorso-lateral, and the mouth is ventral. The oral disc is large relative to closely-related species, and the oral papillae have a wide anterior gap. There are two rows of anterior labial teeth and three posterior rows (Hero *et al*. 1995; Anstis 2013).

In terms of morphologically similar and potentially sympatric species the warty back of *Fiacumminganurea gen. nov*. distinguishes species in this genus from the morphologically similar species *Dryopsophus nudidigita* (Copland, 1962) and its lack of a distinct tympanum distinguishes it from *Dryopsophus citropa* (Dümeril and Bibron, 1841).

Distribution: Eastern Victoria and immediately adjacent southern New South Wales, on both sides of the Great Dividing Range.

Etymology: The genus and type species are named in honour of Fia Cumming of Canberra, ACT, Australia, in recognition for her services to wildlife conservation in Australia as detailed in Hoser (1993) and Hoser (1996).

Content: *Fiacumminganurea fiacummingae sp. nov.* (type species); *F. spenceri* (Dubois, 1984); *F. timdalei sp. nov.*

FIACUMMINGANUREA FIACUMMINGAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:93A202C8-5C46-41A5-93F3-0486501B4B43

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D73096 collected at Bogong Creek, Kosciuszko National Park, New South Wales, Australia, Latitude -36.1 S., Longitude 148.4 E.

This government-owned facility allows access to its holdings.

Paratypes: Fifteen preserved specimens at the National

Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D72995, D72996, D72997, D72998, D72999, D73060, D73061, D73062, D73063, D73064, D73065, D73097, D73098, D73099 and D73100 all collected at Bogong Creek, Kosciuszko National Park, New South Wales, Australia, Latitude -36.1 S., Longitude 148.4 E.

Diagnosis: That there are three highly divergent species until now all placed within the single species described as *Litoria spenceri* (Dubois, 1984), herein placed in the new genus *Fiacumminganurea gen. nov.* has been known for some time (Minister for the Environment, Commonwealth Government of Australia. 2017).

All three populations (species) have declined sharply due to the effects of *Batrachochytrium dendrobatidis* (Gillespie *et al.* 2015) and therefore with reference to Hoser (2019a, 2019b) it is of critical importance that all three species be formally identified and named immediately so that all can have proper conservation management plans enacted.

With reference to Hoser (2020a), it is also important that all three species (AKA divergent genetic lineages) be kept intact and not otherwise be destroyed by well-meaning but unwise translocations of specimens.

The type form of *L. spenceri* and *Hyla maculata* Spencer, 1901 are both based on a holotype specimen at the National Museum of Victoria, in Melbourne, Australia, specimen number D8498 allegedly from "Powong [= Poowong], Victoria", Australia.

To date this locality information has not been questioned in the literature, but clearly the location is in error.

The Poowong area in West Gippsland is relatively flat and devoid of the mountain stream habitats occupied by the putative species.

Furthermore this site is disconnected from all known populations by way of drainage systems and potential migration routes.

No further specimens have been found there since the lodgement of the holotype and none would be expected to be found there either.

Inspection of the said specimen and also the original descriptions of Spencer (1901) and Dubois (1984) confirms it is of the nearest geographically proximal lineage, being that from the south-side of the Great Dividing Range, currently known from the Wongungarra River drainage, being part of the Mitchell River system in eastern Victoria. Hence it is that form that must be treated as nominate *F. spenceri.*

Even allowing for human-created declines in the last 250 years, the nearest potential drainage system for the taxon to occur near the the alleged type locality would be those of the Latrobe Valley which like the Mitchell River drain into Victoria's East Gippsland Lakes region, the likely collection point still being a watershed on the south-side of the Great Dividing Range.

Nominate *F. spenceri* is therefore treated as the form currently only known with certainty from the Wongungarra River system in eastern Victoria and at its widest those from south of the Great Dividing Range.

All other forms previously treated as that taxon are herein described as new species.

F. fiacummingae sp. nov. is found in the Upper Murray Basin, comprising the West Kiewa, Mitta Mitta, Indi and Bundarra Rivers as well as Buffalo, Snowy, Lightning, Wheeler and Bogong Creeks.

F. timdalei sp. nov. previously known as the so-called "Green Form" of "*Litoria spenceri*" is found in the upper Goulburn River basin including the Goulburn, Taponga, Big, Black, North Jamieson and Howqua Rivers as well as Snake, White and Still Creeks.

The three species are readily separated from one another on the basis of colour of adult specimens.

F. spenceri is olive grey above, blotched with darker markings, with the same on the upper surfaces of the limbs. The flanks are generally light, but with prominent large dark spots or blotches.

There is a purply-grey line running from the snout, through the top of the eye and down to the top of the forelimb, where it terminates. Below this line, the snout is generally green. The top of the head is prominently spotted.

F. timdalei sp. nov. is generally lime green above no markings on the upper surfaces of the limbs save for limited peppering on the front limbs. Unlike both other species it also has a distinctive yellow-gold line (occasionally whitish) running from the snout, through the nostril, above the eye and down to the upper arm, where it widens and fades on the anterior flank. There is a blackish-grey border to the lower edge of this line on the snout and to the back of the head. The flanks are whitish with purply-grey mottling.

F. fiacummingae sp. nov. is generally an olive grey colour above, like in *F. spenceri*, but is separated from that species by having no obvious contrasting dark blotches on the upper body or upper surfaces of the limbs.

Any markings on the body are indistinct and consist of numerous tiny darker spots and patches, giving the frog a peppered appearance. Limbs are greenish to grey and have indistinct lighter markings in the form of spots, peppering or patches.

F. fiacummingae sp. nov. is also characterised by a distinctive lime-green semicircle under the eye, which spreads in less intensity to the nearby upper lip, posterior to the nostril.

There is no obvious spotting on the upper surface of the head in this species as seen in *F. spenceri*.

Both *F. fiacummingae sp. nov*. and *F. timdalei sp. nov.* have larger tubercles or warts on the upper surface of the body, being generally tubercular across the entire upper body than is seen in *F. spenceri.*

Comparative illustrative photos of *F. timdalei sp. nov.* and *F. spenceri* can be seen (in that order) on pages 36 and 37 of Hero *et al*. (1991).

The three morphologically similar species within *Fiacumminganurea gen. nov*. are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: A colouration that is grey to green above, with irregular darker mottling, marbling or flecks, the latter often forming irregular cross-bands on the limbs. Ventral surface white or yellow or white becoming yellow towards the rear. Lower and concealed surface of limbs are yellowish. Skin is somewhat leathery, with a few tiny whitish tubercles on

the back becoming numerous on the sides. Skin below is granular. Small but prominent vomerine teeth are located mostly behind the choanae. A pectoral fold is indistinct. Finger and toes discs are moderate, being only a little wider than the digits. Fingers with distinct basal webbing and the toes are fully webbed. There is a small but prominent inner metatarsal tubercle, no outer one. Tympanum is indistinct. Second finger is larger than the first; adult size to 45 mm in lenth.

The tadpole is free-swimming, elongated and flattened, and reaches a total length of 40 mm prior to metamorphosis. The body is dark brown to black above, with fine silver chromatophores extending onto the flanks. Darker spots may be present on the dorsal surface, while the ventral surface is darkly pigmented. The tail fin and muscle are covered with fine melanophores. The tail is moderately thick and has a rounded tip. The eyes are dorso-lateral and the mouth is ventral. The oral disc is large relative to closely-related species, and the oral papillae have a wide anterior gap. There are two rows of anterior labial teeth and three posterior rows (Hero *et al.* 1995; Anstis 2013).

In terms of morphologically similar and potentially sympatric species the warty back of *Fiacumminganurea gen. nov*. distinguishes species in this genus from the morphologically similar species *Dryopsophus nudidigita* (Copland, 1962) and its lack of a distinct tympanum distinguishes it from *Dryopsophus citropa* (Dümeril and Bibron, 1841).

F. fiacummingae sp. nov. in life can be found in Cogger (2014) at page 189 and Anstis (2013), on page 309, top left and second down from top on right and again on page 310 (tadpoles).

F. timdalei sp. nov. in life can be found in Hero *et al.* (1991) on page 36, Anstis (2013) on page 309, top right, as well as in Eipper and Rowland (2018) on page 152 bottom.

F. spenceri in life can be found in Hero *et al.* (1991) on page 37.

Photos of all three species can be found online on photo-sharing sites such as “www.flickr.com”, many not identifiable by location, but easily distinguished from one another on the basis of the diagnostic characters given above.

Distribution: *F. fiacummingae sp. nov*. is found in the Upper Murray Basin, comprising the West Kiewa, Mitta Mitta, Indi and Bundarra Rivers as well as Buffalo, Snowy, Lightning, Wheeler and Bogong Creeks.

Etymology: This species and the genus it is placed in are named in honour of Fia Cumming of Canberra, ACT, Australia, in recognition for her services to wildlife conservation in Australia as detailed in Hoser (1993) and Hoser (1996).

FIACUMMINGANUREA TIMDALEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:19E954EC-4E8F-4D6F-9E58-4285D59BB988

Holotype: A preserved male specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D48831 collected from Bindaree Hut, Howqua River, 9.5 km West of Mount Howitt, Victoria, Australia, Latitude -37.18 S., Longitude 146.53 E.

This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R46682 and R46684, collected from Richies Hut at the Howkwa River, Victoria, Australia, Latitude -37.1944 S., Longitude 146.475 E.

Diagnosis: That there are three highly divergent species until now all placed within the single species described as *Litoria spenceri* (Dubois, 1984), herein placed in the new genus *Fiacumminganurea gen. nov.* has been known for some time (Minister for the Environment, Commonwealth Government of Australia. 2017).

All three populations (species) have declined sharply due to the effects of *Batrachochytrium dendrobatidis* (Gillespie *et al.* 2015) and therefore with reference to Hoser (2019a, 2019b) it is of critical importance that all three species be formally identified and named immediately so that all can have proper conservation management plans enacted.

With reference to Hoser (1995) and Hoser (2020a), it is also important that all three species (AKA divergent genetic lineages) be kept intact and not otherwise be destroyed by well-meaning but unwise translocations of specimens.

The type form of *L. spenceri* and *Hyla maculata* Spencer, 1901 are both based on a holotype specimen at the National Museum of Victoria, in Melbourne, Australia, specimen number D8498 allegedly from “Powong [= Poowong], Victoria”, Australia.

To date this locality information has not been questioned in the literature, but clearly the location is in error.

The Poowong area in west Gippsland is relatively flat and devoid of the mountain stream habitats occupied by the putative species.

Furthermore this site is disconnected from all known populations by way of drainage systems and potential migration routes.

No further specimens have been found there since the lodgement of the holotype and none would be expected to be found there either.

Inspection of the said specimen and also the original descriptions of Spencer (1901) and Dubois (1984) confirms it is of the nearest geographically proximal lineage, being that from the south-side of the Great Dividing Range, currently known from the Wongungarra River drainage, being part of the Mitchell River system in eastern Victoria.

Hence it is that form that must be treated as nominate *F. spenceri.*

Even allowing for human-created declines in the last 250 years, the nearest potential drainage system for the taxon to occur near the the alleged type locality would be those of the Latrobe Valley which like the Mitchell River drain into Victoria’s East Gippsland Lakes region, the likely collection point still being a watershed on the south-side of the Great Dividing Range.

Nominate *F. spenceri* is therefore treated as the form currently only known with certainty from the Wongungarra River system in eastern Victoria or at its widest being from south of the Great Dividing Range.

All other forms previously treated as that taxon are herein described as new species.

F. fiacummingae sp. nov. is found in the Upper Murray Basin, comprising the West Kiewa, Mitta Mitta, Indi and Bundarra Rivers as well as Buffalo, Snowy, Lightning, Wheeler and Bogong Creeks.

F. timdalei sp. nov. previously known as the so-called "Green Form" of "*Litoria spenceri*" is found in the upper Goulburn River basin including the Goulburn, Taponga, Big, Black, North Jamieson and Howqua Rivers as well as Snake, White and Still Creeks.

The three species are readily separated from one another on the basis of colour of adult specimens.

F. spenceri is olive grey above, blotched with darker markings, with the same on the upper surfaces of the limbs. The flanks are generally light, but with prominent large dark spots or blotches.

There is a purply-grey line running from the snout, through the top of the eye and down to the top of the forelimb, where it terminates. Below this line, the snout is generally green. The top of the head is prominently spotted.

F. timdalei sp. nov. is generally lime green above no markings on the upper surfaces of the limbs save for limited peppering on the front limbs. Unlike both other species it also has a distinctive yellow-gold line (occasionally whitish) running from the snout, through the nostril, above the eye and down to the upper arm, where it widens and fades on the anterior flank. There is a blackish-grey border to the lower edge of this line on the snout and to the back of the head. The flanks are whitish with purply-grey mottling.

F. fiacummingae sp. nov. is generally an olive grey colour above, like in *F. spenceri*, but is separated from that species by having no obvious contrasting dark blotches on the upper body or upper surfaces of the limbs.

Any markings on the body are indistinct and consist of numerous tiny darker spots and patches, giving the frog a peppered appearance.

Limbs are greenish to grey and have indistinct lighter markings in the form of spots, peppering or patches.

F. fiacummingae sp. nov. is also characterised by a distinctive lime-green semicircle under the eye, which spreads in less intensity to the nearby upper lip, posterior to the nostril.

There is no obvious spotting on the upper surface of the head in this species as seen in *F. spenceri*.

Both *F. fiacummingae sp. nov*. and *F. timdalei sp. nov.* have larger tubercles or warts on the upper surface of the body, being generally tubercular across the entire upper body than is seen in *F. spenceri.*

Comparative illustrative photos of *F. timdalei sp. nov.* and *F. spenceri* can be seen (in that order) on pages 36 and 37 of Hero *et al.* 1991.

The three morphologically similar species within *Fiacumminganurea gen. nov*. are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

A colouration that is grey to green above, with irregular darker mottling, marbling or flecks, the latter often forming irregular cross-bands on the limbs. Ventral surface white or yellow or white becoming yellow towards the rear. Lower and concealed surface of limbs are yellowish. Skin is somewhat leathery, with a few tiny whitish tubercles on the back becoming numerous on the sides. Skin below is granular. Small but prominent vomerine teeth are located mostly behind the choanae. A pectoral fold is indistinct. Finger and toes discs are moderate, being only a little wider than the digits. Fingers with distinct basal webbing and the toes are fully webbed. There is a small but prominent inner metatarsal tubercle, no outer one. Tympanum is indistinct. Second finger is larger than the first; adult size to 45 mm in lenth.

The tadpole is free-swimming, elongated and flattened, and reaches a total length of 40 mm prior to metamorphosis. The body is dark brown to black above, with fine silver chromatophores extending onto the flanks. Darker spots may be present on the dorsal surface, while the ventral surface is darkly pigmented. The tail fin and muscle are covered with fine melanophores. The tail is moderately thick and has a rounded tip. The eyes are dorso-lateral and the mouth is ventral.

The oral disc is large relative to closely-related species, and the oral papillae have a wide anterior gap. There are two rows of anterior labial teeth and three posterior rows (Hero *et al.* 1995; Anstis 2013).

In terms of morphologically similar and potentially sympatric species the warty back of *Fiacumminganurea gen. nov*. distinguishes species in this genus from the morphologically similar species *Dryopsophus nudidigita* (Copland, 1962) and its lack of a distinct tympanum distinguishes it from *Dryopsophus citropa* (Dümeril and Bibron, 1841).

F. fiacummingae sp. nov. in life can be found in Cogger (2014) at page 189 and Anstis (2013), on page 309, top left and second down from top on right and again on page 310 (tadpoles).

F. timdalei sp. nov. in life can be found in Hero *et al.* (1991) on page 36, Anstis (2013) on page 309, top right, as well as in Eipper and Rowland (2018) on page 152 bottom.

F. spenceri in life can be found in Hero *et al.* (1991) on page 37.

Photos of all three species can be found online on photo-sharing sites such as "www.flickr.com", many not identifiable by location, but easily distinguished from one another on the basis of the diagnostic characters given above.

Distribution: *F. timdalei sp. nov.* previously known as the so-called "Green Form" of "*Litoria spenceri*" is found in the upper Goulburn River basin including the Goulburn, Taponga, Big, Black, North Jamieson and Howqua Rivers as well as Snake, White and Still Creeks.

Etymology: *F. timdalei sp. nov*. is named in honour of Tim Dale of Warrandyte, Victoria, in recognition of his special connection with the drainages in the area this species occurs, including those that flow off Mount Buller, in which he has crashed when riding on his snowboard too many times, sometimes after hitting a grazing wombat *Vombatus ursinus* (Shaw, 1800) at very high speed.

DRYOPSOPHINA SUBTRIBE NOV.

***DRYOPSOPHUS* FITZINGER, 1843**

Type species: *Hyla citropa* Dümeril and Bibron, 1841.

Diagnosis: Frogs in the genus *Dryopsophus* Fitzinger, 1843 as defined herein, are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present and the hind edge is behind the choanae; fingers are free or only webbed at the base; the first finger is much shorter and smaller than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; the heel of the adpressed hindlimb reaches to the eye or beyond; and one or other of the following three suites of characters:

1/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is distinct; the tympanic annulus is clearly visible (subgenus *Dryopsophus*), or:

2/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is indistinct; the tympanic annulus is indistinct, (subgenus *Leucolatera subgen. nov.*), or:

3/ There is no light line along the posterior edge of the upper jaw; there is a narrow light green, white or gold stripe, sometimes with indefinite edges, but always bordered below with dark brown or black along the supra-tympanic ridge; fingers have barely a trace of webbing and the white or gold supratympanic streak is sharp edged (subgenus *Ausverdarana subgen. nov.*)

The nominate subgenus *Dryopsophus* Fitzinger, 1843 only includes the type species *D. citropa* (Dümeril and Bibron, 1841), which is herein split into two morphologically divergent and apparently allopatric subspecies. It is distributed from the lower north coast of New South South Wales, southwards along the coast and nearby ranges south to north-east Victoria.

According to Duellman *et al.* (2016), the assemblage of frogs within the genus *Dryopsophus*, diverged from its nearest living relatives, being species within *Fiacumminganurea gen. nov*. (this paper), about 22.3 MYA.

Distribution: South-eastern Australia from about Kroombit Tops, Queensland in the North, generally along wetter regions near the coast and adjacent ranges to north-east Victoria.

Content: *Dryopsophus citropa* (Dümeril and Bibron, 1841) (type species); *D. barringtonensis* (Copland, 1957); *D. daviesae* (Mahony, Knowles, Foster and Donnellan, 2001); *D. jarrodthomsoni sp. nov.* (Warwick, Qld); *D. kroombitensis* (Hoskin, Hines, Meyer, Clarke and Cunningham, 2013); *D. nudidigita* (Copland, 1962); *D. pearsoniana* (Copland, 1961); *D. phyllochroa* Günther, 1863 (type species); *D. piperata* (Tyler and Davies, 1985); *D. subglandulosa* (Tyler and Anstis, 1983).

LEUCOLATERA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:82F4DFED-E14C-4FB3-A5FE-4D52206C6E0B

Type species: *Litoria subglandulosa* Tyler and Anstis, 1983.

Diagnosis: The two recognized species in the subgenus *Leucolatera subgen. nov.* can be separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present and the hind edge is behind the choanae; fingers are free or only webbed at the base; the first finger is much shorter and smaller than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; the heel of the adpressed hindlimb reaches to the eye or beyond; there is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is indistinct; the tympanic annulus is indistinct.

In turn each of the other subgenera within *Dryopsophus* are separated from the subgenus *Leucolatera subgen. nov.* by one or other of the following suites of characters:

1/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is distinct; the tympanic annulus is clearly visible (subgenus *Dryopsophus*), or:

2/ There is no light line along the posterior edge of the upper jaw; there is a narrow light green, white or gold stripe, sometimes with indefinite edges, but always bordered below with dark brown or black along the supra-tympanic ridge; fingers have barely a trace of webbing and the white or gold supratympanic streak is sharp edged (subgenus *Ausverdarana subgen. nov.*).

Duellman *et al.* (2016) found that the species in this subgenus diverged from the other two subgenera about 15.3 MYA.

Distribution: The coast and ranges from just north (within 50 km) of the Queensland / New South Wales border, extending south for about 500 km in a straight line into northern New South Wales, Australia.

Etymology: “Leuco” in Latin means white and so the name *Leucolatera* refers to the white typically found on the flanks (lateral surfaces AKA “Latera” in Latin) of the relevant frog species.

Content: *Dryopsophus* (*Leucolatera*) *subglandulosa* (Tyler and Anstis, 1983) (type species); *D.* (*Leucolatera*) *daviesae* (Mahony, Knowles, Foster and Donnellan, 2001).

AUSVERDARANA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:30C68D75-FF13-439E-918F-EB1CE72F9612

Type species: *Hyla phyllochroa* Günther, 1863.

Diagnosis: Frogs in the subgenus *Ausverdarana subgen. nov.* as defined herein, are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present and the hind edge is behind the choanae; fingers are free or only webbed at the base; the first finger is much shorter and smaller than the second

and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; the heel of the adpressed hindlimb reaches to the eye or beyond; there is no light line along the posterior edge of the upper jaw; there is a narrow light green, white or gold stripe, sometimes with indefinite edges, but always bordered below with dark brown or black along the supra-tympanic ridge; fingers have barely a trace of webbing and the white or gold supratympanic streak is sharp edged.

In turn the other two subgenera within *Dryopsophus* Fitzinger, 1843 are separated from *Ausverdarana subgen. nov.* by one or other of the following suites of characters:

1/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is distinct; the tympanic annulus is clearly visible (subgenus *Dryopsophus*), or:

2/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is indistinct; the tympanic annulus is indistinct, (subgenus *Leucolatera subgen. nov.*).

Duellman *et al.* (2016) found that the species in this subgenus diverged from the closest related living congener in the nominate subgenus by 14.5 MYA.

Distribution: South-eastern Australia from about Kroombit Tops, Queensland in the North, generally along wetter regions near the coast and adjacent ranges to north-east Victoria.

Etymology: The subgenus name is derived as follows: "Aus" is an abbreviation of Australia, being from where these frogs occur. "Verda" is Latin for green, being the dominant dorsal colouration of most species in the genus as adults, most of the time.

"Rana" is Latin for frog and so the full translation of the name *Ausverdarana* means "Green Australian Frog".

Content: *Dryopsophus* (*Ausverdarana*) *phyllochroa* (Günther, 1863) (type species); *D.* (*Ausverdarana*) *barringtonensis* (Copland, 1957); *D.* (*Ausverdarana*) *jarrodthomsoni sp. nov.*; *D.* (*Ausverdarana*) *kroombitensis* (Hoskin, Hines, Meyer, Clarke and Cunningham, 2013); *D.* (*Ausverdarana*) *nudidigita* (Copland, 1962); *D.* (*Ausverdarana*) *pearsoniana* (Copland, 1961); *D.* (*Ausverdarana*) *piperata* (Tyler and Davies, 1985).

DRYOPSOPHUS* (*DRYOPSOPHUS*) *CITROPA GIPPSLANDENSIS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:AEEB16B9-31AB-4480-B9B8-BBEF4916AB03

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D66034 collected at a small creek at Sandpatch Track, East Gippsland, Victoria, Latitude -37.59 S., Longitude 149.553 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D56458 collected at the Tambo River, at a bridge on Collins Road, East Gippsland, Victoria, Australia, Latitude -37.55 S., Longitude 147.85 E.

Diagnosis: Until now, the taxon *Dryopsophus citropa gippslandensis subsp. nov.* has been treated by all herpetologists as the southernmost population of the species *D. citropa* (Dümeril and Bibron, 1841) and no authors I am aware of have ever speculated of differences between the Victorian form and type form (type locality of Sydney, New South Wales).

However having collected many hundreds of specimens over a period exceeding 50 years, both in and around the Sydney region as well as in north-east Victoria, I have been aware of sufficient morphological differences between the populations to warrant taxonomic division since at least the 1990's.

Both subspecies would be identified as *D. citropa* (under the name "*Litoria citropa*") using the key in Cogger (2014).

D. citropa gippslandensis subsp. nov. is essentially confined to north-east Victoria and immediately adjacent parts of south-east New South Wales, north to Merimbula.

After an apparent break in the distribution of the species (of about 20 km straight line measurement or 30 km by road), *D. citropa citropa* is found north from about Bega in New South Wales to the region of the Hunter Valley, north of Sydney and includes the form described as *Hyla jenolanensis* Copland, 1957.

The two subspecies are readily separated from one another by the following defining characters:

D. citropa citropa from the type region in New South Wales have tight spaced dark flecks all over the upper body and well defined markings on the front and back legs. There is obvious patches of bright lime green on the lower arm and feet. There is also lots of lime green anterior to eye on the snout. The lime green markings on the lower sides of the back and groin are obvious, well-defined and brilliant.

By contrast, *D. citropa gippslandensis subsp. nov.* have well spaced dark flecks on the upper body and poorly defined markings on the front and back legs. As a rule, there is no green on the lower arm or feet (except in aberrant specimens). There is also minimal green anterior to the eye on the snout. The green on the lower sides of the back and groin is faded or absent.

Frogs in the genus *Dryopsophus* Fitzinger, 1843 as defined herein, are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present and the hind edge is behind the choanae; fingers are free or only webbed at the base; the first finger is much shorter and smaller than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; the heel of the adpressed hindlimb reaches to the eye or beyond; and one or other of the following three suites of characters:

1/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is distinct; the tympanic annulus is clearly visible (subgenus *Dryopsophus* , being monotypic for *D. citropa*), or:

2/ There is a narrow light line along at least the posterior

edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is indistinct; the tympanic annulus is indistinct, (subgenus *Leucolatera subgen. nov.*), or:

3/ There is no light line along the posterior edge of the upper jaw; there is a narrow light green, white or gold stripe, sometimes with indefinite edges, but always bordered below with dark brown or black along the supra-tympanic ridge; fingers have barely a trace of webbing and the white or gold supratympanic streak is sharp edged (subgenus *Ausverdarana subgen. nov.*).

In areas where either of these subspecies of *D. citropa* occur I have found *D. citropa gippslandensis subsp. nov.* in significantly greater numbers, although as rule *D. citropa* of either subspecies are never seen in the massive numbers that other sympatric frogs in the same locations commonly occur.

Distribution: *D. citropa gippslandensis subsp. nov.* is essentially confined to north-east Victoria and immediately adjacent parts of south-east New South Wales, north to Merimbula (Latitude 36.8875 S., Longitude 149.9059 E.).

Etymology: The subspecies name *gippslandensis*, refers to where this taxon occurs.

DRYOPSOPHUS* (*AUSVERDARANA*) *JARRODTHOMSONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:8E210C37-8242-4035-98D5-1D88E2FE40DE

Holotype: A preserved specimen at the Queensland Museum in Brisbane, Queensland, Australia, specimen number: J26361 collected at Farm Creek, via Warwick, Queensland, Australia, Latitude -28.3 S., Longitude 152.2 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Queensland Museum in Brisbane, Queensland, Australia, specimen number: J51998, collected at Girraween National Park, Queensland, Australia, Latitude -28.83 S., Longitude 151.9371 E.

2/ A preserved male specimen at the Queensland Museum in Brisbane, Queensland, Australia, specimen number: J17328 collected at Scenic Rim, Cunninghams Gap, Queensland, Australia, Latitude -28.05 S., Longitude 152.4 E.

Diagnosis: *Dryopsophus jarrodthomsoni sp. nov.* has until now been treated as a population of *D. phyllochroa* (Günther, 1863) or more recently *D. pearsoniana* (Copland, 1961) as defined by Anstis (2013) or keyed out by Cogger (2014), however the molecular evidence of Donnellan *et al.* (1999) indicated potential species level divergence for the population.

D. jarrodthomsoni sp. nov. would key out as *D. pearsoniana* in Cogger (2014) as a means of separating both species from all other Australasian tree frogs.

D. jarrodthomsoni sp. nov. is readily separated from its nearest congener *D. pearsoniana*, by colouration.

D. jarrodthomsoni sp. nov. is a light brownish to light green colour dorsally with no flecks or only tiny scattered blackish flecks.

By contrast *D. pearsoniana* has either a few, or many distinct black spots running across the back.

In *D. jarrodthomsoni sp. nov.* there is a well-defined dark brown bar running from the snout, through the eye, across all or most of the tympanum and past the top of the forelimb, with a thin white boundary on top. Significantly this bar does not narrow as it passes through the tympanum, which contrasts with the situation in *D. pearsoniana*. In that species the bar narrows significantly to become a thin line as it passes over the tympanum.

The toes of *D. jarrodthomsoni sp. nov.* are yellow, versus green or brown in *D. pearsoniana*.

D. pearsoniana has obvious moderately distinct blotches or markings on the limbs, versus none in *D. jarrodthomsoni sp. nov.*.

Numerous photos of both *D. pearsoniana* and *D. jarrodthomsoni sp. nov.* in life can be found at the website http://www.flickr.com

Distribution: *D. jarrodthomsoni sp. nov.* is presently known from the ranges and nearby areas west of the Gold Coast/Tweed Heads area, generally in the zone of the headwaters of the Condamine River and other nearby drainages, in particular to the south in New South Wales as well headwaters of some east draining watercourses as well.

Etymology: Named in in honour of Jarrod Thomson of Croydon North in Victoria, Australia, for his assistances in maintaining the infrastructure at the world-class reptile captive breeding facility held at the Snakebusters Reptiles shows business address in Victoria, Australia.

KUMANJAYIWALKERINI TRIBE NOV.

KUMANJAYIWALKERUS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:666B94F4-985E-4E91-8473-F7E6926C7646

Type species: *Kumanjayiwalkerus kumanjayi sp. nov.*

Diagnosis: The genera *Pengilleyia* Wells and Wellington, 1985 as defined within this paper, and *Kumanjayiwalkerus gen. nov.* are as a pair, both readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present; fingers with conspicuous webbing reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth, or with at most a few low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs with contrasting black and yellow bars or marbling, at least dorsally.

The genus *Pengilleyia* Wells and Wellington, 1985 is readily separated from the genus *Kumanjayiwalkerus gen. nov.* by having a back that is either very warty or moderately warty, versus virtually smooth or with well scattered small pointed tubercles on an otherwise smooth body in *Kumanjayiwalkerus gen. nov.*. Furthermore species within *Pengilleyia* invariably have green spots, flecks or blotches on the back versus none in *Kumanjayiwalkerus gen. nov.*.

Kumanjayiwalkerus gen. nov.. has a strongly contrasting reddish-brown upper iris, with grey below, versus either weakly contrasting reddish-brown upper iris or the iris being grey all over in *Pengilleyia.*

Duellman *et al.* (2016) found that the species within each of *Pengilleyia* and *Kumanjayiwalkerus gen. nov.* diverged from one another 16.7 MYA and these two genera in turn diverged from their nearest living relatives 23.2 MYA.

Distribution: Tropical Australia, extending down the east coast of Queensland as far as the wetter south-east of that State and the Fly River region of Southern Papua New Guinea.

Etymology: The genus *Kumanjayiwalkerus gen. nov*. is named in honour Kumanjayi Walker, another indigenous Australian victim of an execution by a racist white Australian police officer in the Northern Territory, being one of over 400 such victims in Australia since 1990.

The 19 year old was shot and killed by NT Police Officer Zachary Rolfe in November 2019.

The world is full of memorials and species named in honour mass murders, thieves and despots and It is appropriate that victims of these people should also be honoured.

Indigenous Australians were subjected to a British Genocide that was pro-rata significantly more destructive than the holocaust caused by the German Nazi regime to Jews and others. The British attempts to rewrite the factual historical record of Australia was far worse than that of the Nazi Propaganda Ministry, including that Australia was "uninhabited" prior to 1770 when Captain James Cook "discovered" the place, but these facts are not well known, even to many Australians.

Also not well known outside Australia is the endemic corruption of Australian police forces in the modern era.

It is hoped that by naming of a widespread and common species of frog in honour of a victim of a police muder in Australia that attention is not only drawn to the victim of the crime, but also other victims and a hope that by doing so, the crime and corruption that is endemic in Australian police forces is eventually stopped (see also etymology for *Nyctimystes* (*Asperohyla*) *georgefloydi sp. nov.* earlier in this paper).

Notable is that George Floyd was killed by police on 26 May 2020 in Minnesota, USA.

The videos of the killing made by bystanders were shared online, sparking widespread protests in over 30 cities and worldwide.

Two days later, on 28 May 2020, Victorian Police officers pulled over a motorist on the busy Monash Freeway at Dandenong North. They got out of their police car and proceeded to execute the 53 year old family man by shooting him dead in broad daylight in full view of other drivers, the entire incident being captured on dashcams and even State Government-owned freeway CCTV cameras. Unlike in Minnesota, USA, the Victorian Police successfully hijacked every video made and none was made public or shared on social media.

As a result there were no protests in Australia arising from the incident.

Police Union boss, Wayne Gatt (remember the Gatt name … and for the wrong reasons), told the media that the execution was wholly justified.

Content: *Kumanjayiwalkerus kumanjayi* (type species); *K. rothii* (De Vis, 1884).

KUMANJAYIWALKERUS KUMANJAYI SP. NOV.

LSIDurn:lsid:zoobank.org:act:9D99A68E-3A87-4AAE-B0AA-B7B31078D521

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R50585, collected at the Drysdale River National Park, Kimberley District, Western Australia, Australia, Latitude -14.7667 S., Longitude 127.0833 E.

This government-owned facility allows access to its holdings.

Paratypes: 14 preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers, R50377, R50382, R50581, R50582, R50583, R50805, R50806, R131681, R173564, R173578, R173579, R173580, R164955 and R164956, collected at the Drysdale River National Park, Kimberley District, Western Australia, Australia, Latitude -14.7667 S., Longitude 127.0833 E.

Diagnosis: *Kumanjayiwalkerus kumanjayi sp. nov.* has until now been treated as merely the western population of *K. rothii* (De Vis, 1884), better known as "*Litoria rothii*", with a type locality of Mackay in North Queensland, Australia.

However the possibility of there being at least two species within putative "*Litoria rothii*", has been known for decades. Hoser (1989) on page 41 had photos of the western and eastern forms of this species and Anstis 2013 on page 297 stated "it is possible there may be more than one species involved.

Kumanjayiwalkerus kumanjayi sp. nov. is the form encompassing the Kimberley District of Western Australia and the top end of the Northern Territory, including the western side of the Gulf of Carpentaria. *K. rothii* of the type form occupies most parts of Queensland, except the driest areas and the south, as well as southern New Guinea.

Both species would key out as "*Litoria rothii*" in either Anstis (2013) or Cogger (2014).

The two species are readily separated from one another as follows:

K. rothii has obvious black spots and blobs above the arm pit, on the rear flank, groin and inner and rear hind leg. In contrast these areas of black are either absent, heavily reduced as to be inconspicuous or shaded as grey.

Where the black spotting and marks are present in *K.*

Hoser 2020 - Australasian Journal of Herpetology 44-46:1-192.

rothii, *K. kumanjayi sp. nov.* has light bluish-purple flash colours instead.

Some north Queensland specimens of *K. rothii* may also have light bluish-purple in these inner areas, but in these specimens, the light bluish-purple areas are always well bounded by thick black outlines (not seen in *K. Kumanjayi sp. nov*).

K. rothii has yellow and black mottling along the inside edge of the foot, versus light bluish-purple and yellow mottling in *K. kumanjayi sp. nov.*.

Black spotting extends along the lower flank, anterior to the hind limb in *K. rothii*, whereas this is not the case in *K. kumanjayi sp. nov.*. The upper lip of *K. rothii* is whitish, versus yellow-brown in *K. kumanjayi sp. nov.*.

Both species *K. kumanjayi sp. nov.* and *K. rothii* are further defined as follows: A medim-sized, somewhat slender tree frog. Has a slender hind limb. Tongue oval, with its free hind edge rather deeply emarginate. Vomerine teeth in two small groups between the choanee. Choanae rather large and angular. Head small. Snout subacute, longer than orbit or interorbit. Nostril much nearer the tip of the snout than to the eye. Loreal region shelving is rather concave. Tympanum distinct, two-thirds of orbit. Fingers half-webbed, but fringed to the discs; discs about two-thirds of tympanum in size. Toes entirely webbed, with small discs. On protraction of the hind foot, the ankle reaches between the eye and the nostril. There is no distinct tarsal fold. There is a faint fold over the wrist. Males to 40 mm, and females to 60 mm in body length. Colour variable, but is usually lead grey, olive or reddish brown, uniform or mottled with darker patches. Colour and intensity changes significantly with time of day, temperature, activity and other factors. The the flash markings of the arm pits, groin and legs are outlined above, but invariably include yellow and one or other of black or bluish-light-purple, or sometimes both. Diagnostic of both species is the distinctive iris of the eye, which has a rediish-orange upper orbit and grey lower half.

Hoser (1989) at page 41 has comparative photos of both *K. kumanjayi sp. nov.* and *K. rothii* in life, with *K. kumanjayi sp. nov.* on middle right and *K. rothii* on bottom right. Anstis (2013) has comparative photos of both *K. kumanjayi sp. nov.* and *K. rothii* in life, with *K. kumanjayi sp. nov.* on page 297 two photos on right and *K. rothii* on page 298 on top left. Vanderduys (2012) has a photo of *K. rothii* in life, from near the type locality on page 68 bottom left and also bottom right. Eipper (2012) at page 113 bottom also has a photo of typical *K. rothii* in life, as does Eipper and Rowland (2018) on page 150 (both photos), as does Cogger (2014) at page 187 bottom. Clyne (1969) has a photo of *K. rothii* in life, on page 35 at top.

The genera *Pengilleyia* Wells and Wellington, 1985 as defined within this paper, and *Kumanjayiwalkerus gen. nov.* are as a pair, both readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present; fingers with conspicuous webbing reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth, or with at most a few low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs with contrasting black and yellow bars or marbling, at least dorsally.

The genus *Pengilleyia* Wells and Wellington, 1985 is readily separated from the genus *Kumanjayiwalkerus gen. nov.* by having a back that is either very warty or moderately warty, versus virtually smooth or with well scattered small pointed tubercles on an otherwise smooth body in *Kumanjayiwalkerus gen. nov.*.

Furthermore species within *Pengilleyia* invariably have green spots, flecks or blotches on the back versus none in *Kumanjayiwalkerus gen. nov.*.

Kumanjayiwalkerus gen. nov.. has a strongly contrasting reddish-brown upper iris, with grey below, versus either weakly contrasting reddish-brown upper iris or the iris being grey all over in *Pengilleyia.*

Duellman *et al.* (2016) found that the species within each of *Pengilleyia* and *Kumanjayiwalkerus gen. nov.* diverged from one another 16.7 MYA and these two genera in turn diverged from their nearest living relatives 23.2 MYA.

Distribution: *Kumanjayiwalkerus kumanjayi sp. nov.* is found from the Kimberley District of Western Australia and the top end of the Northern Territory, to the western side of the Gulf of Carpentaria. *K. rothii* of the type form occupies most parts of Queensland, except the driest areas and the south, as well as southern New Guinea.

Etymology: The species *Kumanjayiwalkerus kumanjayi sp. nov.* is named in honour Kumanjayi Walker, another indigenous Australian victim of an execution by a racist white Australian police officer in the Northern Territory (NT), being one of over 400 such victims in Australia since 1990.

The 19 year old was shot and killed by NT Police Officer Zachary Rolfe in November 2019.

The world is full of memorials and species named in honour mass murderers, thieves and despots and it is appropriate that victims of these people should also be honoured occasionally.

The spelling of the species name is deliberate and should NOT be changed. While it is convention for an “i” to be added to a male patronym name, in this case I have chosen to dispense with this so that the species name more accurately reflects the person it is named in honour of, especially noting that the taxon is common and widespread and it is hoped that people remember the exact person the frog is named after and not be otherwise confused into thinking the person’s name in fact ended with two “i’s” noting that in this case, this is done for the benefit of lay people and not those familiar with the minor details of scientific nomenclature of living animals.

Furthermore this nomenclature decision was made after discussions with people within the Yuendemu Aboriginal Community.

***PENGILLEYIA* WELLS AND WELLINGTON, 1985**

Type species: *Litoria tyleri* Martin, Watson, Gartside, Littlejohn and Loftus-Hills, 1979.

Diagnosis: *Pengilleyia* Wells and Wellington, 1985 as defined by them was literally a “dogs breakfast” of widely divergent species placed into a single putative genus. This creation by them, does stand out as one of their

more significant mess-ups and proves that even competant herpetologists with many years experience can get things really wrong.

Notwithstanding this, the name is available in terms of the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) and all preceding editions. To that extent, all that matters is the phylogenetic placement of the type species and where it relates to other putative genera.

The so-called "*Litoria peroni* " (Tschudi, 1838) species group, includes the species originally described as *Litoria tyleri* Martin, Watson, Gartside, Littlejohn and Loftus-Hills, 1979, and as this species group did not have an available genus name prior to 1985, the Wells and Wellington name *Pengilleyia*, is that which must be used and attached to the species group.

If one were to include the "*Hyla rothii* De Vis, 1884" species group into the genus *Pengilleyia* as done by Wells and Wellington (1985), also otherwise then not assignable to any nearer group, one finds a 23.2 MYA divergence from their nearest living (genus assigned) relatives according to Duellman *et al.* (2016). Those relevant species are within the genera *Audaxura gen. nov.* and *Colleeneremia* Wells and Wellington, 1985, which each diverged from one another 17 MYA according to Duellman *et al.* (2016).

Because the *Hyla rothii* De Vis, 1884 species group diverged from others within *Pengilleyia* as outlined above, being the so-called "*Litoria peroni* " (Tschudi, 1838) species group, approximately 16.7 MYA according to Duellman *et al.* (2016), that species group (treated as two species herein) is placed within a newly named genus *Kumanjayiwalkerus gen. nov.* which is defined and diagnosed previously in this paper.

The genera *Pengilleyia* Wells and Wellington, 1985 and *Kumanjayiwalkerus gen. nov.* are as a pair, both readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present; fingers with conspicuous webbing reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth, or with at most a few low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs with contrasting black and yellow bars or marbling, at least dorsally.

The genus *Pengilleyia* Wells and Wellington, 1985 is readily separated from the genus *Kumanjayiwalkerus gen. nov.* by having a back that is either very warty or moderately warty, versus virtually smooth in *Kumanjayiwalkerus gen. nov.*.

The genus *Pengilleyia* Wells and Wellington, 1985 is readily separated from the genus *Kumanjayiwalkerus gen. nov.* by having a back that is either very warty or moderately warty, versus virtually smooth or with well scattered small pointed tubercles on an otherwise smooth body in *Kumanjayiwalkerus gen. nov.*. Furthermore species within *Pengilleyia* invariably have green spots, flecks or blotches on the back versus none in *Kumanjayiwalkerus gen. nov.*.

Kumanjayiwalkerus gen. nov. has a strongly contrasting reddish-brown upper iris, with grey below, versus either weakly contrasting reddish-brown upper iris or iris being grey all over in *Pengilleyia.*

Distribution: *Pengilleyia* Wells and Wellington, 1985 occurs in Eastern Australia, New Guinea, the Moluccas and lesser Sundas in Indonesia.

Content: *Pengilleyia tyleri* (Martin, Watson, Gartside, Littlejohn and Loftus-Hills, 1979) (type species); *P. amboinensis* (Horst, 1883); *P. darlingtoni* (Loveridge, 1945); *P. everetti* (Boulenger, 1897); *P. peronii* (Tschudi, 1838); *P. obtusirostris* (Meyer, 1875).

AUDAXURINA SUBTRIBE NOV.

AUDAXURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:8864D28E-5477-46B5-842E-9D9F521D6AD0

Type species: *Hyla* (*Litoria*) *congenita* Peters and Doria, 1878.

Diagnosis: The genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone.

There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots.

Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Within *Colleeneremia* the two subgenera are separated as follows:

1/ Fingers with only rudimentary webbing, being the subgenus *Colleeneremia*, or:

2/ With conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger being the subgenus *Balatusrana subgen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Duellman *et al.* (2016) found that the genera *Colleeneremia* and *Audaxura gen. nov*. diverged from one another 17 MYA, with a similar divergence indicated by Pyron and Weins (2011).

Distribution: *Audaxura gen. nov*. is found in New Guinea, immediately offshore Islands to the south and south-west and north-east as well as the nearby Moluccan Islands.

Etymology: Audax in Latin means bold, and by frog standards this is an invasive genus, with specimens commonly entering sites of human habitation in lowland areas. “ura” is an abbreviation of “anura” = frog and hence the name *Audaxura gen. nov.*.

Content: *Audaxura congenita* (Peters and Doria, 1878) (type species); *A. capitula* (Tyler, 1968); *A. pygmaea* (Meyer, 1875); *A. quadrilineata* (Tyler and Parker, 1974).

BREVICRUSYLA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:D6264CA2-F412-46DC-A481-2FC0CE7962F8

Type species: *Hyla wisselensis* Tyler, 1968.

Diagnosis: *Brevicrusyla gen. nov.* includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.,* but readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera.

Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

The genera *Colleeneremia* Wells and Wellington, 1985, *Brevicrusyla gen. nov.* and *Audaxura gen. nov.* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov*. have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Within *Colleeneremia* the two subgenera are separated as follows:

1/ Fingers with only rudimentary webbing, being the subgenus *Colleeneremia*, or:

2/ With conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger being the subgenus *Balatusrana subgen. nov.*.

Tyler and Davis (1978) originally placed their species “*Hyla wisselensis*” in a group with “*Hyla rubella*” now of the genus *Colleeneremia* . Tyler and Davis (1983) placed both “*Hyla wisselensis*” and “*Litoria umbonata*” in a new group of species including just these two.

Significant morphological divergence at both larval and adult stages of the life cycle support this contention and the creation of the genus *Brevicrusyla gen. nov.*

Distribution: Known only from the Wissel Lakes area for *B. wisselensis* (Tyler, 1968) and the Baliem River Valley of West Papua, Indonesia *B. umbonata* (Tyler and Davies 1983).

Etymology: The genus name is a slightly abbreviated form of Latin for short (brevis), leg (Crus) and tree frog as in “*Hyla*”, combined to form the word “*Brevicrusyla*”. This is a reflection of the relatively short hind limbs of the species.

Content: *Brevicrusyla wisselensis* (Tyler, 1968) (type species); *B. umbonata* (Tyler and Davies 1983).

GENUS *COLLEENEREMIA* WELLS AND WELLINGTON, 1985

Type species: *Hyla rubella* Gray, 1842.

Diagnosis: The genus *Colleeneremia* Wells and Wellington, 1985 as defined herein is different to the original diagnosis and definition of Wells and Wellington, 1985.

Wells and Wellington (1985) treated the genus as monotypic for the taxon *Hyla rubella*, Gray, 1842, which they correctly stated was “Believed to be a complex of several undescribed species.” To the extent that the taxon “*Litoria electrica”* Ingram and Corben, 1990 was defined by Ingram and Corben (1990) as a species previously treated as putative *C. rubella* (Gray, 1842), Wells and Wellington (1985) have been vindicated well

before the publication of this paper.

Confirming the position of Wells and Wellington (1985) was Anstis (2013) who at page 301 also stated she thought *C. rubella* was a species complex.

Eipper and Rowland (2018) at page 151 stated, "Probably a species complex".

Even the ultra-conservative Harold Cogger in Cogger (2014) stated of *C. rubella*,

"Almost certainly composite".

Mention of the three above authorities is so that I am not to be accused of merely accepting Wells and Wellington taxonomy and nomenclature on the basis of alleged friendship of the pair as repeatedly stated by the Wolfgang Wüster gang.

Instead the taxonomy herein and nomenclature that follows is solely as result of body of scientific evidence that has also passed peer review (notably unlike Kaiser *et al.* 2013).

In terms of the widespread and variable putative taxon known as *C. rubella* it is herein split into six well defined species all separated by well known biogeograpcial barriers of known antiquity. All populations are morphologically distinct and also appear to be allopatric.

Hence to this extent the original diagnosis of Wells and Wellington (1985) is confirmed.

In terms of divergence, Duellman *et al.* (2016) found that the genus *Colleeneremia* as defined by Wells and Wellington, had a 14 million year divergence from its nearest relative outside, being *Hyla dentata* Keferstein, 1868, which they placed in their newly erected genus *Rawlinsonia* Wells and Wellington, 1985, which had a type species of *Hyla ewingi* Duméril and Bibron, 1841, which in fact is a different phylogentic grouping. Transfer of *Hyla dentata* Keferstein, 1868 to *Colleeneremia* retains the monophyly of *Rawlinsonia* (which according to Duellman *et al.* (2016) has a divergence of 24.7 MYA from nearest living relatives, confirming the good sense in erecting that genus).

The preceding transfer gives the genus *Colleeneremia* a divergence of 17 MYA from its nearest living relative, according to Duellman *et al.* (2016).

That nearest living relative species, is *Hyla* (*Litoria*) *congenita* Peters and Doria, 1878 of southern New Guinea and the associated group of species.

Current taxonomy preceding this paper, has all species in the *L. congenita* group placed in the genus *Litoria* Tschudi, 1838.

This is clearly untenable, because according to Duellman *et al.* (2016) the type group for that genus and all relevant members of the species group have a 31.5 MYA divergence from *Colleeneremia.*

The only solution to the problem of placement of *L. congenita* group of species is therefore one or other of wholly subsuming them within *Colleeneremia*, erecting a subgenus for the *L. congenita* group, or alternatively erecting a new genus for the group.

Based on the divergence of 17 MYA between the species groups and a view that the species diversity of both species groups are in fact underestimated in terms of species diversity (even after the publication of formal descriptions of new species in this paper), I see erection of a new genus for the *L. congenita* group as the only logical situation for those species. That genus is called *Audaxura gen. nov.*. A similar genus-level division is done for the genus *Pengilleyia* Wells and Wellington, 1985 within this paper.

In accordance with the preceding, the genus *Colleeneremia* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs is brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

As well as one or other of the following characters:

1/ Fingers with only rudimentary webbing, being the subgenus *Colleeneremia*, or:

2/ With conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger being the subgenus *Balatusrana subgen. nov.*.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: Most of continental Australia except for the far south, as well as southern New Guinea.

Content: *Colleeneremia rubella* (Gray, 1842) (type species); *C. bogfrog sp. nov.*; *C. chunda sp. nov.*; *C. dentata* (Keferstein, 1868); *C. dunnyseat sp. nov.*; *C. electrica* (Ingram and Corben, 1990); *C. watdat sp. nov.*; *C. wifi sp. nov.*;

BALATUSRANA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:24C7D6E6-2F46-417E-8CD2-8CAE4B59463E

Type species: *Hyla dentata* Keferstein, 1868.

Diagnosis: The subgenus *Balatusrana subgen. nov.* is separated from the nominate subgenus *Colleeneremia* Wells and Wellington, 1985 by having conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger.

In the nominate subgenus *Colleeneremia* the fingers have only rudimentary webbing.

In addition to the character states just mentioned for each subgenus, both subgenera, comprising the totality of the genus *Colleeneremia* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives (with a divergence of 17 MYA according to Duellman *et al.* 2016) as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: East coast of New South Wales, including wetter parts of nearby south-east Queensland and also far north-east Victoria.

Content: *Colleeneremia* (*Balatusrana*) *dentata* (Keferstein, 1868) (treated herein as monotypic, but including at least one subspecies).

COLLEENEREMIA BOGFROG SP. NOV.

LSIDurn:lsid:zoobank.org:act:BE7164BB-D292-48A8-BBE6-5711983E6192

Holotype: A preserved specimen at the Northern Territory Art Gallery and Museum, Darwin, Northern Territory, Australia, specimen number R30936, collected at Jay Creek, central Australia, Northern Territory, Australia, Latitude -23.8 S., Longitude 133.05 E.

This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens at the Northern Territory Art Gallery and Museum, Darwin, Northern Territory, Australia, specimen numbers R30934, R30935, R30827, R30828 and R15422, all collected from the type locality (above).

Diagnosis: The five species, *Colleeneremia watdat sp. nov.* from the Pilbara, Gascoyne and Murchison regions of western Western Australia, *C. bogfrog sp. nov.* from the Macdonnell Ranges of Central Australia, *C. dunnyseat sp. nov.* from the Flinders Ranges of South Australia, *C. wifi* from western New South Wales and southern Queensland and *C. chunda* from the Cape York region in far north Queensland and probably southern New Guinea have until now all been treated as populations of putative *C. rubella* (Keferstein, 1868), herein confined to the dry tropics of the Northern Territory and the Kimberley district of Western Australia.

Another morphologically similar species *C. electrica* (Ingram and Corben, 1990), was prior to 1990 also treated as a regional population of *C. rubella.*

The seven species comprise the total of the subgenus *Colleeneremia* Wells and Wellington, 1985 as defined in this paper.

While these species within *Colleeneremia* have diverse habitat choices, their distribution does coincide with biogeographical barriers generally affecting saxicoline genera of Australian fauna.

This is including for example species of Varanid lizards (Hoser 2013, 2014, 2015g, 2018b-e), Ring-tailed Dragons in the genus *Ctenophorus* Fitzinger, 1843 (Hoser 2020c) other lizards within the genus *Egernia* Gray, 1838 *sensu lato* (Hoser 2018a) and also *Petrogale* Gray, 1837 wallabies (Hoser, 2020b).

The seven aforementioned species are separated from one another as follows:

The type form of *C. rubella* and *C. chunda sp. nov.* conforms to the genus description for *Colleeneremia.*

They can be further diagnosed as follows: Compared to all other species in the genus, these two species have relatively undeveloped lateral digital fringes and a relatively narrow head (medium in cross-section), versus

broad (broad in cross-section) and well-developed lateral digital fringes in all other species. *C. chunda sp. nov.* is readily separated from *C. rubella* by the obvious bright yellow feet, well demarcated from the grey of the digits, versus yellowish feet and digits without a well defined boundary in *C. rubella.*

C. chunda sp. nov. is characterised by significant speckling on the upper dorsum and a well-defined white upper labial area below the eye, versus little specking on the dorsum of *C. rubella* and ill-defined lighter areas on the upper labial region.

C. chunda sp. nov. has well defined areas of yellow in the groin, versus ill-defined and spreading up the lower flank in *C. rubella.*

Both *C. chunda sp. nov.* and *C. rubella* have either smooth, or very minutely granular skin on the upper surface.

C. chunda sp. nov. is further separated from all other species by having a poorly formed and semi-distinct mid-vertebral line.

C. chunda sp. nov. and *C. rubella* further differ from the other species by having a distinctively bitonal upper surface, with a distinct broad grey or red-brown band down the middle of the back on a beige or fawn background.

C. electrica (Ingram and Corben, 1990) is separated from the other six species by having three distinctive dark bars or blotches on the back, a dorsum that is obviously tubercular and the yellow patches in the groin and arm pits are bold and distinctive and made more so by being edged with dark brownish-grey bordering, not seen in any other species.

C. bogfrog sp. nov. is separated from the other six species by having a pinkish red colour on the dorsum and flanks with pinkish white and very light grey marbling. The dorsum has smooth or leathery skin, but without obvious raised tubercles.

Speckling is minimal and where present, usually on the snout and rear, it is still scattered, minimal and very faded as to be indistinct. There are also irregular purple-grey patches running down two longitudinal lines on the upper dorsum, not near the mid-line and these too are faded.

C. watdat sp. nov. is similar in dorsal patterning to *C. bogfrog sp. nov.* except that there is scattered flecking across all the body, as opposed to more being at front of snout and rear. *C. watdat sp. nov.* is also instead a mud-brownish coloured frog (not pinkish-red) and also has a strongly granulated dorsum and to a greater degree than any other species in the complex. Yellow in the groin and armpits is either non-existent or minimal.

C. watdat sp. nov. is further characterised by having a well defined dark brown stripe running from snout, through eye and ear over back leg to flank. The line is well defined, contrasting with the lighter brown surfaces adjacent and clearly runs across the entire tympanum.

C. dunnyseat sp. nov. is readily separated from all other six species by having a light greyish brown, almost tending to white coloured dorsum with distinctive dark brownish-black spots and mottling spread relatively evenly across the dorsum. Limbs are also creamish in colour with obvious darker flecks and mottling. This taxon comes across as a uniquely speckled frog, due to the high density of spotting and it being relatively evenly spaced on the contrasting lighter background, so the dorsum appears spotted, as opposed to one with blotches as may seen in some of the other species. Yellow in armpits and groin is often absent or when present not as brilliant, or prominent as in other species.

C. wifi sp. nov. is readily separated from the other six species by being chocolate brown on the dorsum and gun metal grey on the flanks. The dorsum is irregularly, but heavily peppered, with the same gun-metal grey the result being these patches of peppering forming semi-distinct areas of grey surrounded by otherwise mainly brown pigment. The upper surfaces of the limbs are the same chocolate brown colour as the body, but with even heavier grey peppering. The labial area is also generally grey and the top of the snout is brown, with either no peppering or minimal peppering that tends to be faded. Toes may be brown or grey (in a single specimen) depending on which are peppered heavily and which are not. The upper iris is a dull orange brown in this species, versus brilliant red or orange in all the other six.

C. rubella in life can be seen in Anstis (2013) on page 301 in the two right hand photos.

C. chunda sp. nov. in life can be seen in Anstis (2013) on page 302, on right (bottom image) and in Vanderduys (2012) on page 69 bottom.

C. electrica in life can be seen in Anstis (2013) on page 192, two right hand photos, and Cogger (2014) on page 162 (two photos).

C. bogfrog sp. nov. in life can be seen in Anstis (2013) on page 302 on left at top.

C. watdat sp. nov. in life can be seen online at: https://www.flickr.com/photos/27026445@N06/31419696523/

and:

https://www.flickr.com/photos/warpedtime/2245649035/

and:

https://www.flickr.com/photos/27026445@N06/32155803631/

C. dunnyseat sp. nov. in life can be seen in Anstis (2013) on page 302 at top right image.

C. wifi sp. nov. in life can be seen in Hoser (1989) on page 42 in the top photo and Cogger (2014) on page 188, top left photo.

The subgenus *Balatusrana subgen. nov.* is separated from the nominate subgenus *Colleeneremia* Wells and Wellington, 1985 (being all seven species separated by the descriptions herein) by having conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger.

In the nominate subgenus *Colleeneremia* the fingers have only rudimentary webbing.

In addition to the character states just mentioned for each subgenus, both subgenera, comprising the totality of the genus *Colleeneremia* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of

the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent.

Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives (with a divergence of 17 MYA according to Duellman *et al.* 2016) as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera.

Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: *Colleeneremia bogfrog sp. nov.* occurs in the Macdonnell Ranges of Central Australia, Northern Territory, Australia.

Etymology: In 1978 I was staying with at a camp of Arrernte people near Alice Springs, Northern Territory, which is where these aboriginal people live.

I asked them what they called this taxon of frog and they told me they were the “bog frog”, because whenever they got to do a bog, they see these frogs.

To confirm the point, that evening, I was led to an outside toilet block and in the toilet cubicle were about six of these frogs on the floor and toilet seat.

Hence the somewhat unusual scientific name for this species.

The name will also serve to draw attention to an otherwise locally abundant and potentially ignored component of Australia’s native wildlife.

COLLEENEREMIA CHUNDA SP. NOV.

LSIDurn:lsid:zoobank.org:act:AF3507CE-3294-4777-AA7A-6B38ACDD474E

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J16011 collected at Tolga, Atherton Tablelands, Queensland, Australia, Latitude -17.2167S., Longitude 145.4833 E.

This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J79439, J79472, J81038, J55732 and J55723 collected from near Tolga, Atherton Tablelands, Queensland, Australia, Latitude -17.2167 S., Longitude 145.4833 E.

Diagnosis: The five species, *Colleeneremia watdat sp. nov.* from the Pilbara, Gascoyne and Murchison regions of western Western Australia, *C. bogfrog sp. nov.* from the Macdonnell Ranges of Central Australia, *C. dunnyseat sp. nov.* from the Flinders Ranges of South Australia, *C. wifi* from western New South Wales and southern Queensland and *C. chunda* from the Cape York region in far north Queensland have until now all been treated as populations of putative *C. rubella* (Keferstein, 1868), herein confined to the dry tropics of the Northern Territory and the Kimberley district of Western Australia.

Another morphologically similar species *C. electrica* (Ingram and Corben, 1990), was prior to 1990 also treated as a regional population of *C. rubella.*
The seven species comprise the total of the subgenus *Colleeneremia* Wells and Wellington, 1985 as defined in this paper.

While these species within *Colleeneremia* have diverse habitat choices, their distribution does coincide with biogeographical barriers generally affecting saxicoline genera of Australian fauna.

This is including for example species of Varanid lizards (Hoser 2013, 2014, 2015g, 2018b-e), Ring-tailed Dragons in the genus *Ctenophorus* Fitzinger, 1843 (Hoser 2020c) other lizards within the genus *Egernia* Gray, 1838 *sensu lato* (Hoser 2018a) and also *Petrogale* Gray, 1837 wallabies (Hoser, 2020b).

The seven aforementioned species are separated from one another as follows:

The type form of *C. rubella* and *C. chunda sp. nov.* conforms to the genus description for *Colleeneremia.*

They can be further diagnosed as follows: Compared to all other species in the genus, these two species have relatively undeveloped lateral digital fringes and a relatively narrow head (medium in cross-section), versus broad (broad in cross-section) and well-developed lateral digital fringes in all other species. *C. chunda sp. nov.* is readily separated from *C. rubella* by the obvious bright yellow feet, well demarcated from the grey of the digits, versus yellowish feet and digits without a well defined boundary in *C. rubella.*

C. chunda sp. nov. is characterised by significant speckling on the upper dorsum and a well-defined white upper labial area below the eye, versus little specking on the dorsum of *C. rubella* and ill-defined lighter areas on the upper labial region.

C. chunda sp. nov. has well defined areas of yellow in the groin, versus ill-defined and spreading up the lower flank in *C. rubella.*

Both *C. chunda sp. nov*. and *C. rubella* have either smooth, or very minutely granular skin on the upper surface.

C. chunda sp. nov. is further separated from all other species by having a poorly formed and semi-distinct mid-vertebral line.

C. chunda sp. nov. and *C. rubella* further differ from the other species by having a distinctively bitonal upper surface, with a distinct broad grey or red-brown band down the middle of the back on a beige or fawn background.

C. electrica (Ingram and Corben, 1990) is separated from the other six species by having three distinctive dark bars or blotches on the back, a dorsum that is obviously tubercular and the yellow patches in the groin and arm pits are bold and distinctive and made more so by being edged with dark brownish-grey bordering, not seen in any other species.

C. bogfrog sp. nov. is separated from the other six species by having a pinkish red colour on the dorsum and flanks with pinkish white and very light grey marbling. The dorsum has smooth or leathery skin, but without obvious raised tubercles. Speckling is minimal and where present, usually on the snout and rear, it is still scattered, minimal and very faded as to be indistinct. There are also irregular purple-grey patches running down two longitudinal lines on the upper dorsum, not near the mid-line and these too are faded.

C. watdat sp. nov. is similar in dorsal patterning to *C. bogfrog sp. nov*. except that there is scattered flecking across all the body, as opposed to more being at front of snout and rear. *C. watdat sp. nov*. is also instead a mud-brownish coloured frog (not pinkish-red) and also has a strongly granulated dorsum and to a greater degree than any other species in the complex. Yellow in the groin and armpits is either non-existent or minimal.

C. watdat sp. nov. is further characterised by having a well defined dark brown stripe running from snout, through eye and ear over back leg to flank. The line is well defined, contrasting with the lighter brown surfaces adjacent and clearly runs across the entire tympanum.

C. dunnyseat sp. nov. is readily separated from all other six species by having a light greyish brown, almost tending to white coloured dorsum with distinctive dark brownish-black spots and mottling spread relatively evenly across the dorsum. Limbs are also creamish in colour with obvious darker flecks and mottling. This taxon comes across as a uniquely speckled frog, due to the high density of spotting and it being relatively evenly spaced on the contrasting lighter background, so the dorsum appears spotted, as opposed to one with blotches as may seen in some of the other species. Yellow in armpits and groin is often absent or when present not as brilliant, or prominent as in other species.

C. wifi sp. nov. is readily separated from the other six species by being chocolate brown on the dorsum and gun metal grey on the flanks. The dorsum is irregularly, but heavily peppered, with the same gun-metal grey the result being these patches of peppering forming semi-distinct areas of grey surrounded by otherwise mainly brown pigment. The upper surfaces of the limbs are the same chocolate brown colour as the body, but with even heavier grey peppering. The labial area is also generally grey and the top of the snout is brown, with either no peppering or minimal peppering that tends to be faded. Toes may be brown or grey (in a single specimen) depending on which are peppered heavily and which are not. The upper iris is a dull orange brown in this species, versus brilliant red or orange in all the other six.

C. rubella in life can be seen in Anstis (2013) on page 301 in the two right hand photos.

C. chunda sp. nov. in life can be seen in Anstis (2013) on page 302, on right (bottom image) and in Vanderduys (2012) on page 69 bottom.

C. electrica in life can be seen in Anstis (2013) on page 192, two right hand photos, and Cogger (2014) on page 162 (two photos).

C. bogfrog sp. nov. in life can be seen in Anstis (2013) on page 302 on left at top.

C. watdat sp. nov. in life can be seen online at:
https://www.flickr.com/photos/27026445@N06/31419696523/

and:

https://www.flickr.com/photos/warpedtime/2245649035/

and:
https://www.flickr.com/photos/27026445@N06/32155803631/

C. dunnyseat sp. nov. in life can be seen in Anstis (2013) on page 302 at top right image.

C. wifi sp. nov. in life can be seen in Hoser (1989) on page 42 in the top photo and Cogger (2014) on page 188, top left photo.

The subgenus *Balatusrana subgen. nov*. is separated from the nominate subgenus *Colleeneremia* Wells and Wellington, 1985 (being all seven species separated by the descriptions herein) by having conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger.

In the nominate subgenus *Colleeneremia* the fingers have only rudimentary webbing.

In addition to the character states just mentioned for each subgenus, both subgenera, comprising the totality of the genus *Colleeneremia* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small

and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives (with a divergence of 17 MYA according to Duellman *et al.* 2016) as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: *C. chunda sp. nov.* is generally found on Cape York in far north Queensland including nearby areas to there, including the wet tropics of far north Queensland, being the coastal region north of Mount Spec (near Townsville, Queensland).

Etymology: Chunda is Australian slang for “Watch Under” and this is the word commonly used by residents in North Queensland when they encounter this species of frog on floors of toilet blocks at camping grounds, aboriginal missions, “illegal alien” detention centres and other Australian Federal Government concentration camps and prisons. The Chunda cry is heard by adults and kids as they scream to others not to tread on the small frogs as they walk into a toilet block and can be heard across North Queensland camping grounds on a nightly basis. Scared Australian females also often yell out “Chunda Fuck!”, but it was determined to remove the word “Fuck” from the etymology and name, as it may cause offence and would therefore be contrary to the voluntary recommendations of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Chunda is also a word used by British convicts who were forced onto boats sent to Australia to help in the extermination campaign against the local Aboriginal People (see etymology for *Kumanjayiwalkerus kumanjayi sp. nov.*). After getting sea sick, the convict would lean over the edge of the boat to vomit and would yell out “Watch under” … “Chunda” to anyone below. The word Chunda then became an established Australian term for vomit, although there is no connection whatsoever between this species of frog and humans vomiting, although drunk Australians often vomit in toilet blocks at camping grounds.

COLLEENEREMIA DUNNYSEAT SP. NOV.

LSIDurn:lsid:zoobank.org:act:CEFE393B-3B11-4669-AC4E-8BFB0EB58650

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R7364, collected at Leigh Creek, South Australia, Australia, Latitude -30.48 S., Longitude 138.42 E.

This government-owned facility allows access to its holdings.

Paratypes: 39 preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R7365- R7394, R7396- R7398 and R7400- R7405, also all collected at Leigh Creek, South Australia, Australia, Latitude -30.48 S., Longitude 138.42 E.

Diagnosis: The five species, *Colleeneremia watdat sp. nov.* from the Pilbara, Gascoyne and Murchison regions of western Western Australia, *C. bogfrog sp. nov.* from the Macdonnell Ranges of Central Australia, *C. dunnyseat sp. nov.* from the Flinders Ranges of South Australia, *C. wifi* from western New South Wales and southern Queensland and *C. chunda* from the Cape York region in far north Queensland have until now all been treated as populations of putative *C. rubella* (Keferstein, 1868), herein confined to the dry tropics of the Northern Territory and the Kimberley district of Western Australia.

Another morphologically similar species *C. electrica* (Ingram and Corben, 1990), was prior to 1990 also treated as a regional population of *C. rubella.*

The seven species comprise the total of the subgenus *Colleeneremia* Wells and Wellington, 1985 as defined in this paper.

While these species within *Colleeneremia* have diverse habitat choices, their distribution does coincide with biogeographical barriers generally affecting saxicoline genera of Australian fauna.

This is including for example species of Varanid lizards (Hoser 2013, 2014, 2015g, 2018b-e), Ring-tailed Dragons in the genus *Ctenophorus* Fitzinger, 1843 (Hoser 2020c) other lizards within the genus *Egernia* Gray, 1838 *sensu lato* (Hoser 2018a) and also *Petrogale* Gray, 1837 wallabies (Hoser, 2020b).

The seven aforementioned species are separated from one another as follows:

The type form of *C. rubella* and *C. chunda sp. nov.* conforms to the genus description for *Colleeneremia.*

They can be further diagnosed as follows: Compared to all other species in the genus, these two species have relatively undeveloped lateral digital fringes and a relatively narrow head (medium in cross-section), versus broad (broad in cross-section) and well-developed lateral digital fringes in all other species. *C. chunda sp. nov.* is readily separated from *C. rubella* by the obvious bright yellow feet, well demarcated from the grey of the digits, versus yellowish feet and digits without a well defined boundary in *C. rubella.*

C. chunda sp. nov. is characterised by significant speckling on the upper dorsum and a well-defined white upper labial area below the eye, versus little specking on the dorsum of *C. rubella* and ill-defined lighter areas on the upper labial region.

C. chunda sp. nov. has well defined areas of yellow in the groin, versus ill-defined and spreading up the lower flank in *C. rubella.*

Both *C. chunda sp. nov*. and *C. rubella* have either smooth, or very minutely granular skin on the upper surface.

C. chunda sp. nov. is further separated from all other species by having a poorly formed and semi-distinct mid-vertebral line.

C. chunda sp. nov. and *C. rubella* further differ from the other species by having a distinctively bitonal upper surface, with a distinct broad grey or red-brown band down the middle of the back on a beige or fawn background.

C. electrica (Ingram and Corben, 1990) is separated from the other six species by having three distinctive dark bars or blotches on the back, a dorsum that is obviously tubercular and the yellow patches in the groin and arm pits are bold and distinctive and made more so by being edged with dark brownish-grey bordering, not seen in any other species.

C. bogfrog sp. nov. is separated from the other six species by having a pinkish red colour on the dorsum and flanks with pinkish white and very light grey marbling. The dorsum has smooth or leathery skin, but without obvious raised tubercles. Speckling is minimal and where present, usually on the snout and rear, it is still scattered, minimal and very faded as to be indistinct. There are also irregular purple-grey patches running down two longitudinal lines on the upper dorsum, not near the mid-line and these too are faded.

C. watdat sp. nov. is similar in dorsal patterning to *C. bogfrog sp. nov*. except that there is scattered flecking across all the body, as opposed to more being at front of snout and rear. *C. watdat sp. nov*. is also instead a mud-brownish coloured frog (not pinkish-red) and also has a strongly granulated dorsum and to a greater degree than any other species in the complex. Yellow in the groin and armpits is either non-existent or minimal.

C. watdat sp. nov. is further characterised by having a well defined dark brown stripe running from snout, through eye and ear over back leg to flank. The line is well defined, contrasting with the lighter brown surfaces adjacent and clearly runs across the entire tympanum.

C. dunnyseat sp. nov. is readily separated from all other six species by having a light greyish brown, almost tending to white coloured dorsum with distinctive dark brownish-black spots and mottling spread relatively evenly across the dorsum. Limbs are also creamish in colour with obvious darker flecks and mottling. This taxon comes across as a uniquely speckled frog, due to the high density of spotting and it being relatively evenly spaced on the contrasting lighter background, so the dorsum appears spotted, as opposed to one with blotches as may seen in some of the other species. Yellow in armpits and groin is often absent or when present not as brilliant, or prominent as in other species.

C. wifi sp. nov. is readily separated from the other six species by being chocolate brown on the dorsum and gun metal grey on the flanks. The dorsum is irregularly, but heavily peppered, with the same gun-metal grey the result being these patches of peppering forming semi-distinct areas of grey surrounded by otherwise mainly brown pigment. The upper surfaces of the limbs are the same chocolate brown colour as the body, but with even heavier grey peppering. The labial area is also generally grey and the top of the snout is brown, with either no peppering or minimal peppering that tends to be faded. Toes may be brown or grey (in a single specimen) depending on which are peppered heavily and which are not. The upper iris is a dull orange brown in this species, versus brilliant red or orange in all the other six.

C. rubella in life can be seen in Anstis (2013) on page 301 in the two right hand photos.

C. chunda sp. nov. in life can be seen in Anstis (2013) on page 302, on right (bottom image) and in Vanderduys (2012) on page 69 bottom.

C. electrica in life can be seen in Anstis (2013) on page 192, two right hand photos, and Cogger (2014) on page 162 (two photos).

C. bogfrog sp. nov. in life can be seen in Anstis (2013) on page 302 on left at top.

C. watdat sp. nov. in life can be seen online at: https://www.flickr.com/photos/27026445@N06/31419696523/

and:

https://www.flickr.com/photos/warpedtime/2245649035/

and:

https://www.flickr.com/photos/27026445@N06/32155803631/

C. dunnyseat sp. nov. in life can be seen in Anstis (2013) on page 302 at top right image.

C. wifi sp. nov. in life can be seen in Hoser (1989) on page 42 in the top photo and Cogger (2014) on page 188, top left photo.

The subgenus *Balatusrana subgen. nov*. is separated from the nominate subgenus *Colleeneremia* Wells and Wellington, 1985 (being all seven species separated by the descriptions herein) by having conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger.

In the nominate subgenus *Colleeneremia* the fingers have only rudimentary webbing.

In addition to the character states just mentioned for each subgenus, both subgenera, comprising the totality of the genus *Colleeneremia* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small

and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives (with a divergence of 17 MYA according to Duellman *et al.* 2016) as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: *Colleeneremia dunnyseat sp. nov.* occurs at the Flinders Ranges of South Australia, Australia.

Etymology: In 2019 I spent a week at Leigh Creek in South Australia, to educate local miners about snake handling and snake safety where I managed to kill yet another motor vehicle, that one being a Toyota Rav4.

I also spent considerable time surveying the local fauna including *C. dunnyseat sp. nov.*.

While at Leigh Creek I tried to find one or more members of the local Adnyamathanha Aboriginal Tribe in order to find out the local tribal name for this species of frog. Unfortunately pretty much the entire tribe had been killed off a hundred years prior as part of the British Empire genocide of the Australian Aboriginals.

This was done so that the British King could steal the entire country and pillage it as they saw fit.

There were some Adnyamathanha still hiding in the hills behind the Leigh Creek reservoir, occasionally emerging to grab some Freshwater Tortoises in the dam lake.

But they ran when I approached them for fear of being shot. After all my skin was “white” and they knew white people carried and used guns against them (see etymology for *Kumanjayiwalkerus kumanjayi sp. nov.*).

The locals in the Leigh Creek mining camp called the relevant frogs “dunny seat frogs” as they regularly secreted themselves under the toilet seat.

Dunny is an Australian word for toilet. Men and women would find them by day when they lifted a toilet seat and saw then balled up as they slept.

Hence the scientific name “dunnyseat”.

COLLEENEREMIA WATDAT SP. NOV.

LSIDurn:lsid:zoobank.org:act:2AF9CC4A-09B4-4F28-A5AC-4C5132C47287

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R62379 collected at Mount Narryer Station, Western Australia, Australia, Latitude -26.3500 S., Longitude 115.5500 E.

This government-owned facilility allows access to its holdings.

Paratypes: Six preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R62374, R62375, R62376, R62377, R62378 and R62380 all collected at Mount Narryer Station, Western Australia, Australia, Latitude -26.3500 S., Longitude 115.5500 E.

Diagnosis: The five species, *Colleeneremia watdat sp. nov.* from the Pilbara, Gascoyne and Murchison regions of western Western Australia, *C. bogfrog sp. nov.* from the Macdonnell Ranges of Central Australia, *C. dunnyseat sp. nov.* from the Flinders Ranges of South Australia, *C. wifi* from western New South Wales and southern Queensland and *C. chunda* from the Cape York region in far north Queensland have until now all been treated as populations of putative *C. rubella* (Keferstein, 1868), herein confined to the dry tropics of the Northern Territory and the Kimberley district of Western Australia.

Another morphologically similar species *C. electrica* (Ingram and Corben, 1990), was prior to 1990 also treated as a regional population of *C. rubella.*

The seven species comprise the total of the subgenus *Colleeneremia* Wells and Wellington, 1985 as defined in this paper.

While these species within *Colleeneremia* have diverse habitat choices, their distribution does coincide with biogeographical barriers generally affecting saxicoline genera of Australian fauna.

This is including for example species of Varanid lizards (Hoser 2013, 2014, 2015g, 2018b-e), Ring-tailed Dragons in the genus *Ctenophorus* Fitzinger, 1843 (Hoser 2020c) other lizards within the genus *Egernia* Gray, 1838 *sensu lato* (Hoser 2018a) and also *Petrogale* Gray, 1837 wallabies (Hoser, 2020d).

The seven aforementioned species are separated from one another as follows:

The type form of *C. rubella* and *C. chunda sp. nov.* conforms to the genus description for *Colleeneremia.*

They can be further diagnosed as follows: Compared to all other species in the genus, these two species have relatively undeveloped lateral digital fringes and a relatively narrow head (medium in cross-section), versus broad (broad in cross-section) and well-developed lateral digital fringes in all other species. *C. chunda sp. nov.* is readily separated from *C. rubella* by the obvious bright yellow feet, well demarcated from the grey of the digits, versus yellowish feet and digits without a well defined boundary in *C. rubella.*

C. chunda sp. nov. is characterised by significant speckling on the upper dorsum and a well-defined white upper labial area below the eye, versus little specking on the dorsum of *C. rubella* and ill-defined lighter areas on the upper labial region.

C. chunda sp. nov. has well defined areas of yellow in the groin, versus ill-defined and spreading up the lower flank in *C. rubella.*

Both *C. chunda sp. nov*. and *C. rubella* have either smooth, or very minutely granular skin on the upper surface.

C. chunda sp. nov. is further separated from all other species by having a poorly formed and semi-distinct mid-vertebral line.

C. chunda sp. nov. and *C. rubella* further differ from the other species by having a distinctively bitonal upper surface, with a distinct broad grey or red-brown band down the middle of the back on a beige or fawn background.

C. electrica (Ingram and Corben, 1990) is separated from the other six species by having three distinctive dark bars or blotches on the back, a dorsum that is obviously tubercular and the yellow patches in the groin and arm pits are bold and distinctive and made more so by being edged with dark brownish-grey bordering, not seen in any other species.

C. bogfrog sp. nov. is separated from the other six species by having a pinkish red colour on the dorsum and flanks with pinkish white and very light grey marbling. The dorsum has smooth or leathery skin, but without obvious raised tubercles. Speckling is minimal and where present, usually on the snout and rear, it is still scattered, minimal and very faded as to be indistinct. There are also irregular purple-grey patches running down two longitudinal lines on the upper dorsum, not near the mid-line and these too are faded.

C. watdat sp. nov. is similar in dorsal patterning to *C. bogfrog sp. nov*. except that there is scattered flecking across all the body, as opposed to more being at front of snout and rear. *C. watdat sp. nov*. is also instead a mud-brownish coloured frog (not pinkish-red) and also has a strongly granulated dorsum and to a greater degree than any other species in the complex. Yellow in the groin and armpits is either non-existent or minimal.

C. watdat sp. nov. is further characterised by having a well defined dark brown stripe running from snout, through eye and ear over back leg to flank. The line is well defined, contrasting with the lighter brown surfaces adjacent and clearly runs across the entire tympanum.

C. dunnyseat sp. nov. is readily separated from all other six species by having a light greyish brown, almost tending to white coloured dorsum with distinctive dark brownish-black spots and mottling spread relatively evenly across the dorsum. Limbs are also creamish in colour with obvious darker flecks and mottling. This taxon comes across as a uniquely speckled frog, due to the high density of spotting and it being relatively evenly spaced on the contrasting lighter background, so the dorsum appears spotted, as opposed to one with blotches as may seen in some of the other species. Yellow in armpits and groin is often absent or when present not as brilliant, or prominent as in other species.

C. wifi sp. nov. is readily separated from the other six species by being chocolate brown on the dorsum and gun metal grey on the flanks. The dorsum is irregularly, but heavily peppered, with the same gun-metal grey the result being these patches of peppering forming semi-distinct areas of grey surrounded by otherwise mainly brown pigment. The upper surfaces of the limbs are the same chocolate brown colour as the body, but with even heavier grey peppering. The labial area is also generally grey and the top of the snout is brown, with either no peppering or minimal peppering that tends to be faded. Toes may be brown or grey (in a single specimen) depending on which are peppered heavily and which are not. The upper iris is a dull orange brown in this species, versus brilliant red or orange in all the other six.

C. rubella in life can be seen in Anstis (2013) on page 301 in the two right hand photos.

C. chunda sp. nov. in life can be seen in Anstis (2013) on page 302, on right (bottom image) and in Vanderduys (2012) on page 69 bottom.

C. electrica in life can be seen in Anstis (2013) on page 192, two right hand photos, and Cogger (2014) on page 162 (two photos).

C. bogfrog sp. nov. in life can be seen in Anstis (2013) on page 302 on left at top.

C. watdat sp. nov. in life can be seen online at: https://www.flickr.com/photos/27026445@N06/31419696523/

and:

https://www.flickr.com/photos/warpedtime/2245649035/

and:

https://www.flickr.com/photos/27026445@N06/32155803631/

C. dunnyseat sp. nov. in life can be seen in Anstis (2013) on page 302 at top right image.

C. wifi sp. nov. in life can be seen in Hoser (1989) on page 42 in the top photo and Cogger (2014) on page 188, top left photo.

The subgenus *Balatusrana subgen. nov*. is separated from the nominate subgenus *Colleeneremia* Wells and Wellington, 1985 (being all seven species separated by the descriptions herein) by having conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger.

In the nominate subgenus *Colleeneremia* the fingers have only rudimentary webbing.

In addition to the character states just mentioned for each subgenus, both subgenera, comprising the totality of the genus *Colleeneremia* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small

and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives (with a divergence of 17 MYA according to Duellman *et al.* 2016) as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: *Colleeneremia watdat sp. nov.* occurs in the Pilbara, Gascoyne and Murchison regions of western Western Australia, Australia.

Etymology: In 1981, I was in the wilderness of Western Australia with some Yamatji Aboriginal elders sharing a few drinks. When I pulled a specimen of this species out of a bag he exclaimed “watdat”, so I took that as the local word for this taxon.

COLLEENEREMIA WIFI SP. NOV.

LSIDurn:lsid:zoobank.org:act:7734BCBF-314E-4954-BEBB-D01E4405958D

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.43573 collected at Walgett, New South Wales, Australia, Latitude -29.416 S., Longitude 147.566 E.

This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.43574, R.43575, R.43576, R.45511 and R.45512 all collected at Walgett, New South Wales, Australia, Latitude -29.416 S., Longitude 147.566 E.

Diagnosis: The five species, *Colleeneremia watdat sp. nov.* from the Pilbara, Gascoyne and Murchison regions of western Western Australia, *C. bogfrog sp. nov.* from the Macdonnell Ranges of Central Australia, *C. dunnyseat sp. nov.* from the Flinders Ranges of South Australia, *C. wifi* from western New South Wales and southern Queensland and *C. chunda* from the Cape York region in far north Queensland have until now all been treated as populations of putative *C. rubella* (Keferstein, 1868), herein confined to the dry tropics of the Northern Territory and the Kimberley district of Western Australia.

Another morphologically similar species *C. electrica* (Ingram and Corben, 1990), was prior to 1990 also treated as a regional population of *C. rubella.*

The seven species comprise the total of the subgenus *Colleeneremia* Wells and Wellington, 1985 as defined in this paper.

While these species within *Colleeneremia* have diverse habitat choices, their distribution does coincide with biogeographical barriers generally affecting saxicoline genera of Australian fauna.

This is including for example species of Varanid lizards (Hoser 2013, 2014, 2015g, 2018b-e), Ring-tailed Dragons in the genus *Ctenophorus* Fitzinger, 1843 (Hoser 2020c) other lizards within the genus *Egernia* Gray, 1838 *sensu lato* (Hoser 2018a) and also *Petrogale* Gray, 1837 wallabies (Hoser, 2020b).

The seven aforementioned species are separated from one another as follows:

The type form of *C. rubella* and *C. chunda sp. nov.* conforms to the genus description for *Colleeneremia.*

They can be further diagnosed as follows: Compared to all other species in the genus, these two species have relatively undeveloped lateral digital fringes and a relatively narrow head (medium in cross-section), versus broad (broad in cross-section) and well-developed lateral digital fringes in all other species. *C. chunda sp. nov.* is readily separated from *C. rubella* by the obvious bright yellow feet, well demarcated from the grey of the digits, versus yellowish feet and digits without a well defined boundary in *C. rubella.*

C. chunda sp. nov. is characterised by significant speckling on the upper dorsum and a well-defined white upper labial area below the eye, versus little specking on the dorsum of *C. rubella* and ill-defined lighter areas on the upper labial region.

C. chunda sp. nov. has well defined areas of yellow in the groin, versus ill-defined and spreading up the lower flank in *C. rubella.*

Both *C. chunda sp. nov.* and *C. rubella* have either smooth, or very minutely granular skin on the upper surface.

C. chunda sp. nov. is further separated from all other species by having a poorly formed and semi-distinct mid-vertebral line.

C. chunda sp. nov. and *C. rubella* further differ from the other species by having a distinctively bitonal upper surface, with a distinct broad grey or red-brown band down the middle of the back on a beige or fawn background.

C. electrica (Ingram and Corben, 1990) is separated from the other six species by having three distinctive dark bars or blotches on the back, a dorsum that is obviously tubercular and the yellow patches in the groin and arm pits are bold and distinctive and made more so by being edged with dark brownish-grey bordering, not seen in any other species.

C. bogfrog sp. nov. is separated from the other six species by having a pinkish red colour on the dorsum and flanks with pinkish white and very light grey marbling. The dorsum has smooth or leathery skin, but without

obvious raised tubercles. Speckling is minimal and where present, usually on the snout and rear, it is still scattered, minimal and very faded as to be indistinct. There are also irregular purple-grey patches running down two longitudinal lines on the upper dorsum, not near the mid-line and these too are faded.

C. watdat sp. nov. is similar in dorsal patterning to *C. bogfrog sp. nov*. except that there is scattered flecking across all the body, as opposed to more being at front of snout and rear. *C. watdat sp. nov*. is also instead a mud-brownish coloured frog (not pinkish-red) and also has a strongly granulated dorsum and to a greater degree than any other species in the complex. Yellow in the groin and armpits is either non-existent or minimal.

C. watdat sp. nov. is further characterised by having a well defined dark brown stripe running from snout, through eye and ear over back leg to flank. The line is well defined, contrasting with the lighter brown surfaces adjacent and clearly runs across the entire tympanum.

C. dunnyseat sp. nov. is readily separated from all other six species by having a light greyish brown, almost tending to white coloured dorsum with distinctive dark brownish-black spots and mottling spread relatively evenly across the dorsum. Limbs are also creamish in colour with obvious darker flecks and mottling. This taxon comes across as a uniquely speckled frog, due to the high density of spotting and it being relatively evenly spaced on the contrasting lighter background, so the dorsum appears spotted, as opposed to one with blotches as may seen in some of the other species. Yellow in armpits and groin is often absent or when present not as brilliant, or prominent as in other species.

C. wifi sp. nov. is readily separated from the other six species by being chocolate brown on the dorsum and gun metal grey on the flanks. The dorsum is irregularly, but heavily peppered, with the same gun-metal grey the result being these patches of peppering forming semi-distinct areas of grey surrounded by otherwise mainly brown pigment. The upper surfaces of the limbs are the same chocolate brown colour as the body, but with even heavier grey peppering. The labial area is also generally grey and the top of the snout is brown, with either no peppering or minimal peppering that tends to be faded. Toes may be brown or grey (in a single specimen) depending on which are peppered heavily and which are not. The upper iris is a dull orange brown in this species, versus brilliant red or orange in all the other six.

C. rubella in life can be seen in Anstis (2013) on page 301 in the two right hand photos.

C. chunda sp. nov. in life can be seen in Anstis (2013) on page 302, on right (bottom image) and in Vanderduys (2012) on page 69 bottom.

C. electrica in life can be seen in Anstis (2013) on page 192, two right hand photos, and Cogger (2014) on page 162 (two photos).

C. bogfrog sp. nov. in life can be seen in Anstis (2013) on page 302 on left at top.

C. watdat sp. nov. in life can be seen online at: https://www.flickr.com/photos/27026445@N06/31419696523/

and:

https://www.flickr.com/photos/warpedtime/2245649035/

and:

https://www.flickr.com/photos/27026445@N06/32155803631/

C. dunnyseat sp. nov. in life can be seen in Anstis (2013) on page 302 at top right image.

C. wifi sp. nov. in life can be seen in Hoser (1989) on page 42 in the top photo and Cogger (2014) on page 188, top left photo.

The subgenus *Balatusrana subgen. nov*. is separated from the nominate subgenus *Colleeneremia* Wells and Wellington, 1985 (being all seven species separated by the descriptions herein) by having conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger.

In the nominate subgenus *Colleeneremia* the fingers have only rudimentary webbing.

In addition to the character states just mentioned for each subgenus, both subgenera, comprising the totality of the genus *Colleeneremia* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives (with a divergence of 17 MYA according to Duellman *et al.* 2016) as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or

irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: *C. wifi sp. nov.* is generally found in the region of the Darling River basin in western New South Wales and inland southern Queensland, with a distribution towards the coast north of the south-east Queensland subtropical wet zone, but not including Cape York or nearby areas to there, including the wet tropics of far north Queensland.

Etymology: In 1992, I was speaking with a well-known Aboriginal Elder and ex underworld figure, Steve Gordon, also a commissioner with the Australian Federal Government's Aboriginal and Torres Strait Islander Commission (ATSIC). He liked the job as ATSIC Commissioner as in his own words "I get paid heaps to do bugger all!" He was from Brewarrina in New South Wales, which is where *C. wifi sp. nov.* occurs and I asked him about these and other frogs in the area. I did this by showing him the relevant pictures in the book Hoser (1989). He called the relevant species the "wife ee" frog and when I asked why, he said it was because of the bleating call of the species, which sounded like a wife yelling at you. Hence the species name "wifi". It does not have a connection with the well known "wifi" of more recent wireless internet fame. For more about other relevant to herpetology conversations with Steve Gordon, refer to Hoser (1993) and Hoser (1996).

COLLEENEREMIA* (*BALATUSRANA*) *DENTATA TOOWOOMBAENSIS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:9E5884CC-18ED-40E3-B022-5AEB01982952

Holotype: A preserved male specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J93230 collected from the Esk-Hampton Road, between Perseverance Hall Road and Clive Road, Perseverance, Queensland, Australia, Latitude -27.3733 S., Longitude 152.1081 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J93231 collected from the Esk-Hampton Road, between Perseverance Hall Road and Clive Road, Perseverance, Queensland, Australia, Latitude -27.3733 S., Longitude 152.1081 E.

Diagnosis: The south-east Queensland subspecies *Colleeneremia dentata toowoombaensis subsp. nov.* is similar in most respects to nominate *C. dentata* (Keferstein, 1868) from New South Wales.

Both would key out as "*Litoria dentata*" in Anstis (2013) and Cogger (2014).

C. dentata toowoombaensis subsp. nov. is readily separated from *C. dentata dentata* as follows:

Both have a similar dorsal pattern incorporating an irregularly shaped broad mid vertebral stripe that is dark in colour, with lighter surfaces on the sides of the dorsum and upper flank.all also have yellow in the armpits, groin and yellowish toes.

However *C. dentata toowoombaensis subsp. nov.* has a significantly greater contrast between dark and light on the dorsum (resting by day) than seen in *C. dentata dentata* and the stripe from snout, through eye and tympanum to upper anterior flank is dark-grey to black and distinct, versus light grey or brown and ranging from distinct to semi-distinct. Perhaps the most obvious diference between the two subspecies is the that the toes of *C. dentata toowoombaensis subsp. nov.* are a brilliant yellow colour, strongly contrasting with the grey or brown feet, versus at most slightly yellowish and with minimal contrast between the non-yellow feet in *C. dentata dentata*.

The subgenus *Balatusrana subgen. nov*. herein treated as monotypic for *C. dentata* is separated from the nominate subgenus *Colleeneremia* Wells and Wellington, 1985 (herein treated as seven species as outlined in this paper) by having conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger.

In the nominate subgenus *Colleeneremia* the fingers have only rudimentary webbing.

In addition to the character states just mentioned for each subgenus, both subgenera, comprising the totality of the genus *Colleeneremia* are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives (with a divergence of 17 MYA according to Duellman *et al.* 2016)

as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov*. have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

The nominate form of *C. dentata dentata* in life is depicted in Cogger (2014) on page 161.

C. dentata toowoombaensis subsp. nov. in life is depicted in Vanderduys (2012) on page 37.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Distribution: *C. dentata toowoombaensis subsp. nov.* is believed to be restricted to South-east Queensland, generally north of the border ranges area on the New South Wales and Queensland border. Nominate *C. dentata* is believed to occupy the rest of the range for this species and subgenus, being the coast and nearby ranges of New South Wales, along its entire length and into far north-east Victoria.

Etymology: The subspecies *C. dentata toowoombaensis subsp. nov.* is named in reflection of the type locality for the taxon.

RAWLINSONINA SUBTRIBE NOV.

***RAWLINSONIA* WELLS AND WELLINGTON, 1985**

Type species: *Hyla ewingi* Duméril and Bibron, 1841.

Diagnosis: The nine known living species within the genus *Rawlinsonia* Wells and Wellington, 1985 (one formally described within this paper) are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: smallish frogs usually about 35 mm in body length. Fingers are free or only webbed at the base. First finger is much shorter and smaller than the second, when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger. Hind edge of vomerine teeth are between the choanae. Usually one or a pair of semidistinct mid dorsal patches, darker than the ground colour, extending from a line joining the centre of the eyes; white stripe below eye, if present does not extend beyond the anterior edge of the base of the forelimb.

Duellman *et al.* (2016) found that the living species in this genus diverged from their nearest living relatives 23.2 MYA, giving support to the erection of this genus by Wells and Wellington, 1985 and this is before one considers the significant morphological divergence of the species group.

Distribution: Wetter parts of south-east Australia, ranging from South Australia, through Victoria and Tasmania, along the New South Wales coast to south-east Queensland, with outlier populations at Eungella, west of Mackay and the Atherton Tableland and adjacent mountains in the southern wet tropics of North Queensland.

Content: *Rawlinsonia ewingi* (Duméril and Bibron, 1841) (type species); *R. alpina* (Fry, 1915); *R. corbeni* Wells and Wellington, 1985; *R. ventrileuco sp. nov.*; *R. jervisensis* (Duméril and Bibron, 1851); *R. littlejohni* (White, Whitford and Mahoney, 1994); *R. paraewingi* (Wilson, Loftus-Hills and Littlejohn, 1971); *R. revelata* (Ingram, Corben and Hosmer, 1982); *R. verreauxii* (Duméril, 1853).

RAWLINSONIA VENTRILEUCO SP. NOV.

LSIDurn:lsid:zoobank.org:act:B00A719B-60AD-4BAB-B092-0CE78100283F

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J35087 collected at Mount William Road, 18 km from Dalrymple Heights, near Eungella, near Mackay, Queensland, Australia, Latitude -21.03 S., Longitude 148.6 E.

This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J35105-6 and J35115-6 all collected at Mount William Road, 18 km from Dalrymple Heights, near Eungella, near Mackay, Queensland, Australia, Latitude -21.03 S., Longitude 148.6 E.

Diagnosis: *R. ventrileuco sp. nov*. has until now been treated as an isolated population of *R. revelata* (Ingram, Corben and Hosmer, 1982), with a type locality of "O'Reillys (28.14' S, 153.08' E), Lamington Plateau, SE. Queensland", Australia, as has the species *R. corbeni* Wells and Wellington, 1985.

All three would be identified as *R. revelata*, called "*Litoria revelata*" in either Anstis (2013) or Cogger (2014).

All three have similar morphology and call, although all are widely disjunct in terms of distribution and clearly evolving as separate species. They are also morphologically divergent.

While divergence between the three populations is relatively recent in geological terms, it still appropriate that each be recognized as separate species, as opposed to subspecies.

I also note that while Anstis (2013) treats all populations as a single species, she also makes comments indicating in her view the likelihood that there is more than one species being called "*Litoria revelata*" and to that extent details obvious differences between forms.

The three species are readily separated from one another as follows:

By distribution, *Rawlinsonia revelata* from coastal New South Wales, immediately adjacent ranges and nearby wetter parts of south-east Queensland is separated from *R. corbeni* from the southern wet tropics of far north Queensland and *R. ventrileuco sp. nov*. from the Eungella uplands region near Mackay in north eastern Queensland.

The three species are turn also separated from one another as follows: *R. revelata* and *R. ventrileuco sp. nov*. have a few small black spots in the groin, versus prominent black blotches in the groin and red-orange on the back of the thighs as seen in *R. corbeni.*

R. ventrileuco sp. nov. and *R. corbeni* are in turn both separated from *R. revelata* by having small pointed tubercles running in a distinct line down the upper surface of the forearm, versus mainly scattered tubercles on the upper surface of the forearm in *R. corbeni.* Scattered, raised tubercles on the upper surface of the hind limb are prominent in both *R. revelata* and *R. corbeni* but not in *R. ventrileuco sp. nov*..

The upper iris of both *R. corbeni* and *R. ventrileuco sp. nov.* is noticeably lighter than the lower, versus not so in *R. revelata.*

The upper forearms of both *R. corbeni* and *R. ventrileuco sp. nov*. is dark brown, versus light brown or yellow in *R. revelata.*

The transverse row of usually about four tubercles between the eyes is found in all three species.

The three species *R. corbeni*, *R. ventrileuco sp. nov*. and *R. revelata* are in turn separated from all other species within the genus *Rawlinsonia* Wells and Wellington, 1985 by having finger and toe discs that are conspicuously broader than the digits; conspicuous black spots or blotches on the groin and a mid-dorsal patch divided along at least part of its length, including between the eyes.

All species within the genus *Rawlinsonia* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: smallish frogs usually about 35 mm in body length. Fingers are free or only webbed at the base. First finger is much shorter and smaller than the second, when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger. Hind edge of vomerine teeth are between the choanae. Usually one or a pair of semidistinct mid dorsal patches, darker than the ground colour, extending from a line joining the centre of the eyes; white stripe below eye, if present does not extend beyond the anterior edge of the base of the forelimb.

Distribution: *R. ventrileuco sp. nov*. is known only from the vicinity of Eungella, near Mackay in north-east Queensland and is believed to be isolated to this relatively wet uplands region.

Etymology: The name "*ventrileuco*" refers to the whitish venter of this species of frog in the adult form.

MAXINEHOSERRANINI TRIBE NOV.

MAXINEHOSERRANAE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:B603EFB7-4D33-4BDF-86C7-9552414B2127

Type species: *Eucnemis bicolor* Gray, 1842.

Diagnosis: Known in many books as the "*Litoria bicolor* complex" (e.g. Menzies 2006), this distinctive group of frogs has long been recognized as distinct within the genus *Litoria* Tschudi, 1838 as defined by Menzies (2006), Cogger (2014), Anstis (2013) Eipper and Rowland (2018), Vanderduys (2012) and most other contemporary authors. With a divergence of 21.5 MYA from nearest living relatives according to Duellman *et al*. (2016), genus-level recognition of this group of species is an obvious taxonomic judgement.

The only surprising thing is that this judgement has not been sooner, and hence the erection of a new genus herein.

I note that the nearest living relatives (from within the New Guinea area) are also in what have until now been ungrouped species and they too are placed in new genera, all of which (as a group) are most closely related to *Maxinehoserranae gen. nov.* and not any other species.

Species within *Maxinehoserranae gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: No vomerine teeth (Australian species) or in two small patches between the choanae (New Guinea species); dorsal colour is usually green, or occasionally fawn or a mixture of green and bronze; dorsal surface has a broad vertebral band of bronze bordered on either side by green; in terms of flecks or blotches, there are at most a few dark flecks on the dorsal surface; dorsal surface is smooth; at least one strong pectoral fold; no tubercles above the eye; brown head streak present; tympanum brown; internarial distance/eye-naris distance ratio is less than 1.0.

Frogs within the subgenus *Vegrandihyla subgen. nov.* are separated from the nominate subgenus *Maxinehoserranae subgen. nov.* by having concealed surfaces of the legs being bright red in colour (in life), versus blue-black, brown, yellow to orange in colour in all other species.

Vegrandihyla subgen. nov. are further separated from New Guinea species within *Maxinehoserranae subgen. nov.* by their non-overlapping HL/HW ratios, 1.027-1.189 versus 1.243-1.254.

In terms of the Australian species in *Maxinehoserranae subgen. nov.* the magnitude of the difference is less, being a mean HL/HW for *Vegrandihyla subgen. nov.* 1.04, versus 1.10 in the the Australian species in *Maxinehoserranae subgen. nov.*.

Distribution: Found in New Guinea, including islands north, south and east, as well as tropical northern Australia.

Etymology: The new genus is named in honour of Maxine Hoser of Margate a loyal subject (minion) the United Kingdom of England, Scotland, Wales, Northern Island, Gibralta, the Falkland Islands and formerly including Hong Kong and other colonies, in recognition of her services to the author in herpetology.

Content: *Maxinehoserranae bicolor* (Gray, 1842) (type species); *M. albolabris* (Wandolleck, 1911); *M. bibonius* (Kraus and Allison, 2014); *M. brettbarnetti sp. nov.*; *M. chloristona* (Menzies, Richards and Tyler, 2008); *M. contrastens* (Tyler, 1968); *M. eurynastes* (Menzies, Richards and Tyler, 2008); *M. lodesdema* (Menzies, Richards and Tyler, 2008); *M. maxinehoserae sp. nov.*; *M. mystax* (Van Kampen, 1906); *M. piersoni sp. nov.*; *M. viranula* (Menzies, Richards and Tyler, 2008).

VEGRANDIHYLA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:5E1A91FF-2426-4DCA-B8DA-EDEB534437E3

Type species: *Hyla contrastens* Tyler, 1968.

Diagnosis: Frogs within the subgenus *Vegrandihyla subgen. nov.* are separated from the nominate subgenus *Maxinehoserranae subgen. nov.* by having concealed surfaces of the legs being bright red in colour (in life), versus blue-black, brown, yellow to orange in colour in all other species.

Vegrandihyla subgen. nov. are further separated from New Guinea species within *Maxinehoserranae subgen. nov.* by their non-overlapping HL/HW ratios, 1.027-1.189 versus 1.243-1.254. In terms of the Australian species in *Maxinehoserranae subgen. nov.* the magnitude of the difference is less, being a mean HL/HW for *Vegrandihyla subgen. nov.* 1.04, versus 1.10 in the the Australian species in *Maxinehoserranae subgen. nov..*

Species within *Maxinehoserranae gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: No vomerine teeth (Australian species) or in two small patches between the choanae (New Guinea species); dorsal colour is usually green, or occasionally fawn or a mixture of green and bronze; dorsal surface has a broad vertebral band of bronze bordered on either side by green; in terms of flecks or blotches, there are at most a few dark flecks on the dorsal surface; dorsal surface is smooth; at least one strong pectoral fold; no tubercles above the eye; brown head streak present; tympanum brown; internarial distance/eye-naris distance ratio is less than 1.0.

Distribution: Found in highlands of Papua New Guinea, being mountains between Kundiawa and Wau-Bulolo at around 1200-1500 m elevation.

Etymology: The subgenus name *Vegrandihyla* in Latin means “small” and “Hyla”, with *Hyla* known as a tree frog and hence “small tree frog”, which accurately describes the species in the subgenus.

Content: *Maxinehoserranae* (*Vegrandihyla*) *contrastens* (Tyler, 1968) (monotypic).

MAXINEHOSERRANAE* (*MAXINEHOSERRANAE*) *BRETTBARNETTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:96665B4E-56F6-45AA-9CE3-7D8B889F0BEA

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R12264, collected from 5 miles west of Cooktown, North Queensland, Australia, Latitude -15.45 S., Longitude 145.17 E.

This government-owned facility allows access to its holdings.

Paratypes: Five preserved specimens at the Queensland Museum, specimen numbers: J23245, J23246, J23247, J23248 and J23249 collected from Marina Plains, North Queensland, Australia, Latitude -14.55 S., Longitude 143.8667 S.

Diagnosis: Until now, the putative species originally described as *Hyla bicolor* Oken, 1816, with a type locality of Port Essington, Northern Territory, has been treated as occurring across the northern wet tropics of Australia, including the Kimberley Division of Western Australia, the top end of the Northern Territory and Cape york in Queensland, as well as most parts of New Guinea and islands to the north, east and west of New Guinea.

Various species have been “split off” with Menzies, Richards and Tyler (2008) formally restricting *Maxinehoserranae bicolor* (Oken, 1816) (as *Litoria bicolor*) to Northern Australia, with a view that the Cape York population was closest to their New Guinea species, but not conspecific with them.

They did not put a name to that taxon and as of 2019, this taxon remained unnamed.

While restricting *M. bicolor* to the top end of the Northern Territory and Western Australia, Menzies, Richards and Tyler (2008) and no one since appears to have ever countenanced the possibility that there may be more than one species in north-west Australia, save for material to this effect in a thesis by James (1998).

However over more than 3 decades of active fieldwork in the relevant region, it was always apparent that those specimens from the West Kimberley were radically different to those from near Darwin and were therefore a separate species.

As that one was also unnamed as of 2019, it too is described herein.

All three species, namely *L. bicolor* from the Northern Territory, *M. maxinehoserae sp. nov*. from the Kimberley District of Western Australia and *M. brettbarnetti sp. nov*. from Cape York in Queensland would key out as *M. bicolor* in either Cogger (2014) or Anstis (2013).

The three Australian species are readily separated from those in the genus outside Australia (New Guinea and nearby offshore islands) by their call, which in the Australian species is a very distinctive short rolling sound, or rasp, which accelerates slightly at the end of the sequence.

The three Australian species are separated from one another as follows:

Adult male *M. brettbarnetti sp. nov*. and *M. bicolor* both have a well-defined broad band running from the back of the eye along the side of the back towards the groin. This is either green, or yellow with a stong greenish tinge in *M. brettbarnetti sp. nov*., versus yellow in *M. bicolor.* Below this line, the border is brown in *M. brettbarnetti sp. nov*. versus brown, purple or grey in *M. bicolor.*

The forelimbs of both sexes of adult *M. brettbarnetti sp. nov*. are always heavily peppered with dark brown pigment, versus not so in *M. bicolor* which have light forelimbs.

The flanks of both sexes of adult *M. brettbarnetti sp. nov*. has a moderate amount of scattered black peppering, versus none or very little in *M. bicolour.*

In terms of further separation of the two species Menzies, Richards and Tyler (2008) stated *M. bicolor* are larger than Queensland *M. brettbarnetti sp. nov*., with mean snout-vent 25.0 mm +/-0.98 versus 23.1 mm +/-1.58 mm in *M. brettbarnetti sp. nov*., Queensland *M. brettbarnetti sp. nov*., have larger heads, mean HL/HB 0.34 +/- 0.017 versus 0.33 +/- 0.014 in *M. bicolor*, but there are no differences in head proportions.

... CONTINUES IN *AJH* ISSUE 45

Hoser, R. T. 2020. For the first time ever! An overdue review and reclassification of Australasian Tree Frogs (Amphibia: Anura: Pelodryadidae), including formal descriptions of 12 tribes, 11 subtribes, 34 genera, 26 subgenera, 62 species and 12 subspecies new to science. *Australasian Journal of Herpetology* 44-46:1-192.

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... Continued from* AJH *Issue 44 ...

M. brettbarnetti sp. nov. have more widely placed nostrils, mean EN/IN 0.99 +/- 0.01 versus 1.06 +/- 0.01 in *M. bicolor*.. A combination of two metrics, i.e. HB and HL/HB, provides better, but not absolute, separation (paraphrased here). *M. maxinehoserae sp. nov.* is by far the most distinctive Australian species in the genus *Maxinehoserranae gen. nov.*. It is readily separated from both other species as follows:

M. maxinehoserae sp. nov. has a distinctive, bright lime green dorsum with thin well-defined chocolate brown line running from tip of snout to eye, after which the line continues as a broad stripe, over-writing the entire tympanum and going along the mid flank to the groin. On the flank of the body, the line is distinctive and well defined. It is bordered on top by the lime green dorsum and below by a thick white band, bordered below with brown, that then fades to the white underside.

The chocolate coloured line from snout, through nostril to eye is bordered on top by a thin gold line in turn bordered by the lime green on top of the head and body.

This thin gold line upper border is not seen in the other two species. The limbs of *Maxinehoserranae gen. nov.* have scattered brown spots and the dorsum of this species is moderately granular.

M. brettbarnetti sp. nov. also has a moderately granular dorsum, whereas *M. bicolor* has a smooth dorsum.

Specimens of *M. brettbarnetti sp. nov*. that have a brownish coloured line running from the ear to the groin do not have either the rich dark chocolate colour seen in *M. maxinehoserae sp. nov*. or the sharp well defined upper edge on the dorsum as seen in *M. maxinehoserae sp. nov*..

The upper dorsum of *M. maxinehoserae sp. nov*. does not have the somewhat faded two tone colouration seen in both *M. brettbarnetti sp. nov.* and *M. bicolor*.

Images of *M. maxinehoserae sp. nov*. in life can be seen in Tyler, Smith and Johnstone (1994) on plate 27 at bottom and online at:
https://www.flickr.com/photos/euprepiosaur/22190269488/in/photolist-885upC-zNSW2f-z9rhah
and:
https://www.flickr.com/photos/euprepiosaur/21755237474/in/photolist-885upC-zNSW2f-z9rhah/
and:
https://www.flickr.com/photos/liquidghoul/4674588858/in/photolist-885upC-zNSW2f-z9rhah/

Images of *M. brettbarnetti sp. nov*. in life can be seen in Anstis (2013) on page 150 at bottom and page 151 at top left and page 153 top, in Vanderduys (2012) on page 26 in all images and Tyler and Davies (1986) in plate 20.

An image of *M. bicolor* in life can be seen in Anstis (2013) on page 150 at top.

Distribution: *M. brettbarnetti sp. nov*. is restricted to Cape York in Queensland. *M. bicolor* is restricted to the area spanning the environs of Darwin, across the top of the Northern Territory, including offshore islands and the western side of the Gulf of Carpentaria.

Etymology: Named in honour of Brett Barnett of Ardeer, Victoria, Australia in recognition of his significant contributions to herpetology over many decades.

MAXINEHOSERRANAE* (*MAXINEHOSERRANAE*) *MAXINEHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:C3873D43-BDD9-4F22-A5EB-0D5A72AAC722

Holotype: A preserved specimen at the Western Australian Museum, Australia, specimen number R47475, collected at Lake Gilbert, Beverley Springs Station, near Charnley River, Prince Regent District, Kimberley Division of Western Australia, Australia, Latitude -16.5667 S., Longitude 125.2667 E.

This government-owned facility allows access to its holdings.

Paratypes: Nine preserved specimens at the Western Australian Museum, specimen numbers R47476, R47477, R47478, R47479, R47480, R47481, R47482, R47483 and R47484 all collected at Lake Gilbert, Beverley Springs Station, near Charnley River, Prince Regent District, Kimberley Division of Western Australia, Australia, Latitude -16.5667 S., Longitude 125.2667 E.

Diagnosis: Until now, the putative species originally described as *Hyla bicolor* Oken, 1816, with a type locality of Port Essington, Northern Territory, has been treated as occurring across the northern wet tropics of Australia, including the Kimberley Division of Western Australia, the top end of the Northern Territory and Cape york in Queensland, as well as most parts of New Guinea and islands to the north, east and west of New Guinea.

Various species have been “split off” with Menzies, Richards and Tyler (2008) formally restricting *Maxinehoserranae bicolor* (Oken, 1816) (as *Litoria bicolor*) to Northern Australia, with a view that the Cape York population was closest to their New Guinea species, but not conspecific with them.

They did not put a name to that taxon and as of 2019, this taxon remained unnamed.

While restricting *M. bicolor* to the top end of the Northern Territory and Western Australia, Menzies, Richards and Tyler (2008) and no one since appears to have ever countenanced the possibility that there may be more than one species in north-west Australia, save for material to this effect in a thesis by James (1998).

However over more than 3 decades of active fieldwork in the relevant region, it was always apparent that those specimens from the West Kimberley were radically different to those from near Darwin and were therefore a separate species.

As that one was also unnamed as of 2019, it too is described herein.

All three species, namely *L. bicolor* from the Northern Territory, *M. maxinehoserae sp. nov*. from the Kimberley District of Western Australia and *M. brettbarnetti sp. nov*. from Cape York in Queensland would key out as *M. bicolor* in either Cogger (2014) or Anstis (2013).

The three Australian species are readily separated from those in the genus outside Australia (New Guinea and nearby offshore islands) by their call, which in the Australian species is a very distinctive short rolling sound, or rasp, which accelerates slightly at the end of the sequence as well as an absence of vomerine teeth,

or very tiny ones, versus presence in New Guinea species.

The three Australian species are separated from one another as follows:

Adult male *M. brettbarnetti sp. nov*. and *M. bicolor* both have a well-defined broad band running from the back of the eye along the side of the back towards the groin. This is either green, or yellow with a stong greenish tinge in *M. brettbarnetti sp. nov.*, versus yellow in *M. bicolor.* Below this line, the border is brown in *M. brettbarnetti sp. nov*. versus brown, purple or grey in *M. bicolor.*

The forelimbs of both sexes of adult *M. brettbarnetti sp. nov*. are always heavily peppered with dark brown pigment, versus not so in *M. bicolor* which have light forelimbs.

The flanks of both sexes of adult *M. brettbarnetti sp. nov*. has a moderate amount of scattered black peppering, versus none or very little in *M. bicolour.*

In terms of further separation of the two species Menzies, Richards and Tyler (2008) stated *M. bicolor* are larger than Queensland *M. brettbarnetti sp. nov.*, with mean snout-vent 25.0 mm +/-0.98 versus 23.1 mm +/-1.58 mm in *M. brettbarnetti sp. nov.*, Queensland *M. brettbarnetti sp. nov.*, have larger heads, mean HL/HB 0.34 +/- 0.017 versus 0.33 +/- 0.014 in *M. bicolor*, but there are no differences in head proportions. *M. brettbarnetti sp. nov*. have more widely placed nostrils, mean EN/IN 0.99 +/- 0.01 versus 1.06 +/- 0.01 in *M. bicolor*, but none of these characters will provide

absolute separation as all measurements and ratios show extensive overlap and so are of little practical value. A combination of two metrics, i.e. HB and HL/HB, provides better, but not absolute, separation (paraphrased here).

M. maxinehoserae sp. nov. is by far the most distinctive Australian species in the genus *Maxinehoserranae gen. nov..* It is readily separated from both other species as follows:

M. maxinehoserae sp. nov. has a distinctive, bright lime green dorsum with thin well-defined chocolate brown line running from tip of snout to eye, after which the line continues as a broad stripe, over-writing the entire tympanum and going along the mid flank to the groin. On the flank of the body, the line is distinctive and well defined. It is bordered on top by the lime green dorsum and below by a thick white band, bordered below with brown, that then fades to the white underside.

The chocolate coloured line from snout, through nostril to eye is bordered on top by a thin gold line in turn bordered by the lime green on top of the head and body.

This thin gold line upper border is not seen in the other two species.

The limbs of *Maxinehoserranae gen. nov.* have scattered brown spots and the dorsum of this species is moderately granular.

M. brettbarnetti sp. nov. also has a moderately granular dorsum, whereas *M. bicolor* has a smooth dorsum.

Specimens of *M. brettbarnetti sp. nov*. that have a brownish coloured line running from the ear to the groin do not have either the rich dark chocolate colour seen in *M. maxinehoserae sp. nov*. or the sharp well defined upper edge on the dorsum as seen in *M. maxinehoserae sp. nov*..

The upper dorsum of *M. maxinehoserae sp. nov*. does not have the somewhat faded two tone colouration seen in both *M. brettbarnetti sp. nov.* and *M. bicolor*.

Images of *M. maxinehoserae sp. nov*. in life can be seen in Tyler, Smith and Johnstone (1994) on plate 27 at bottom and online at:
https://www.flickr.com/photos/euprepiosaur/22190269488/in/photolist-885upC-zNSW2f-z9rhah
and:
https://www.flickr.com/photos/euprepiosaur/21755237474/in/photolist-885upC-zNSW2f-z9rhah/
and:
https://www.flickr.com/photos/liquidghoul/4674588858/in/photolist-885upC-zNSW2f-z9rhah/

Images of *M. brettbarnetti sp. nov*. in life can be seen in Anstis (2013) on page 150 at bottom and page 151 at top left and page 153 top, in Vanderduys (2012) on page 26 in all images and Tyler and Davies (1986) in plate 20.

An image of *M. bicolor* in life can be seen in Anstis (2013) on page 150 at top.

Distribution: *M. maxinehoserae sp. nov*. is found throughout the Kimberley Division of Western Australia and into nearby parts of far north-west Western Australia, in the region generally south of the Daly River (inclusive). *M. bicolor* is restricted to the area spanning the environs of Darwin, across the top of the Northern Territory, including offshore islands and the western side of the Gulf of Carpentaria.

Etymology: the new species is named in honour of Maxine Hoser of Margate a loyal subject (minion) the United Kingdom of England, Scotland, Wales, Northern Island, Gibralta, the Falkland Islands and formerly including Hong Kong and other colonies, in recognition of her services to the author in herpetology.

MAXINEHOSERRANAE* (*MAXINEHOSERRANAE*) *PIERSONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:10C131B1-4741-4046-9702-4A782CFEC91F

Holotype: A preserved specimen in the University of Papua New Guinea, Port Moresby, Papua New Guinea, specimen number UP5276, collected from Yala River, Seram, Indonesia, Latitude 3.28 S., Longitude 128.99 E. This facility allows access to its holdings.

Paratypes: Four preserved specimens in the University of Papua New Guinea, Port Moresby, Papua New Guinea, specimen numbers UP5271-74, collected from Yala River, Seram, Indonesia, Latitude 3.28 S., Longitude 128.99 E.

Diagnosis: *Maxinehoserranae piersoni sp. nov.* from the island of Seram has until now been variously treated as *M. bicolor* (Gray, 1842) (in most texts placed in the genus *Litoria* Tschudi, 1838) and herein restricted to the top end of the Northern Territory, Australia, or more recently as a western population of the species formally named *Litoria eurynastes* Menzies *et al.* (2008) with a type locality of Madang, in the north of Papua New Guinea.

However this taxon (*M. piersoni sp. nov.*) is neither and herein formally described as a new species.

While it would be diagnosed as *Maxinehoserranae eurynastes* (Menzies *et al.*, 2008) using the diagnostic information within Menzies *et al.* (2018) the two species

are readily separated on the basis of the colouration of the concealed surfaces of the thighs. In *M. piersoni sp. nov.* these surfaces are vaguely mottled brown and not distinct, versus concealed surfaces of thighs with sparse to moderate sprinkling of blue-black.

M. piersoni sp. nov. is further separated by having a generally variable but dull olive green coloured dorsum, versus immaculate yellow green to bright green in *M. eurynastes.*

M. piersoni sp. nov. is further diagnosed by a pale yellow band running from the upper lip to the mid-body and vague dark dorsolateral stripe (versus bronze in *M. eurynastes*); and males with a pale yellow venter; throat deep yellow and gold iris.

Both *M. piersoni sp. nov.* and *M. eurynastes* are separated from all other species within *Maxinehoserranae gen. nov.* by the following quite of characters: A larger species of *Maxinehoserranae gen. nov.* with adult snout-vent 25.7-31.5 mm, HBF 27.3-33.0 mm; snout rounded and projecting in profile, somewhat angular from above; lores slightly sloping, flat; canthus rostralis rounded, straight; nostrils lateral, slightly visible from above; eyes large, tympanum large, distinct, except extreme upper margin; shallow postorbital fold fades before axilla; outer fingers about half webbed, others webbed only at base; simple, pale brown nuptial pad; all fingers with discs, larger than on the toes; toes fully webbed, except fourth with terminal phalanx free, all with discs; dorsal skin finely granular; ventral surface more coarsely; throat wrinkled; vomerine teeth in two small patches between the choanae and otherwise as for the genus.

Menzies *et al.* (2008) placed the Seram population described herein as *M. piersoni sp. nov.* within their species *M. eurynastes* on the basis of biogeographic proximity to New Guinea and the associated fact that other New Guinea frogs occur there, namely the identified (by them) species of "*Litoria amboinensis*, *L. infrafrenata*, *Platymantis papuensis*".

In doing so, they chose to ignore the morphological divergence between their type form of *M. eurynastes* from Alexishafen, Madang Province Papua New Guinea and this new species from Seram, which is highlighted here to separate the two taxa.

It should also be noted that biogeographically, Seram associates with southern New Guinea fauna and not that of the north, of which their species *M. eurynastes* is. Based on biogeography, the closest match to the Seram population (identified herein as *M. piersoni sp. nov.*) would logically be their southern New Guinea species, *M. viranula* (Menzies *et al.*, 2008), with a type locality of Wegamu Camp, Bensbach River, Western Province, Papua New Guinea.

However Menzies *et al.*, 2008 identify a raft of morphological differences separating those two forms and hence the only logical conclusion is that *M. piersoni sp. nov.* must therefore be a separate species.

The population of frogs from Yamur Lake and Siewa River in the neck of the Bird's Head of New Guinea, (south running drainages) are morphologically similar to *M. piersoni sp. nov.* and are tentatively included within this species. The quoted mean snout-vent for *M. piersoni sp. nov.* is 28 mm, versus 29 mm for the Yamur Lake and Siewa River forms, being of no significant difference.

For the record *M. viranula* is separated from *M. piersoni sp. nov.* by being a significantly smaller species maximum snout-vent of 23.5 mm and HBF 26.4 mm.

M. viranula is further separated from *M. piersoni sp. nov.* by having a green dorsum with mid-dorsal bronze band; narrow dark canthal stripe continuing through eye and tympanum, but becoming

indistinct between green dorsum and white ventrum; upper lip white, colour continuing below eye and tympanum before merging with ventral colour; male throat pale yellow, ventrum elsewhere white; groin and concealed surfaces of thigh dark brown (versus an indistinct mottled brown in *M. piersoni sp. nov.*).

M. viranula was illustrated in life by Menzies (2006) in plate 44 as "*Litoria bicolor*".

M. piersoni sp. nov. was illustrated by Menzies (2006) in plate 46 as "*Litoria cf. bicolor*, Yala River, Seram".

Based on the original description of *Hyla albolabris* Wandolleck, 1911 and relevant account in Tyler and Davies (1978), this taxon appears to fall within the genus *Maxinehoserranae gen. nov.,* but that placement is of course tentative.

Tyler and Davies (1978) placed the taxon in its own species group, but provided no evidence or justification for this quite drastic action. In key characters, *M. albolabris* clearly matches species within *Maxinehoserranae gen. nov.* (AKA "the *bicolor* group") including finger and toe webbing, adult size and colour, both dorsal and ventral. On this basis, it is highly likely that this taxon is in fact conspecific with *M. viranula*, or alternatively related to *M. contrastens* (Tyler, 1968) and possibly conspecific that that. If either situation is ultimately found to be correct, then *M. albolabris* will be the senior name and the other taxon name will move into its synonymy in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Distribution: Known definitively only from the southern parts of the island of Seram, Indonesia, however this taxon presumably occurs in all suitable lowland parts of the island, and nearby islands. Specimens from Yamur Lake and Siewa River in the neck of the Bird's Head of New Guinea, (south running drainages) are morphologically similar to *M. piersoni sp. nov.* and are tentatively included within this species.

Etymology: Named in honour of Charles Pierson of Moss Vale, New South Wales, Australia, publisher of numerous books on Australian wildlife, including Hoser (1989, 1991 and 1993) in recognition of his major contributions to wildlife conservation in Australia and assisting.

His efforts were also critical in forcing the Australian government to revoke draconian and anti-conservation wildlife laws that were enforced at gunpoint in Australia for two decades from the 1970's to the 1990's as detailed in Hoser (1993 and 1996). Those laws which, Person's efforts finally had revoked did in that 20 year period cause the extinctions of several species including frogs and at least one dragon species (*Tympanocryptis pinguicolla* Mitchell, 1948) (Hoser 2019a, 2019b).

ANGULARANTA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:5BEECB54-ABB0-444B-B17E-36C69FBF7105

Type species: *Hyla* (*Litoria*) *arfakiana* Peters and Doria, 1878.

Diagnosis: The genus *Angularanta gen. nov.* includes most of the better-known small, medium or large sized mountain stream dwelling tree frogs of New Guinea as well as a number of larger but morphologically similar lowland species.

The described species in the genus *Angularanta gen. nov.* are most easily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by separation of each of the relevant subgenera.

Frogs in the nominate subgenus *Angularanta subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by one of the two following suites of characters:

1/ Small to medium sized, stream-breeding species with unwebbed or slightly webbed, long fingers, large finger discs and fully webbed toes. Intercalary structures are broad or elongate and ossified. Straight canthus rostralis. The hyoid plate lacks alary processes. The eggs are large and unpigmented, or alternatively:

2/ Medium to large species wlth long and variously webbed fingers, long hindlimbs, pigmented or unpigmented bones and very highly variable dorsal coloration. The intercalary structures are small and cartilaginous. The hyoid plate bears pedunculate alary processes. The ova are small and pigmented.

Frogs in the subgenus *Alliuma subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are medium-sized montane tree frogs with spiniform tubercles on the hindlimbs, but no spiniform tubercles on the body, a green and brown blotched dorsum, and yellow colouration on the hidden surfaces of the thighs.The ventral surface is variegated with dark pigments. Moderate to extensive finger webbing. Vocal slits present in males; strongly curved canthus rostralis.

Frogs in the subgenus *Naveosrana subgen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: A small (under 50 mm snout-vent in both sexes) grey or brown species of frog with broad half-webbed fingers bearing large discs, and having a strongly curved canthus rostralis. The intercalary structures are elongate and cartilaginous. The hyoid plate lacks alary processes. Ova are small and unpigmented. Further diagnostic characters of this subgenus are as follows: The dorsum varies from grey to dark brown with pale markings including light pigment over the site of the cutaneous blood vessels. The snout is gently rounded and the canthus rostralis sharply curved. The fingers have broad discs and are approximately half webbed. The toes are webbed to the base of the discs. Tubercles occur commonly on the upper eyelids, below the anus, on the back of the thighs and on the heels.

The cranial elements are reduced. The nasals are small and very widely separated medially. They do not articulate with the sphenethmoid, which appears to be lobulated anteriorly in retaining a double condition and does not extend between the nasals. The frontoparietal fontanelle is large and ovoid. The squamosal has a short zygomatic ramus and slightly longer otic ramus. The quadratojugal is not developed. The pars facialis is shallow and the short posterior process does not articulate with the maxillary process of the nasal. The alary processes of the premaxillaries are well developed, bifurcated at their extremities, widely separated medially and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are reduced. The sacral diapophyses are broadly expanded and the ilia extend one third along their length. No flange is present on the third metacarpal and the intercalary structures are long and cartilaginous. Alary processes of the hyoid plate are lacking. The adductor mandibulae externus superficialis is absent.

Frogs within the subgenus *Scelerisqueanura subgen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small (adult males 25.8-30.3 mm) frogs. Dorsum is chocolate brown, with or without paler patches. Short, narrow fringed, half-webbed fingers and webbed toes. The finger lengths are as follows 3>4>2>1. The webbing between the third and fourth fingers extends to a point slightly below the paired subarticular tubercles at the base of the penultimate phalanx on the fourth toe. Broadly spaced nares (E-N/IN 0.657-0.758). No vomerine teeth. The head is slightly longer than broad (HL/HW 1.031), its length equivalent to more than one-third of the snout to vent length (HL/S-V 0.356). The snout is not prominent; abrupt and truncate when viewed from above and very slightly rounded in profile. The nostrils are lateral, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.694). The canthus rostralis is well defined and very slightly curved. The eye is large and conspicuous, its diameter greater than the eye to naris distance.

The tympanum is covered with skin and very small, its diameter equivalent to one-third of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue is broadly cordiform with weakly indented posterior border.

The terminal discs are prominent. Long and slender hindlimbs with a TL/S-V ratio of 0.584.

Toe lengths 4>5=3>2>1. The webbing of all toes except for the fourth reaches the base of the discs, while on the fourth toes the webbing reaches the subarticular tubercle at the base of the penultimate phalanx and continues to the disc via a narrow fringe. The dorsal and lateral surfaces of the body are finely pitted and striated. There is an inconspicuous supratympanic fold. The throat and chest are smooth. Abdomen and nearby halves of the ventral surface of the thighs are coarsely granular. There is a small pigmented nuptial pad at the base of the first finger. Vocal sac openings are exceptionally long, extending from the base of the tongue to the angles of the jaw.

Ventrally the frogs are a pale creamish colour, stippled with dark brown on the throat.

Frogs within the subgenus *Longuscrusanura subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small size with male maximum length 23 mm, female 28 mm. Fingers are slightly fringed and slightly less than half webbed and of moderate length. The toes are fully webbed and the hindlimbs are particularly long, with a ratio of tibia length to snout-vent length of 0.59-0.68.

The dorsum is greyish (in preservative) and marked with pale, cryptic markings resembling lichens.

The snout is short and very slightly pointed.

Ovarian eggs are unpigmented. Vomerine teeth are present in some individuals and absent in others.

The snout is prominent, slightly projecting and obtusely pointed when viewed from above and slightly projecting in profile. The nostrils are more lateral than superior, their distance from the end of the snout approximately two thirds that from the eye. The distance from the eye and the naris is less than the internarial span. The canthus rostralis is well defined and strongly rounded. The eyes are large and prominent the eye diameter being greater than the eye to naris distance.

The tympanum is covered with skin, only the inferior half of the annulus is visible. The tympanum diameter approximates the equivalent of two fifths of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue shape is somewhat distorted and roughly cordiform in shape with a very slightly indented posterior margin.

The two species *Angularanta impura* and *A. oxyeei sp. nov.* constitute the entirety of the subgenus *Raucus subgen. nov*. and are separated from all other species within *Angularanta gen. nov.* and all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: unpigmented bones; single subarticular tubercle on fourth finger; reduced toe webbing; reduced hand webbing (versus moderate to extensive in one or both in all species of *Angularanta gen. nov.*), narrow lateral fringes on fingers; dark brown to blackish chin in males; dark brown to reddish brown dorsum; dark brown canthal stripe; upper-lip may be white, with a very thin white line bordered by black or brown; concealed surfaces of thighs are brown with yellow spots; yellow to orange iris, sometimes with a green upper margin; ventrum white; slightly pointed snout when viewed from above, side on or below; a raucous call; IN/SV 0.072-0.08, TY/SV 0.067-0.075, HW/SV 0.34-0.3, HL/SV 0.34-0.3, EN/IN 1.1-1.2.

According to Duellman *et al*. (2016), the genus *Angularanta gen. nov.* diverged from its nearest living relatives in the divergent genus *Bellarana gen. nov*. 12.7 MYA, in turn diverged as a pair from their next nearest living relatives in the two genera *Hopviridi gen. nov.* and *Ornatanura gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Frogs in this genus are found in all parts of New Guinea, nearby offshore Islands, including those to the north (New Britain, New Ireland), with some species also occurring as far afield as most major islands within the Solomon Islands.

Etymology: The new genus name *Angularanta* comes from the Latin words meaning sharp snout, or sharp front, in reference to the generally pointed snouts of most of these species.

Content: *Angularanta arfakiana* (Peters and Doria, 1878) (type species); *L. mukherjii sp. nov.*; *A. becki* (Loveridge, 1943); *A. brongersmai* (Loveridge, 1945); *A. bulmeri* (Tyler, 1968); *A. chydaeus sp. nov.*; *A. communia sp. nov.*; *A. dorsivena* (Tyler, 1968); *A. extentacrus sp. nov.*; *A. flavescens* (Kraus and Allison, 2004); *A. fuscula* (Oliver and Richards, 2007); *A. impura* (Peters and Doria, 1878); *A. longicrus* (Boulenger, 1911); *L. louisiadensis* (Tyler, 1968); *A. lutea* (Boulenger, 1887); *A. macki* (Richards, 2001); *A. milneana* (Loveridge, 1945); *A. napaea* (Tyler, 1968); *A. oenicolen* (Menzies and Zweifel, 1974); *A. oxyeei sp. nov.*; *A. pratti* (Boulenger, 1911); *A. quaeinfernas sp. nov.*; *A. solomonis* (Vogt, 1912); *A. spartacus* (Richards and Oliver, 2006); *A. spinifera* (Tyler, 1968); *A. thesaurensis* (Peters, 1877); *A. vulgarans sp. nov.*; *A. wollastoni* (Boulenger, 1914).

ALLIUMA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:C23E103A-0397-4910-A0FB-30A3216FC26F

Type species: *Litoria spartacus* Richards and Oliver, 2006.

Diagnosis: Frogs in the subgenus *Alliuma subgen. nov.* (being a subgenus within the genus *Angularanta subgen. nov.*) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are medium-sized montane tree frogs with spiniform tubercles on the hindlimbs, but no spiniform tubercles on the body, a green and brown blotched dorsum and yellow colouration on the hidden surfaces of the thighs.The ventral surface is variegated with dark pigments. Moderate to extensive finger webbing. Vocal slits present in males; strongly curved canthus rostralis.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

According to Duellman *et al.* (2016), the subgenus *Alliuma subgen. nov.* diverged from the nominate subgenus *Angularanta subgen. nov.* 10.8 MYA.

According to Duellman *et al.* (2016), the genus *Angularanta gen. nov.* diverged from its nearest living relatives in the divergent genus *Bellarana gen. nov*. 12.7 MYA, in turn diverged as a pair from their next nearest living relatives in the two genera *Hopviridi gen. nov.* and *Ornatanura gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Known only from a few scattered locations around watercourses at 800-1500 metres in altitude in the central highlands region of central New Guinea, only in association with the main central cordillera.

Etymology: *Alliuma* is derived from the Latin word “alium” meaning different, reflecting the flanges on the frog, giving it a different appearance to a lot of other frogs. The name spelling of this genus with the addition of the letter “a” is deliberate as it avoids the genus being a homonym with the plant genus *Allium* Linnaeus, 1753

and the extra "l" is added for similar reasons.

Content: *Angularanta* (*Alliuma*) *spartacus* (Richards and Oliver, 2006) (type species); *A.* (*Alliuma*) *macki* (Richards, 2001); *A.* (*Alliuma*) *spinifera* (Tyler, 1968).

LONGUSCRUSANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:83CEADF8-E6D4-421E-B5E9-7AA0124924B6

Type species: *Hyla napaea* Tyler, 1968.

Diagnosis: Frogs within the subgenus *Longuscrusanura subgen. nov*. (being a subgenus within the genus *Angularanta subgen. nov.*) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small size with male maximum length 23 mm, female 28 mm. Fingers are slightly fringed and slightly less than half webbed and of moderate length.

The toes are fully webbed and the hindlimbs are particularly long, with a ratio of tibia length to snout-vent length of 0.59-0.68.

The dorsum is greyish (in preservative) and marked with pale, cryptic markings resembling lichens.

The snout is short and very slightly pointed.

Ovarian eggs are unpigmented.

Vomerine teeth are present in some individuals and absent in others.

The snout is prominent, slightly projecting and obtusely pointed when viewed from above and slightly projecting in profile. The nostrils are more lateral than superior, their distance from the end of the snout approximately two thirds that from the eye. The distance from the eye and the naris is less than the internarial span. The canthus rostralis is well defined and strongly rounded. The eyes are large and prominent, the eye diameter being greater than the eye to naris distance.

The tympanum is covered with skin, only the inferior half of the annulus is visible. The tympanum diameter approximates the equivalent of two fifths of the eye diameter, separated from the eye by a distance greater than its own diameter.

The tongue shape is somewhat distorted and roughly cordiform in shape with a very slightly indented posterior margin.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: Known only from the type locality in the Snow Mountains and from the Wapoga River catchments 300 km to the west, New Guinea, Papua, Indonesia.

Etymology: The new subgenus name is taken from Latin and literally means long legged frog, in direct reflection of the sole species in the subgenus.

Content: *Angularanta* (*Longuscrusanura*) *napaea* (Tyler, 1968) (monotypic).

NAVEOSRANA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:89B00246-658A-4EAF-AA19-7E09E4284B1C

Type species: *Hyla dorsivena* Tyler, 1968.

Diagnosis: Frogs in the subgenus *Naveosrana subgen. nov*. (being a subgenus within the genus *Angularanta subgen. nov.*) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: A small (under 50 mm snout-vent in both sexes) grey or brown species of frog with broad half-webbed fingers bearing large discs and having a strongly curved canthus rostralis. The intercalary structures are elongate and cartilaginous. The hyoid plate lacks alary processes. Ova are small and unpigmented. Further diagnostic characters of this subgenus are as follows: The dorsum varies from grey to dark brown with pale markings including light pigment over the site of the cutaneous blood vessels. The snout is gently rounded and the canthus rostralis sharply curved. The fingers have broad discs and are approximately half webbed. The toes are webbed to the base of the discs. Tubercles occur commonly on the upper eyelids, below the anus, on the back of the thighs and on the heels.

The cranial elements are reduced. The nasals are small and very widely separated medially. They do not articulate with the sphenethmoid, which appears to be lobulated anteriorly in retaining a double condition, and does not extend between the nasals. The frontoparietal fontanelle is large and ovoid. The squamosal has a short zygomatic ramus and slightly longer otic ramus. The quadratojugal is not developed. The pars facialis is shallow and the short posterior process does not articulate with the maxillary process of the nasal. The alary processes of the premaxillaries are well developed, bifurcated at their extremities, widely separated medially and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are reduced. The sacral diapophyses are broadly expanded and the ilia extend one third along their length. No flange is present on the third metacarpal and the intercalary structures are long and cartilaginous. Alary processes of the hyoid plate are lacking. The adductor mandibulae externus superficialis is absent.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: Known only from locations around watercourses in the central highlands region of central New Guinea, only in association with the main central cordillera mainly in the vicinity of the upper Fly and Sepik Rivers and slightly west of there in the Star Mountains as well as the Darewa River headwaters in West Papua, although there are specimens from the Ramu River, Eastern Highlands as well.

Reports of (putative) species in this genus from the Arfak Mountains further east are not confirmed, but if true, are probably of a different species.

Etymology: Taken from Latin, the words "naveos" means flecked and "rana" means frog and so the new genus name "*Naveosrana*" literally means flecked frog, which is the usual colouration of relevant species.

Content: *Angularanta* (*Naveosrana*) *dorsivena* (Tyler, 1968) (type species); *A.* (*Naveosrana*) *fuscula* (Oliver and Richards, 2007).

RAUCUS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:1DEED3E3-61E6-49B4-B560-8BB44C0F6D64

Type species: *Hyla* (*Litoria*) *impura* Peters and Doria, 1878.

Diagnosis: The two species *Angularanta impura* and *A. oxyeei sp. nov.* constitute the entirety of the subgenus *Raucus subgen. nov*. and are separated from all other species within *Angularanta gen. nov.* and all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: unpigmented bones; single subarticular tubercle on fourth finger; reduced toe webbing; reduced hand webbing (versus moderate to extensive in one or both in all other species of *Angularanta gen. nov.*), narrow lateral fringes on fingers; dark brown to blackish chin in males; dark brown to reddish brown dorsum; dark brown canthal stripe; upper-lip may be white, with a very thin white line bordered by black or brown; concealed surfaces of thighs are brown with yellow spots; yellow to orange iris, sometimes with a green upper margin; ventrum white; slightly pointed snout when viewed from above, side-on or below; a raucous call; IN/SV 0.072-0.08, TY/SV 0.067-0.075, HW/SV 0.34-0.3, HL/SV 0.34-0.3, EN/IN 1.1-1.2.

Until now *Angularanta oxyeei sp. nov.*. has been treated as the far south-eastern population of *A. impura* (Peters and Doria, 1878) with a type locality of Yule Island, north-west of Port Moresby, in Central Province, Papua New Guinea, being the form of the genus from that area.

Angularanta oxyeei sp. nov. is the similar and closely related species from the far east of the Milne Bay region in Papua New Guinea.

Angularanta oxyeei sp. nov. is readily separated from *A. impura* by the following suite of characters: Dorsum smooth and flanks either smooth or only very slightly granular; a chocolate brown dorsum with a significant amount of distinctive and well-defined blackish markings and mottling, including on the upper surfaces of the limbs as well as the posterior part of the upper surface of the head. Anterior to the eyes, the upper surface of the snout is immaculate or near immaculate chocolate brown, but the sides of the snout below the eye and anterior to them is wholly blackish brown in colour, there being a well defined border at the upper margin where the colours meet to form a line from tip of snout to top of eye along a well-defined ridge. The lower margin at the jawline is in turn bordered by a thin and well defined white line running the entire length of the mouth.

The upper surfaces of the front legs are well marked with chocolate brown and blackish blotches tending to form cross bands. Markings on the upper surfaces of the back legs are well defined but do not form any obvious pattern. By contrast, *A. impura* is separated from *A. oxyeei sp. nov.* by the following suite of characters: slightly granular dorsum, becoming more granular on the flanks; a medium brownish dorsum with minimal markings, being indistinct grey mottling or peppering mainly between the eyes and on the lower back. The upper lip and below the eye is also mainly brown with indistinct blackish markings on the upper surfaces of the limbs. The iris is light orangeish in colour. There is no obvious thin white line demarcating the upper lip.

A. impura in life is depicted on plate 51 of Menzies (2006).

A. oxyeei sp. nov. is depicted in life on plate 50 of Menzies (2006).

Distribution: The two species within *Raucus subgen. nov*. are only definitvely known from the south east of New Guinea in the Central and Milne Bay Provinces of Papua New Guinea.

Etymology: The new subgenus name *Raucus* is taken directly from the Latin word meaning raucous in English, meaning “making or constituting a disturbingly harsh and loud noise”, which reflects the nature of the mating call of males in both species.

Content: *Angularanta* (*Raucus*) *impura* (Peters and Doria, 1878) (type species); *A.* (*Raucus*) *oxyeei sp. nov.*.

SCLERISQUEANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:C1D3835F-B3D2-4A6A-857F-DF8C3F9C3A2F

Type species: *Hyla louisiadensis* Tyler, 1968.

Diagnosis: Frogs within the subgenus *Scelerisqueanura subgen. nov*. (being a subgenus within the genus *Angularanta subgen. nov*.) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small (adult males 25.8-30.3 mm) frogs. Dorsum is chocolate brown, with or without paler patches. Short, narrow fringed, half-webbed fingers and webbed toes. The finger lengths are as follows 3>4>2>1. The webbing between the third and fourth fingers extends to a point slightly below the paired subarticular tubercles at the base of the penultimate phalanx on the fourth toe. Broadly spaced nares (E-N/IN 0.657-0.758). No vomerine teeth. The head is slightly longer than broad (HL/HW 1.031), its length equivalent to more than one-third of the snout to vent length (HL/S-V 0.356). The snout is not prominent; abrupt and truncate when viewed from above and very slightly rounded in profile. The nostrils are lateral, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.694).

The canthus rostralis is well defined and very slightly curved. The eye is large and conspicuous, its diameter greater than the eye to naris distance. The tympanum is covered with skin and very small, its diameter equivalent to one-third of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue is broadly cordiform with weakly indented posterior border.

The terminal discs are prominent. Long and slender hindlimbs with a TL/S-V ratio of 0.584.

Toe lengths 4>5=3>2>1. The webbing of all toes except for the fourth reaches the base of the discs, while on the fourth toes the webbing reaches the subarticular tubercle at the base of the penultimate phalanx and continues to the disc via a narrow fringe. The dorsal and lateral surfaces of the body are finely pitted and striated. There is an inconspicuous supratympanic fold. The throat and chest are smooth. Abdomen and nearby halves of the ventral surface of the thighs are coarsely granular.

There is a small pigmented nuptial pad at the base of the first finger. Vocal sac openings are exceptionally long,

extending from the base of the tongue to the angles of the jaw.

Ventrally the frogs are a pale creamish colour, stippled with dark brown on the throat.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: Known only from Sudest (Tagula) and Rossell Islands in the Louisiade Islands, in the Milne Bay Province, south-east of the main landmass of New Guinea, Papua New Guinea.

Etymology: The new subgenus name taken from Latin literally means chocolate (brown) coloured frog in reflection of the usual colour of the dorsum.

Content: *Angularanta* (*Scelerisqueanura*) *louisiadensis* (Tyler, 1968), including one subspecies.

ANGULARANTA* (*ANGULARANTA*) *CHYDAEUS SP. NOV.

LSIDurn:lsid:zoobank.org:act:6B3CE863-7862-41D8-9093-ADE406B22687

Holotype: A preserved specimen in the National Museum of Natural History; Smithsonian Institution; Washington, DC, USA, specimen number Amphibians and Reptiles 195538 collected from north of Brown River Road, between Laloki River and Brown River, Central Province, Papua New Guinea, Latitude -9.2916 S., Longitude 147.227 E.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ Herp A-90396 collected at 2 km west of Sogeri, 3 km north of Bisianumu, Central Province, Papua New Guinea, Latitude -9.3968 S., Longitude 147.4016 E.

Diagnosis: The three species *A. chydaeus sp. nov.* from the Central Province of Papua New Guinea, in the Port Moresby region, *A. quaeinfernas sp. nov.* from the West Sepik region of Papua New Guinea including the Bewani Mountains and *Angularanta vulgarans sp. nov.* from Guadalcanal, Solomon Islands, have all until now been treated as populations of the widespread species *A. thesaurensis* (Peters, 1877), originally described as "*Hyla thesaurensis* Peters, 1877" with a type locality of Treasury Island, Solomon Islands.

The four species are separated from one another as follows:

Both *A. vulgarans sp. nov.* and *A. chydaeus sp. nov.* are separated from *A. quaeinfernas sp. nov.* and *A. thesaurensis* by their shorter legs with a TL/S-V of less than 0.55, versus greater than this in the latter two species.

A. vulgarans sp. nov. is separated from the other three species by the chin having a distinctive mottlling with brown, which in effect also separates *A. chydaeus sp. nov.* from the other three species in that it, *A. chydaeus sp. nov.*, lacks distinctive brown mottling on the chin and also has shorter legs than both *A. quaeinfernas sp. nov.* and *A. thesaurensis.*

Kraus and Allison (2014a) noted that *A. chydaeus sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. quaeinfernas sp. nov. is separated from the other three species in that the yellow colouration of the undersurfaces extends onto the tympanum (versus not so in the other three species) and the posterior part of the middle iris is orange in colour.

Kraus and Allison (2014a) also noted that *A. quaeinfernas sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. thesaurensis is separated from the other three species by its larger adult size with a maximum snout vent of 67 mm in females and 50 mm in males, versus 59 mm in females and 45 mm in males in the other three species, an orange iris and a narrow well-defined ring of greenish-yellow around the eye.

A. vulgarans sp. nov. is separated from *A. chydaeus sp. nov.* by having an orange iris, versus yellow with red peppering or obvious red venation in *A. chydaeus sp. nov.*.

The flanks of *A. vulgarans sp. nov.* and *A. thesaurensis* are yellowish in colour, with no markings other than some indistinct darker, greyish marbling. In *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* the flanks are also yellow in colour but punctuated by well defined dark brown spots, flecks or peppering. The hind legs of both *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* have well defined black spots, blotches or marks on them, versus either none or indistinct at best in both *A. vulgarans sp. nov.* and *A. thesaurensis.*

A. vulgarans sp. nov. and *A. thesaurensis* have smooth skin above the eyelid, versus a few tiny tubercles above the eyelid in *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.*.

A photo of *A. chydaeus sp. nov.* in life can be found on plate 53 in Menzies (2006).

The four species *A. chydaeus sp. nov.*, *A. quaeinfernas sp. nov.*, *A. vulgarans sp. nov.* and *A. thesaurensis* until now treated as the single putative taxon *A. thesaurensis* can all be separated from other species within the genus *Angularanta gen. nov.* by the following suite of characters: Reduced webbing of the fingers and green bones. Adult maximum snout vent of 67 mm in females and 50 mm in males (smaller in all of the three species formally named herein).

The head is flattened and longer than broad (HL/HW 1.023-1.200), its length greater than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is prominent, when viewed from above and in profile it is slightly rounded.

The nostrils are more lateral than superior, their distance from the end of the snout approximately half that from the eye. The distance between the eye and the naris is very much greater than the internarial span (E-N/IN 1.257-1.485).

The canthus rostralis is curved and slightly defined. The eye is large and prominent, its diameter less than, equal to, or greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter. The vomerine teeth are in two large, oblique series between the upper margins of the choanae. The tongue is broadly

oval with a slightly indented posterior border.

The fingers are long and slender with large terminal discs and very narrow lateral fringes, in decreasing order of length 3>4>2>1. The webbing between the fingers is scant, just reaching the sub-articular tubercle at the base of the penultimate phalanx of the fourth.

The length of the hind limbs is highly variable, differing markedly between species and within species. The range of TL/S-V is from 0.528-0.629. Toes in decreasing order of length 4>5 =3>2>1. The webbing reaches the base of the disc on the fifth toe and the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface is smooth. In some specimens the upper eyelids are slightly granular. A row of tubercles on the posterior surface of the forearm vary from well developed to being scarcely detectable.

There is a very weak supra-tympanic fold extending from the posterior corner of the eye to a point above the insertion of the forearm. A very small portion of the superior margin of the tympanic annulus is usually hidden beneath the supra-tympanic fold. There are a few flattened tubercles on the throat. The chest is smooth and the abdomen and lower surfaces of the thighs coarsely granular.

The male possesses a sub-gular vocal sac and an exceptionally elongate nuptial pad on the first finger.

The ground colouration of the dorsal surfaces is usually pale grey, buff, brown or cream with or without lighter or darker markings.

The lighter markings sometimes consist of three pale yellow longitudinal stripes situated mid-dorsally and dorso-laterally. The darker markings are commonly in the form of irregularly shaped brown or black spots. A white (in *A. chydaeus sp. nov.*) or yellow (in *A. vulgarans sp. nov.*, *A. thesaurensis*, and *A. quaeinfernas sp. nov.*) bar is present above the upper lip directly beneath the eye of most specimens. The backs of the thighs are brown with or without numerous, very small, circular white or cream spots. The white spots on the backs of the thighs being most common in the two Solomon Islands species. The bones are green. Pigmentation is not confined to the periosteum but is present throughout the bone and persists in specimens preserved in formalin for at least thirty years (according to Tyler, 1978).

In the two Solomon Islands species the three pale to bright yellow longitudinal stripes, found on most if not all specimens, are united by a narrow trans-ocular bar.

See the detailed description for the genus *Angularanta gen. nov.* in this paper for details of the separation of the subgenus *Angularanta subgen. nov.* and other subgenera within *Angularanta gen. nov.* from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta chydaeus sp. nov.* is belived to be restricted to the region generally around the Central Province of Papua New Guinea including the outskirts of the PNG capital Port Moresby.

Etymology: The new species name "*chydaeus*" is taken from the same Latin word meaning common or ordinary, as this species is both common where found and ordinary in general appearance. As a frog species there is nothing particularly unusual about its appearance.

ANGULARANTA* (*ANGULARANTA*) *COMMUNIA SP. NOV.

LSIDurn:lsid:zoobank.org:act:830EEE3B-4E23-4A5E-A2C1-7D0F8B769684

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.137991 collected at Param Village, Milne Bay Province, Papua New Guinea, Latitude -9.966 S., Longitude 149.483 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.137945 collected at the Munimum Village, Agaun area, Milne Bay Province, Papua New Guinea, Latitude -9.883 S., Longitude 149.383 E.

Diagnosis: *Angularanta communia sp. nov.* has until now been treated as a far south-eastern population of *Angularanta arfakiana* (Peters and Doria, 1878) (type species for the genus *Angularanta gen. nov.*).

They are however readily separated on the basis of colouration.

Adult *A. arfakiana* have an olive grey or olive brown dorsum, vaguely mottled with or without an hour-glass mak. Concealed parts of thighs are yellowish-purplish spotted yellow. The dorsum merges into a plain whitish ventrum and the iris is speckled fawn in colour. Scattered tubercles on upper hind leg are small. Tubercles above the eye are tiny.

By contrast Adult *A. communia sp. nov.* are light brown with an hour-glass mark. Snout is lighter or with a pale bar between the eyelids. Lores are dark, the colour extending to include the tympanum. Flanks are speckled dark and light brown and green. Concealed surfaces of the thighs are dark brown, speckled white. Ventrum is white and spotted with grey-brown. Scattered tubercles on upper hind leg are medium to large. Tubercles above eye obvious.

Both *A. communia sp. nov.* and *A. arfakiana* are readily separated from all other species in the genus *Angularanta gen. nov.* by the following suite of characters: A prominent pointed snout with a sharp canthus rostralis, and a conspicuous, straight supra-tympanic fold. Large sub-anal tubercles are exhibited by all specimens and conical heel tubercles are usually present, ranging in size from tiny to large, depending on species. The S-V length of adult males varies from approximately 35 mm to 45 mm and from 45 mm to 65 mm in females.

The head is flattened, being longer than broad (HL/HW 1.077-1.152), its length slightly more than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is projecting; when viewed from above its shape may be acutely pointed (males) or obtusely pointed (most large females); in profile the snout is acutely pointed in both sexes. The nostrils are lateral, their distance from the tip of the snout slightly less than that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.600-0.760). The canthus rostralis is very slightly curved and extremely sharply defined. The loreal region is concave and oblique. The eye is large, its diameter greater than the distance

separating it from the nostril. The tympanum is visible, its diameter equivalent to one-third to one-half of the eye diameter. The vomerine teeth are in two, short oblique series situated between the rounded choanae. The tongue is cordiform with a slightly indented posterior border. The fingers are long and slender and lack lateral fringes; in decreasing order of length 3>4>2>1; unwebbed or with a trace of webbing at the base of the third and fourth fingers. The terminal discs are extremely prominent. The hind limbs are slender and there is considerable variation in the TL/S-V ratio (range 0.554-0.712, mean 0.645). The extreme individuals in most samples differ by approximately 10 percent. Toes in decreasing order of length 4>5>3>2>1. The webbing between the outer and fourth toes extends to the sub-articular tubercle at the base of the penultimate phalanx or to approximately half way up the penultimate phalanx on the fifth, whilst the penultimate phalanx of the fourth may be free or webbed to slightly above the sub-articular tubercle. The skin on the dorsal surfaces is roughened. Conical tubercles are distributed as follows: on the upper eyelid (usually confined to the posterior half), where they may be tiny to large, depending on species and individual, and on the heel and beneath the vent. Throat lightly granular, abdomen and lower femur coarsely granular. There is a conspicuous, straight supra-tympanic fold extending from the eye to the shoulder, an irregular, slightly raised tubercular ridge above the vent and rows of small tubercles on the posterior surface of the forearm and the tarsus. The canthus rostralis and the skin fold behind the eye are usually darker than the surrounding areas and may be surrounded by a narrow white line. The pre-anal fold is white and the backs of the thighs are red or dull brown. Males possess a sub-gular vocal sac.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *A. communia sp. nov*. is currently known only from the vicinity of the type locality and the Owen Stanley Ranges in south-east New Guinea. *A. arfakiana* as a species complex, including those species resurrected from synonymy in this paper are found in most other parts of New Guinea from the Central Highlands and west to include the Bird's Head region of Irian Jaya, Indonesia.

Etymology: The new species name "*communia*" comes from the Latin word *communia* which means common, general, ordinary, universal, public, usual, in reflection of the fact that these frogs are common and "ordinary" to people where they naturally occur.

ANGULARANTA* (*ANGULARANTA*) *EXTENTACRUS SP. NOV.

LSIDurn:lsid:zoobank.org:act:6102BFFE-7AAA-4114-A300-A848EC162992

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R6482 collected at Kawolabib in the Star Mountains, Papua New Guinea. This government owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R9154 and R9429, collected from "Camp 2" at Pio River, Gulf Province, Papua New Guinea.

Diagnosis: Until now *Angularanta extentacrus sp. nov.* from the central highlands of New Guinea has been treated as an eastern population of *A. longicrus* (Boulenger, 1911) with syntypes type localities of Fakfak and Wendessi, both on the Vogelkop Peninsula (Bird's Head), Indonesian New Guinea.

A. extentacrus sp. nov. is however readily separated from *A. longicrus* by having pigment on the dorsal surface of the thigh (versus unpigmented) and in lacking the white bar below the eye (versus a short white bar below the eye extending posteriorly to the angle of the jaws in *A. longicrus*).

Both *A. extentacrus sp. nov.* and *A. longicrus* are readily separated from all other species in the genus *Angularanta gen. nov.* by the following unique suite of characters: Exceptionally long hind limbs (TL/S-V 0.623-0.628), widely spaced nares (E-N/IN 0.579-0.616) and uniform dorsal colouration. In more detail, adult snout to vent lengths are approximately 31.8 mm (female), 27.4 mm (male). The head is flattened and as long as broad, its length equivalent to slightly less than or more than one-third of the snout to vent length (HL/S-V 0.321-0.358). The snout is not prominent; rounded when viewed from above and in profile. The nostrils are more lateral than superior, their distance from the end of the snout about one-half that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.579-0.616). The canthus rostralis is slightly defined and gently curved. The eye is large and conspicuous, its diameter equivalent to one and one-half the eye to naris distance. The tympanum is visible, its diameter equivalent to slightly less than one-half the eye diameter. The vomerine teeth are in two very small, circular series on a line directly between the choanae. The tongue is oval with a weakly indented posterior margin. The fingers are short and equipped with narrow lateral fringes; in decreasing order of length 3>4>2>1. The webbing between the third and fourth fingers reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The hind limbs are extremely long with a TL/S-V ratio of 0.623-0.628. Toes in decreasing order of length 4>5>3>2>1. The webbng of all toes except the fourth reaches the base of the discs. On the fourth toe the webbing reaches the sub-articular tubercle at the base of the penultimate phalanx. The dorsal and lateral surfaces of the body are smooth. There is an inconspicuous, flattened supra-tympanic fold. The throat and chest are smooth, and the abdomen and lower surface of the thighs are granular.

In life, the dorsal surface is green and unmarked. In preservative the dorsal surface of the body is dull blue and unmarked. The limbs with the exception of the thighs, are a similar colour. The thighs are unpigmented. In *A. longicrus* there is a short white bar below the eye

extending posteriorly to the angle of the jaws, but this is absent in *A. extentacrus sp. nov.*. The ventral surfaces of the body and limbs are white to cream.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta extentacrus sp. nov.* occurs in the central highlands of New Guinea. *A. longicrus* (Boulenger, 1911) is apparently confined to the Vogelkop Peninsula (Bird's Head), Indonesian New Guinea.

Etymology: The new species name is taken from the Latin words "extent" meaning stretched and "crus" meaning leg, thereby meaning stretched leg, in reflection of the relative length of the leg in this species.

ANGULARANTA* (*ANGULARANTA*) *MUKHERJII SP. NOV.

LSIDurn:lsid:zoobank.org:act:C669E69D-8BC3-4145-861E-57CD08DE4CA7

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R70092 collected from Townsville Drill Station at the headwaters of the Ok Tedi River, Western Province, Papua New Guinea, Latitude -5.15972 S., Longitude 141.1666 E.

This government-owned facility allows access to its holdings.

Diagnosis: Until now *Angularanta mukherjii sp. nov.* from the Fly River basin has been regarded as a southern population of *Angularanta bulmeri* (Tyler, 1968), with a type locality of upper Aunjung Valley, Schrader Mountains, Eastern Mountains, Madang Province, Papua New Guinea.

A. mukherjii sp. nov. is separated from *A. bulmeri* by a lack of a well-defined black lateral stripe extending from the naris to a point at least midway along the body, instead the stripe becoming indistinct on the body in *A. bulmeri* as well as numerous small tubercles on the upper surface of the hind legs, versus relatively few in *A. bulmeri*.

A. mukherjii sp. nov. and *A. bulmeri* are readily separated from all other species in the subgenus *Angularanta subgen. nov.* by the following suite of characters: small size (males 29-34 mm), broadly spaced nares (E-N/IN 0.605-0.641) and distinctive colouration. The dorsal surface is a dark greenish grey, being somewhat mottled and with white spots or flecks (often on tubercles). There is a broad, black lateral stripe extending from the naris through the tympanum and posterior to this to a point at least midway along the body in *A. bulmeri* or merging with the body colour past the ear in *A. mukherjii sp. nov.*. The head is high and the head is consistently longer than broad with a range 1.030-1.160, and the head length less than or greater than one-third of the snout to vent length, its length equivalent to slightly more than one-third of the snout to vent length (HL/S-V 0.366). The snout is abrupt, broadly rounded when viewed from above, projecting and almost pointed in profile. The nostrils are more lateral than superior, their distance from the end of the snout less than one-half that from the eye. The distance between the eye and the naris is very much less than the internarial span (E-N/IN 0.605-0.641). The canthus rostralis is slightly defined and gently rounded. The eye is not prominent, its diameter is considerably greater than the eye to naris distance. The tympanum is covered with skin and the annulus only slightly defined. The tympanum diameter is equivalent to one-third of the eye diameter; separated from the eye by a distance equivalent to half its own diameter. Vomerine teeth may or may not be present, depending on the individual frog. When present they are small and round and situated near the upper margin of the choana. The choanae are very widely spaced. The tongue is small and broadly cordiform with a slightly indented posterior border. The fingers are very long and slender with narrow lateral fringes, in decreasing order of length 3>4>2>1. There is no webbing between the fingers. The terminal discs are prominent. The hind limbs are long and slender (TL/S-V 0.590-0.665). Toes in decreasing order of length 4>5=3>2>1. The webbing between the toes reaches the base of the disc on the fifth toe and slightly below the sub-articular tubercle at the base of the penultimate phalanx on the fourth toe. There is a small depressed inner metatarsal tubercle. The dorsal surface of the head and body is smooth. There is a very weak supra-tympanic fold extending from the posterior corner of the eye to above the insertion of the forearm. Above and at the sides of the anus is a row of tubercles. The throat and chest are smooth, and the abdomen and lower surface of the thighs coarsely granular.

There is a nuptial pad on the first finger.

There is a short black, horizontal line beneath the eye and a smaller marking beneath it on the margin of the upper jaw. The anterior and posterior surfaces of the thigh are pale yellow and the anal region pale brown. The throat is white, finely stippled with palegreen or otherwise simply pale green or grey. The chest and lower surfaces of the thighs are dull yellow or green and the abdomen cream. On the abdomen and lower surfaces of the thighs are small indistinct spots of pale brown. The plantar surface is a very dark brown and there is a very fine white line at the margin of the plantar surface and the lateral greenish grey colouration. The proximal half of the posterior surface of the thigh is usually dull greyish-greenish-brown.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: The species *A. mukherjii sp. nov.* is only known from the type locality. *A. bulmeri* is found in uplands of headwaters draining north of the main cordillera.

Etymology: The new species name "*mukherjii*" is named in honour of Melbourne, Victoria, Australia barrister Gautam Mukherji, in recognition for his services to wildlife conservation, defending Raymond Hoser against unlawful attacks by trademark infringing thieves and others working to attack the wildlife conservation cause for their own financial self-gratification.

ANGULARANTA* (*ANGULARANTA*) *QUAEINFERNAS SP. NOV.

LSIDurn:lsid:zoobank.org:act:474462DF-1FA2-4723-ABDC-AB4FC2D3CD5F

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.135574 collected at Imonda Village, West Sepik Province, Papua New Guinea, Latitude 3.20 S., Longitude 141.10 E.

This government-owned facility allows access to its holdings.

Diagnosis: The three species *A. quaeinfernas sp. nov.* from the West Sepik region of Papua New Guinea including the Bewani Mountains, *Angularanta vulgarans sp. nov.* from Guadalcanal, Solomon Islands and *A. chydaeus sp. nov.* from the Central Province of Papua New Guinea, in the Port Moresby region, have all until now been treated as populations of the widespread species *A. thesaurensis* (Peters, 1877), originally described as "*Hyla thesaurensis* Peters, 1877" with a type locality of Treasury Island, Solomon Islands.

The four species are separated from one another as follows:

Both *A. vulgarans sp. nov.* and *A. chydaeus sp. nov.* are separated from *A. quaeinfernas sp. nov.* and *A. thesaurensis* by their shorter legs with a TL/S-V of less than 0.55, versus greater than this in the latter two species.

A. vulgarans sp. nov. is separated from the other three species by the chin having a distinctive mottlling with brown, which in effect also separates *A. chydaeus sp. nov.* from the other three species in that it, *A. chydaeus sp. nov.*, lacks distinctive brown mottling on the chin and also has shorter legs than both *A. quaeinfernas sp. nov.* and *A. thesaurensis.*

Kraus and Allison (2014a) noted that *A. chydaeus sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. quaeinfernas sp. nov. is separated from the other three species in that the yellow colouration of the undersurfaces extends onto the tympanum (versus not so in the other three species) and the posterior part of the middle iris is orange in colour.

Kraus and Allison (2014a) also noted that *A. quaeinfernas sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. thesaurensis is separated from the other three species by its larger adult size with a maximum snout vent of 67 mm in females and 50 mm in males, versus 59 mm in females and 45 mm in males in the other three species, an orange iris and a narrow well-defined ring of greenish-yellow around the eye.

A. vulgarans sp. nov. is separated from *A. chydaeus sp. nov.* by having an orange iris, versus yellow with red peppering or obvious red venation in *A. chydaeus sp. nov..*

The flanks of *A. vulgarans sp. nov.* and *A. thesaurensis* are yellowish in colour, with no markings other than some indistinct darker, greyish marbling. In *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* the flanks are also yellow in colour but punctuated by well defined dark brown spots, flecks or peppering. The hind legs of both *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* have well defined black spots, blotches or marks on them, versus either none or indistinct at best in both *A. vulgarans sp. nov.* and *A. thesaurensis.*

A. vulgarans sp. nov. and *A. thesaurensis* have smooth skin above the eyelid, versus a few tiny tubercles above the eyelid in *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.*.

The four species *A. chydaeus sp. nov.*, *A. quaeinfernas sp. nov.*, *A. vulgarans sp. nov.* and *A. thesaurensis* until now treated as the single putative taxon *A. thesaurensis* can all be separated from other species within the genus *Angularanta gen. nov.* by the following suite of characters: Reduced webbing of the fingers and green bones. Adult maximum snout vent of 67 mm in females and 50 mm in males (smaller in all of the three species formally named herein). The head is flattened and longer than broad (HL/HW 1.023-1.200), its length greater than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is prominent, when viewed from above and in profile it is slightly rounded. The nostrils are more lateral than superior, their distance from the end of the snout approximately half that from the eye. The distance between the eye and the naris is very much greater than the internarial span (E-N/IN 1.257-1.485). The canthus rostralis is curved and slightly defined. The eye is large and prominent, its diameter less than, equal to, or greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter. The vomerine teeth are in two large, oblique series between the upper margins of the choanae. The tongue is broadly oval with a slightly indented posterior border.

The fingers are long and slender with large terminal discs and very narrow lateral fringes. In decreasing order of length 3>4>2>1. The webbing between the fingers is scant, just reaching the sub-articular tubercle at the base of the penultimate phalanx of the fourth.

The length of the hind limbs is highly variable, differing markedly between species and within species. The range of TL/S-V is from 0.528-0.629. Toes in decreasing order of length 4>5 =3>2>1. The webbing reaches the base of the disc on the fifth toe and the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface is smooth. In some specimens the upper eyelids are slightly granular. A row of tubercles on the posterior surface of the forearm vary from well developed to being scarcely detectable.

There is a very weak supra-tympanic fold extending from the posterior corner of the eye to a point above the insertion of the forearm. A very small portion of the superior margin of the tympanic annulus is usually hidden beneath the supra-tympanic fold. There are a few flattened tubercles on the throat. The chest is smooth and the abdomen and lower surfaces of the thighs coarsely granular.

The male possesses a sub-gular vocal sac and an exceptionally elongate nuptial pad on the first finger.

The ground colouration of the dorsal surfaces is usually pale grey, buff, brown or cream with or without lighter or

darker markings.

The lighter markings sometimes consist of three pale yellow longitudinal stripes situated mid-dorsally and dorso-laterally. The darker markings are commonly in the form of irregularly shaped brown or black spots. A white (in *A. chydaeus sp. nov.*) or yellow (in *A. vulgarans sp. nov.*, *A. thesaurensis*, and *A. quaeinfernas sp. nov.*) bar is present above the upper lip directly beneath the eye of most specimens. The backs of the thighs are brown with or without numerous, very small, circular white or cream spots. The white spots on the backs of the thighs being most common in the two Solomon Islands species. The bones are green. Pigmentation is not confined to the periosteum but is present throughout the bone and persists in specimens preserved in formalin for at least thirty years (according to Tyler, 1978).

In the two Solomon Islands species the three pale to bright yellow longitudinal stripes, found on most if not all specimens, are united by a narrow trans-ocular bar.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta quaeinfernas sp. nov.* is belived to be restricted to northern Papua New Guinea and nearby Irian Jaya, including the Bewani Mountains, in areas generally proximate to the type locality in the West Sepik Province and west of the Huon Peninsula.

Etymology: The new species name "*quaeinfernas*" is taken from the Latin words meaning lowland dwelling, which is apt, as this species, while being found in some hilly locations is not found in the higher altitude regions.

ANGULARANTA* (*ANGULARANTA*) *VULGARANS SP. NOV.

LSIDurn:lsid:zoobank.org:act:9C4268DD-45F0-4B3D-A251-CD423D9088F3

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.90277 collected at Mount Austin, Guadalcanal, Solomon Islands, Latitude -9.29 S., Longitude 160.00 E. This government owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.136387 collected from Mount Austen, Guadalcanal, Solomon Islands, Latitude -9.29 S., Longitude 159.58 E.

2/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.137027.001 collected from Makarakomburu (South Slope), Guadalcanal, Solomon Islands, Latitude -9.45 S., Longitude 160.00 E.

3/ Five preserved specimens at the American Museum of Natural History, Manhattan, New York City, USA, specimen numbers AMNH 52173 and 52176-79 collected from Guadalcanal, Solomon Islands.

4/ Two preserved specimens at the California Academy of Sciences, San Francisco, California, USA, specimen numbers CAS. 49952-3 collected from Guadalcanal, Solomon Islands.

Diagnosis: The three species *Angularanta vulgarans sp. nov.* from Guadalcanal, Solomon Islands, *A. quaeinfernas sp. nov.* from the West Sepik region of Papua New Guinea including the Bewani Mountains and *A. chydaeus sp. nov.* from the Central Province of Papua New Guinea, in the Port Moresby region, have all until now been treated as populations of the widespread species *A. thesaurensis* (Peters, 1877), originally described as "*Hyla thesaurensis* Peters, 1877" with a type locality of Treasury Island, Solomon Islands.

The four species are separated from one another as follows:

Both *A. vulgarans sp. nov.* and *A. chydaeus sp. nov.* are separated from *A. quaeinfernas sp. nov.* and *A. thesaurensis* by their shorter legs with a TL/S-V of less than 0.55, versus greater than this in the latter two species.

A. vulgarans sp. nov. is separated from the other three species by the chin having a distinctive mottlling with brown, which in effect also separates *A. chydaeus sp. nov.* from the other three species in that it, *A. chydaeus sp. nov.*, lacks distinctive brown mottling on the chin and also has shorter legs than both *A. quaeinfernas sp. nov.* and *A. thesaurensis.*

Kraus and Allison (2014a) noted that *A. chydaeus sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. quaeinfernas sp. nov. is separated from the other three species in that the yellow colouration of the undersurfaces extends onto the tympanum (versus not so in the other three species) and the posterior part of the middle iris is orange in colour.

Kraus and Allison (2014a) also noted that *A. quaeinfernas sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. thesaurensis is separated from the other three species by its larger adult size with a maximum snout vent of 67 mm in females and 50 mm in males, versus 59 mm in females and 45 mm in males in the other three species, an orange iris and a narrow well-defined ring of greenish-yellow around the eye.

A. vulgarans sp. nov. is separated from *A. chydaeus sp. nov.* by having an orange iris, versus yellow with red peppering or obvious red venation in *A. chydaeus sp. nov..*

The flanks of *A. vulgarans sp. nov.* and *A. thesaurensis* are yellowish in colour, with no markings other than some indistinct darker, greyish marbling. In *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* the flanks are also yellow in colour but punctuated by well defined dark brown spots, flecks or peppering.

The hind legs of both *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* have well defined black spots, blotches or marks on them, versus either none or indistinct at best in both *A. vulgarans sp. nov.* and *A. thesaurensis.*

A. vulgarans sp. nov. and *A. thesaurensis* have smooth skin above the eyelid, versus a few tiny tubercles above the eyelid in *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.*.

The four species *A. chydaeus sp. nov.*, *A. quaeinfernas sp. nov.*, *A. vulgarans sp. nov.* and *A. thesaurensis* until now treated as the single putative taxon *A. thesaurensis* can all be separated from other species within the genus *Angularanta gen. nov.* by the following suite of characters: Reduced webbing of the fingers and green bones. Adult maximum snout vent of 67 mm in females and 50 mm in males (smaller in all of the three species formally named herein). The head is flattened and longer than broad (HL/HW 1.023-1.200), its length greater than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is prominent, when viewed from above and in profile it is slightly rounded. The nostrils are more lateral than superior, their distance from the end of the snout approximately half that from the eye. The distance between the eye and the naris is very much greater than the internarial span (E-N/IN 1.257-1.485). The canthus rostralis is curved and slightly defined. The eye is large and prominent, its diameter less than, equal to, or greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter. The vomerine teeth are in two large, oblique series between the upper margins of the choanae. The tongue is broadly oval with a slightly indented posterior border.

The fingers are long and slender with large terminal discs and very narrow lateral fringes. In decreasing order of length 3>4>2>1. The webbing between the fingers is scant, just reaching the sub-articular tubercle at the base of the penultimate phalanx of the fourth.

The length of the hind limbs is highly variable, differing markedly between species and within species. The range of TL/S-V is from 0.528-0.629. Toes in decreasing order of length 4>5 =3>2>1. The webbing reaches the base of the disc on the fifth toe and the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface is smooth. In some specimens the upper eyelids are slightly granular. A row of tubercles on the posterior surface of the forearm vary from well developed to being scarcely detectable.

There is a very weak supra-tympanic fold extending from the posterior corner of the eye to a point above the insertion of the forearm. A very small portion of the superior margin of the tympanic annulus is usually hidden beneath the supra-tympanic fold. There are a few flattened tubercles on the throat. The chest is smooth and the abdomen and lower surfaces of the thighs coarsely granular.

The male possesses a sub-gular vocal sac and an exceptionally elongate nuptial pad on the first finger.

The ground colouration of the dorsal surfaces is usually pale grey, buff, brown or cream with or without lighter or darker markings.

The lighter markings sometimes consist of three pale yellow longitudinal stripes situated mid-dorsally and dorso-laterally. The darker markings are commonly in the form of irregularly shaped brown or black spots. A white (in *A. chydaeus sp. nov.*) or yellow (in *A. vulgarans sp. nov.*, *A. thesaurensis*, and *A. quaeinfernas sp. nov.*) bar is present above the upper lip directly beneath the eye of most specimens. The backs of the thighs are brown with or without numerous, very small, circular white or cream spots. The white spots on the backs of the thighs being most common in the two Solomon Islands species. The bones are green. Pigmentation is not confined to the periosteum but is present throughout the bone and persists in specimens preserved in formalin for at least thirty years (according to Tyler, 1978).

In the two Solomon Islands species the three pale to bright yellow longitudinal stripes, found on most if not all specimens, are united by a narrow trans-ocular bar.

See the detailed description for the genus *Angularanta gen. nov.* in this paper for details of the separation of the subgenus *Angularanta subgen. nov.* and other subgenera within *Angularanta gen. nov.* from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta vulgarans sp. nov.* occurs on Guadalcanal, Solomon Islands. It is assumed that the morphologically similar species *A. thesaurensis* is found on the other main islands to the north and west, at least as far as Bougainville.

Etymology: The new species name *vulgarans* is taken from the Latin word “vulgarins” meaning common, or ordinary, which is a fair account of this species of frog among local people where these frogs occur. The name “*vulgarans*” is a deliberate misspelling and should not be amended as the spelling is chosen to avoid a potential homonym with another species.

ANGULARANTA* (*ANGULARANTA*) *LUTEA LEUCOPUNCTATA SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:79031E4B-473C-4C65-BC6E-02238BAC1C59

Holotype: A preserved specimen at the Naturhistorisches Museum, Basle, Switzerland, specimen number NMB 4274 collected from New Georgia, Solomon Islands.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Naturhistorisches Museum, Basle, Switzerland, specimen number NMB 4275 collected from New Georgia, Solomon Islands, and:

2/ A preserved specimen at the Field Museum of Natural History, Chicago, Illinois, USA, specimen number FMNH Amphibians and Reptiles 190313 collected from New Georgia, Solomon Islands.

Diagnosis: The subspecies *A. lutea leucopunctata subsp. nov.* is separated from the nominate form of *A. lutea lutea* (Boulenger, 1887) by having a slightly granular dorsal surface (versus smooth), few if any white spots on the head between the eyes or anterior to them (versus many) and an obvious orangeish upper iris, versus not so in *A. lutea lutea.*

The taxon *A. lutea leucopunctata subsp. nov.* has been conservatively formally named as a subspecies in the absence of molecular evidence. However in light of the biogeograpical barrier separating the New Georgia group of islands from the other populations of *A. lutea* in the form of a deep sea barrier present even in the height of the most recent glacial maxima, it is likely that the New Georgia frogs may in fact be divergent at the species level.

The species *A. lutea* has been treated by some past authors as a synonym of *A. thesaurensis* (Peters, 1877).

However it is readily separated from that species by having a very flattened head; disc of third finger generally larger than the tympanum and discs of fingers not or scarcely broader than the subtending digit which is bordered by a wide flange of skin. By contrast *A. thesaurensis* has a head that is only slightly flattened; disc of third finger generally smaller than the tympanum and discs of fingers (except the inner one) much broader than the subtending digit which is not bordered by a wide flange of skin.

A. lutea are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Head slightly less broad to as broad as long, its breadth about 1/3 the length from snout to vent; snout round-pointed; eye moderate, its diameter about 1/3 the breadth of the head; tympanum round, its diameter 1/2 or slightly more than that of the eye; loreal region strongly oblique, concave; canthus rostralis rounded, rather indistinct; interorbital space broader than upper eyelid; vomerine teeth in two transverse patches between the choanae and almost in contact medially; tongue broadly oval and but feebly indented at the mid-point of the posterior margin.

Forelimb well developed; finger tips strongly depressed with large discs; discs broader than long (except for the inner finger), but scarcely broader than the subtending digits as measured to include the flanges of skin on the lateral margins; fingers more extensively webbed than in the sympatric species *A. thesaurensis* (Peters, 1877), which has minimal hand webbing, the third finger in *A. lutea* being webbed to the subdistal tubercle on the outside and to a point between this and the basal tubercle on the inside, the second almost to the distal tubercle on the outside; subarticular tubercles small, low, transversely elongate; metacarpal tubercles indistinct; hindlimb long, length of tibia about 3/5 the length from snout to vent; discs of toes smaller than those of the fingers.

Subarticular tubercles small, more strongly protrudent than those of the hands; inner metatarsal tubercle narrow and elliptical, its length less than its distance from the basal tubercle of the inner toe; outer absent; toes webbed almost to the discs except for the fourth; skin smooth or granular dorsally except for the flat granules of the lower surfaces of the thighs and abdomen.

Two penultimate subarticular tubercles on finger four (versus one in *A. thesaurensis* and all other species most similar to it, including the three formally named in this paper, formerly treated as populations of *A. thesaurensis*).

Colour of the dorsum is uniformly green save for numerous scattered white (usually, or rarely yellow) tiny spots on the dorsum. Whiteish or yellow ventrally. Concealed areas of limbs yellow.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian / New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *A. lutea leucopunctata subsp. nov.* is restricted to the New Georgia group of islands within the Solomon Islands.

Etymology: The new subspecies name "*leucopunctata*" is taken from the Latin words meaning "white spots" or "white points", in reflection of the tiny white dots scattered on the dorsum of the species.

ANGULARANTA* (*RAUCUS*) *OXYEEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:9105FBA3-99CE-4072-8A81-906E48D8A696

Holotype: A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number: BPBM 4101 collected from Alotau, Milne Bay Province, Papua New Guinea (PNG), Latitude -10.3157 S., Longitude 150.4588 E.

This facility allows access to its holdings.

Paratypes: Five preserved specimens at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, being BPBM 4102-04 collected from Alotau, Milne Bay Province, Papua New Guinea, Latitude -10.3157 S., Longitude 150.4588 E. and BPBM 15194-95 collected from Pini Range at 300 metres elevation, Milne Bay Province, Papua New Guinea, Latitude -10.25 S., Longitude 150.18 E.

Diagnosis: Until now *Angularanta oxyeei sp. nov.*. has been treated as the far south-eastern population of *A. impura* (Peters and Doria, 1878) with a type locality of Yule Island, north-west of Port Moresby, in Central Province, Papua New Guinea, being the form of the genus from that area.

Angularanta oxyeei sp. nov. is the similar and closely related species from the far east of the Milne Bay region in Papua New Guinea.

Angularanta oxyeei sp. nov. is readily separated from *A. impura* by the following suite of characters: Dorsum smooth and flanks either smooth or only very slightly granular; a chocolate brown dorsum with a significant amount of distinctive and well-defined blackish markings and mottling, including on the upper surfaces of the limbs as well as the posterior part of the upper surface of the head. Anterior to the eyes, the upper surface of the snout is immaculate or near immaculate chocolate brown, but the sides of the snout below the eye and anterior to them is wholly blackish brown in colour, there being a well defined border at the upper margin where the colours meet to form a line from tip of snout to top of eye along a well-defined ridge.

The lower margin at the jawline is in turn bordered by a thin and well defined white line running the entire length of the mouth.

The upper surfaces of the front legs are well marked with chocolate brown and blackish blotches tending to form cross bands. Markings on the upper surfaces of the back legs are well defined but do not form any obvious pattern. By contrast, *A. impura* is separated from *A. oxyeei sp. nov.* by the following suite of characters: slightly granular dorsum, becoming more granular on the flanks; a medium brownish dorsum with minimal markings, being indistinct grey mottling or peppering mainly between the eyes and on the lower back. The upper lip and below the eye is also mainly brown with indistinct blackish markings on the upper surfaces of the limbs. The iris is light orangeish in colour. There is no obvious thin white line demarcating the upper lip. *A. impura* in life is depicted on plate 51 of Menzies (2006).

A. oxyeei sp. nov. is depicted in life on plate 50 of Menzies (2006).

The two preceding species are separated from all other species within *Angularanta gen. nov.* and all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: unpigmented bones; single subarticular tubercle on fourth finger; reduced toe webbing; reduced hand webbing (versus moderate to extensive in one or both in all species of *Angularanta gen. nov.*), narrow lateral fringes on fingers; dark brown to blackish chin in males; dark brown to reddish brown dorsum; dark brown canthal stripe; upper-lip may be white, with a very thin white line bordered by black or brown; concealed surfaces of thighs are brown with yellow spots; yellow to orange iris, sometimes with a green upper margin; ventrum white; slightly pointed snout when viewed from above, side on or below; a raucous call; IN/SV 0.072-0.08, TY/SV 0.067-0.075, HW/SV 0.34-0.3, HL/SV 0.34-0.3, EN/IN 1.1-1.2.

Distribution: *Angularanta oxyeei sp. nov.* is known only from the far east of the Milne Bay region in Papua New Guinea.

Etymology: The new species is named in honour of "Oxy", being the abbreviated name of a now deceased Great Dane dog that protected this author's scientific research facility for 8 years. It is appropriate that a species is formally named in his honour. His full name was "Oxyuranus", being the genus name for a group of large venomous Australian elapid snakes. The spelling of the species name with the extra two letter "e's" is deliberate and should not be changed.

ANGULARANTA* (*SCELERISQUEANURA*) *LOUSIADENSIS BRUNETUS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:2ECB4A36-4D24-4EF0-B7A8-CABAE66B511D

Holotype: A preserved specimen in the American Museum of Natural History, Manhattan, New York City, USA, specimen number 60069 collected at Mount Riu, Sudest Island, Louisiadae Archipelago, Milne Bay Province, Papua New Guinea.

This facility allows access to its holdings.

Paratypes: Nine preserved specimens in the American Museum of Natural History, Manhattan, New York City, USA, specimen numbers 60070-60078 collected at Mount Riu, Sudest Island, Louisiadae Archipelago, Milne Bay Province, Papua New Guinea.

Diagnosis: The subspecies *Angularanta* (*Scelerisqueanura*) *louisiadensis brunetus subsp. nov.* from Sudest Island (AKA Tagula Island) has until now been treated as wholly conspecific with *A. louisiadensis* (Tyler, 1968) from nearby Rossell Island, with the type material here for *A. brunetus subsp. nov.* treated as paratypes of *A. louisiadensis* by Tyler (1968).

However both populations are consistently morphologically divergent, are clearly evolving separately and can be reasonably expected to have diverged most recently at the end of the Pleistocene (11.7 K years ago).

A check of sea level depths (to the 120 m level), shows a likely narrow connection between Sudest Island and Rossell Island, or alternatively a gap of less than 1 km. The ambiguity in determination relates to positions of fringing reefs, sediment accumulation or removal, tectonic movements of land and sea beds and factors that cannot be determined with precision.

Significantly, Weijola *et al.* (2020) found late Pleistocene divergence between populations of putative Mangrove Monitors *Euprepiosaurus indicus* (Daudin, 1802) from Rossell Island and Sudest Island.

I note that an estuarine dwelling species, *E. indicus* would be far more able to breach any gap between the two nearby islands than a salt water vulnerable species like a tree frog.

Those same authors named a species "*Varanus bennetti* Weijola *et al.*, 2020" based on a similar late Pleistocene divergence between their new putative species and populations of the previously described "*Varanus tsukamotoi* Kishida, 1929".

Fred Kraus a man well known for science grant rorting and for engaging in taxonomic vandalism, this being the recklessly renaming of species previously properly described and named by others, did in Kraus (2009) name *Toxicocalamus mintoni* from Sudest Island as a distinct species from the near identical *Toxicocalamus holopelturus* McDowell, 1969 from the adjacent Rossel Island based on a single scalation difference on the head of the single specimen he had on hand.

This was the frontal fused with the supraoculars, which may well have been an unusual trait for the specimen as opposed to a species specific diagnostic character.

In light of the two recent preceding cases of species-level recognition of similarly divergent populations, I view late Pleistocene divergence being a depth of divergence more appropriate for subspecies-level differentiation at the taxonomic level and hence describe *A. louisiadensis brunetus subsp. nov.* as a new subspecies accordingly.

A. louisiadensis brunetus subsp. nov. is readily separated from nominate *A. louisiadensis louisiadensis* by having relatively shorter hindlimbs. Comparative measurements are TL/S-V range of 0.511-0.575, versus 0.584 in *A. louisiadensis louisiadensis*.

A. louisiadensis brunetus subsp. nov. has a dark chocolate brown dorsum, lateral surfaces and limbs versus one that is dark, but with obscure, faint irregular patches in *A. louisiadensis louisiadensis*.

Both subspecies of *A. louisiadensis*, comprising the entirety of the subgenus *Scelerisqueanura subgen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small (adult males 25.8-30.3 mm) frogs. Dorsum is chocolate brown, with or without paler patches. Short, narrow fringed, half-webbed fingers and webbed toes. The finger lengths are as follows 3>4>2>1. The webbing between the third and fourth fingers extends to a point slightly below the paired subarticular tubercles at the base of the penultimate phalanx on the fourth toe. Broadly spaced nares (E-N/IN 0.657-0.758). No vomerine teeth.

The head is slightly longer than broad (HL/HW 1.031), its length equivalent to more than one-third of the snout to vent length (HL/S-V 0.356). The snout is not prominent; it is abrupt and truncate when viewed from above and very slightly rounded in profile. The nostrils are lateral, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris

is less than the internarial span (E-N/IN 0.694). The canthus rostralis is well defined and very slightly curved. The eye is large and conspicuous, its diameter greater than the eye to naris distance. The tympanum is covered with skin and very small, its diameter equivalent to one-third of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue is broadly cordiform with weakly indented posterior border.

The terminal discs are prominent. Long and slender hindlimbs with a TL/S-V ratio of 0.584.

Toe lengths 4>5=3>2>1. The webbing of all toes except for the fourth reaches the base of the discs, while on the fourth toes the webbing reaches the subarticular tubercle at the base of the penultimate phalanx and continues to the disc via a narrow fringe. The dorsal and lateral surfaces of the body are finely pitted and striated. There is an inconspicuous supratympanic fold. The throat and chest are smooth. Abdomen and nearby halves of the ventral surface of the thighs are coarsely granular. There is a small pigmented nuptial pad at the base of the first finger. Vocal sac openings are exceptionally long, extending from the base of the tongue to the angles of the jaw.

Ventrally the frogs are a pale creamish colour, stippled with dark brown on the throat.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera within *Angularanta subgen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *A. louisiadensis brunetus subsp. nov.* is confined to Sudest Island in the Louisiade Archipelago, Milne Bay Province of Papua New Guinea.

Conservation: As an evolutionary divergent taxon within a confined geographical range, *A. louisiadensis brunetus subsp. nov.* is always at high risk of extinction by way of human activities or their consequences. The highest risks are probably from introduced species of vertebrate or pathogen of some form not previously encountered by the species and for which it may have no reasonable defence.

Etymology: *A. louisiadensis brunetus subsp. nov.* is named in reflection of its generally brown dorsum (from the Latin word brunneis).

BELLARANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:AF9FC11C-932C-48AB-95CB-9F5C3308917D

Type species: *Hyla angiana* Boulenger, 1915.

Diagnosis: The five described species in the genus *Bellarana gen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: The head is high and usually broader than long (average HL/HW 0.878-1.012), its length usually less than one-third of the snout to vent length (average HL/S-V 0.300-0.347). The snout is not prominent; when viewed from above it is evenly rounded or obtusely angular; in profile it is rounded or acutely angular. The nostrils are more lateral than superior, their distance from the end of the snout less than that from the eye.

The distance between the eye and the naris is either more or less than the internarial span (average E-N/IN 0.509-0.884). The canthus rostralis may be curved, slightly defined or straight. The eye is moderate to large, its diameter greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to one-third to one-quarter of the eye diameter. The vomerine teeth are in two short oblique series situated between the choanae. The tongue is cordiform wih a slightly indented posterior border.

The fingers are moderately long and are equipped with narrow lateral fringes; in decreasing order of length 3>4>2>1; the webbing is not extensive, not reaching the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are moderate.

The hind limbs are long with a moderate to high TL/S-V ratio (0.524-0.689). Toes in decreasing order of length 4>3>or= 5>2>1. The toes are webbed to the discs with the exception of the fourth which is webbed to the sub-articular tubercle at the base of the penultimate phalanx.

The skin on the dorsal surfaces is smooth or at most slightly tubercular with very small and widely scattered tubercles distributed evenly across the upper body and upper surfaces of the limbs. The throat is smooth and the chest, abdomen and lower femora granular. There is a prominent, curved supra-tympanic fold extending from the posterior corner of the eye to the shoulder. On the posterior surface of the forearm are tubercles which are widely separated from one another, in juxtaposition in a distinct row, or replaced by a continuous fold. There is a poorly defined dermal ridge on the posterior surface of the heel and tarsus.

The colouration is very highly variable, including at times, strong sexual dimorphism in many locations.

Two species synonymised with *Bellarana angiana* (Boulenger, 1915), namely, *B. mintima* (Tyler, 1963), based on an exceptionally dark variant from south of the central cordillera (Mintima, Chimbu Region, at 6,000 feet, Central Highlands, Papua New Guinea. Latitude -5.57 S., Longitude 144.54 E.), and *B. angularis* (Loveridge, 1945) from, Mount Wilhelm, 5000-8000 feet, Bismarck Range, Madang Division, Papua New Guinea, are herein resurrected.

This is done on the basis that all three described taxa are from different parts of New Guinea to the type locality of *B. angiana* (Arfak Mountains, Vogelkop Peninsula, West Papua, Indonesia), separated by wide zones of unsuitable habitat and/or well-known biogeographical barriers, combined with the known divergence of the *B. angiana* lineage being about 9.5 MYA from nearest living relatives indicating presence of more than one species. At this stage however, all these species cannot be properly separated on the basis of morphology or colour, or at least this has not yet been done.

Within most populations of putative *B. angiana*, *B. mintima* and *B. angularis* it is possible to separate the majority of specimens in collections into at least four main colour groups, with the remainder representing so-called intergrades beween the main colour variants.

The characteristic features of each of the most common variant (a term of convenience coined by Tyler 1978) and the names applied to them are as follows:

1/ Type Variant (as figured by Boulenger, 1915) and depicted on plate 66 of Menzies (2006). The dorsal surface is pale green with or without a few indistinct black spots or marbling. There is a dark (usually black) patch at the end of the snout, dividing on a level with the nares and continuing as a broad stripe along the canthus rostralis to the eye and continuing behind the eye as a short stripe to the insertion of the forearm. There are brilliant, white longitudinal stripes on the posterior surface of the forearm, heel and tarsus, and a broad, curved, white supra-anal bar. The lateral surfaces of the body are dull crimson marked with large, irregular white spots. The ventral surfaces of the body are a paler crimson with white spots which are particularly dense on the throat.

2/ Brown Variant as depicted in plate 67 of Menzies (2006). A uniform brown dorsally and laterally. The only markings are a triangular, pale blue patch behind the eye and a white supra-anal bar. The ventral surfaces vary from white to a very pale brown.

3/ So-called Mintima variant. The dorsal and lateral surfaces are uniformly a very deep slate and lack markings of any kind. The ventral surfaces are pale slate.

4/ Dull variant. Basically similar to the type variant but with extensive black markings on the dorsal and lateral surfaces. The white limb and supra-anal markings are absent or replaced by poorly defined pale grey patches. The ventral surfaces are dull grey.

5/ So-called Intergrades. Many specimens exhibit large white spots on the dorsal surfaces and some the hour-glass shaped marking on the posterior portion of the head and anterior portion of the body (a marking common to other New Guinea tree frog species). These markings are not seen in any of the other variants described above.

B. micromembrana (Tyler, 1963) with a distribution also centered on the central cordillera of New Guinea is readily separated from *B. angiana* (and those species recently synonymised with it) by having a larger eye, the eye is larger than the internarial span and the canthus rostralis is strongly curved (particularly in females), versus not curved in *B. angiana*.

In turn the species *B. megalops* (Richards and Iskandar, 2006) is separated from *B. micromembrana* by its smaller size (average male SVL: 24.6-27.5 mm versus 31.7-35.5 mm in *B. micromembrana*), exceptionally large and prominent eyes and conical tubercles on the dorsum.

According to Duellman *et al*. (2016), the genus *Bellarana gen. nov*. diverged from its nearest living relatives in the divergent genus *Angularanta gen. nov.* 12.7 MYA, in turn diverged as a pair from their next nearest living relatives in the two genera *Hopviridi gen. nov.* and *Ornatanura gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: The genus *Bellarana gen. nov*. is found along the main cordillera of New Guinea, from west to East and including outlier mountain ranges such as the Foja Mountains.

Etymology: Bella in Latin means “cute” and Rana means “frog” and these are “cute frogs”, hence the new genus name *Bellarana*.

Content: *Bellarana angiana* (Boulenger, 1915) (type species); *B. angularis* (Loveridge, 1945); *B. megalops* (Richards and Iskandar, 2006); *B. micromembrana* (Tyler, 1963); *B. mintima* (Tyler, 1963).

FLUVIRANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:4F7D63C9-585D-4862-BE99-7E1146CBD195

Type species: *Litoria rara* Günther and Richards, 2005.

Diagnosis: *Fluvirana gen. nov.* are a genus of stream-dwelling frogs only known from the north-west of New Guinea (Indonesia) separated from all other similar species in New Guinea (including those sympatric in northern New Guinea) by having a stout build, only slightly pointed snout from above or below, also being slightly truncate; distinctive finger webbing on otherwise short, thick fingers, an absence of distinctive markings on the dorsum; brownish or grey dorsum; limited markings on upper limbs and usually in the form of scattered flecks or indistinct bars or spots; white to whitish underparts; dorsal skin that is either smooth or only moderately granular or tuberculate; short thick limbs which are greyish in colour and spotted with white; relatively dull concealed areas of limbs and a moderate tympanic fold that covers the top section of the otherwise exposed tympanum.

Distribution: As far as is known, the three species in this genus are confined to north-west New Guinea (Indonesia), being known only from Nabire and Waponga River, Irian Jaya, Indonesia.

Etymology: The new genus name *Fluvirana* is taken from the Latin words “*Fluvi*” for stream and “*rana*” for frog, as these are stream dwelling species.

Content: *Fluvirana rara* (Günther and Richards, 2005) (type species); *F. rivicola* (Günther and Richards, 2005); *F. scabra* (Günther and Richards, 2005).

HOPVIRIDI GEN. NOV.

LSIDurn:lsid:zoobank.org:act:FA913E50-A9B1-4667-9B6A-88E99AD95623

Type species: *Hyla leucova* Tyler, 1968.

Diagnosis: The species in the genus *Hopviridi gen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small, montane species. They are uniformly green, sometimes lacking flash markings on the undersides of limbs or alternatively pink with yellow spots in *H. leucova* (Tyler, 1968) or otherwise bright orange in *H. chloronota* (Boulenger, 1911). Short, slightly fringed, half-webbed fingers, fully webbed toes and eggs unpigmented, 2 mm in diameter ova. Maximum size of females is 30 mm snout-vent. The snout is short with a low internarial span. Vomerine teeth are absent.

According to Duellman *et al.* (2016), the genus *Hopviridi gen. nov*. diverged from its nearest living relatives in the divergent genus *Ornatanura gen. nov.* 12.1 MYA.

These in turn diverged as a pair from their next nearest living relatives in the genera *Bellarana gen. nov*. and *Angularanta gen. nov.* 13.5 MYA.

All these genera diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Known only from the upper Sepik River system in Papua New Guinea (*H. leucova*) and the Arfak Mountains in Irian Jaya (*H. chloronota*). Alleged records from other areas to date (e.g. Upper Fly River, in PNG) have invariably turned out to be other, not particularly similar species.

Etymology: These animals "hop" because they are frogs and they are green in colour (viridi in Latin) and so the new genus name *Hopviridi* is a direct combination of these.

Content: *Hopviridi leucova* (Tyler, 1968) (type species); *H. chloronota* (Boulenger, 1911).

INCERTANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:26D001AA-6F36-4E1D-AB1B-BC898078DE6A

Type species: *Incertanura fakfakensis sp. nov.*

Diagnosis: The genus *Incertanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

A long (up to at least 2.8 mm) erectile rostral spike in males that is circular in cross section; relatively small size (SVL up to 30.5 mm); slender build (HW/SVL 0.22-0.26); tibia approximately half length of the body (TL/SVL 0.049-0.053); moderately large eyes (EYE/SVL 0.10-0.12); moderately small tympanum (TYM/SVL 0.42-0.53); small, rounded and often green tubercles extending across the mid-dorsum in life; brown to yellowish-brown dorsal colouration with, or without, distinct green transverse bands; and orange colouration in concealed areas of the thighs and axilla.

The five species within *Incertanura gen. nov*. are further defined as follows: Body very slender and elongate, tibia approximately half length of body; head wider than body in dorsal profile, clearly distinct from neck. Snout rounded in dorsal view and truncate in lateral view. Rostral spike in males extending from tip of upper jaw; mean spike length varies among populations and species from different localities. Canthus rostralis moderately well defined, slightly curved; loreal region concave. Nares closer to tip of snout (excluding spike) than to eye, oriented laterally. Eyes moderately large, protruding in both dorsal and lateral views; pupil horizontal. Upper jaw protruding marginally beyond lower jaw. Tympanum small with distinct to indistinct annulus, bordered dorsally by a fleshy supratympanic fold extending to the superior edge of the insertion of the upper arm. Choanae small and circular, situated close to anterior and lateral edge of palate; no vomerine teeth visible; tongue fleshy and ovoid and usually with a slightly indented posterior edge. Vocal slits present in males. Dorsal skin tuberculate; ventral skin finely to coarsely granular on throat, abdomen and tibia; remaining ventral surfaces of limbs smooth; additional tubercles also present in clusters around the vent and to a variable extent on sides of ankles and upper forearms.

Fingers with relative lengths 3>4>2>1; fleshy, whitish to translucent webbing between all digits, forming a narrow basal strip between 1 and 2, extending to disc on distal edge of 2 and proximal edge of 4 and to penultimate phalanx on both sides on 3. Terminal finger discs expanded or narrower (depending on species) and usually wider than toe discs and with distinct circum-marginal grooves. Nuptial pads dark brown, roughly tear-shaped with point of tear oriented in posteroventral direction. Indistinct unpigmented bifid subarticular tubercles usually visible at the base of penultimate phalanx on all fingers, further indistinct unpigmented subarticular tubercles in series on finger four, indistinct proximal metacarpal tubercles at base of finger one, and small distal metacarpal tubercles at base of three and four.

Toes moderately long, relative lengths 4>3>5>2>1. All digits with extensive fleshy, opaque webbing, basal between 1 and 2, extending to anterior end of penultimate phalanx on distal edge of 2 and 3 and proximal edge of five, to halfway along penultimate phalanx on proximal edge of three and four, and base of penultimate tubercle on distal edge of four. Terminal discs slightly expanded to not really expanded and otherwise, narrower than finger discs and with distinct circum-marginal grooves. Indistinct unpigmented subarticular tubercles on penultimate phalanx of all toes, single on 1-3, bifid on 4 and 5. No other tubercles clearly apparent. Small, indistinct unpigmented metatarsal tubercle at base of 1.

In preservative, ground colour of all dorsal surfaces is medium brown, with extensive blueish green and darker brown flecking, maculations, vermiculations and/or blotches across all dorsal surfaces, blueish pattern elements sometimes coalesce into three indistinct transverse blotches, overall darker pigmentation elements tend to be densest on body and less concentrated and more finely reticulated towards distal extremities of limbs.

Rostral spike is usually light brown, with extensive darker brown flecking at base, tending towards unpatterned at tip. White or yellow patches often, but not always, present on either side of head, extending from posterolateral edge of eye, below tympanum and around axilla. Venter predominantly buff, internal organs sometimes visible, throat sometimes offwhite, and/or with two clusters of dark brown maculations laterally, tubercles around vent and sometimes those along outer edge of limbs, off-white.

Appearance in life is as follows: Dorsal base colouration is light to dark brown, with variable amounts of green and darker brown spotting, mottling or banding on the body, limbs and head. Dorsal and lateral tubercles on torso and limbs often, but not always, green and contrasting against the brown base colouration. Head brown, often with extensive green pigmentation, usually including a ring around the eyes and more variably a green transverse band between the eyes. Dense clusters of dark-brown to almost black maculations extend to a variable degree across the limbs, lateral portions of torso and in patches across the back. Off-white patches sometimes present below tympanum and on exposed surfaces of lower hindlimbs. Iris pattern complex; base colouration is usually light brownish, with extensive darker brown vermiculations; rim of pupil orange. Hidden regions of axilla and groin orange (adapted from Oliver *et al.* 2019a).

Frogs treated by Oliver *et al.* (2019a) as outlier populations of *Incertanura pronimia* (Menzies, 1993),

which they placed in the genus *Litoria* Tschudi, 1838 from the Fakfak Mountains and near Timika, both being in Irian Jaya are within this paper formally named as new species, namely *I. fakfakensis sp. nov.*and *I. cuspis sp. nov.* based on geographical an morphological divergence of these forms with one another and all other known species in the genus.

According to Duellman *et al.* (2016), *Incertanura gen. nov*. diverged from their nearest living relatives 14.6 MYA, being other newly named genera (within this paper) and at least 21.5 MYA diverged from nearest living relatives in previously named genera.

Distribution: Known only from mid-montane regions in New Guinea, including at least one satellite Mountain Range to the north of the main cordillera (Foja Mountains) and another to the west (Fakfak)

Etymology: In Latin “Incertis” means variable and “anura” means frog and hence the effective name “variable frog”, which is a fair description of the variability of dorsal colour patterning in these frogs, even within a given population of a given species and of the same sex.

Content: *Incertanura pronimia* (Menzies, 1993) (type species); *I. cuspis sp. nov.*; *I. fakfakensis sp. nov.*; *I. pinocchio* (Oliver, Günther and Richards, 2019); *I. vivissimia* (Oliver, Richards and Donnellan, 2019).

INCERTANURA CUSPIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:A586FF1C-BB98-4C47-B83E-AEDFCA6EDAEA

Holotype: A preserved adult specimen at the Museum Zoologie Bogor, Indonesia, specimen numbers, MZB amphibians 13775 collected from the Timika area, Papua Province, Indonesia, Latitude -4.371 S., Longitude 136.270 E.

This facility allows access to its holdings.

Paratypes: Five preserved adult specimens at the Museum Zoologie Bogor, Indonesia, specimen numbers, MZB amphibians 13776-13380 collected from the Timika area, Papua Province, Indonesia, Latitude -4.371 S., Longitude 136.270 E.

Diagnosis: All species within *Incertanura gen. nov.* are morphologically similar. All can be separated from all other Tree Frogs (Pelodryadidae) by the following suite of characters: A long (up to at least 2.8 mm) erectile rostral spike in males that is circular in cross section; relatively small size (SVL up to 30.5 mm); slender build (HW/SVL 0.22-0.26); tibia approximately half length of the body (TL/SVL 0.049-0.053); moderately large eyes (EYE/SVL 0.10-0.12); moderately small tympanum (TYM/SVL 0.42-0.53); small, rounded and often green tubercles extending across the mid-dorsum in life; brown to yellowish-brown dorsal colouration with, or without, distinct green transverse bands; and orange colouration in concealed areas of the thighs and axilla.

The three previously described species within the genus, are *Incertanura pronimia* (Menzies, 1993), with a type locality of near Ok Ma, Western Province of Papua New Guinea, *I. pinocchio* (Oliver, Günther and Richards, 2019) with a type locality of Foja Mountains, Papua Province, Indonesia and *I. vivissimia* (Oliver, Richards and Donnellan, 2019), with type locality of Hides Ridge, Hela Province, Papua New Guinea. The latter two were defined and diagnosed with direct reference to their morphological differences to the earlier described taxon *I. pronimia.*

With this in mind, it is important that this description of *I. cuspis sp. nov.* and the other newly named species, *I. fakfakensis sp. nov.* set out what separates all five named species within the genus from one another.

Each of the five relevant species are separated from one another by the following unique suites of meristic and other characters:

I. pronimia can be readily separated from the other four species by the following unique suite of (average) meristic characters: rostral spike length/snout-vent length from vent to tip of snout minus the spike if present (RL/SVL) of 0.067 (a figure much higher than for *I. fakfakensis sp. nov.*and *I. cuspis sp. nov.* and also much lower than for *I. pinocchio*), head width measured as transverse distance between tympana/snout-vent length from vent to tip of snout minus the spike if present (HW/SVL) of 0.24, horizontal eye diameter/snout-vent length from vent to tip of snout minus the spike if present (EYE/SVL) 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.51, horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.047, transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present (4TD/SVL) 0.045 and transverse diameter of finger 3 disc/ snout-vent length from vent to tip of snout minus the spike if present (3FD/SVL) 0.048.

I. cuspis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL (rostral spike length/snout-vent length from vent to tip of snout minus the spike if present) 0.034 (a figure much smaller than for all other species), HW/SVL 0.25, EYE/SVL 0.12, TL/SVL 0.51, TYM/SVL 0.047, 4TD/SVL (transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present) 0.034 and 3FD/SVL (transverse diameter of finger 3 disc/ snout-vent length from vent to tip of snout minus the spike if present) 0.042, meaning this species has much smaller hand and toe pads than all other species, beingn indistinct versus distinct I the other species.

I. fakfakensis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.052, HW/SVL 0.25, EYE/SVL 0.11, TL/SVL (tibia length/snout-vent length from vent to tip of snout minus the spike if present) 0.52 (a figure that is higher than for all other species), TYM/SVL (horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present) 0.043 (a figure lower than for all other species), 4TD/SVL 0.045, 3FD/SVL 0.049.

I. pinocchio can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.086, HW/SVL 0.26, EYE/SVL 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.48 (a number lower than for all other species), horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.055 (a number higher than for all other species), 4TD/SVL 0.045, 3FD/

SVL .051.

I. vivissimia can be readily separated from the other (preceding) four species by the following unique suite of characters: TL/SVL 0.52, TYM/SVL 0.049, extensive olive-green tubercles across the dorsum and white crenulations; tubercles along the outer edge of the ankle (vs absent). dorsal and ventral edges of the lateral flanges on the shanks with extensive white flecking and tubercles and rugose skin on the ventral surface of the thigh extending more than half the distance from the cloaca to the knee (vs extending less than half way in the other species). *I. vivissimia* also has prominent and larger blue (green in life) blotches on the dorsal surface of upper arms, forearms, thighs and shanks (vs mottled light and dark), more extensive white flecking on the dorsal and ventral edges of lateral flanges on the shank, and only sparse dark-brown maculations on the digits and ankles (versus dense in the other species) (modified from Oliver *et al.* 2019a).

Adult male *I. cuspis sp. nov.*, *I. pinocchio* and *I. fakfakensis sp. nov.* also have noticeably thicker forearms than the other two species in the genus.

A photo of the type form of *I. pronimia* in life can be found in Oliver *et al*. (2019a) on page 337 (two top images).

A photo of *I. cuspis sp. nov.* in life can be found in Oliver *et al*. (2019a) on page 337 middle right.

A photo of *I. pinocchio* in life can be found in Oliver *et al*. (2019a) on page 434, five photos on page.

A photo of *I. vivissimia* in life can be found in Oliver *et al*. (2019b) on page 447 in the top image.

All five species are known from relatively few collected specimens in relatively undisturbed locations, which are increasingly under threat as deforestation and agriculture take hold in most parts of New Guinea, as a direct consequence of exploding human populations in New Guinea and globally.

Distribution: *I. cuspis sp. nov.* is only known from the general area that the six type specimens were collected, being the Timika area, Papua Province, Indonesia.

Etymology: The name *cuspis* in Latin, means “point” or “cone” with reference to the frontal appendage of males of this species.

INCERTANURA FAKFAKENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:2F7210FA-0ED5-499A-9660-4AAEC291BE7E

Holotype: A preserved adult specimen at the Museum für Naturkunde, Berlin, Germany, specimen number ZMB 85620 collected from Fakfak Mountains, Bomberai Peninsula, Papua Barat Province, Indonesia Latitude -2.780 S., Longitude 132.270 E.

This facility allows access to its holdings.

Paratype: A preserved adult specimen at the Museum für Naturkunde, Berlin, Germany, specimen number ZMB 85621 collected from Fakfak Mountains, Bomberai Peninsula, Papua Barat Province, Indonesia Latitude -2.780 S., Longitude 132.270 E.

Diagnosis: All species within *Incertanura gen. nov.* are morphologically similar.

All can be separated from all other Tree Frogs (Pelodryadidae) by the following suite of characters: A long (up to at least 2.8 mm) erectile rostral spike in males that is circular in cross section; relatively small size (SVL up to 30.5 mm); slender build (HW/SVL 0.22-0.26); tibia approximately half length of the body (TL/SVL 0.049-0.053); moderately large eyes (EYE/SVL 0.10-0.12); moderately small tympanum (TYM/SVL 0.42-0.53); small, rounded and often green tubercles extending across the mid-dorsum in life; brown to yellowish-brown dorsal colouration with, or without, distinct green transverse bands; and orange colouration in concealed areas of the thighs and axilla.

The three previously described species within the genus, are *Incertanura pronimia* (Menzies, 1993), with a type locality of near Ok Ma, Western Province of Papua New Guinea, *I. pinocchio* (Oliver, Günther and Richards, 2019) with a type locality of Foja Mountains, Papua Province, Indonesia and *I. vivissimia* (Oliver, Richards and Donnellan, 2019), with type locality of Hides Ridge, Hela Province, Papua New Guinea. The latter two were defined and diagnosed with direct reference to their morphological differences to the earlier described taxon *I. pronimia.*

With this in mind, it is important that this description of *I. fakfakensis sp. nov.* and the other newly named species, *I. cuspis sp. nov.* set out what separates all five named species within the genus from one another.

Each of the five relevant species are separated from one another by the following unique suites of meristic and other characters:

I. pronimia can be readily separated from the other four species by the following unique suite of (average) meristic characters: rostral spike length/snout-vent length from vent to tip of snout minus the spike if present (RL/SVL) of 0.067 (a figure much higher than for *I. fakfakensis sp. nov.*and *I. cuspis sp. nov.* and also much lower than for *I. pinocchio*), head width measured as transverse distance between tympana/snout-vent length from vent to tip of snout minus the spike if present (HW/SVL) of 0.24, horizontal eye diameter/snout-vent length from vent to tip of snout minus the spike if present (EYE/SVL) 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.51, horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.047, transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present (4TD/SVL) 0.045 and transverse diameter of finger 3 disc/ snout-vent length from vent to tip of snout minus the spike if present (3FD/SVL) 0.048.

I. cuspis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL (rostral spike length/snout-vent length from vent to tip of snout minus the spike if present) 0.034 (a figure much smaller than for all other species), HW/SVL 0.25, EYE/SVL 0.12, TL/SVL 0.51, TYM/SVL 0.047, 4TD/SVL (transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present) 0.034 and 3FD/SVL (transverse diameter of finger 3 disc/snout-vent length from vent to tip of snout minus the spike if present) 0.042, meaning this species has much smaller hand and toe pads than all other species, beingn indistinct versus distinct in the other species.

I. fakfakensis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.052, HW/SVL 0.25, EYE/SVL 0.11, TL/SVL (tibia length/snout-vent length from vent to tip of snout minus the spike if present) 0.52 (a figure that is higher than for all other species), TYM/SVL (horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present) 0.043 (a figure lower than for all other species), 4TD/SVL 0.045, 3FD/SVL 0.049.

I. pinocchio can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.086, HW/SVL 0.26, EYE/SVL 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.48 (a number lower than for all other species), horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.055 (a number higher than for all other species), 4TD/SVL 0.045, 3FD/SVL .051.

I. vivissimia can be readily separated from the other (preceding) four species by the following unique suite of characters: TL/SVL 0.52, TYM/SVL 0.049, extensive olive-green tubercles across the dorsum and white crenulations; tubercles along the outer edge of the ankle (vs absent). dorsal and ventral edges of the lateral flanges on the shanks with extensive white flecking and tubercles and rugose skin on the ventral surface of the thigh extending more than half the distance from the cloaca to the knee (vs extending less than half way in the other species). *I. vivissimia* also has prominent and larger blue (green in life) blotches on the dorsal surface of upper arms, forearms, thighs and shanks (vs mottled light and dark), more extensive white flecking on the dorsal and ventral edges of lateral flanges on the shank, and only sparse dark-brown maculations on the digits and ankles (versus dense in the other species) (modified from Oliver *et al.* 2019a).

Adult male *I. cuspis sp. nov.*, *I. pinocchio* and *I. fakfakensis sp. nov.* also have noticeably thicker forearms than the other two species in the genus.

A photo of the type form of *I. pronimia* in life can be found in Oliver *et al*. (2019a) on page 337 (two top images).

A photo of *I. cuspis sp. nov.* in life can be found in Oliver *et al*. (2019a) on page 337 middle right.

A photo of *I. pinocchio* in life can be found in Oliver *et al*. (2019a) on page 434, five photos on page.

A photo of *I. vivissimia* in life can be found in Oliver *et al*. (2019b) on page 447 in the top image.

All five species are known from relatively few collected specimens in relatively undisturbed locations, which are increasingly under threat as deforestation and agriculture take hold in New Guinea, as a direct consequence of exploding human populations in New Guinea and globally.

Distribution: *I. fakfakensis sp. nov.* is only known from the type locality in the Fakfak Mountains of Bomberai Peninsula, Papua Barat Province, Indonesia and is probably confined to this range due to the absence of suitable habitat in nearby areas (being flat lands).

Etymology: The name *fakfakensis* is taken from where this species is known to occur.

INLUSTANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:006C107D-4BEC-41A5-BD7B-D02627566E13

Type species: *Hyla multiplica* Tyler, 1964.

Diagnosis: Frogs of the genus *Inlustanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

The known species are characterised by fully webbed outer fingers, a large rounded head with inconspicuous to large eyes (depending on the species), and distinctive well developed dermal folds on the posterior surface of the forearm, anus, tibia, tarsus and fifth toe. However, in at least one species the development of the fold on the tarsus may be reduced. These frogs have a distinctive dorsal colouration of green intersperced with yellow spots in life (in preservative a distinctive colouration in which blue and violet are the predominant pigments), with yellow spots absent in at least some specimens of one species. These frogs are moderately sized species. Females attain a maximum snout to vent length of 35-48 mm and males 39-42 mm.

According to Duellman *et al.* (2016), the species within *Inlustanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Variabilanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

Distribution: Known from scattered locations in the ranges areas of New Guinea both north and south of the main cordillera and in both the Papua New Guinea (PNG) and Indonesian sides.

Etymology: The Latin word *inluster* means “bright coloured” and by adding “*anura*” for frog, the full genus name means “bright coloured frog”.

Content: *Inlustanura multiplica* (Tyler, 1964) (type species); *I. gasconi* (Richards, Oliver, Krey and Tjaturadi, 2009); *I. inluster sp. nov*.

INLUSTANURA INLUSTER SP. NOV.

LSIDurn:lsid:zoobank.org:act:D1535947-0F68-4274-BD76-65FDD2CB230C

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R34360, collected from Magidobo, Southern Highlands Province, Papua New Guinea, Latitude -6.11 S., Longitude 142.46 E.

This government-owned facility allows access to its holdings.

Diagnosis: The species *Inlustanura inluster sp. nov*. from the Southern Highlands Province, Papua New Guinea, conforms to the genus diagnosis for the genus *Inlustanura gen. nov.* (this paper). It is morphologically most similar to the species *I. multiplica* (Tyler, 1964), originally described as *Hyla multiplica* Tyler, 1964. However *I. inluster sp. nov.* is separated from that species by lacking any obvious sign of dorsal yellow spots (in life), has a distinctive white marking along the posterior-ventral edge of the eye (not seen in *I. multiplica*), and has reduced development of a dermal flange on the tarsus, versus well-developed in both *I. multiplica* and the morphologically similar *I. gasconi* (Richards, Oliver, Krey and Tjaturadi, 2009).

I. gasconi is from the Foja Mountains, Irian Jaya, are separated from both *I. inluster sp. nov.* and *I. multiplica* by in lacking extensive bright blue, or orange mixed with bright blue markings on the groin, venter and lateral surfaces, and instead having bright orange groin, thigh and axillary colouration as well as having noticeably larger eyes (average EYE/SVL 0.13 versus 0.10).

All three preceding species, consisting the entirety of the genus *Inlustanura gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: The known species are characterised by fully webbed outer fingers, a large rounded head with inconspicuous to large eyes (depending on the species), and distinctive well developed dermal folds on the posterior surface of the forearm, anus, tibia, tarsus and fifth toe. Although in at least one species the development of the fold on the tarsus may be reduced. These frogs have a distinctive dorsal colouration of green intersperced with yellow spots in life (in preservative a distinctive colouration in which blue and violet are the predominant pigments), with dorsal yellow spots absent in at least some specimens of one species. These frogs are moderately sized species. Females attain a maximum snout to vent length of 35-48 mm and males 39-42 mm.

According to Duellman *et al.* (2016), the species within *Inlustanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Variabilanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

Distribution: The species *Inlustanura inluster sp. nov.* is only known from the type locality in the Southern Highlands Province of Papua New Guinea.

Etymology: The Latin word *inluster* means “bright coloured” and is an accurate diagnosis of the colour in life of this species, noting however that it is well camoflagued in its natural habitat.

MOECHAENURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:BFE0BAB6-ABE1-411D-B244-7A3A54067C3F

Type species: *Hyperolius nigropunctatus* Meyer, 1874.

Diagnosis: Species within *Moechaeanura gen. nov.* are morphologically similar to those species in the genus *Variabilanura gen. nov.*, with some differences between the two detailed in this description.

Moechaeanura gen. nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small to medium species (male maximum snout-vent length 34 mm, female maximum snout-vent length 38 mm with short, three webbed fingers and almost fully webbed toes.

The webbing of the fourth toe extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx, (versus reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger in the genus *Variabilanura gen. nov.*). The skin on the dorsal surfaces of the head, body and limbs is minutely roughened.

The throat and chest are smooth except for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Predominantly green in life and may be marked with gold and black. The intercalary structures are elongate and ossified. The hyoid plate lacks alary processes. The ova are small and pigmented (see below).

The dorsum is green, stippled with black and occasionally marked quite extensively with gold. The fingers are short and slender, with about one third webbing; the toes are almost fully webbed. The snout is slightly rounded in profile.

The cranial elements are poorly developed. The nasals are widely separated medially and do not articulate with the sphenethmoid. The sphenethmoid remains double in the adult. The frontoparietal foramen is large and ovoid. The squamosals have short zygomatic rami and very much longer otic rami. The pars facialis of the maxillary is shallow and the posterior process does not make contact with the maxillary process of the nasal. The alary processes of the premaxillary are broad, widely separated medially, and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are very much reduced.

A phlange is present on the distal surface of the third metacarpal. The sacral diapophyses are broadly dilated and the intercalary structures are elongate and ossified. There are no alary processes on the hyoid plate. The adductor mandibulae externus superficialis is absent.

The ova are small and pigmented (brown animal pole) and laid in stagnant marshes. The mean ovidiameters are 1.2-1.7 mm. Tadpoles have moderately developed fins and the labial teeth comprise 2 upper and 3 lower rows (Tyler 1963; Menzies 1972). The chromosome number is 26.

Moechaeanura gen. nov. is further separated from a number of morphologically similar New Guinea species within the genus *Variabilanura gen. nov.* by its very different reproductive mode. *Moechaeanura gen. nov.* species have small brown pigmented eggs (average ova size of 1.2-1.7 mm) that are deposited in water, while species in the genus *Variabilanura gen. nov.* attach a mass of large green eggs with an average ova size of 2.5 mm to vegetation overhanging slow moving streams.

In *Variabilanura gen. nov.* the ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements (Tyler 1978).

Frogs within the subgenus *Aspercutis subgen. nov.* (within *Moechaeanura gen. nov.*) conform to the above diagnosis for the genus *Moechaeanura gen. nov.*, except for their more extensive finger webbing, highly tuberculate dorsum (versus smooth to slightly tuberculate

in the nominate subgenus), distinctively crenulated ridges following the outer surfaces of the lower limbs, silvery-gold and heavily veined iris and fully truncate snout (versus normal to slightly truncate in the nominate subgenus) which as a full diagnosis separates them from all other New Guinea frogs.

Frogs within the subgenus *Telaater subgen. nov*. are separated from all other New Guinea tree frogs by having full black webbing on hands and feet, the venter with extensive areas of black, white and yellow and a transparent periphery on the tympanic membrane combined with a small adult size of less than 30 mm. the placement of these species within a subgenus within a greater *Moechaeanura gen. nov.* is tentative and elevation to full genus may be required as further evidence is obtained.

According to Duellman *et al.* (2016), the genus *Moechaeanura gen. nov.* diverged from its nearest living relatives, the morphologically distinctive *Nasuscuspis gen. nov.* 13.4 MYA, and the morphologically similar genera *Incertanura gen. nov*., *Inlustanura subgen. nov*. and *Variabilanura gen. nov*. 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

Distribution: New Guinea including offshore islands to the east and west at least as far as Halmahera.

Etymology: In Latin "*Moechaeanura*" means drab frog, which is true in the context of the colouration of a number of species in this genus.

Content: *Moechaeanura nigropunctatus* (Meyer, 1874) (type species); *M. albatermacula sp. nov.*; *M. biakensis* (Günther, 2006); *M. christianbergmanni* (Günther, 2008); *M. richardsi* (Dennis and Cunningham, 2006); *M. rubrops* (Kraus and Allison, 2004); *M. singadanae* (Richards, 2005); *M. spica sp. nov.*; *M. tritong sp. nov.*; *M. umarensis* (Günther, 2008); *M. verae* (Günther, 2004); *M. vocivincens* (Menzies, 1972); *M. wapogaensis* (Richards and Iskandar, 2001).

ASPERCUTIS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:57D4B7F9-DD7E-4E98-8496-50B075E95CD4

Type species: *Litoria verae* Günther, 2004.

Diagnosis: Species within *Moechaeanura gen. nov*. are morphologically similar to those species in the genus *Variabilanura gen. nov.*, with some differences between the two detailed in this description.

Moechaeanura gen. nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

They are small to medium species (male maximum snout-vent length 34 mm, female maximum snout-vent length 38 mm with short, three webbed fingers and almost fully webbed toes.

The webbing of the fourth toe extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx, (versus reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger in the genus *Variabilanura gen. nov.*). The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth except for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Predominantly green in life and may be marked with gold and black. The intercalary structures are elongate and ossified. The hyoid plate lacks alary processes. The ova are small and pigmented (see below).

The dorsum is green, stippled with black and occasionally marked quite extensively with gold. The fingers are short and slender, with about one third webbing; the toes are almost fully webbed. The snout is slightly rounded in profile.

The cranial elements are poorly developed. The nasals are widely separated medially and do not articulate with the sphenethmoid. The sphenethmoid remains double in the adult. The frontoparietal foramen is large and ovoid. The squamosals have short zygomatic rami and very much longer otic rami. The pars facialis of the maxillary is shallow and the posterior process does not make contact with the maxillary process of the nasal. The alary processes of the premaxillary are broad, widely separated medially, and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are very much reduced.

A phlange is present on the distal surface of the third metacarpal. The sacral diapophyses are broadly dilated, and the intercalary structures are elongate and ossified. There are no alary processes on the hyoid plate. The adductor mandibulae externus superficialis is absent.

The ova are small and pigmented (brown animal pole) and laid in stagnant marshes. The mean ovidiameters are 1.2-1.7 mm. Tadpoles have moderately developed fins and the labial teeth comprise 2 upper and 3 lower rows (Tyler 1963; Menzies 1972). The chromosome number is 26.

Moechaeanura gen. nov. is further separated from a number of morphologically similar New Guinea species within the genus *Variabilanura gen. nov.* by its very different reproductive mode. *Moechaeanura gen. nov*. species have small brown pigmented eggs (average ova size of 1.2-1.7 mm) that are deposited in water, while species in the genus *Variabilanura gen. nov.* attach a mass of large green eggs with an average ova size of 2.5 mm to vegetation overhanging slow moving streams.

In *Variabilanura gen. nov.* the ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water. The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements (Tyler 1978).

Frogs within the subgenus *Aspercutis subgen. nov.* (within *Moechaeanura gen. nov.*) conform to the above diagnosis for the genus *Moechaeanura gen. nov.*, except for their more extensive finger webbing, highly tuberculate dorsum (versus smooth to slightly tuberculate

in the nominate subgenus), distinctively crenulated ridges following the outer surfaces of the lower limbs, silvery-gold and heavily veined iris and fully truncate snout (versus normal to slightly truncate in the nominate subgenus) which as a full diagnosis separates them from all other New Guinea frogs.

Frogs within the subgenus *Telaater subgen. nov*. are separated from all other New Guinea tree frogs by having full black webbing on hands and feet, the venter with extensive areas of black, white and yellow and a transparent periphery on the tympanic membrane combined with a small adult size of less than 30 mm. the placement of these species within a subgenus within a greater *Moechaeanura gen. nov.* is tentative and elevation to full genus may be required as further evidence is obtained.

According to Duellman *et al.* (2016), the genus *Moechaeanura gen. nov.* diverged from its nearest living relatives, the morphologically distinctive *Nasuscuspis gen. nov.* 13.4 MYA, and the morphologically similar genera *Incertanura gen. nov*., *Inlustanura subgen. nov*. and *Variabilanura gen. nov*. 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

Distribution: The two species in this subgenus are only known from their type localities being, Wandamen Peninsula, near the Birds Head of Irian Jaya, Indonesia and Huon Peninsula, northeastern Papua New Guinea.

Etymology: The subgenus name "*Aspercutis*"comes from the Latin words meaning rough skinned. The "a" at the end of "Aspera" has been removed from this genus name to prevent potential risk of creating a homonym and so the spelling is deliberate.

Content: *Moechaeanura* (*Aspercutis*) *verae* (Günther, 2004) (type species); *M.* (*Aspercutis*) *singadanae* (Richards, 2005).

TELAATER SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:028D0D83-90D3-4BDB-8BC4-12AE2518DA32

Type species: *Litoria richardsi* Dennis and Cunningham, 2006.

Diagnosis: Species within *Moechaeanura gen. nov*. are morphologically similar to those species in the genus *Variabilanura gen. nov.*, with some differences between the two detailed in this description.

Moechaeanura gen. nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small to medium species (male maximum snout-vent length 34 mm, female maximum snout-vent length 38 mm with short, three webbed fingers and almost fully webbed toes.

The webbing of the fourth toe extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx, (versus reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger in the genus *Variabilanura gen. nov.*).

The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth except for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Predominantly green in life and may be marked with gold and black. The intercalary structures are elongate and ossified. The hyoid plate lacks alary processes. The ova are small and pigmented (see below).

The dorsum is green, stippled with black and occasionally marked quite extensively with gold. The fingers are short and slender, with about one third webbing; the toes are almost fully webbed. The snout is slightly rounded in profile.

The cranial elements are poorly developed. The nasals are widely separated medially and do not articulate with the sphenethmoid. The sphenethmoid remains double in the adult. The frontoparietal foramen is large and ovoid. The squamosals have short zygomatic rami and very much longer otic rami. The pars facialis of the maxillary is shallow and the posterior process does not make contact with the maxillary process of the nasal. The alary processes of the premaxillary are broad, widely separated medially, and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are very much reduced.

A phlange is present on the distal surface of the third metacarpal. The sacral diapophyses are broadly dilated, and the intercalary structures are elongate and ossified. There are no alary processes on the hyoid plate. The adductor mandibulae externus superficialis is absent.

The ova are small and pigmented (brown animal pole) and laid in stagnant marshes. The mean ovidiameters are 1.2-1.7 mm. Tadpoles have moderately developed fins and the labial teeth comprise 2 upper and 3 lower rows (Tyler 1963; Menzies 1972). The chromosome number is 26.

Moechaeanura gen. nov. is further separated from a number of morphologically similar New Guinea species within the genus *Variabilanura gen. nov.* by its very different reproductive mode. *Moechaeanura gen. nov*. species have small brown pigmented eggs (average ova size of 1.2-1.7 mm) that are deposited in water, while species in the genus *Variabilanura gen. nov.* attach a mass of large green eggs with an average ova size of 2.5 mm to vegetation overhanging slow moving streams.

In *Variabilanura gen. nov.* the ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements (Tyler 1978).

Frogs within the subgenus *Aspercutis subgen. nov.* (within *Moechaeanura gen. nov.*) conform to the above diagnosis for the genus *Moechaeanura gen. nov.*, except for their more extensive finger webbing, highly

tuberculate dorsum (versus smooth to slightly tuberculate in the nominate subgenus), distinctively crenulated ridges following the outer surfaces of the lower limbs, silvery-gold and heavily veined iris and fully truncate snout (versus normal to slightly truncate in the nominate subgenus) which as a full diagnosis separates them from all other New Guinea frogs.

Frogs within the subgenus *Telaater subgen. nov*. are separated from all other New Guinea tree frogs by having full black webbing on hands and feet, the venter with extensive areas of black, white and yellow and a transparent periphery on the tympanic membrane combined with a small adult size of less than 30 mm. the placement of these species within a subgenus within a greater *Moechaeanura gen. nov.* is tentative and elevation to full genus may be required as further evidence is obtained.

According to Duellman *et al.* (2016), the genus *Moechaeanura gen. nov.* diverged from its nearest living relatives, the morphologically distinctive *Nasuscuspis gen. nov.* 13.4 MYA, and the morphologically similar genera *Incertanura gen. nov*., *Inlustanura subgen. nov*. and *Variabilanura gen. nov*. 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

Distribution: Known only from the type localities of the type specimens of each species, being the upper reaches of the Mamberano Drainage, Irian Jaya, Indonesia and the Upper Fly River drainage in Western Province, Papua New Guinea.

Etymology: The subgenus name "*Telaater*" comes from the Latin words "web" and "black" in reference to the distinctive black webbing on the feet of both species.

Content: *Moechaeanura (Telaater) richardsi* (Dennis and Cunningham, 2006); *M. (Telaater) spica sp. nov.*.

MOECHAEANURA* (*MOECHAEANURA*) *TRITONG SP. NOV.

LSIDurn:lsid:zoobank.org:act:1D81F542-71BB-4ECE-941D-5D68113AF63B

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R65036, collected from the Western Province, Papua New Guinea, Latitude -5.7292 S., Longitude 142.2633 E. This government-owned facility allows access to its holdings.

Diagnosis: *Moechaeanura* (*Moechaeanura*) *tritong sp. nov.* and *M. albatermacula sp. nov*. have until now been treated as a Papua New Guinea populations of *M. nigropunctatus* (Meyer, 1874), with a type locality of Japen Island, West Papua, Indonesia, better known to most people as *Litoria nigropunctatus* (Meyer, 1874).

M. tritong sp. nov. and *M. albatermacula sp. nov*. would key out as *M. nigropunctatus* in Tyler (1968) in terms of separation from all other New Guinea species of Tree Frogs. However *M. tritong sp. nov.* from Western Province, Papua New Guinea and *M. albatermacula sp. nov*. from the northern foothills of the Owen Stanley Range, Papua New Guinea are readily separated from *M. nigropunctatus* as follows:

M. tritong sp. nov. has a grey-green dorsum without marks, except for a yellow patch above the axilla. Ventral surface is white except for the intense yellow below the limbs and concealed surfaces of the limbs. The dark patch at the jaw angles.

M. albatermacula sp. nov. has a dorsum that is a lichenous grey-brown with ill-defined black spots; lower limbs are white with dark black cross bars; concealed surfaces of the thighs and posterior of the belly are a brilliant golden yellow.

M. nigropunctatus is readily separated from the other two species by being grey-green to grey-brown dorsally with well-defined green or brown spotting or marks, especially on the limbs, hands and feet; concealed surfaces of the thighs, groins and axillae are brilliant orange; ventral surface white; lateral sides of throat lightly or heavily spotted black; iris is gold and with heavy black veins.

M. nigropunctatus, *M. tritong sp. nov.* and *M. albatermacula sp. nov*. are readily separated from all other Tree Frogs in New Guinea by the following suite of characters: The head is moderately flattened and longer than broad (HL/HW 1.033-1.077), its length slightly or considerably more than one third of the snout to vent length (HL/S-V 0.334-0.366). The snout is not prominent; when viewed from above and in profile it is gently rounded.

The nostrils are lateral, their distance from the tip of the snout less than that from the eye. The canthus rostralis is curved and only slightly defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-quarter to one-half of the eye diameter. The vomerine teeth are reduced to a single or pair of teeth near each choana and are not elevated. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with fairly prominent lateral fringes and paired sub-articular tubercles; in decreasing order of length 3>4>2>1. The webbing reaches midway up the terminal phalanx on the fourth finger. The terminal discs are prominent.

The hind limbs are moderate with a TL/S-V ratio of 0.526-0.566. Toes in decreasing order of length 4>5 >3>2>1. The webbing reaches the base of the disc of all toes, except the fourth where it extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx.

The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth but for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Distribution: *M. tritong sp. nov.* is known only definitively from the type locality, south of the main central cordillera in the Western Province of Papua New Guinea.

Etymology: In Latin, *Trito* means unmarked and so the letters NG, which are an abbreviation for New Guinea are added to the name to to make the word *tritong* to mean "unmarked from New Guinea", in reflection to the most common dorsal colour state for the species and where it comes from.

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MOECHAEANURA* (*MOECHAEANURA*) *ALBATERMACULA SP. NOV.

LSIDurn:lsid:zoobank.org:act:D65F2F2C-3972-4363-8E2A-0BC145B18795

Holotype: A preserved specimen at the National Museum of Natural History, Smithsonian Institution (USNM), Washington, DC, United States of America, Amphibians and Reptiles collection specimen number 121216 collected from Dobadura, Northern Province, Papua New Guinea, Latitude -8.7708 S., Longitude 148.375 E.

This facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Natural History, Smithsonian Institution (USNM), Washington, DC, United States of America, Amphibians and Reptiles collection specimen number 269421, collected from 7 miles north of Kokoda, Northern Province, Papua New Guinea, Latitude -8.7785 S., Longitude 147.741.

Diagnosis: *Moechaeanura* (*Moechaeanura*) *albatermacula sp. nov.* and *M. tritong sp. nov*. have until now been treated as a Papua New Guinea populations of *M. nigropunctatus* (Meyer, 1874), with a type locality of Japen Island, West Papua, Indonesia, better known to most people as *Litoria nigropunctatus* (Meyer, 1874).

M. tritong sp. nov. and *M. albatermacula sp. nov*. would key out as *M. nigropunctatus* in Tyler (1968) in terms of separation from all other New Guinea species of Tree Frogs. However *M. tritong sp. nov.* from Western Province, Papua New Guinea and *M. albatermacula sp. nov*. from the northern foothills of the Owen Stanley Range, Papua New Guinea are readily separated from *M. nigropunctatus* as follows:

M. tritong sp. nov. has a grey-green dorsum without marks, except for a yellow patch above the axilla. Ventral surface is white except for the intense yellow below the limbs and concealed surfaces of the limbs. The dark patch at the jaw angles.

M. albatermacula sp. nov. has a dorsum that is a lichenous grey-brown with ill-defined black spots; lower limbs are white with dark black cross bars; concealed surfaces of the thighs and posterior of the belly are a brilliant golden yellow.

M. nigropunctatus is readily separated from the other two species by being grey-green to grey-brown dorsally with well-defined green or brown spotting or marks, especially on the limbs, hands and feet; concealed surfaces of the thighs, groins and axillae are brilliant orange; ventral surface white; lateral sides of throat lightly or heavily spotted black; iris is gold and with heavy black veins.

M. nigropunctatus, *M. tritong sp. nov.* and *M. albatermacula sp. nov*. are readily separated from all other Tree Frogs in New Guinea by the following suite of characters: The head is moderately flattened and longer than broad (HL/HW 1.033-1.077), its length slightly or considerably more than one third of the snout to vent length (HL/S-V 0.334-0.366). The snout is not prominent; when viewed from above and in profile it is gently rounded.

The nostrils are lateral, their distance from the tip of the snout less than that from the eye. The canthus rostralis is curved and only slightly defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-quarter to one-half of the eye diameter. The vomerine teeth are reduced to a single or pair of teeth near each choana and are not elevated. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with fairly prominent lateral fringes and paired sub-articular tubercles; in decreasing order of length 3>4>2>1. The webbing reaches midway up the terminal phalanx on the fourth finger.

The terminal discs are prominent.

The hind limbs are moderate with a TL/S-V ratio of 0.526-0.566. Toes in decreasing order of length 4>5 >3>2>1. The webbing reaches the base of the disc of all toes, except the fourth where it extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx.

The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth but for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Distribution: *M. albatermacula sp. nov*. is only definitively known from the Northern Province of Papua New Guinea near where the holotype and paratype were caught.

Etymology: In Latin "*alba ater macula*" literally means pale black spots and so the name *albatermacula* literally means that same thing and refers to the dorsal colouration of the species.

MOECHAEANURA* (*TELEATER*) *SPICA SP. NOV.

LSIDurn:lsid:zoobank.org:act:B5929C08-060F-44E5-BA4A-84AFF569BEFD

Holotype: A preserved adult male specimen at the Museum Zoologie Bogor, Indonesia, specimen number MZB Amphibians 11823 caught in forest adjacent to Tin River, Mamberamo Drainage, Papua, Indonesia, Latitude -3.1730 S., Longitude 134.3453 E.

This facility allows access to its holdings.

Diagnosis: The holotype of this species *Moechaeanura spica sp. nov.* was the paratype for the similar species originally described as *Litoria richardsi* Dennis and Cunningham, 2006, but now placed in the genus *Moechaeanura gen. nov.*. Their holotype was an adult female collected at 5.5 km west of Tabubil township, Western Province, Papua New Guinea, Latitude -5.1730 S., Longitude 141.1155 E.

Dennis and Cunningham (2006) concluded that they were of opposite sexes of the same species, but this is not the contention here.

Both specimens were morphologically distinct from one another and the noting that closely related species do not show significant sexual dimporphism to anywhere near the extent seen between the two relevant specimens, one is forced to conclude that they are in fact separate

species. Furthermore, the two specimens come from different bio-regions, with one being from north of the central New Guinea cordillera and the other from the south. This also leads to a reasonable inference that the two frogs would be of different species, even in the absence of strong morphological divergence. In combination these two elements are compelling evidence for two species being involved and not just one.

Moechaeanura spica sp. nov. is readily separated from *M. richardsi* (Dennis and Cunningham, 2006) by having little if any webbing between the first and second fingers, versus webbing that goes to the first finger disc and nearly the second finger disc in *M. richardsi.*

The dorsum of *M. spica sp. nov.* is a light grey colour overlain with scattered yellowish brown irregular markings, with a limited number of chocolate brown spots and blotches, mainly on the flanks. There are areas of bright yellow in the groin. Forearms have few if any dark brown or black markings. The cross-bands on the upper hind legs are thick, brown in colour and mainly complete. The white tipped tubercles on the sides of body and to a lesser extent elsewhere are of moderate size. The tympanum is mainly brown. The iris is pink and brown.

By contrast *M. richardsi* has a relatively dark blue-grey dorsum, with irregular black markings forming cross bands across the body and also and huge areas of bright yellow in the groin. Forearms have numerous black markings. The cross-bands on the upper hind legs are thin, black in colour, mainly broken and mainly incomplete. The white tipped tubercles on the sides of body and to a lesser extent elsewhere are large and prominent. The tympanum is mainly blue. The iris is yellow and grey.

Both *M. spica sp. nov.* and *M. richardsi* constituting the entirety of the subgenus *Telaater subgen. nov.* are separated from all other Tree Frogs in New Guinea and Australia by a combination of black webbing on the feet, venter with large areas of black, white and yellow, a small size being less than 30 mm snout vent length in both sexes and a transparent periphery on the tympanic membrane.

Areas where both *M. spica sp. nov.* and *M. richardsi* are known to occur in are regions of severe habitat degradation and explosive human population growth and further research on these species should be conducted as a matter of urgency.

Colour photos of both *M. spica sp. nov.* and *M. richardsi* in life are depicted in Dennis and Cunningham (2006) on page 66 (*M. spica sp. nov.* in photo “B”).

Distribution: *M. spica sp. nov.* is known only from the type locality at Tin River, Mamberamo Drainage, Papua, Indonesia.

Etymology: The name **“***spica*” means “spikey” in Latin in reference to the tubercles on the upper flanks and other parts of the frog’s body.

ORNATANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:C857380D-A567-4F6E-A3C5-298B91B032A8

Type species: *Hyla modica* Tyler, 1968.

Diagnosis: The species in the genus *Ornatanura gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suites of characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818).

The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling.

The anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being, 1/ Liberally spotted with white, 2/

Hoser 2020 - Australasian Journal of Herpetology 44-46:1-192.

Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

According to Duellman *et al*. (2016), the genus *Ornatanura gen. nov.* diverged from its nearest living relatives in the divergent genus *Hopviridi gen. nov*. 12.1 MYA, in turn diverged as a pair from their next nearest living relatives in the genera *Bellarana gen. nov*. and *Angularanta gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Species of *Ornatanura gen. nov.* are abundant in lower montane forests in geologically more ancient ranges and uplands of New Guinea from the far south-east to far north-west.

Etymology: The etymology of the new genus *Ornatanura* is simply a reference in Latin to the fact that the species in this genus are ornate frogs.

Content: *Ornatanura modica* (Tyler, 1968) (type speces); *O. parsviridis sp. nov.*; *O. parscinereo sp. nov.*; *O. leucopicturas sp. nov.*

ORNATANURA LEUCOPICTURAS SP. NOV.

LSIDurn:lsid:zoobank.org:act:CE695639-BD80-4EF6-B1A1-B34D57C22B6D

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.23566 collected from Wharton Range, Central Province, Papua New Guinea, Latitude -8.33 S., Longitude 147.15 E.

This government-owned facility allows access to their holdings.

Diagnosis: The three species *O. leucopicturas sp. nov.*, *O. parscinereo sp. nov.* and *O. parsviridis sp. nov.* are all similar in most respects to *O. modica* (Tyler, 1968) and like *O. modica* conform to the genus diagnosis for *Ornatanura gen. nov.*.

The four preceding species are separated from one another as follows.

The species *Ornatanura parsviridis sp. nov.* from Madang is similar in most respects to *O. modica* (Tyler, 1968), but is readily separated from that taxon as well as *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov*. by the following suite of colouration character and morphology traits: Flanks are light greenish in colour overlain with about 6 large black spots or blotches (sometimes merged), in turn edged with thick white lines, dorsal surface of the hindlimbs are medium brown with indistinct dark brown to black crossbands. Upper forearms are barred with white on a dark background. Small blunt tubercles scattered across all parts of the dorsum and limbs, and only a small percentage are white tipped. The tympanum is less than a third of the diameter of the eye.

By contrast *O. modica* from the higher elevation areas in the region bound by the Star Mountain, West Papua and the Eastern Highlands Province in Papua New Guinea, mainly from upper reaches of south flowing drainages, has flanks that are greenish in colour and liberally spotted with white. Markings on the upper forearms are indistinct and blotches on the upper surfaces of the hind limbs do not form indistinct or obvious bands. The skin on the dorsal surface of the head, body and limbs is smooth but for a few small and only slightly developed tubercles on the scapular region. The tympanum is slightly more than a third of the diameter of the eye.

The species *O. parscinereo sp. nov.* from Utikini Village, At Waa River in the Tembagapura Area, West Papua is separated from *O. parsviridis sp. nov.*, *O. modica* and *O. leucopicturas* by having a dorsum with numerous scattered and large tubercles that are the same colour as the skin surrounding them. There are no distinctive markings on upper surfaces of limbs, green on the dorsum is restricted to the upper surface of the head anterior to the eyes, which also has some dark peppering on it and similarly peppered green on the upper surfaces of the arms, save for scattered green spots elsewhere. The tympanum is less than a third of the diameter of the eye.

The species *O. leucopicturas* from central Province, Papua New Guinea is readily separated from

O. parsviridis sp. nov., *O. parscinereo sp. nov.*, *O. modica* and *O. leucopicturas* by having a brownish grey dosum with numerous scattered black spots, as well as numerous areas of green, generally arranged in one or more irregular blotches forming a sort of longitudinal stripe, rich immaculate green on the upper snout anterior to the eyes; large black spots and blotches from the dorsum spread to the flanks, where their size generally increases but number decreases. There are scattered small tubercles all over the body, with a noticeable general absence on the head, save for an exceptionally large series of tubercles above each eye. Most are white or light tipped.

O. parsviridis sp. nov. in life is depicted in Menzies (2006) on plate 75.

The four preceding species, being the entirety of the genus *Hopviridi gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of

characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818). The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling. The

anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws, and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being, 1/ Liberally spotted with white, 2/ Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

Distribution: *O. leucopicturas sp. nov.* is known only from hilly areas in the Central Province of New Guinea, associated with the headwaters of south-flowing drainages.

Etymology: The new species name is taken directly from the Latin words "*leuco picturas*" which means "white markings" which accurately describes the dorsal colouration of the labial region and flanks of this species.

ORNATANURA PARSCINEREO SP. NOV.

LSIDurn:lsid:zoobank.org:act:F8ACAFF8-E95B-483B-8EBC-A266B291CD88

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.144550 collected from Utikini Village, At Waa River, Tembagapura Area, West Papua, Indonesia, Latitude -4.24 S., Longitude 137.08 E.

This government-owned facility allows access to their holdings.

Diagnosis: The three species *O. parscinereo sp. nov.*, *O. parsviridis sp. nov.* and *O. leucopicturas sp. nov.* are all similar in most respects to *O. modica* (Tyler, 1968) and like *O. modica* conform to the genus diagnosis for *Ornatanura gen. nov.*.

The four preceding species are separated from one another as follows.

The species *Ornatanura parsviridis sp. nov.* from Madang is similar in most respects to *O. modica* (Tyler, 1968), but is readily separated from that taxon as well as *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov.* by the following suite of colouration character and morphology traits: Flanks are light greenish in colour overlain with about 6 large black spots or blotches (sometimes merged), in turn edged with thick white lines, dorsal surface of the hindlimbs are medium brown with indistinct dark brown to black crossbands. Upper forearms are

barred with white on a dark background. Small blunt tubercles scattered across all parts of the dorsum and limbs, and only a small percentage are white tipped. The tympanum is less than a third of the diameter of the eye.

By contrast *O. modica* from the higher elevation areas in the region bound by the Star Mountain, West Papua and the Eastern Highlands Province in Papua New Guinea, mainly from upper reaches of south flowing drainages, has flanks that are greenish in colour and liberally spotted with white. Markings on the upper forearms are indistinct and blotches on the upper surfaces of the hind limbs do not form indistinct or obvious bands. The skin on the dorsal surface of the head, body and limbs is smooth but for a few small and only slightly developed tubercles on the scapular region. The tympanum is slightly more than a third of the diameter of the eye.

The species *O. parscinereo sp. nov.* from Utikini Village, At Waa River in the Tembagapura Area, West Papua is separated from *O. parsviridis sp. nov.*, *O. modica* and *O. leucopicturas* by having a dorsum with numerous scattered and large tubercles that are the same colour as the skin surrounding them. There are no distinctive markings on upper surfaces of limbs, green on the dorsum is restricted to the upper surface of the head anterior to the eyes, which also has some dark peppering on it and similarly peppered green on the upper surfaces of the arms, save for scattered green spots elsewhere. The tympanum is less than a third of the diameter of the eye.

The species *O. leucopicturas* from central Province, Papua New Guinea is readily separated from *O. parsviridis sp. nov.*, *O. parscinereo sp. nov.*, *O. modica* and *O. leucopicturas* by having a brownish grey dosum with numerous scattered black spots, as well as numerous areas of green, generally arranged in one or more irregular blotches forming a sort of longitudinal stripe, rich immaculate green on the upper snout anterior to the eyes; large black spots and blotches from the dorsum spread to the flanks, where their size generally increases but number decreases. There are scattered small tubercles all over the body, with a noticeable general absence on the head, save for an exceptionally large series of tubercles above each eye. Most are white or light tipped.

O. parsviridis sp. nov. in life is depicted in Menzies (2006) on plate 75.

The four preceding species, being the entirety of the genus *Hopviridi gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818). The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling. The anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws, and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being 1/ Liberally spotted with white, 2/ Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently

longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

Distribution: *O. parscinereo sp. nov.* is known only from hilly areas west of the headwaters of the Lorentz River in West Papua, Indonesia.

Etymology: The new species name is taken directly from the Latin words "*pars cinereo*" which means "partly grey" which accurately describes the dorsal colouration of this species.

ORNATANURA PARSVIRIDUS SP. NOV.

LSIDurn:lsid:zoobank.org:act:D0BEEEDF-C48E-4A81-BC95-DDB678CC7DE7

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.31051 collected from Wau, on the Eddie Creek Road, Morobe Province, Papua New Guinea, Latitude -7.24 S., Longitude 146.40 E.

This government-owned facility allows access to their holdings.

Diagnosis: The three species *O. parsviridis sp. nov.*, *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov*. are all similar in most respects to *O. modica* (Tyler, 1968) and like *O. modica* conform to the genus diagnosis for *Ornatanura gen. nov.*.

The four preceding species are separated from one another as follows.

The species *Ornatanura parsviridis sp. nov.* from Madang is similar in most respects to *O. modica* (Tyler, 1968), but is readily separated from that taxon as well as *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov*. by the following suite of colouration character and morphology traits: Flanks are light greenish in colour overlain with about 6 large black spots or blotches (sometimes merged), in turn edged with thick white lines, dorsal surface of the hindlimbs are medium brown with indistinct dark brown to black crossbands. Upper forearms are barred with white on a dark background. Small blunt tubercles scattered across all parts of the dorsum and limbs, and only a small percentage are white tipped. The tympanum is less than a third of the diameter of the eye.

By contrast *O. modica* from the higher elevation areas in the region bound by the Star Mountain, West Papua and the Eastern Highlands Province in Papua New Guinea, mainly from upper reaches of south flowing drainages, has flanks that are greenish in colour and liberally spotted with white. Markings on the upper forearms are indistinct and blotches on the upper surfaces of the hind limbs do not form indistinct or obvious bands. The skin on the dorsal surface of the head, body and limbs is smooth but for a few small and only slightly developed tubercles on the scapular region. The tympanum is slightly more than a third of the diameter of the eye.

The species *O. parscinereo sp. nov.* from Utikini Village, At Waa River in the Tembagapura Area, West Papua is separated from *O. parsviridis sp. nov.*, *O. modica* and *O. leucopicturas* by having a dorsum with numerous scattered and large tubercles that are the same colour as the skin surrounding them. There are no distinctive markings on upper surfaces of limbs, green on the dorsum is restricted to the upper surface of the head anterior to the eyes, which also has some dark peppering on it and similarly peppered green on the upper surfaces of the arms, save for scattered green spots elsewhere. The tympanum is less than a third of the diameter of the eye.

The species *O. leucopicturas* from central Province, Papua New Guinea is readily separated from

O. parsviridis sp. nov., *O. parscinereo sp. nov.*, *O. modica* and *O. leucopicturas* by having a brownish grey dosum with numerous scattered black spots, as well as numerous areas of green, generally arranged in one or more irregular blotches forming a sort of longitudinal stripe, rich immaculate green on the upper snout anterior to the eyes; large black spots and blotches from the dorsum spread to the flanks, where their size generally increases but number decreases. There are scattered small tubercles all over the body, with a noticeable general absence on the head, save for an exceptionally large series of tubercles above each eye. Most are white or light tipped.

O. parsviridis sp. nov. in life is depicted in Menzies (2006) on plate 75.

The four preceding species, being the entirety of the genus *Hopviridi gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818). The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling. The anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its

diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws, and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being 1/ Liberally spotted with white, 2/ Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

Distribution: *O. parsviridis sp. nov.* is presently only known from Madang, Papua New Guinea.

Etymology: The new species name is taken directly from the Latin words “pars” meaning some, or partly and the word “viridis” which means green. This reflects the reality that most specimens of these frogs have some green in their colour, but they are never wholly green.

NASUSCUSPIS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:ABB692F7-77D0-47C0-86BE-9EC2A41BEC8A

Type species: *Hyla prora* Menzies, 1969.

Diagnosis: Species within the genus *Nasuscuspis gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are montane species, growing to a maximum of 50 mm snout vent length in females and males to 45 mm. The dorsum is a mixture of greys, greenish greys and ochres. The fingers and toes are extensively webbed. There are highly developed dermal appendages including crenulated ridges on the posterior surfaces of the radius and tarsus, prominent dermal folds above the vent; a row of very large tubercles on the undersurface of the mandible and an elongate rostral, dermal spike always in males and females although in some reduced form in females of some species.

Duellman *et al.* (2016) found that species in the genus *Nasuscuspis gen. nov.* diverged from nearest living relatives 13.4 MYA, being members of the genus *Moechaeanura gen. nov.*. In turn both these genera as a pair diverged from the morphologically similar genera *Incertanura gen. nov.*, *Inlustanura subgen. nov.* and *Variabilanura gen. nov.* 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

The species name “*Litoria rostandi* Kraus, 2007” is an illegally coined junior synonym of “*Litoria hilli* Hiaso and Richards, 2006 improperly created by the serial taxonomic vandal Fred Kraus, best known for scamming millions of dollars in US Government research grants that he uses for personal self-gratification and then justifies via the repeated stealing of work from other others in is acts of taxonomic vandalism.

While US Government authorites are aware of his highly illegal activities, he continues (in 2020) to operate with corrupt protection from within the US government, giving him immunity from prosecution in the same way that police officers in the USA can kill unarmed black people without risk of being charged and convicted fo such crimes.

Distribution: *Nasuscuspis gen. nov.* species are known from scattered highland locations in various parts of Papua New Guinea and Irian Jaya, Indonesia.

Etymology: In Latin, the genus name “*Nasuscuspis*” means “nose pointed” as fits the case for adult males and many adult females in the genus.

Content: *Nasuscuspis prora* (Menzies, 1969) (type species); *N. chrisdahli* (Richards, 2007); *N. humboldtorum* (Günther, 2006); *N. hilli* (Hiaso and Richards, 2006).

ROTUNDAURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:264E5827-AA91-421E-91D2-F56901121E9E

Type species: *Hyla jeudii* Werner, 1901.

Diagnosis: Known only from the type specimen collected in the north of New Guinea, this species (and genus) do not conform to any other in New Guinea or Australia and is therefore placed in a monotypic genus *Rotundaura gen. nov.*.

Rotundaura gen. nov. is separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

A very high E-N/IN ratio (1.435), short limbs with a low TL/S-V ratio (0.482), wholly unwebbed fingers and incompletely webbed toes characterise this species. The head is long and flattened and longer than broad (HL/HW 1.073), its length more than one-third of the snout to vent length (HL/S-V 0.355). The snout is rather prominent, gently rounded when viewed from above and strongly rounded in profile. The nostrils are more superior than lateral, their distance from the end of the snout about one-half that from the eye and separated from each other by a distance which is equivalent to approximately two-thirds of the eye to naris distance (E-N/IN 1.435). The canthus rostralis is straight and inconspicuous and the loreal region oblique. The eye is small, its diameter less than the eye to naris distance. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter and separated from the eye by a distance equivalent to approximately one-half its own diameter. The vomerine teeth are in two obliquely oval series in juxtaposition on the midline between the small, obliquely oval choanae. The tongue is small, triangular and very feebly indented on its posterior border. The fingers are long, slender and unwebbed. The terminal discs are large and the sub-articular tubercles prominent. The fingers in decreasing order of length 3>4>2>1. The hind limbs are short with a TL/S-V ratio of 0.482. The toes are incompletely webbed, the webbing reaching the base of the penultimate phalanx on the fourth toe and half-way up the penultimate phalanx of the fifth. Toes in decreasing order of length 4>5=3>2>1. The skin on the dorsal surfaces of the head and body is smooth but for a few flattened tubercles on the back. The throat is smooth and the chest, abdomen and back of the thighs are coarsely granular. There is an inconspicuous supratympanic fold barely obscuring any of the tympanum and a pronounced skin fold across the chest. There is neither a tarsal ridge nor a dermal appendage on the heel. Dimensions: Of gravid female holotype are snout-vent 33.2 mm; tibia length 15.8 mm; head length 11.8 mm; head width 11.0 mm; eye to naris distance 3.3 mm; internarial span 2.3 mm; eye diameter 3.1 mm; tympanum diameter 2.0 mm. The dorsal surfaces of the head and body and limbs are a very pale brown with indistinct darker and lighter marbling. Marbling is present and most conspicuous on the dorsal surface of the thigh and tibia.

The ventral surfaces of the body and limbs are dull cream with an irregular brown patch on the throat (modified from Tyler 1978).

Specimens of the morphologically similar *Llewellynura* Wells and Wellington, 1985 are readily separated by their much smaller adult size of less than 25 mm adult body length.

Species of *Rotundaura gen. nov*. are separated from the genus *Summaviridis gen. nov.* by the tympanum being fully exposed and round, versus the upper surface being cut at the rear by a well-defined and prominent skin fold forming a straight line and a significantly blunter snout in *Rotundaura gen. nov*. versus pointed, when both are viewed in profile side-on.

Distribution: The holotype and sole known representative of this genus is believed to be from northern New Guinea somewhere in the vicinity of Madang (Tyler, 1978).

Etymology: The name *Rotundaura* is derived from Latin and refers to the visible round ear (tympanum) in the sole species in the genus.

Content: *Rotundaura jeudii* (Werner, 1901).

VARIABILANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:573588FF-F254-4979-AD95-1D9F134A7B34

Type species: *Hyla iris* Tyler, 1962.

Diagnosis: The genus *Variabilanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small montane species (males 24.3-34.1 mm; females 30.1-43 mm in SV). In life they are green, usually with yellow spots or markings (in preservative the dorsal surface is blue, usually with darker and occasionally lighter markings). There is usually a deep violet, orange, yellow or red patch in the groin and similarly coloured markings occur on the axilla, posterior surface of the thighs, tibia and tarsus.

The head is as broad as long or longer than broad (HL/HW 0.910-1.192), its length less than or greater than one-third of the snout to vent length (HL/S-V 0.328-0.384). The shape of the snout is highly variable, being from prominent to inconspicuous and strongly or only slightly rounded when viewed from above and in profile. The nostrils are lateral in specimens with prominent snouts and more lateral than superior in specimens with inconspicuous snouts. The nares are very much nearer the eye than the tip of the snout in the latter individuals and almost equidistant in the former. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.667-0.965). The canthus rostralis is curved and slightly or well defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-third to slightly less than one-half the eye diameter. Vomerine teeth are present in the majority of specimens and confined to small circular series on slight elevations between the choanae. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with very slight lateral fringes; in decreasing order of length 3>4>2>1. The webbing reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are prominent. The hind limbs are variable with a TL/S-V ratio of 0.485-0.587. Toes in decreasing order of length 4>5>3>2>1. The webbing between the toes reaches the base of the disc of all toes, except the fourth

where it reaches the tubercle at the base of the penultimate phalanx. The skin on the dorsal surface of the head, body and limbs is minutely roughened. The throat and chest are slightly granular. There are a row of tubercles on the posterior surface of the forearm, and conspicuous tubercles below the anus. Femoral tubercles are usually present. The supra-tympanic fold is inconspicuous. In preservative and in life, dull orange patches may extend on to the dorsum in the axillary region.

The lateral surfaces of the body are frequently heavily pigmented with black or deep yellow (in life, being violet in preservative), marked with large white patches. There is invariably a yellow, orange, red or violet patch in the groin (in life) and the same colouration may be present in the axilla and on the posterior surface of the tibia and tarsus. There is a white patch beneath the eye extending to the angle of the jaws or on the lateral surfaces of the body. The ventral surface of the body is cream to white (white in subgenus *Sudesanura subgen. nov.*), with or without sparse blue stippling on the throat near the angle of the jaws. The lower surface of the hind limbs is creamish yellow or dull yellow. These species are often beautifully pigmented in life being marked with cream, orange, yellow, green, violet and black (Tyler, 1962).

The ovum is pale green in colour and has a diameter of approximately 2.5 mm. The ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements. The mouth is anterior in position, and surrounded by a band of papillae on the inferior and lateral borders. There are two upper and three lower rows of labial teeth.

Species in the subgenus *Sudesanura subgen. nov.* (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

Species within *Sudesanura subgen. nov.* are further defined as follows: Small (SV max. 30.05 mm); head narrow (average HL/HW 1.08); Head always longer than wide (average HL/HW>1.0) except in females, which lack the rostral spike, where HL=HW; canthus rounded, concave, lores oblique, nostrils more or less lateral, widely placed (average EN/IN 0.63 in males and EN/IN 0.54 in females); snout with a prominent pointed rostral spike; vomerine teeth absent; eye large (EY/SV 0.11); tympanum visible, upper margin covered by skin fold. Fore limb with indistinct row of raised tubercles down outer side; hind limb without heel lappets or other dermal appendages; fingers half-webbed, toes fully webbed; subarticular tubercles poorly developed. Legs always long (average TL/SV>0.54). Dorsum usually immaculate, bright pale green, yellow or fawn brown reduced to a very narrow band on the thighs and ceasing at ankle and wrist, leaving hands and feet virtually colourless; concealed thighs and axillae bright cherry-red; white band on upper lip, snout to axilla; raised tubercles on fore limb white; ventral surfaces pure white.

According to Duellman *et al.* (2016), the species within *Variabilanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Inlustanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

According to Duellman *et al.* (2016), the subgenus *Sudesanura subgen. nov.* diverged from the nominate genus 12 MYA.

The type species for *Sudesanura subgen. nov.*, being "*Litoria havina* Menzies, 1993" as currently understood by most authors, is in fact a number of morphologically similar and closely related species.

Distribution: New Guinea mainly in the mountainous areas and adjacent foothills.

Etymology: Species within this genus can be quite variable in colouration, including depending on time of day and with variation in body temperature and they are frogs, so therefore the genus name *Variabilanura* reflects both.

Content: *Variabilanura iris* (Tyler, 1962) (type species); *V. tomcottoni sp. nov.*; *V. havina* (Menzies, 1993); *V. majikthise* (Johnston and Richards, 1994); *L. mucro* (Menzies, 1993); *L. mareku* (Günther 2008); *L. ollauro* (Menzies, 1993).

SUDESANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:4A1CB6B5-C8FF-47EC-B94D-D22439DB3242

Type species: *Litoria havina* Menzies, 1993.

Diagnosis: Species in the subgenus *Sudesanura subgen. nov.* (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus (*Variabilanura subgen. nov.*) by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

The genus *Variabilanura gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small montane species (males 24.3-34.1 mm; females 30.1-43 mm). In life they are green, usually with yellow spots or markings (in preservative the dorsal surface is blue, usually with darker and occasionally lighter markings). There is usually a deep violet, orange, yellow or red patch in the groin and similarly coloured markings occur on the axilla, posterior surface of the thighs, tibia and tarsus. The head is as broad as long or longer than broad (HL/HW 0.910-1.192), its length less than or greater than one-third of the snout to vent length (HL/S-V 0.328-0.384). The shape of the snout is highly variable, being from prominent to inconspicuous and strongly or only slightly rounded when viewed from above and in profile. The nostrils are lateral in specimens with prominent snouts and more lateral than superior in specimens with inconspicuous snouts. The nares are very much nearer the eye than the tip of the snout in the latter individuals and almost equidistant in the former.

The distance between the eye and the naris is less than the internarial span (E-N/IN 0.667-0.965). The canthus

rostralis is curved and slightly or well defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-third to slightly less than one-half the eye diameter. Vomerine teeth are present in the majority of specimens, and confined to small circular series on slight elevations between the choanae. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with very slight lateral fringes; in decreasing order of length 3>4>2>1. The webbing reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are prominent. The hind limbs are variable with a TL/S-V ratio of 0.485-0.587. Toes in decreasing order of length 4>5>3>2>1. The webbing between the toes reaches the base of the disc of all toes, except the fourth where it reaches the tubercle at the base of the penultimate phalanx. The skin on the dorsal surface of the head, body and limbs is minutely roughened. The throat and chest are slightly granular. There are a row of tubercles on the posterior surface of the forearm, and conspicuous tubercles below the anus. Femoral tubercles are usually present. The supra-tympanic fold is inconspicuous. In preservative and in life, dull orange patches may extend on to the dorsum in the axillary region.

The lateral surfaces of the body are frequently heavily pigmented with black or deep yellow (in life, being violet in preservative), marked with large white patches. There is invariably a yellow, orange, red or violet patch in the groin (in life) and the same colouration may be present in the axilla and on the posterior surface of the tibia and tarsus. There is a white patch beneath the eye extending to the angle of the jaws or on the lateral surfaces of the body. The ventral surface of the body is cream to white (white in subgenus *Sudesanura subgen. nov.*), with or without sparse blue stippling on the throat near the angle of the jaws. The lower surface of the hind limbs is creamish yellow or dull yellow. These species are often beautifully pigmented in life being marked with cream, orange, yellow, green, violet and black (Tyler, 1962).

The ovum is pale green in colour and has a diameter of approximately 2.5 mm.

The ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen.

A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements. The mouth is anterior in position, and surrounded by a band of papillae on the inferior and lateral borders.

There are two upper and three lower rows of labial teeth.

As already mentioned, species in the subgenus *Sudesanura subgen. nov.* (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

Species within *Sudesanura subgen. nov.* are further defined as follows: Small (SV max. 30.05 mm); head narrow (average HL/HW 1.08); Head always longer than wide (average HL/HW>1.0) except in females, which lack the rostral spike, where HL=HW; canthus rounded, concave, lores oblique, nostrils more or less lateral, widely placed (average EN/IN 0.63 in males and EN/IN 0.54 in females); snout with a prominent pointed rostral spike; vomerine teeth absent; eye large (EY/SV 0.11); tympanum visible, upper margin covered by skin fold. Fore limb with indistinct row of raised tubercles down outer side; hind limb without heel lappets or other dermal appendages; fingers half-webbed, toes fully webbed; subarticular tubercles poorly developed. Legs always long (average TL/SV>0.54). Dorsum usually immaculate, bright pale green, yellow or fawn brown reduced to a very narrow band on the thighs and ceasing at ankle and wrist, leaving hands and feet virtually colourless; concealed thighs and axillae bright cherry-red; white band on upper lip, snout to axilla; raised tubercles on fore limb white; ventral surfaces pure white.

According to Duellman *et al.* (2016), the species within *Variabilanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Inlustanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

According to Duellman *et al.* (2016), the subgenus *Sudesanura subgen. nov.* diverged from the nominate genus 12 MYA.

The type species for *Sudesanura subgen. nov.*, being "*Litoria havina* Menzies, 1993" as currently understood by most authors, is in fact a number of morphologically similar and closely related species.

From photos of the various regional forms alone this contention is clearly supported.

Due to the extreme urgency in which species of frog need to be formally identified and named in the New Guinea region, as in before human population growth and associated issues cause their demise and extinction, I seriously considered naming two outlier forms of putative *V. havina* as new species herein on the basis of previously published photos.

Heeding the advice of Krell and Marshall (2017), I have refrained from doing so.

However I take this opportunity to urge those who do have access to specimens of these frogs, to immediately obtain specimens and lodge them with a State or National Museum and then formally describe them so that proper conservation management plans can be enacted.

Refer also to the statements in Hoser (2019a, 2019b).

Distribution: *Sudesanura subgen. nov.* species are found in New Guinea mainly in the mountainous areas and adjacent foothills.

Etymology: *Sudes* in Latin means "spike", while "anura" means frog and therefore the new genus name *Sudesanura* literally means spike frog, in reference to the rostral appendage in males.

Content: *Variabilanura* (*Sudesanura*) *havina* (Menzies, 1993) (type species) (treated herein as monotypic, but in fact a group of species).

VARIABILANURA* (*VARIABILANURA*) *TOMCOTTONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:BB6A8CEF-84A4-40CB-9679-626F97E9DCFD

Holotype: A preserved specimen at the Museum of Natural History, London, United Kingdom, specimen number 1980.630-634 collected at the banks of Lake Trist, Kuper Range, Morobe Province, Papua New Guinea.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Museum of Natural History, London, United Kingdom, specimen number 1980.635-637 collected at the banks of Lake Trist, Kuper Range, Morobe Province, Papua New Guinea.

Diagnosis: *Variabilanura tomcottoni sp. nov*. has until now been treated as an eastern population of *V. iris* (Tyler, 1962), but can be separated from that species by having generally unmarked and translucent toes in adults and a slightly larger tympanum, versus marked toes in adult *V. iris* and more reduced tympanum. Outside of these differences, there are general differences between the forms, including a greater preponderance of mainly brown and green coloured specimens in *V. tomcottoni sp. nov*. versus mainly with green and not necessarily brown in *V. iris*, but in both species the variation between specimens and various colour morphs within a single site is significant.

That both populations are also reproductively isolated across the Wau-Bulolo area and likely to have been so for an extended geological time, gives me no hesitation in describing *V. tomcottoni sp. nov*. as a new species being different to the type form of *V. iris* from the south-side of the main central cordillera.

Both *V. tomcottoni sp. nov*. and *V. iris* are readily separated from all other species in the genus *Variabilanura gen. nov.* by the following unique suite of characters: Small species (male average SV 24-36 mm, female average SV 34-43 mm); legs short to long (TL/SV 0.46-0.63); head about as broad as long (HL/HW 0.91-1.06); nostrils moderately widely spaced (EN/IN 0.77-0.97); snout truncate to slightly pointed in profile; eye large; tympanum usually visible but small.

Dorsum is green, green-and-brown or entirely brown and always mottled with black or darker green. Occasionally the body is with scattered white spots and a white lateral stripe commencing below the eye. In life it appears that no two examples are exactly alike but they can be divided into four main morphotypes: (a) dark green, with indistinct black reticulation; (b) pale green, with distinct fine or coarse black reticulation; (c) pale green, with distinct fine or coarse black reticulation, but also the green has patches of brown; and (d) mostly brown, with distinct fine or coarse black reticulation. The ventral surface is white, tending to creamy posteriorily and on the hind limbs. The concealed parts of the thighs are basically purple-blotched white, or white and red, or white and pale blue, these colours sometimes meeting below abdomen and thighs.

There is invariably a violet patch in the groin, and often in the axilla as well, and this may be interrupted with blue or white spots or the patch may extend along the side of the body between dorsal green and ventral white.

The genus *Variabilanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small montane species (males 24.3-34.1 mm; females 30.1-43 mm). In life they are green, usually with yellow spots or markings (in preservative the dorsal surface is blue, usually with darker and occasionally lighter markings). There is usually a deep violet, orange, yellow or red patch in the groin and similarly coloured markings occur on the axilla, posterior surface of the thighs, tibia and tarsus. The head is as broad as long or longer than broad (HL/HW 0.910-1.192), its length less than or greater than one-third of the snout to vent length (HL/S-V 0.328-0.384). The shape of the snout is highly variable, being from prominent to inconspicuous and strongly or only slightly rounded when viewed from above and in profile. The nostrils are lateral in specimens with prominent snouts and more lateral than superior in specimens with inconspicuous snouts. The nares are very much nearer the eye than the tip of the snout in the latter individuals and almost equidistant in the former. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.667-0.965). The canthus rostralis is curved and slightly or well defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-third to slightly less than one-half the eye diameter. Vomerine teeth are present in the majority of specimens and confined to small circular series on slight elevations between the choanae. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with very slight lateral fringes; in decreasing order of length 3>4>2>1. The webbing reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are prominent. The hind limbs are variable with a TL/S-V ratio of 0.485-0.587. Toes in decreasing order of length 4>5>3>2>1. The webbing between the toes reaches the base of the disc of all toes, except the fourth where it reaches the tubercle at the base of the penultimate phalanx. The skin on the dorsal surface of the head, body and limbs is minutely roughened. The throat and chest are slightly granular. There are a row of tubercles on the posterior surface of the forearm and conspicuous tubercles below the anus. Femoral tubercles are usually present. The supra-tympanic fold is inconspicuous. In preservative and in life, dull orange patches may extend on to the dorsum in the axillary region.

The lateral surfaces of the body are frequently heavily pigmented with black or deep yellow (in life, being violet in preservative), marked with large white patches. There is invariably a yellow, orange, red or violet patch in the groin (in life) and the same colouration may be present in the axilla and on the posterior surface of the tibia and tarsus. There is a white patch beneath the eye extending to the angle of the jaws or on the lateral surfaces of the body. The ventral surface of the body is cream to white (white in subgenus *Sudesanura subgen. nov.*), with or without sparse blue stippling on the throat near the angle of the jaws. The lower surface of the hind limbs is

creamish yellow or dull yellow. These species are often beautifully pigmented in life being marked with cream, orange, yellow, green, violet and black (Tyler, 1962).

The ovum is pale green in colour and has a diameter of approximately 2.5 mm. The ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water. The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements. The mouth is anterior in position, and surrounded by a band of papillae on the inferior and lateral borders. There are two upper and three lower rows of labial teeth.

Species in the subgenus *Sudesanura subgen. nov*. (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

Species within *Sudesanura subgen. nov*. are further defined as follows: Small (SV max. 30.05 mm); head narrow (average HL/HW 1.08); Head always longer than wide (average HL/HW>1.0) except in females, which lack the rostral spike, where HL=HW; canthus rounded, concave, lores oblique, nostrils more or less lateral, widely placed (average EN/IN 0.63 in males and EN/IN 0.54 in females); snout with a prominent pointed rostral spike; vomerine teeth absent; eye large (EY/SV 0.11); tympanum visible, upper margin covered by skin fold. Fore limb with indistinct row of raised tubercles down outer side; hind limb without heel lappets or other dermal appendages; fingers half-webbed, toes fully webbed; subarticular tubercles poorly developed. Legs always long (average TL/SV>0.54). Dorsum usually immaculate, bright pale green, yellow or fawn brown reduced to a very narrow band on the thighs and ceasing at ankle and wrist, leaving hands and feet virtually colourless; concealed thighs and axillae bright cherry-red; white band on upper lip, snout to axilla; raised tubercles on fore limb white; ventral surfaces pure white.

According to Duellman *et al.* (2016), the species within *Variabilanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Inlustanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

According to Duellman *et al.* (2016), the subgenus *Sudesanura subgen. nov*. diverged from the nominate genus 12 MYA.

The type species for *Sudesanura subgen. nov*., being "*Litoria havina* Menzies, 1993" as currently understood by most authors, is in fact a number of morphologically similar and closely related species.

Distribution: *V. tomcottoni sp. nov*. is known only from the type locality being the banks of Lake Trist, Kuper Range, Morobe Province, Papua New Guinea.

Etymology: The new species name "*tomcottoni*" is named in honour of Tom Cotton, formerly of Ringwood in Victoria in recognition of his many years work with the team at Snakebusters and Australia's best reptiles educating people with Australia's only hands on reptile shows that let people hold the animals and a significant amount of other critically important wildlife conservation work. Another species of tree frog named in honour of Tom Cotton has the nomen "*cottoni*".

DRYMONTANTINA SUBTRIBE NOV.

***DRYOMANTIS* PETERS, 1882**

Type species: *Drymomantis fallax* Peters, 1882.

Diagnosis: Frogs in the genus *Drymomantis* Peters, 1882 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: These are small elongated and agile frogs averaging about 25 mm in body length with moderately pointed snouts, varying somewhat between species; brown head streak present or absent; dorsal surface is uniform green or fawn, sometimes with darker flecks and with at most a paler vertebral zone; there is not a broad vertebral band of bronze bordered on either side with green; skin is smooth above; finely granular on the throat and coarsely granular below; at least one strong pectoral fold, no dorsolateral fold and no tubercles above each eye; fingers webbed at the base and toes moderately webbed. A moderate oval inner and small rounded outer metatarsal tubercle; vomerine teeth absent, or if present, the hind edge of vomerine teeth are between the choanae; first finger is much smaller than the second when pressed together, the top of the first finger reaching no further than the base of the disc of the second finger.

According to Duellman *et al.* (2016), the members of this genus diverged from their nearest living relatives 21.5 MYA.

Distribution: East coast of Australia.

Content: *Drymomantis fallax* Peters, 1882 (type species); *D. ausviridis sp. nov.*; *D. celantur sp. nov.*; *D. cooloolensis* (Liem, 1974); *D. glauerti* (Copland, 1957); *D. northdtradbrokeensis sp. nov.*; *D. olongburensis* (Liem and Ingram, 1977).

DRYMOMANTIS AUSVIRIDIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:FC390EC9-13B7-4C17-AFBE-AA22A6DB27AE

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J54722 collected at Cairns, Queensland, Australia, Latitude 16.9186 S., Longitude 145.7781 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J54723, J54727, J54730 and J54733 all collected at Cairns, Queensland, Australia, Latitude 16.9186 S., Longitide 145.7781 E.

Diagnosis: The putative species defined as "*Litoria fallax* (Peters, 1882)" as defined and separated from other species by Cogger (2014) and Anstis (2013) is found along the coast and ranges from southern New South Wales along the east Australian coast to the northern edge of the wet tropics in far north Queensland. However as far back as 1985, Wells and Wellington (1985) correctly resurrected from synonymy the taxon *Drymomantis glauerti* (Copland, 1957) (in this form) from the synonymy of *Litoria fallax* (Peters, 1882).

At the same time, Wells and Wellington resurrected from

synonymy of *Litoria* Tschudi, 1838 the genus *Drymomantis* Peters, 1882, as proposed for the species "*fallax*".

To make it clear, *D. fallax* has a type locality of Bowen, Mackay and Rockhampton, while *D. glauerti* has a type locality of Colo, north-west of Sydney, New South Wales.

Wells and Wellington (1985) have been consistently lampooned and vilified by the Wolfgang Wüster gang of thieves ever since 1985 (see for example a recent hate post by Wolfgang Wüster on the ICZN internet list server dated 6 May 2020, posted at 7:44 AM, UK time). In that post, he yet again implores people to ignore the taxonomy and nomenclature of Wells and Wellington (1985) and all other publications by them and to ignore or steal from the works of all other people the Wüster gang declare as not being within their gang.

Wüster and his his cohort harass and threaten others who dare to use the Wells and Wellington taxonomy including so far as committing acts of violence against them and telephone death threats to kill. See for example the threat to kill phone call by police-protected criminal Crystal Kniese made on 10 Feb 2019. This call was made from a blocked phone number, which was tape recorded and has been posted online at: http://www.smuggled.com/Gatt-Girlfriend-11-2-19-11-43-17_AM.m4a

The Wüster gang have been involved in attacks on private property, including for example a failed attempt to burn down this author's research facility with an incendiary attack, instigation of illegal and violent police raids on properties and other criminal actions.

This activity, described by Lynn Raw of the ICZN list server in 2020 as "Mafia" style misconduct has been successful in that most herpetologists have in the past 35 years been bludgeoned into not using the Wells and Wellington taxonomy or nomenclature, even when it is clearly correct.

Hal Cogger, author of numerous major works on Australian herpetofauna has even openly stated he often uses the Wüster gang taxonomy and nomenclature, knowing it to be illegal, unscientific and just plain "wrong" so that "I don't get getting threatening phone calls from them at strange hours of the night", as stated by him in a recorded phone call in 2018 (author's phone automatically records and archives all phone calls).

These actions by Wüster and his gang are not science, but rather a form of anarachy instead.

In terms of the taxonomic actions of Wells and Wellington taken with regards to the putative species *Drymomantis fallax* Peters, 1882, the science is clearly on the side of Wells and Wellington. These two men made their taxonomic judgement on the basis of some decades of field experience with the putative taxon from most areas it was known to occur and with good reason thought the Queensland animals were different from those on the central coast of New South Wales, as explicitly stated by them on page 5 of their paper Wells and Wellington (1985).

Unlike the Wüster gang, who have never stepped foot into a swamp in Eastern Australia to search for or inspect the relevant taxa, I have and on many occasions across a 50 year time span, having caught thousands of the relevant frogs from north of Cairns along the coast to southern New South Wales must agree with the conclusions of Wells and Wellington (1985) with regards to the relevant frogs.

I note herein that according to Duellman *et al.* (2016) the relevant species in the genus *Drymomantis* Peters, 1882 being the lineage of *Drymomantis fallax* Peters, 1882 and close relatives, diverged from their nearest living relatives assigned to other genera by 21.5 MYA, confiming the correct genus-level assignment by Wells and Wellington (1985).

The name *Drymomantis* was a creation of Wilhelm Karl Hartwich (or Hartwig) Peters, a prominent German herpetologist from the 1800's, not of Wells and Wellington (1985), as they only resurrected the name from synonymy, but the Wüster gang were blissfully unaware of this minor detail and so forced everyone else on the planet not to use the name as part of their "mafia" style attack on Wells and Wellington.

I however will not be cowed or intimidated by these anti-scientists and therefore correctly assign the relevant frogs to the genus *Drymomantis.*

At the species level of classification, Wells and Wellington were also correct.

James and Moritz (2000), published a molecular phylogeny for the putative species from the entire known range and confirmed the Wells and Wellington classification.

They found two major genetic lineages for the putative taxon, including an estimated 6 MYA divergence between the coastal New South Wales and east Queensland frogs (11.1-12.5 per cent sequence divergence of mtDNA), thereby confirming species level division between the two populations.

Furthermore James and Moritz (2000) found that the population from north of the Burdekin Gap, north Queensland and Kroombit Tops south-west of Gladstone, Queensland, had populations with a 5 percent sequence divergence (= 2.5 MYA), also warranting species-level recognition.

Those two species are therefore formally recognized and named herein.

The four species, until now usually treated all as *Drymomantis fallax* Peters, 1882 are readily separated from their nearest relatives and congeners, *D. cooloolensis* (Liem, 1974); the similar *D. northstradbrokensis sp. nov.* and *D. olongburensis* (Liem and Ingram, 1977) by morphology. Same applies in terms of the morphologically similar species most widely known as "*Litoria bicolor* (Gray, 1842)" (e.g. Cogger, 2014), but herein placed in the new genus *Maxinehoserranae gen. nov..*

Duellman *et al.* (2016) found a divergence of the so-called *bicolor* species group of 21.5 MYA from the genus *Drymomantis* making separate genus-level recognition an obvious judgement.

The morphologically similar species *Drymomantis fallax* Peters, 1882 from coastal Queensland south of the Burdekin River, North Queensland, just into north-east New South Wales and excluding Kroombit Tops, *D. ausviridis sp. nov.* from the wet tropics of North Queensland, *D. celantur sp. nov.* from Kroombit Tops,

south-west of Gladstone, Queensland and *D. glauerti* (Copland, 1957) from New South Wales and just into south-east Queensland are all readily separated from the species *D. cooloolensis* (Liem, 1974), *D. northstradbrokensis sp. nov.*, *D. olongburensis* (Liem and Ingram, 1977) and *Maxinehoserranae bicolor* (Gray, 1842) including associated similar species formerly included within *M. bicolor* by the following unique combination of characters:

Dorsal colour uniformly green or brownish (not obviously bicoloured); web of first toe reaches base of disc; posterior of thighs orange; IN/EN and HW/HL ratio is less than 1.000; no dark brown spots or reticulations of any form and no purplish-brown femoral streak bordering the dorsal green colour of the thigh (this colour configuration as seen in *D. cooloolensis* (Liem, 1974) and *D. northstradbrokensis sp. nov.*); no extremely pointed snout with a distinct, slightly upturned rostrum, with upper jaw protruding rostrum (as seen in *D. oblongburensis*).

While all of *D. fallax*, *D. ausviridis sp. nov., D. celantur sp. nov.* and *D. glauerti* are morphologically similar and also variable in colouration within a single population, there are consistent differences in terms of character suites that separate all from one another.

The four species are separated from one another as follows:

D. fallax has a brown iris, with a slight reddish tinge, the dark brown line running from nostril to eye is bounded on both sides by a light brown border; scattered raised tubercles on the forelimbs are obvious.

D. glauerti has a brown iris, numerous indistinct tubercles on the forelimbs and the line running from nostril to eye is not bordered by a lighter brown border and is otherwise well defined and sharp edged.

D. ausviridis sp. nov. has a red iris and tiny white spots on the upper hind limbs. The line between the nostril and the eye has indistinct upper and lower boundaries.Tubercles on the forelimbs are so small as to be effectively invisible.

D. celantur sp. nov. has scattered tiny raised white tubercles on the front limbs, an ill-defined line from nostril to eye, a brown iris and often has indistinct blotches or flecks arranged longitudinally down the back. The white line commencing on the upper-lip below the eye, that runs across the forelimb and along the lower side of the flank is particularly well defined.

D. ausviridis sp. nov. in life is depicted in Vanderduys (2012) on page 40 at bottom left and Anstis (2013) on page 200 on the right (2 images).

D. fallax in life is depicted in Vanderduys (2012) on page 40 at bottom right.

D. glauerti in life is depicted in Cogger (2014) on page 164 bottom right and in Anstis (2013) on page 203 top left (2 images).

Photos of all of *D. ausviridis sp. nov.*, *D. fallax*, *D. glauerti* and *D. celantur sp. nov.* can be found at http://www.flickr.com

By doing a search for “Litoria fallax”.

Distribution: *D. ausviridis sp. nov.* occurs on Cape York in Queensland, generally north of the Burdekin River gap, a well defined biogeographical barrier separating this taxon from the species *D. fallax* Peters, 1882 found south of there along the Queensland coast to the NSW Queensland border south of which the similar species *D. glauerti* (Copland, 1957) occurs, further down the coast and adjacent ranges to southern New South Wales.

This means *D. ausviridis sp. nov.* is found along the Queensland coast and ranges from Townsville, north to include the wet tropics region, but not including drier parts of Cape York further north.

Etymology: Named in refection of where the frog is found (Australia) and the dorsal colour, usually being a bright emerald green (hence “aus” and “viridis” = “ausviridis”).

DRYMOMANTIS CELANTUR SP. NOV.

LSIDurn:lsid:zoobank.org:act:230275D2-ACA8-4803-AA4B-CE6B0CF65211

Holotype: A preserved adult male specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J86217 collected at Kroombit Creek at the crossing of Kroombit Forest Drive, Kroombit Tops National Park, south-west of Gladstone, Queensland, Australia, Latitude -24.3842 S., Longitude 151.0014 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J42175 collected at Kroombit Tops, south-west of Gladstone, Queensland, Australia, Latitude -24.3667 S., Longitude 151.0167 E.

Diagnosis: The putative species defined as “*Litoria fallax* (Peters, 1882)” as defined and separated from other species by Cogger (2014) and Anstis (2013) is found along the coast and ranges from southern New South Wales along the east Australian coast to the northern edge of the wet tropics in far north Queensland.

That putative taxon is treated herein as four morphologically similar species.

The four species, until now usually treated all as *Drymomantis fallax* Peters, 1882 are readily separated from their nearest relatives and congeners, *D. cooloolensis* (Liem, 1974); the similar *D. northstradbrokensis sp. nov.* and *D. olongburensis* (Liem and Ingram, 1977) by morphology. Same applies in terms of the morphologically similar species group most widely known as “*Litoria bicolor* (Gray, 1842)” (e.g. Cogger, 2014), but herein placed in the new genus *Maxinehoserranae gen. nov.*.

Duellman *et al.* (2016) found a divergence of the so-called *bicolor* species group of 21.5 MYA from the genus *Drymomantis* making separate genus-level recognition an obvious judgement.

The morphologically similar species *Drymomantis fallax* Peters, 1882 from coastal Queensland south of the Burdekin River, North Queensland, just into north-east New South Wales and excluding Kroombit Tops, *D. ausviridis sp. nov.* from the wet tropics of North Queensland, *D. celantur sp. nov.* from Kroombit Tops, south-west of Gladstone, Queensland and *D. glauerti* (Copland, 1957) from New South Wales and just into south-east Queensland are all readily separated from the species *D. cooloolensis* (Liem, 1974), *D.*

northstradbrokensis sp. nov., *D. olongburensis* (Liem and Ingram, 1977) and *Maxinehoserranae bicolor* (Gray, 1842) by the following unique combination of characters: Dorsal colour uniformly green or brownish (not obviously bicoloured); web of 1st toe reaches base of disc; posterior of thighs orange; internarial/eye-naris distance and head-width/head-length ratio is less than 1; no dark brown spots or reticulations of any form and no purplish-brown femoral streak bordering the dorsal green colour of the thigh (this colour configuration as seen in *D. cooloolensis* (Liem, 1974) and *D. northstradbrokensis sp. nov.*); no extremely pointed snout with a distinct, slightly upturned rostrum, with upper jaw protruding rostrum (as seen in *D. oblongburensis*).

While all of *D. fallax*, *D. ausviridis sp. nov., D. celantur sp. nov.* and *D. glauerti* are morphologically similar and also variable in colouration within a single population, there are consistent differences in terms of character suites that separate all from one another. The four species are separated from one another as follows:

D. fallax has a brown iris, with a slight reddish tinge, the dark brown line running from nostril to eye is bounded on both sides by a light brown border; scattered raised tubercles on the forelimbs are obvious.

D. glauerti has a brown iris, numerous indistinct tubercles on the forelimbs and the line running from nostril to eye is not bordered by a lighter brown border and is otherwise well defined and sharp edged.

D. ausviridis sp. nov. has a red iris and tiny white spots on the upper hind limbs. The line between the nostril and the eye has indistinct upper and lower boundaries. Tubercles on the forelimbs are so small as to be effectively invisible.

D. celantur sp. nov. has scattered tiny raised white tubercles on the front limbs, an ill-defined line from nostril to eye, a brown iris and often has indistinct blotches or flecks arranged longitudinally down the back. The white line commencing on the upper-lip below the eye, that runs across the forelimb and along the lower side of the flank is particularly well defined.

D. ausviridis sp. nov. in life is depicted in Vanderduys (2012) on page 40 at bottom left and Anstis (2013) on page 200 on the right (2 images).

D. fallax in life is depicted in Vanderduys (2012) on page 40 at bottom right.

D. glauerti in life is depicted in Cogger (2014) on page 164 bottom right and in Anstis (2013) on page 203 top left (2 images).

Photos of all of *D. ausviridis sp. nov.*, *D. fallax*, *D. glauerti* and *D. celantur sp. nov.* can be found at http://www.flickr.com

By doing a search for “Litoria fallax”.

Distribution: Currently *D. celantur sp. nov.* is only known from Kroombit Tops National Park in Queensland, Australia and based on an absence of Museum voucher specimens of these frogs from the periphery of this highland reserve, it is most probably restricted to this area. A similar situation exists at Kroombit Tops for other climatically confined taxa.

Etymology: Celantur in Latin means concealed and this species has been effectively concealed from science for longer than it should have been.

DRYMOMANTIS NORTHSTRADBROKENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:9DE222E5-C9E8-430E-AF71-3C6BD6C0F2CF

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27569 collected at Tortoise Lagoon, North Stradbroke Island, Queensland, Australia, Latitude -27.5183 S., Longitude 153.4728 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27558 collected at Blue Lake, North Stradbroke Island, Queensland, Australia, Latitude -27.5303 S., Longitude 153.4764 E. 2/ A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J81495, collected at Swallow Lagoon, North Stradbroke Island, Queensland, Australia, Latitude -27.4989 S., Longitude 153.4547 E.

Diagnosis: Until now, *Drymomantis northstradbrokensis sp. nov.* from North Stradbroke Island, east of Brisbane in Queensland, Australia, has been treated as a southern population of *D. cooloolensis* (Liem and Ingram, 1977), with a type locality of Cooloola, Queensland, Australia.

However the two species are morphologically divergent and this has been known for some time and hence it being formally named herein.

D. cooloolensis is restricted to Cooloola and nearby Fraser Island, Queensland (Cogger, 2014), while *D. northstradbrokensis sp. nov.* is known only from North Stradbroke Island, East of Brisbane, Queensland.

Both species are separated from all other species within the genera *Drymomantis* Peters, 1882 and

the morphologically similar *Maxinehoserranae gen. nov.* (known as the “*Litoria bicolor* group” to most herpetologists as of 2020) by the following unique suite of characters: The green dorsum has numerous brown spots and reticulations (versus none or very few in all morphologically similar Australian species); absence of a brown or grey head streak between nostril and eye (present in all morphologically similar Australian species); the tympanum is always green; there is a purplish-brown streak along the upper thigh (absent or obscure in all morphologically similar Australian species); internarial/eye-naris distance and head-width/head-length ratio is less than 1 (versus less than 1 in all morphologically similar Australian species).

Adult *D. northstradbrokensis sp. nov.* are readily separated from adult *D. cooloolensis* by having an orange iris (versus grey/brown in *D. cooloolensis*) and a dorsum where the spots or flecks are ill-defined and subdued, versus obvious and distinct in *D. cooloolensis.* In *D. northstradbrokensis sp. nov.* the white line from the back of the upper-lip over the forelimb to the lower flank is obvious and distinct, versus indistinct and often broken in *D. cooloolensis.*

Photos of both *D. northstradbrokensis sp. nov.* and *D. cooloolensis*, side-by-side in life can be found in Cogger (2014), page 158, with *D. northstradbrokensis sp. nov.* on right, Vanderduys (2012) on page 31 with *D. northstradbrokensis sp. nov.* on left and in Anstis (2013) on page 173, with *D. northstradbrokensis sp. nov.* on left.

NYCTIMYSTINI TRIBE NOV.

***NYCTIMYSTES* STEJNEGER, 1916.**

Type species: *Nyctimantis papua* Boulenger, 1897.

Diagnosis: The genus *Nyctimystes* Stejneger, 1916 has in the past 3 decades undergone significant revision and alteration by various authors.

Zweifel (1958) defined the genus as follows: "The genus *Nyctimystes* (family Hylidae) is defined as including those species that combine the following characteristics: pupil forming a vertical slit when closed, lower eyelid with pigmented venation, feet without elongate or opposable first digits."

Cogger (2014) had a similar diagnosis for the genus stating "Species of *Nyctimystes* are distinguished by their large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females."

With the preceding diagnosis in mind, Cogger (2014) removed the Australian species from *Nyctimystes* on the basis of recent phylogenetic studies and the fact that their pupils were in fact horizontally elliptical, in line with other Australian tree frogs.

With a divergence of 19.9 MYA from their nearest living relatives (according to Duellman *et al.* 2016), those species have been formally transferred to the newly erected genus *Gedyerana gen. nov.*.

However the preceding diagnosis applies to all of the six following genera, all relevant species of which until now, were included in the single genus *Nyctimystes.*

The other five newly erected genera are *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov..*

The diagnosis of all six genera, including of a narrower group of species now treated as the entirety of the genus *Nyctimystes* and the other five genera which are formally named within this paper for the first time is given below.

Duellman *et al.* (2016) expanded the genus *Nyctimystes* to include a clade of frogs with a divergence of 41 MYA from nearest living relatives, thereby including lineages of frogs previously included in the genus "*Litoria* Tschudi, 1838. However such deep divergence is more appropriate for tribe level in classification and not genus level. Hence the break up as indicated herein and/or throughout this paper in it's full state.

Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov.* are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov.* by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov.* are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Webpede subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with

relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc.

The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov.* as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov.* diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: New Guinea including nearby offshore islands on the continental shelf.

Content: *Nyctimystes papua* (Boulenger, 1897) (type species); *N. aspera sp. nov.*; *N. charlottae sp. nov.*; *N. doggettae sp. nov.*; *N. disruptus* Tyler, 1963; *N. georgefloydi sp. nov.*; *N. mondoensis sp. nov.*; *N. oktediensis* Richards and Johnston, 1993; *N. pulchra* (Wandolleck, 1910); *N. trachydermis* Zweifel, 1983; *N. tyleri* (Zweifel, 1983).

MAGNUMMANIBUS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:084E0A6D-0B8C-4521-8139-4E53BA85F70B

Type species: *Hyla pulchra* Wandolleck, 1910.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often

having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

For further detail see the diagnosis of the genus *Nyctimystes* above.

Frogs within *Magnummanibus subgen. nov*. are further diagnosed and separated from other morphologically similar species as follows: Moderately large 60 mm in snout-vent length frogs. Head very broad and flat; palpebral venation is a network of gold or dark brown lines with vertical-oblique orientation and frequent horizontal cross connections. Very long, prominent heel lappets. Dorsum varies in coliur and pattern, but is usually brownish. Venter is usually yellowish and mottled or speckled with darker pigment all over. Iris is dark to very dark brown.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov*. diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Distribution: Both north and south of the main cordillera in New Guinea.

Etymology: The name *Magnummanibus* is derived from the Latin meaning, which is “large hand” and is an obvious characteristic of the subgenus.

Content: *Nyctimystes* (*Magnummanibus*) *pulchra* (Wandolleck, 1910) (type species); *N.* (*Magnummanibus*) *charlottae sp. nov.*; *N.* (*Magnummanibus*) *doggettae sp. nov*.

ASPEROHYLA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:C7F57438-81FF-45EA-BB77-635BAACE1219

Type species: *Nyctimystes trachydermis* Zweifel, 1983.

Diagnosis: *Nyctimystes* Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

For further detail see the diagnosis of the genus *Nyctimystes* above.

Distribution: New Guinea from the Irian Jaya border, along the central ranges and nearby mountain ranges east to Milne Bay on both sides of the central cordillera.

Etymology: The subgenus name “Asperohyla” refers in Latin to the relevant species having a relative rough to touch skin on the dorsal surface and the fact that the said frogs are also tree frogs.

Content: *Nyctimystes* (*Asperohyla*) *trachydermis* Zweifel, 1983 (type species); *N.* (*Asperohyla*) *aspera sp. nov.*; *N.* (*Asperohyla*) *georgefloydi sp. nov.*.

NYCTIMYSTES* (*NYCTIMYSTES*) *MONDOENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:72AF2EBA-F8B9-46B2-844C-3B6F88E0400B

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A 21816 collected at Mondo, elevation 5000 feet (1524 m.) on the north slope of Mt. Tafa, Papua New Guinea, Latitude -8.6333 S., Longitude 147.1833 E.

This facility allows access to its holdings.

Paratypes: Three preserved specimens at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen numbers MCZ A 21817-21820 collected at Mondo, elevation 5000 feet (1524 m.) on the north slope of Mt. Tafa, Papua New Guinea, Latitude -8.6333 S., Longitude 147.1833 E.

Diagnosis: *Nyctimystes mondoensis sp. nov.* is similar in most respects to *N. papua* (Boulenger, 1897) and would key out as that species as seen in Zweifel (1958). Both species are separated from all other species in the genus *Nyctimystes* Stejneger, 1916 by having palpebral venation that is relatively weak and disconnected, sometimes virtually absent (versus distinct in all other species); outer fingers with only a basal web or not much greater and male without vocal-sac openings and adult size usually between 50-60 mm in snout-vent length.

Nyctimystes mondoensis sp. nov. is separated from *N. papua* by having a semi-distinct pigmentation, with diagonal lines, occasionally interconnected, over three-quarters of the palpebral area (versus almost absent in *N. papua*), moderate finger webbing (versus little in *N. papua* and a lot in the related species *N. disruptus* Tyler, 1963 and *N. oktediensis* Richards and Johnston, 1993) relatively shorter legged than *N. papua* and a greater EN distance (over 5.8 mm) than in *N. papua* (below 5.7 mm).

Distribution: *Nyctimystes mondoensis sp. nov.* is known only from the type locality, but probably occurs more widely on the northern side of the Owen Stanley Range in south-east New Guinea.

Etymology: Named in reflection of the type locality.

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NYCTIMYSTES* (*MAGNUMMANIBUS*) *CHARLOTTAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:37FE756E-47A1-4ACC-9A10-21AFD84CCE49

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-110420, collected at Olsobip at an elevation of 1,500 feet, Western Province, Papua New Guinea, Latitude -5.3895 S., Longitude 141.5153 E.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-95510 collected at Imigabip, at an elevation of 4,200 feet, Western Province, Papua New Guinea, Latitude -5.2898 S., Longitude 141.5018 E.

2/ A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-110442, collected at Wangbin at an elevation of 4,800 feet, Western Province, Papua New Guinea, Latitude -5.2518 S., Longitude 141.2412 E.

3/ A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-87137 collected at Kavorabip, elevation 5,000 feet, Western Province, Papua New Guinea, Latitude -5.1301 S., Longitude 141.1148 E.

Diagnosis: *Nyctimystes* (*Magnummanibus*) *charlottae sp. nov.* and *N. doggettae sp. nov.* have both until now been treated as populations of the species *N. pulchra* (Wandolleck, 1910).

All would until now have been identified as that species via the information given in Menzies (2006).

These three species, constituting all frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Males grow to 70 mm in body length and females to 80 mm. The body is slender and the head broad and flat with large foreward facing eyes. The venation on the eyelid forms a network of dark brown lines oriented in a vertical/ oblique direction.

The three species *N. charlottae sp. nov.* from south of the central cordillera in New Guinea, *N. doggettae sp. nov.* from the Milne Bay region of Papua New Guinea and *N. pulchra* from Madang and nearby parts of the north of New Guinea are all readily separated from one another on the basis of colour.

N. pulchra has a dorsum that is plain medium to dark brown with whitish or yellowish lichen-like spots or mottled tan to medium dark brown; flanks bluish mottled with darker or yellowish brown, speckled black; concealed surfaces of thighs bluish, mottled brown; ventral surface yellowish, mottled or speckled dark all over. Iris is dark brown.

N. charlottae sp. nov. is brown or olive brown above, with orange blotches; flanks mottled bluish or yellowish, speckled black; concealed surfaces of thighs greenish blue, with dark reticulum; entire ventral surface is yellowish, mottled or speckled dark all over. The iris is a very dark brown.

N. doggettae sp. nov. is chocolate brown above with irregular indistinct blotches of lighter brown breaking up the darker dorsum. At the rear of the back on the dorsum are areas of light yellowish-brown, more or less in the central region of the rear of the back. The thin dark and light bands on the upper surfaces of the upper and lower hind legs are very well defined (as opposed to being ill-defined or absent in the other two species). Prominent in this species are scattered white tipped tubercles on the back, which are either absent, or small and ill-defined in the other two species. Iris is a very dark brown.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera (*Magnummanibus subgen. nov.* and *Nyctimystes*) and by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Distribution: *N. charlottae sp. nov.* is found in high elevation regions south of the central cordillera in New Guinea, including in both Papua New Guinea and Indonesia.

Etymology: The species is named in honour of Charlotte Doggett of Ringwood East, Victoria, this species being named after her first name, in recognition of her services to wildlife conservation in assisting the team at Australia's best reptiles shows and Snakebusters.

NYCTIMYSTES* (*MAGNUMMANIBUS*) *DOGGETTAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:57D5C8C1-66AB-423A-8CC2-834654F48FFB

Holotype: A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 11032, collected at Iana River, 3.8 km West of Agaun, Papua New Guinea, Latitude -9.876 S., Longitude 149.352 E.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 17045 collected at Uga River, Papua New Guinea, Latitude -10.0245 S., Longitude 149.59 E.

2/ A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 39561 collected at Binigua, Papua New Guinea, Latitude -9.7071. S., Longitude 149.25 E.

Diagnosis: *Nyctimystes* (*Magnummanibus*) *doggettae sp. nov.* and *N. charlottae sp. nov.* have both until now been treated as populations of the species *N. pulchra* (Wandolleck, 1910).

All would until now have been identified as that species via the information given in Menzies (2006).

These three species, constituting all frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Males grow to 70 mm in body length and females to 80 mm. The body is slender and the head broad and flat with large foreward facing eyes. The venation on the eyelid forms a network of dark brown lines oriented in a vertical/ oblique direction.

The three species *N. doggettae sp. nov.* from the Milne Bay region of Papua New Guinea, *N. charlottae sp. nov.* from south of the central cordillera in New Guinea and *N. pulchra* from Madang and nearby parts of the north of New Guinea are all readily separated from one another on the basis of colour.

N. pulchra has a dorsum that is plain medium to dark brown with whitish or yellowish lichen-like spots or mottled tan to medium dark brown; flanks bluish mottled with darker or yellowish brown, speckled black; concealed surfaces of thighs bluish, mottled brown; ventral surface yellowish, mottled or speckled dark all over. Iris is dark brown.

N. doggettae sp. nov. is chocolate brown above with irregular indistinct blotches of lighter brown breaking up the darker dorsum. At the rear of the back on the dorsum are areas of light yellowish-brown, more or less in the central region of the rear of the back. The thin dark and light bands on the upper surfaces of the upper and lower hind legs are very well defined (as opposed to being ill-defined or absent in the other two species). Prominent in this species are scattered white tipped tubercles on the back, which are either absent, or small and ill-defined in the other two species. Iris is a very dark brown.

N. charlottae sp. nov. is brown or olive brown above, with orange blotches; flanks mottled bluish or yellowish, speckled black; concealed surfaces of thighs greenish blue, with dark reticulum; entire ventral surface is yellowish, mottled or speckled dark all over. The iris is a very dark brown.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera (*Magnummanibus subgen. nov.* and *Nyctimystes*) and by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Distribution: *N. doggettae sp. nov.* is found in the Milne Bay region of Papua New Guinea.

Etymology: The species is named in honour of Charlotte Doggett of Ringwood East, Victoria in recognition of her services to wildlife conservation in assisting the team at Australia's best reptiles shows and Snakebusters. In this case the species name is taken from her last name (*N. doggettae sp. nov.*) as opposed to the first, which was the case for the previous species (*N. charlottae sp. nov.*) also named in her honour.

NYCTIMYSTES* (*ASPEROHYLA*) *ASPERA SP. NOV.

LSIDurn:lsid:zoobank.org:act:E9912B48-3433-4D33-A6D8-D918AE430260

Holotype: A preserved specimen at the American Museum of Natural History, Manhattan, New York, USA, herpetology collection, specimen number 103184 collected at Nipa, Southern Highlands Province, Papua New Guinea, Latitude 6.1272 S., Longitude 143.4203 E. This facility allows access to its holdings.

Paratypes. Four preserved specimens at the American Museum of Natural History, Manhattan, New York, USA, herpetology collection, specimen number 103185-8 collected at Nipa, Southern Highlands Province, Papua New Guinea, Latitude 6.1272 S., Longitude 143.4203 E.

Diagnosis: Both species, *Nyctimystes* (*Asperohyla*) *aspera sp. nov.* and *N. georgefloydi sp. nov.* have until now been treated as populations of *N. trachydermis* Zweifel, 1983 and as a trio form the entirety of the subgenus *Asperohyla subgen. nov..*

The three species *N. trachydermis* Zweifel, 1983 from the Bowutu Mountains in Morobe Province, Papua New Guinea, *N. aspera sp. nov.* from the Southern Highlands Province of Papua New Guinea and *N. georgefloydi sp. nov.* from south-flowing watersheds in the Owen Stanley Range, Central Province of Papua New Guinea can all be separated as follows.

N. trachydermis has a dorsal ground color that is brown in life, with a pale tan area on the top of the snout, continuous along the outer edge of the eyelids with an elongate patch of the same color on the right side and slightly separated from a similar, shorter patch on the left. Smaller, irregularly shaped areas of the same light color are present on the hind limbs and lower back.

The upper lip is edged with yellowish tan, but with the upper edge of that color ill defined.

The dorsal patterning just described may be prominent or indistinct.

The iris is reddish brown, with the conspicuous vertical pupil narrowly edged in yellow. The supratympanic ridge is moderately well-defined. Tubercles are significantly enlarged on the lower flanks.

N. aspera sp. nov. is similar in most respects to *N. trachydermis* but differs in not having significantly enlarged tubercles on the lower flanks and prominent whitish markings on the upper toes.

N. georgefloydi sp. nov. is similar in most respects to *N. trachydermis* and *N. aspera sp. nov.* but differs in not having significantly enlarged tubercles on the lower flanks, no prominent whitish markings on the upper toes, a dorsum that is generally unmarked in any way and a distinctive dark brown colour with strong green peppering all over, giving it an obvious dark greenish hue; no markings on snout or upper lip and a very strongly developed supratympanic ridge.

In *N. trachydermis* and *N. aspera sp. nov.* the back of forearm tubercles are large, prominent and closely spaced, sometimes forming a fold or ridge, whereas in *N. georgefloydi sp. nov.* the tubercles are well spaced and smaller.

N. trachydermis in life is depicted in Zweifel (1983) at fig. 10.

N. georgefloydi sp. nov. in life is depicted in Menzies (2006) at plate 96.

Distribution: *N. aspera sp. nov.* is known from the Southern Highlands Province of Papua New Guinea.

Etymology: The species name “Aspera” in Latin refers to the species being rough to touch.

NYCTIMYSTES* (*ASPEROHYLA*) *GEORGEFLOYDI SP. NOV.

LSIDurn:lsid:zoobank.org:act:3711B439-F2E6-4FA8-B210-3E6556B9FAE1

Holotype: A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 19446 collected at Mount Obree, Central Province, Papua New Guinea, Latitude -9.46014 S., Longitude 148.03 S.

This facility allows access to its holdings.

Paratypes: 8 preserved specimens at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 18181, 19447, 19448, 19450, 19451, 19453, 19455 and 19457 all from Mount Obree, Central Province, Papua New Guinea, Latitude -9.46014 S., Longitude 148.03 S.

Diagnosis: Both species, *Nyctimystes* (*Asperohyla*) *georgefloydi sp. nov.* and *N. aspera sp. nov.* have until now been treated as populations of *N. trachydermis* Zweifel, 1983 and as a trio form the entirety of the subgenus *Asperohyla subgen. nov.*.

The three species *N. trachydermis* Zweifel, 1983 from the Bowutu Mountains in Morobe Province, Papua New Guinea, *N. aspera sp. nov.* from the Southern Highlands Province of Papua New Guinea and *N. georgefloydi sp. nov.* from south-flowing watersheds in the Owen Stanley Range, Central Province of Papua New Guinea can all be separated as follows.

N. trachydermis has a dorsal ground color that is brown in life, with a pale tan area on the top of the snout, continuous along the outer edge of the eyelids with an elongate patch of the same color on

the right side and slightly separated from a similar, shorter patch on the left. Smaller, irregularly shaped areas of the same light color are present on the hind limbs and lower back. The upper lip is edged with yellowish tan, but with the upper edge of that color ill defined.

The dorsal patterning just described may be prominent or indistinct.

The iris is reddish brown, with the conspicuous vertical pupil narrowly edged in yellow. The supratympanic ridge is moderately well-defined. Tubercles are significantly enlarged on the lower flanks.

N. aspera sp. nov. is similar in most respects to *N. trachydermis* but differs in not having significantly enlarged tubercles on the lower flanks, prominent whitish markings on the upper toes and a very strongly developed supratympanic ridge.

N. georgefloydi sp. nov. is similar in most respects to *N. trachydermis* and *N. aspera sp. nov.* but differs in not having significantly enlarged tubercles on the lower flanks, no prominent whitish markings on the upper toes, a dorsum that is generally unmarked in any way and a distinctive dark brown colour with strong green peppering all over, giving it an obvious dark greenish hue; no markings on snout or upper lip and a very strongly developed supratympanic ridge.

In *N. trachydermis* and *N. aspera sp. nov.* the back of forearm tubercles are large, prominent and closely spaced, sometimes forming a fold or ridge, whereas in *N. georgefloydi sp. nov.* the tubercles are well spaced and smaller.

N. trachydermis in life is depicted in Zweifel (1983) at fig. 10.

N. georgefloydi sp. nov. in life is depicted in Menzies (2006) at plate 96.

Distribution: *N. georgefloydi sp. nov.* is known from south-flowing watersheds in the Owen Stanley Range, Central Province of Papua New Guinea**.**

Etymology: The species is named in honour of the late George Floyd, a victim of an unprovoked attack by four thug police officers at Powderhorn, in downtown Minneapolis, USA, on 25 May 2020.

Floyd was bashed by four Police Officers, Derek Chauvin, Thomas Kane, Tou Thao and J. Alexander Jueng. The attack was apparently led by Derek Chauvin who in the final moments put his knee on top of Floyd’s neck and killed him by blocking his airways by maintaining the blockage for at least 8 minutes (Bungard *et al.* 2020).

The viciously subdued Floyd, was lying handcuffed, face-down on the bitumen of the city street.

There is no doubt Chauvin would have got away with the murder were it not for the fact that his vicious attack was filmed by members of the public from at least three different angles.

After the videos were posted on the internet, public

protests globally caused the Minneapolis Police department to stand the four officers down, but within days, the police were blaming the victim, alleging the death was caused by pre-existing medical conditions and not the police actions.

Floyd died after Derek Chauvin put his weight on top of Floyd's neck for more than eight minutes causing his death. Two other police were also on top of the handcuffed Floyd face-down with their body weight on his lower body causing further pain and suffering, while a third, heavily armed officer made sure that no members of the public intervened to stop the vicious attack.

During this time, Floyd repeatedly asked the thug police officer Chauvin to get off him and at least fifteen times Floyd said "I can't breath".

One bystander told officers they needed to let him breathe. Another yelled at them to check the man's pulse (Forliti and Baenen 2020). They were herded away from the scene by one of the police officers.

Chauvin only removed his body from on top of Floyd after it was clear Floyd was non-responsive and dead.

Prior to this part of the attack being filmed by bystanders from both sides of the car, as well as two CCTV cameras that also caught footage of the police bashing Floyd on the back seat of the police car, after which the attack was continued with Floyd being removed from the police car with his face slammed onto the hard road surface.

What a viewing of the video shows is that Chauvin was not just a single rogue cop.

The four officers were working as a well organised team, all knowing their well-defined roles and working together. Two were full body weight down holding handcuffed Floyd onto the bitumen, without which, Chauvin would not have been in a position to be able to put his foot on a fully restrained Floyd to suffocate and kill him. The fourth police officer as part of the team aggressively pushed, shoved and threatened concerned bystanders who wanted to assist the clearly severely injured and dying Floyd.

Derek Chauvin has also used his proceeds of crime to amass a huge property portfolio spanning the United States from California to Florida, which at this stage seems safe and not likely to be seized on behalf of his many victims.

State police were guarding his assets from demonstrators to ensure none were attacked.

Floyd is one of millions of victims of police violence and brutality and his death sparked massive demonstrations of solidarity across the United States in over 30 major cities and other parts of the world including London, Berlin, Sydney and Melbourne.

Police buildings in California, Minnesota and Washington were torched as were countless police cars.

The government-controlled media in the United States and Australia, including the Murdoch Press and CNN, tried to paint the protests as black people versus white people (see for example Bolt 2020), but this was never the case.

Most of the protestors were in fact white people!

The protest was against police corruption, police brutality, police lies and dishonesty and the destruction of innocent people's lives, with murder being the most serious crime committed against a fellow human being, but most certainly not the only crime being perpetrated by police and associated corrupt government employees.

The United States in law has a "death penalty" and there as never a better case in which to apply this penalty for a crime than arising from the murder of the unarmed and handcuffed George Floyd by Derek Chauvin.

Chauvin, had been subject of at least 18 previous complaints against him since 2001 and all were systematically whitewashed by the Minneapolis Police Department.

Had the law been properly applied in the first place, George Floyd would not have been murdered by Derek Chauvin.

In terms of the 4 corrupt police who killed Chauvin, the corruption did not stop there.

The response of the Minneapolis Police Department was also coordinated to minimize damage to their murderer cops from the outset.

Following a massive public uprising that caused over 30 police cars to be destroyed and a major Minneapolis Police Station torched and burnt to the ground, the Mineapolis Police charged Derek Chauvin with "third degree murder". The other three co-murderers were not charged!

In fact they were quietly shifted out of town with full police protection.

This degree of murder is a low-level of murder in US law. It borders on accidental murder, whereas first degree is a planned killing.

However in line with such matters there is also little doubt that the case will be sabotaged and Chauvin will walk free in the same way that police who got caught on video bashing Rodney King in Los Angeles 3 March 1991.

This will be treated as a green light for more like-minded law-enforcement people to conduct similar acts of brutality, lies, deception and murder in the future to destroy the lives of yet more innocent victims.

Indication of the final result came when the Minnesota Police department released their "official" autopsy report which claimed that Floyd had in fact died of "Coronavirus" and not the bashing, with his death at the time of the bashing being nothing more than an unfortunate coincidence.

So when you have 4 bad cops and a department with 10,000 other cops who do nothing to stop the corruption, lies and violence, you have an entire police department that is corrupt! That is 10,004 bad cops!

Meanwhile the USA President, Donald Trump got onto "Twitter" and tweeted to State Governors to get police to start shooting protesters, an instruction many actually followed, adding a few dozen more people to the USA death toll of people killed and maimed by their police, already pumped up with over 100,000 coronavirus deaths in the USA at the time Floyd was murdered.

In the USA victims of police violence and corruption now have the chants "I can't breathe" and "George Floyd, say his name!"

Australian victims of police violence and corruption say "lest we forget" which was a line borrowed from Nazi Holocaust survivors. See also the etymology for *Kumanjayiwalkerus kumanjayi sp. nov*. in this paper.

ALBOGIBBA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:CAA18748-21DC-4A71-859D-567F6548FB8D

Type species: *Hyla humeralis* Boulenger, 1912.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections.

A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique “reticulated” palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of

the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc. The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov*. diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov*. as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov*. diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: Distributed on the northern and southern flanks of the central mountain ranges of New Guinea, from approximately 138 deg E. to 147 deg E., New Guinea, usually at 600-1700 metres elevation.

Etymology: "*Albogibba*" in Latin means "white lumps", with the small raised white tipped tubercles or lumps on the lower flanks being characteristic of the type species.

Content: *Albogibba humeralis* (Boulenger, 1912) (type species); *A. granti* (Boulenger, 1914); *A. ingens sp. nov.*; *A. zweifeli* (Tyler, 1967).

RATIOBRUNNEIS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:AFD879FD-2C28-4032-9975-342A10E36B55

Type species: *Nyctimystes zweifeli* Tyler, 1967.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present.

The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the

mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc. The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov.* as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov.* diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: The two species in the subgenus *Ratiobrunneis subgen. nov.* are known from West Sepik,

Chimbu, Southern Highlands and Western Provinces (Papua New Guinea) as well as on the Utakwa River, Eipomek (Papua, Indonesia).

Etymology: In Latin "*Ratiobrunneis*" means brown pattern, which is exactly the character state of the dorsal surface of these frogs.

Content: *Badiohyla* (*Ratiobrunneis*) *zweifeli* (Tyler, 1967) (type species); *B.* (*Ratiobrunneis*) *granti* (Boulenger, 1914).

ALBOGIBBA* (*ALBOGIBBA*) *INGENS SP. NOV.

LSIDurn:lsid:zoobank.org:act:DFF9FB1D-9B0B-4AB3-B787-188F6417AB0A

Holotype: A preserved specimen at the American Museum of Natural History, Manhatten, New York, USA, reptile collection, specimen number AMNH 49691 collected from 6 kilometers southwest of the Bernhard Camp, 1200 meters, Idenburg River region, Irian Jaya, Indonesia, Latitude -3.48 S., Longitude 139.2 E.

This facility allows access to its holdings.

Paratypes: Two preserved specimens at the American Museum of Natural History, Manhatten, New York, USA, reptile collection, specimen numbers AMNH 49695 and AMNH 49697 collected from 4 kilometers southwest of the Bernhard Camp, 1200 meters, Idenburg River region, Irian Jaya, Indonesia, Latitude -3.48 S., Longitude 139.2 E.

Diagnosis: *Albogibba ingens sp. nov*. has until now been treated as a north-west population of *A. humeralis* (Boulenger, 1912), known in most texts as *Nyctimystes humeralis* (e.g. Zweifel 1958 or Menzies 2006).

Both would key out as *A. humeralis* in both Zweifel (1958) or Menzies (2006).

A. ingens sp. nov. is readily separated from *A. humeralis* by the following suite of characters: Iris is reddish-brown; white tubercles on the flanks are broad and blunt in profile and sometimes yellowish instead of white; flanks and venter are white or yellow; upper lip has a thick yellow or white bar of consistent thickness running from tip of snout along top of mouth; fingers yellow or white and toes orangeish. Dorsum usually a brilliant emerald green. Dorsum and legs smooth and covered with numerous tiny evenly spaced granules. Forearms have numerous tubercles.

By contrast *A. humeralis* has a brown iris; white tubercles on flanks are not broad or flattened, but well defined and more-or-less conical in shape or pointed. There is no thick yellow bar of consistent thickness running from tip of snout along top of mouth, but instead either simply the normal greenish colour of the upper surface, or sometimes a very thin, narrow white edge (hairline). Toes are greenish and pads light green or sometimes yellowish in males. Venter is whitish. Dorsum varies in colour, but is invariably green, sometimes with indistinct mottling and only sometimes covered with numerous tiny evenly spaced granules.

Forearms not with numerous tubercles.

Both *A. ingens sp. nov.* and *A. humeralis* sometimes have scattered yellow spots or rings on the dorsum and sometimes a red, brown or violet flush on the flanks. Males usually have a yellowish throat, versus cream or white in females.

Both *A. ingens sp. nov.* and *A. humeralis* comprising the entirety of the nominate subgenus *Albogibba gen. nov.* are separated from the two species in the other subgenus *Ratiobrunneis subgen. nov*. by the following: Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus (these two species), the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm).

These characters also separate *A. ingens sp. nov.* and *A. humeralis* from all other tree frogs in Australia and New Guinea.

Ratiobrunneis subgen. nov. are similar in most respects to *A. ingens sp. nov.* and *A. humeralis* but are separated as follows: Male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks.

Photos of a male *A. ingens sp. nov.* in life from near the type locality can be found at:

https://www.naturepl.com/stock-photo-tree-frog-nature-image01361627.html

and

https://timlaman.photoshelter.com/image/I0000WOJyFmCZ70g

A photo of a female *A. humeralis* in life can be found in Menzies (1976) on plate 8 at top left and Menzies (2006) at photo 90 (same image).

Distribution: *A. ingens sp. nov.* is distributed on the northern side of the central cordillera of New Guinea west of the Huon Peninsula in Papua New guinea, at least as far west as the Mamberamo River in Irian Jaya. *A. humeralis* occurs south of the central cordillera, including in Central Province, Papua New guinea.

Etymology: "*Ingens*" is Latin for "huge", or "big". As the adults of this species are very large, the species name is appropriate.

OCCULTATAHYLA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:1CDD42D2-B7BC-4F75-ABF0-F57A8383CFC2

Type species: *Nyctimystes semipalmata* Parker, 1936.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin.

Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen.*

nov., *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Webpede subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique “reticulated” palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc.

The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to

vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov*. diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov*. as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov*. diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: New Guinea and immediately adjacent islands on the continental shelf.

Etymology: In Latin, “Occultata” means “hidden”, and with “*Hyla*” meaning “tree frog”, the genus name in effect means hidden tree frog. This reflects the excellent camoflague in the wild state of these species.

Content: *Occultatahyla semipalmatus* (Parker, 1936) (type species); *O. avocalis* (Zweifel, 1958); *O. daymani* (Zweifel, 1958); *O. fluviatilis* (Zweifel, 1958); *O. foricula* (Tyler, 1963); *O. perimetri* (Zweifel, 1958); *O. rueppelli* (Boettger, 1895).

WEBPEDE SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:96A567B5-A1A4-44DF-8336-6B97080036D8

Type species: *Hyla rueppelli* Boettger, 1895.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Webpede subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections. Fingers with much webbing, the outer finger webbed almost to disc.

According to Duellman *et al.* (2016), *Occultatahyla gen. nov*. diverged 16.7 MYA from its nearest living relatives in other genera.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by

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variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

The other four genera including species previously treated as being within *Nyctimystes* are dealt with elsewhere in this paper.

Distribution: The single species constituting this subgenus is known only from Halmahera and Morotai Islands in the Moluccas, Indonesia.

Etymology: "Webpede" is derived from the Latin words "web" meaning "web" in English and the Latin "Pede" meaning "paw", or in the context of a frog, the hand or front foot.

Content: *Occultatahyla* **(***Webpede***)** *rueppelli* (Boettger, 1895) (monotypic).

NIGREOSOCULUS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:8FB6CBD7-F9BC-4C0C-8D2A-071067F436C2

Type species: *Nyctimystes cheesmani* Tyler, 1964.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc.

The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov.* as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov.* diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: New Guinea, including offshore islands on the continental shelf.

Etymology: In Latin *Nigreosoculus* means black eye, in reflection of the near black iris in some species.

Content: *Nigreosoculus cheesmani* (Tyler, 1964) (type species); *N. bivocalis* (Kraus, 2012); *N. calcaratus* (Menzies, 2014); *N. eucavatus* (Menzies, 2014); *N. intercastellus* (Kraus, 2012); *N. kuduki* (Richards, 2007); *N. latratus* (Menzies, 2014); *N. montana* (Peters and Doria, 1878); *N. obsoletus* (Lönnberg, 1900); *N. persimilis* (Zweifel, 1958); *N. traunae* (Menzies, 2014).

BADIOHYLINA SUBTRIBE NOV.

BADIOHYLA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:D0D7D60F-CD8F-454D-9EBB-357AEF6BF5CD

Type species: *Nyctimystes kubori* Zweifel, 1958.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov.* are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov.* by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov.* are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50

to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc. The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov*. as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov*. diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: Confined to the highlands of the central cordillera of New Guinea.

Etymology: In Latin "*Badio*" means the colour beige and "*Hyla*" is a tree frog. Many specimens in this tree frog genus are in fact beige coloured, meaning that the genus name is entirely descriptive.

Content: *Badiohyla kubori* (Zweifel, 1958) (type species); *B. gularis* (Parker, 1936).

MAGNUMOCULUS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:7CC692B4-52AB-48BC-84C2-4BF322A74060

Type species: *Nyctimystes narinosa* Zweifel, 1958.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular

above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Distribution: New Guinea, including offshore islands on the continental shelf.

Etymology: In Latin "*Magnumoculus*" means big eyes, in reflection of the big eyes in all species.

Content: *Magnumoculus narinosus* (Zweifel, 1958) (type species); *N. ocreptus* (Menzies, 2014); *N. myolae* (Menzies, 2014); *N. cryptochrysos* (Kraus, 2012).

PELODRYANINI TRIBE NOV.

***PELODRYAS* GÜNTHER, 1858.**

Type species: *Rana caerulea* White, 1790.

Diagnosis: Species in the genus *Pelodryas* Günther, 1858 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colour in life is usually a near unform emerald-green in life, but varies from dark purplish-green to fawn or at times even blue, often with scattered white or yellow spots or dots; there is no obvious white stripe running along the edge of the lower jaw; the hind side of thighs lacks black or yellow marbling, either being plain or sometimes pinkish or orangeish; hind edge of forearm is smooth, or with at most a few, low, discontinuous tubercles; the skin on top is smooth or slightly leathery; venter is white and coarsely granular; hind edge of foot is smooth; fingers have conspicuous webbing, but reaching no further than the base of the penultimate phalanx of the fourth finger; toes are about 2/3 webbed; finger and toe discs are large and obvious; vomerine teeth present and prominent, between and behind the choanae; there is obvious thick, supratympanic gland and the tympanum is large and obvious.

Duellman *et al.* (2016) found that the four named and currently recognized species within this genus diverged from their nearest living relatives, 24.7 MYA, these being species within the genus *Shireenhoserhylea gen. nov..*

Distribution: Most parts of continental Australia, except the coldest regions as well as parts of New Guinea. Because the most common species *P. caerulea* (White, 1790) is often commensal of human habitation and a popular pet, the distribution has expanded in Australia and New Guinea in modern times.

Content: *Pelodryas caerulea* (White, 1790) (type species); *P. cavernicola* (Tyler and Davies, 1979); *P. splendida* (Tyler, Davies and Martin, 1977); *P. gilleni* (Spencer, 1896).

SHIREENHOSERHYLINA SUBTRIBE NOV.

SHIREENHOSERHYLEA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:A50DB4CA-5049-4818-9BF2-98ECA036D81C

Type species: *Hyla chloris* Boulenger, 1893.

Diagnosis: Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

The taxon *S. luteiventris* (Ogilby, 1907), originally described as "*Hyla luteiventris*" with a type locality of Brisbane, Queensland, is herein resurrected from the synonymy of *S. gracilenta* (Peters, 1869) with a type locality of Mackay, North Queensland.

Differences between the two nominate taxa are explained in Anstis (2013) on pages 209-211, where she treats them as a single species but also notes "appears to comprise more than one species awaiting further description".

Hence *S. luteiventris* (Ogilby, 1907) appears in the list of species within this genus.

The species *S. megaviridis sp. nov.* from Eungella, near Mackay in north Queensland, formally described herein, has until now been treated as a northern population of "*Hyla chloris* Boulenger, 1893" from the Richmond River, in New South Wales.

However in many respects this taxon is intermediate between the two forms now known as *S. chloris* (Boulenger, 1893) and *S. xanthomera* (Davies, McDonald, and Adams, 1986), which have a 4 MYA divergence from one another according to Duellman *et al.* (2016).

Because the Eungella population is also reproductively isolated from both other populations, as well as being clearly divergent morphologically, it is herein formally named as a new species, *S. megaviridis sp. nov..*

The most closely related species to this genus (*Shireenhoserhylea gen. nov.*) are the morphologically divergent species within the genus *Pelodryas* Günther, 1858, type species being *Rana caerulea* White, 1790. According to Duellman *et al.* (2016) the two species groups diverged 24.7 MYA, making genus level division a common-sense decision.

The *Litoria kumae* Menzies and Tyler, 2004 species group, being the New Guinea members of the genus *Shireenhoserhylea gen. nov.*, as well as *S. bella* (McDonald, Rowley, Richards and Frankham, 2016) from Cape York, Australia had according to Duellman *et al.* (2016) diverged from the Australian *Hyla chloris* Boulenger, 1893 group 16.6 MYA.

Therefore the mainly New Guinea group is herein placed in a new subgenus *Emeraldhyla subgen. nov.*.

Distribution: Wetter parts of the east coast of Australia, excluding colder parts of the far south, New Guinea and

offshore islands. The nominate subgenus *Shireenhoserhylea subgen. nov.* is restricted to the East Coast of Australia, south of the northern wet tropics in Queensland. The subgenus *Emeraldhyla subgen. nov.* occurs in New Guinea and offshore islands as well as the far north of Cape York, Queensland.

Etymology: Named in honour of Shireen Hoser, of Park Orchards, Victoria, Australia, who also happens to be my wife, in recognition of decades of work supporting wildlife conservation globally, including successfully defending herpetology against taxonomic vandalism by members of the Wolfgang Wüster gang of thieves in the 1990's. This was done via a successful submission to the ICZN in 1998. That submission, (Hoser 1998), successfully stopped Robert Sprackland illegally renaming the species originally described as *Odatria keithhornei* Wells and Wellington, 1985 the obscenely coined name "*Varanus teriae*" being that of Sprackland's wife.

The ICZN correctly struck out the illegally coined patronym of Sprackland, this being the second ruling by the ICZN in favour of the Wells and Wellington papers, which was not so much a defence of Wells and Wellington (1985), but rather a defence of the *International Code of Zoological Nomenclature* and the rules that are supposed to bind all scientists.

Content: *Shireenhoserhylea chloris* (Boulenger, 1893) (type species); *S. aruensis* (Horst, 1883); *S. auae* (Menzies and Tyler, 2004); *S. bella* (McDonald, Rowley, Richards and Frankham, 2016); *S. callista* (Kraus, 2013); *S. elkeae* (Günther and Richards, 2000); *S. eschata* (Kraus and Allison, 2009); *S. gracilenta* (Peters, 1869); *S. kumae* (Menzies and Tyler, 2004); *S. luteiventris* (Ogilby, 1907); *S. megaviridis sp. nov.*; *S. robinsonae* (Oliver, Stuart-Fox and Richards 2008); *S. xanthomera* (Davies, McDonald, and Adams, 1986).

EMERALDHYLA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:F0C25610-5D1F-40E6-B0CC-E343EC59991E

Type species: *Litoria kumae* Menzies and Tyler, 2004.

Diagnosis: Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

The *Litoria kumae* Menzies and Tyler, 2004 species group, being the New Guinea members of the genus

Shireenhoserhylea gen. nov., as well as *S. bella* (McDonald, Rowley, Richards and Frankham, 2016) from Cape York, Australia had according to Duellman *et al.* (2016) diverged from the Australian *Hyla chloris* Boulenger, 1893 group 16.6 MYA. Therefore the mainly New Guinea group is herein placed in this new subgenus *Emeraldhyla subgen. nov.*.

Distribution: Species within *Emeraldhyla subgen. nov.* are found in New Guinea, including offshore islands as well as the northern parts of Cape York, Australia.

Etymology: *Emeraldhyla* literally means Emerald green tree frog, which is exactly what these species are!

Content: *Shireenhoserhylea* (*Emeraldhyla*) *kumae* (Menzies and Tyler, 2004); (type species); *S.* (*Emeraldhyla*) *aruensis* (Horst, 1883); *S.* (*Emeraldhyla*) *auae* (Menzies and Tyler, 2004); *S.* (*Emeraldhyla*) *bella* (McDonald, Rowley, Richards and Frankham, 2016); *S.* (*Emeraldhyla*) *callista* (Kraus, 2013); *S.* (*Emeraldhyla*) *elkeae* (Günther and Richards, 2000); *S.* (*Emeraldhyla*) *eschata* (Kraus and Allison, 2009); *S.* (*Emeraldhyla*) *robinsonae* (Oliver, Stuart-Fox and Richards 2008).

SHIREENHOSERHYLEA (SHIREENHOSERHYLEA) MEGAVIRIDIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:3541C57B-6D88-4D1A-AC3E-4E95ABF9E6AD

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J35941, collected from Broken River, Eungella National Park, (near Mackay), Queensland, Australia, Latitude -21.175 S., Longitude 148.5083 E.

This government-owned facility allows access to its holdings.

Paratypes: Ten preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J35906, J35912, J35965, J35970, J35979, J35980, J36002, J36007, J36016 and J36025 all collected from within 10 km of the type locality above.

Diagnosis: *Shireenhoserhylea megaviridis sp. nov.* has until now been treated as a population of *S. chloris* (Boulenger, 1893) known in most texts as "*Litoria chloris*", including in Anstis (2013) and Cogger (2014). A more northerly (wet tropics in Queensland) population previously treated as *S. chloris* was formally named in

1986 and is herein known as *S. xanthomera* (Davies, McDonald, and Adams, 1986).

According to Duellman *et al.* (2016), the two preceding species diverged from one another 4 MYA.

In many respects *S. megaviridis sp. nov.* is intermediate between the two forms, but due to divergence between each, as well as geographic disjunction, it is appropriate that this population be treated as a full species as opposed to subspecies of one or other.

S. megaviridis sp. nov. would key as *S. chloris* (as "*Litoria chloris*") in Anstis (2013) or Cogger (2014).

The morphologically similar and closely related *S. xanthomera* is separated from both *S. megaviridis sp. nov.* and *S. chloris* by having bright orange-yellow sides and upper arms, hands and feet as well as inner surfaces of thighs being bright orange, with whitish or yellow undersides.

This is opposed to light yellow sides and upper arms, hands and feet as well as inner surfaces of thighs being dark purplish-red or brown often with a purple surface in *S. chloris.*

S. megaviridis sp. nov. is separated from both *S. xanthomera* and *S. chloris* by having brilliant blue on the inner surfaces of the thighs.

The tadpoles of *S. xanthomera* are separated from both *S. megaviridis sp. nov.* and *S. chloris* by having a narrowly arched jaw sheath, versus not so narrow in the other two species.

S. megaviridis sp. nov. is separated from *S. chloris* by the expansion of flash colour under the lower left leg to occupy the entire lower surface, versus not so in *S. chloris.*

The upper arm of *S. megaviridis sp. nov.* is usually yellow, versus usually greenish-yellow in *S. chloris.*

In dorsal colouration, pre-metamorphosing tadpoles of *S. megaviridis sp. nov.* are like those of *S. xanthomera* and not *S. chloris.* In *S. chloris* the anterior of the tadpole is greyish with peppering and any markings are indistinct. There are no obvious spots or blotches, with two spots on the snout anterior to the eyes being indistinct. Only the anterior fringe is pale.

By contrast the relevant tadpoles of both *S. xanthomera* and *S. megaviridis sp. nov.* have a generally pale anterior end and snout, with two distinct large greyish brown dots on the snout anterior to the eyes. Anteriorly, the relevant *S. xanthomera* are whitish, versus yellowish-brown in *S. megaviridis sp. nov..*

The other two species within the subgenus *Shireenhoserhylea gen. nov.*, namely *S. gracilenta* (Peters, 1869) and *S. luteiventris* (Ogilby, 1907) are both separated from the three preceding species by the following characters: The green colour of the forearms stops abruptly with a sharp edge at the elbow. The skin covering the tympanum is finely granular. The rim of the lower jaw, especially near the tip of the snout is narrowly edged with white.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Photos of *L. chloris* in life can be found in Hoser (1989) on page 36, top two images, Vanderduys (2012) at page 30, both images, Cogger (2014) on p. 156 at bottom right and Anstis (2013) at page 168 both images.

Photos of *S. megaviridis sp. nov.* in life can be found in Anstis (2013) at page 170 (metamorphosed young), two top left images, and adults in life can be seen online at: https://lyrebird-gallery.smugmug.com/Frogs/Litoria-chloris/i-zHZKnxq

and:

https://www.flickr.com/photos/huntermccall/31855340567/

and:

https://www.flickr.com/photos/jaricornelis/38736419370/

and:

https://www.flickr.com/photos/reptileshots/24091549126/

and:

https://www.flickr.com/photos/reptileshots/31194264913/

and:

https://www.flickr.com/photos/144043627@N08/40530915481/

and:

https://www.flickr.com/photos/piazzi1969/5772240176/

Photos of *S. xanthomera* in life can be found in Vanderduys (2012) on page 78 in both images, Cogger (2014) on page 196 at top and Anstis (2013) on page 339 in all photos.

Distribution: Known with certainty only from the vicinity of Eungella National Park in north-east Queensland and generally south of the area known as the Burdekin Gap, north Queensland and north of the St. Lawrence Gap, east Queensland, both being major lowland biogeographical barriers in the Queensland region.

However based on specimens in State Museums, the potential limits of this taxon are likely to be Caithu State Forest, Latitude -19.58 S., Longitude 147.43 E. in the north and Bruce Highway at the junction of St. Lawrence, Latitude -22.3667 S., Longitude 149.45 E in the south and of course confined to the east by the Pacific Ocean and in the west of the coastal zone by drier lowland habitats.

Etymology: The word "mega" usually means lots and "viridis" means green and as the relevant species is very green, the species name *S. megaviridis sp. nov.* is wholly appropriate.

SUMMAVIRIDIS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:6187EF08-0B88-40F9-837F-C0C06F50525F

Type species: *Hyla* (*Litoria*) *vagabunda* Peters and Doria, 1878.

Diagnosis: The genus *Summaviridis gen. nov.* is monotypic for a West Papuan species, *S. vagabunda* that does not appear to have close affinities to any other species or genus. Tyler (1968) placed it in a group on its own, although Menzies (2006) associated it with his so-called "*Litoria gracielenta* complex". However *S. vagabunda* has unwebbed hands, versus heavily webbed in the other species, which in effect scuttles any close association at the genus level.

Summaviridis gen. nov. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following unique suite of characters: A broad head, short limbs, unwebbed fingers, a prominent fold of skin across the chest and (in life) a dark green dorsal colouration.

In further detail the *Summaviridis gen. nov.* is separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) as follows: The head is broader than long (HL/HW 0.951), its length slightly less than one-third of the snout to vent length (HL/S-V 0.310). The snout is rounded when viewed from above and in profile. The nostrils are more lateral than superior, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is greater than the internarial span (E-N/IN 1.154). The canthus rostralis is straight and poorly defined. The eye is large, its diameter greater than the distance separating it from the nostril. Three-quarters of the tympanum is visible, the superior rim of the tympanic annulus is hidden beneath the supra-tympanic fold. The tympanal diameter is equivalent to two-thirds of the eye diameter. The vomerine teeth are in two broadly oval series situated between the choanae. The tongue is broadly cordiform with a deeply indented posterior border. The fingers are very long and slender with narrow lateral fringes; in decreasing order of length 3>4>2>1; unwebbed. The terminal discs and sub-articular tubercles are large and prominent. The hind limbs are short and slender with a TL/S-V ratio of 0.513. Toes in decreasing order of length 4>5>3 >2>1. The webbing between the outer and fourth toe reaches half-way up the penultimate phalanx on the fifth toe, and the sub-articular tubercle at the base of the penultimate phalanx on the fourth. The skin on the dorsal surfaces is smooth with a few minute flattened tubercles. The throat and chest are slightly tubercular; the abdomen, sides of the body and lower surface of the thighs are extremely granular. There is a conspicuous curved supra-tympanic fold, and a prominent skin fold across the chest. The dorsal surfaces are in life dark green and in preservative dark blue. There is a faint trace of a narrow white line above a broader brown line on the canthus rostralis, upper eyelid and supra-tympanic fold. The backs of the thighs are pale brown and marked with small irregularly-shaped, pale yellow spots. The backs of the tarsus and forearm are pale brown. The ventral surfaces are pale yellow with leaden blue patches at the angles of the jaws, and small faint brown spots on the remainder of the mandibular border and on the throat. Adult females are about 37 mm in body length (modified from Tyler, 1978).

Specimens of the morphologically similar *Llewellynura* Wells and Wellington, 1985 are readily separated by their much smaller adult size of less than 25 mm body length.

The species within the morphologically similar genus *Rotundaura gen. nov*. are separated from this genus (*Summaviridis gen. nov.*) by the tympanum being fully exposed and round, versus the upper surface being cut at the rear by a skin fold forming a straight line and a significantly blunter snout in *Rotundaura gen. nov*..

Distribution: The type species for *Summaviridis gen. nov.* is only known from the two types, a male and a female, being from Vogelkop Peninsula, Papua (New Guinea) (female) and Seram (= Ceram) Island, Molucca Islands, Indonesia.

Etymology: The name *Summaviridis* in Latin means intense or deep green in reflection of the colour of the dorsal surface of these frogs in life.

Content: *Summaviridis vagabunda* (Peters and Doria, 1878) (monotypic).

PUSTULATARANINI TRIBE NOV.

PUSTULATARANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:E2F68230-6BBB-4518-A9C2-C8432FE558DE

Type species: *Litoria longirostris* Tyler and Davies, 1977.

Diagnosis: The type species in this genus *Litoria longirostris* Tyler and Davies, 1977 is phylogenetically and morphologically closest to species within *Llewellynura* Wells and Wellington, 1985. However Duellman *et al.* (2016) found a divergence of 18 MYA between this and other living species within *Llewellynura.* Duellman *et al.* (2016) also found a divergence of 20.9 MYA between "*Litoria longirostris* Tyler and Davies, 1977" and species within the genus *Mahoneybatrachus* Wells and Wellington, 1985.

With such deep divergences between the three groups and obvious morphological divergence, the most sensible classification system (taxonomy) calls for them to be placed in three separate groups, or genera. Hence the erection of the genus *Pustulatarana gen. nov.* herein.

Because this genus is monotypic for "*Litoria longirostris* Tyler and Davies, 1977", the diagnosis for the species is the same as for the genus. The keys in Cogger (2014) and Anstis (2013) for this species taxon, in effect also diagnose this genus.

The single known living species within the genus *Pustulatarana gen. nov.* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: A smallish sized tree frog being 27 mm in body length. Brown to greenish brown or even yellow above, with obscure and irregular darker flecks and blotches. Creamy-white below, finely peppered with dark blackish-brown or shading of other lighter colour on the throat, with heavy concentrations of stippling on chin, chest and flanks of some specimens, and ...

... Continued in AJH Issue 46...

Hoser, R. T. 2020. For the first time ever! An overdue review and reclassification of Australasian Tree Frogs (Amphibia: Anura: Pelodryadidae), including formal descriptions of 12 tribes, 11 subtribes, 34 genera, 26 subgenera, 62 species and 12 subspecies new to science. *Australasian Journal of Herpetology* 44-46:1-192.

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... Continued from AJH Issue 45 ...

Underside of thighs have irregular darker patches and hind isde of thigh has irregular fine creamish coloured stripes. Skin is leathery and with numerous scattered tubercles which may or not be arranged in well-defined longitudinal rows, including sometimes some of medium to large size and a prominent one on the eyelid. Belly is smooth except for some granular skin on the lower belly and thighs. Vomerine teeth present, but weakly developed and between the choanae. Fingers lack webbing but have large oval discs. Toes poorly to moderately webbed. A minute rounded outer metatarsal tubercle and a moderate-zied oval inner metatarsal tubercle. Tympanum distinct.

Pustulatarana gen. nov. are separated from the genus *Llewellynura* Wells and Wellington, 1985 by the large oval discs on the forelimbs and larger body size (27 mm vs 20 mm). *Pustulatarana gen. nov*. are separated from the genus *Mahoneybatrachus* Wells and Wellington, 1985, by having reduced toe webbing, versus well developed webbing on the feet.

Living specimens of *Pustulatarana longirostris* (Tyler and Davies, 1977) are depicted in Vanderduys (2012) on page 49 at bottom (2 images), as well as in Anstis (2013) on pages 234-237, including tadpoles and in Cogger (2014) on page 172 at top.

Distribution: Known only from McIllwraith Range, Mount Tozer and William Thomson Ranges on Cape York Peninsula in Far North Queensland, Australia.

Etymology: In Latin *Pustulata* means warty and *rana* means frog, so the name literally means warty frog, which sums up the morphology of the species in the genus.

Content: *Pustulatarana longirostris* (Tyler and Davies, 1977).

PUSTULATARANA LONGIROSTRIS TOZERENSIS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:6FA68D51-7733-43A7-A381-129BE1723EAD

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J92480 collected from the south side of Mount Tozer, far north Queensland, Australia, Latitude -13.1 S., Longitude 143.2 E.

This facility gives access to its holdings.

Paratypes: Five preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J92481-J92485 all collected from the south side of Mount Tozer, far north Queensland, Australia, Latitude -13.1 S., Longitude 143.2 E.

Diagnosis: *Pustulata longirostris tozerensis subsp. nov*. has until now been treated as a northern outlier population of nominate *P. longirostris* (Tyler and Davies, 1977), with a type locality of Rocky River (Latitude 13.46 S., Longitude 142.23 E), McIlwraith Range, Cape York Peninsula, Queensland, Australia and found generally in the rainforested tributaries of the Rocky River system.

By contrast *P. longirostris tozerensis subsp. nov*. is found in the rainforest streams running from the south side of Mount Tozer and including the Sir William Thompson Range, north of Lockhart River, far north Queensland, Australia. The two populations are separated by a dry zone of apparently unsuitable habitat of significant geological antiquity and are therefore reproductively isolated and therefore evolving in separate directions. They are also morphologically divergent, warranting identification of the unnamed population at least to subspecies level as done herein.

The zone dividing known populations of each species is only about 30 km in a straight line.

P. longirostris tozerensis subsp. nov. is separated from *P. longirostris longirostris* by having a dorsum covered with numerous small pointed tubercles and some small folds of skin not obviously arranged in a longitudinal manner, versus small pointed and larger tubercles including large rounded ones on the dorsum, some of which are clearly arranged in a longitudinal manner down the dorsum. White on the upper lip, under the eye of *P. longirostris tozerensis subsp. nov*. extends beyond the eye towards the snout, but does not do so in *P. longirostris longirostris.*

The single known living species within the genus *Pustulatarana gen. nov*., *P. longirostris* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: A smallish sized tree frog being 27 mm in body length. Brown to greenish brown or even yellow above, with obscure and irregular darker flecks and blotches. Creamy-white below, finely peppered with dark blackish-brown or shading of other lighter colour on the throat, with heavy concentrations of stippling on chin, chest and flanks of some specimens. Underside of thighs have irregular darker patches and hind isde of thigh has irregular fine creamish coloured stripes. Skin is leathery and with numerous scattered tubercles which may or not be arranged in well-defined longitudinal rows, including sometimes some of medium to large size and a prominent one on the eyelid. Belly is smooth except for some granular skin on the lower belly and thighs. Vomerine teeth present, but weakly developed and between the choanae. Fingers lack webbing but have large oval discs. Toes poorly to moderately webbed. A minute rounded outer metatarsal tubercle and a moderate-zied oval inner metatarsal tubercle. Tympanum distinct.

Pustulatarana gen. nov. are separated from the genus *Llewellynura* Wells and Wellington, 1985 by the large oval discs on the forelimbs and larger body size (27 mm vs 20 mm).

Pustulatarana gen. nov. are separated from the genus *Mahoneybatrachus* Wells and Wellington, 1985, by having reduced toe webbing, versus well developed webbing on the feet.

Distribution: *P. longirostris tozerensis subsp. nov*. is found in the vicinity of rainforest streams running from just south of Mount Tozer to include the Sir William Thompson Range, north of Lockhart River, far north Queensland, Australia.

Etymology: The subspecies name reflects the locality that most specimens of this taxon have been found to date, namely the environs of Mount Tozer.

***LLEWELLYNURA* WELLS AND WELLINGTON, 1985**

Type species: *Hyla dorsalis microbelos* Cogger, 1966.

Diagnosis: The type species *Hyla dorsalis microbelos*

Cogger, 1966 is now recognized as a full species separate to the morphologically similar New Guinea taxon originally described as *Litoria dorsalis* Macleay, 1878. The putative taxon *Llewellynura microbelos* (Cogger, 1966), with a type locality of Cairns in Queensland, Australia has long been recognized as a so-called composite species (e.g. Anstis 2013). Two new forms previously included in *L. microbelos* are formally named within this paper.

Species within the genus *Llewellynura* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: they are tiny in size, being about 20 mm in body length as adults. Colour is variegated dark and brown dorsally; a row of widely spaced dorsolateral tubercles and ridges may be on each side, or alternatively just a few randomly scattered small tubercles on either side of upper flank; no pectoral fold; several conspicuous tubercles above each eye; tiny, slender and agile and with a sharply pointed snout. The dorsum may be grey, brown, yellow or red, often flecked or mottled with darker colour. There is usually a broad dark band from behind the eye to the groin and an even darker stripe along the snout, through the eye and over the base of the arm to the flank. Snout and upper surfaces of the limbs are peppered with dark brown. There is a conspicuous dark bar along the front edge of the arm. Ventral surface is white except for a fine peppering of brown on the throat, chest and limbs. Skin is smooth dorsally, with at least some small tubercles or warts or skin folds and usually several small subercles over each eye. Throat skin is smooth, but belly is granular. Finger and toe discs are moderate in size but distinct. Fingers lack webbing and toes are less than half webbed. The disc and nearly two phlanges are free on the outer side of the fourth toe. The inner metatarsal tubercle is prominent and there is no outer one. Tympanum ranges from small to indistinct. Second finger longer than first.

The Australian species within *Llewellynura* being of the nominate subgenus *Llewellynura* are separated from the New Guinea species herein placed in the subgenus *Microlitoria subgen. nov*. by lacking vomerine teeth.

Distribution: The three species within the nominate subgenus *Llewellynura* are found in the tropical parts of northern Australia from three main areas being:

1/ The north-west Kimberley Division of Western Australia, centred around the Mitchell Plateau (*L. fukker sp. nov.*), and:

2/ The top end of the Northern Territory, from Litchfield National Park in the west and extending east to include Groote Eylandt, and also including the Tiwi Islands (*L. yehbwudda sp. nov.*), and:

3/ Cape York Queensland, extending as far south as Townsville (*L. microbelos*). Records south of there are almost certainly specimens inadvertently moved in recent times by humans.

Species within the subgenus *Microlitoria subgen. nov*. are known from various locations in New Guinea.

Content: *Llewellynura microbelos* (Cogger, 1966) (type species); *L. dorsalis* (Macleay, 1878); *L. fukker sp. nov.*; *L. jeudii* (Werner, 1901); *L. timida* (Tyler and Parker, 1972); *L. yehbwudda sp. nov.*.

MICROLITORIA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:6DA3701D-5A02-4C6C-B19A-8670E0ECD0BA

Type species: *Litoria dorsalis* Macleay, 1878.

Diagnosis: Species within the genus *Llewellynura* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: they are tiny in size, being about 20 mm in body length as adults. Colour is variegated dark and brown dorsally; a row of widely spaced dorsolateral tubercles and ridges may be on each side, or alternatively just a few randomly scattered small tubercles on either side of upper flank; no pectoral fold; several conspicuous tubercles above each eye; tiny, slender and agile and with a sharply pointed snout. The dorsum may be grey, brown, yellow or red, often flecked or mottled with darker colour. There is usually a broad dark band from behind the eye to the groin and an even darker stripe along the snout, through the eye and over the base of the arm to the flank. Snout and upper surfaces of the limbs are peppered with dark brown. There is a conspicuous dark bar along the front edge of the arm.

Ventral surface is white except for a fine peppering of brown on the throat, chest and limbs. Skin is smooth dorsally, with at least some small tubercles or warts or skin folds and usually several small subercles over each eye. Throat skin is smooth, but belly is granular. Finger and toe discs are moderate in size but distinct. Fingers lack webbing and toes are less than half webbed. The disc and nearly two phlanges are free on the outer side of the fourth toe. The inner metatarsal tubercle is prominent and there is no outer one. Tympanum ranges from small to indistinct. Second finger longer than first.

The Australian species within *Llewellynura* being of the nominate subgenus *Llewellynura* are separated from the New Guinea species herein placed in the subgenus *Microlitoria subgen. nov*. by lacking vomerine teeth. These are present in species of *Microlitoria subgen. nov.*.

According to Duellman *et al*. (2016), the two subgenera diverged from one another 14.8 MYA.

Distribution: Species within the subgenus *Microlitoria subgen. nov*. are known from various locations in New Guinea.

The three species within the nominate subgenus *Llewellynura* are found in the tropical parts of northern Australia from three main areas being:

1/ The north-west Kimberley Division of Western Australia, centred around the Mitchell Plateau (*L. fukker sp. nov.*), and:

2/ The top end of the Northern Territory, from Litchfield National Park in the west and extending east to include Groote Eylandt, and also including the Tiwi Islands (*L. yehbwudda sp. nov.*), and:

3/ Cape York Queensland, extending as far south as Townsville (*L. microbelos*). Records south of there are almost certainly specimens inadvertently moved in recent times by humans.

Etymology: The species in the subgenus have until now been treated by most publishing authors as being within the genus "*Litoria* Tschudi, 1838". Due to them being

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among the tinyest species in the putative genus, they are herein called “Micro” as in small and hence in full “Microlitoria”.

Content: *Llewellynura* (*Microlitoria*) *dorsalis* (Macleay, 1878); *L.* (*Microlitoria*) *jeudii* (Werner, 1901); *L.* (*Microlitoria*) *timida* (Tyler and Parker, 1972).

LLEWELLYNURA* (*LLEWELLYNURA*) *FUKKER SP. NOV.

LSIDurn:lsid:zoobank.org:act:DBE25DB2-10D7-4380-A5CF-40F842506D43

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R56470, collected 20 km south east of Mitchell Plateau Camp, Latitude -14.95 S., Longitude 125.95 E.

This government-owned facility allows access to its holdings.

Paratypes: Thirteen preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R43337, R43361- R43370, R56470 and R62203 all collected from Mitchell Plateau, Western Australia, Australia, Latitude -14.8667 S., Longitude125.8333 E.

Diagnosis: The three species within the nominate subgenus *Llewellynura* Wells and Wellington, 1985 have until 2019 been treated as a single species, namely *L. microbelos* (Cogger, 1966). However this putative taxon in fact consists of three separate and widely allopatric species.

This has been known for many years and Anstis (2013) stated a view that more than one species was within putative *L. microbelos* as described in her book.

As a trio, they are found in the tropical parts of northern Australia from three main areas being:

1/ The north-west Kimberley Division of Western Australia, centred around the Mitchell Plateau (*L. fukker sp. nov.*), and:

2/ The top end of the Northern Territory, from Litchfield National Park in the west and extending east to include Groote Eylandt and also including the Tiwi Islands (*L. yehbwudda sp. nov.*), and:

3/ Cape York Queensland, extending as far south as Townsville (*L. microbelos*). Records south of there are almost certainly specimens inadvertently moved in recent times by humans, such as when being translocated in boxes of fruit via trucks and trains.

All three species would key out as *L. microbelos* in either Anstis (2013) or Cogger (2014).

The three species can however be readily separated from one another as follows:

L. microbelos with a type locality of Cairns in far north Queensland, and confined to the Cape York area, has an orange iris and tubercles on the flanks are mainly, but not entirely small, blunt and widely scattered and not in any well-defined longitudinal rows. The white labial marking under the eye does extend foreward beyond the nostril, but is ill-defined at this point.

L. fukker sp. nov. from the north-west Kimberley in Western Australia has an orange iris and very few widely scattered tubercles on the flanks. The white labial marking under the eye extends foreward beyond the nostril and is well defined at this point.

L. yehbwudda sp. nov. has a yellow-grey iris (rarely seen with a slight orange tinge) and a prominent well-defined row of skin folds and tubercles running in a line on either side of the back of the dorsum and a second similar well-defined row of smaller tubercles running along each side of the mid flank. The white labial marking under the eye does not extend as far foreward as the nostril.

Anstis (2013) on page 247, gives detail of differences between the tadpoles and metamorps of Queensland *L. microbelos*, and Northern Territory *L. yehbwudda sp. nov.* (which are treated by her provisionally as a separate population of *L. microbelos*).

Significantly the images of two metamorphs (one of each species) on page 247 bottom of Anstis (2013) readily shows the diagnostic differences also in the adults of both species as outlined herein.

Photos of *L. microbelos* in life can be seen in Vanderduys (2012) on page 54 in two images, Cogger (2014) on page 174 bottom left and Anstis (2013) on page 245 at top left and second from top on right.

Photos of *fukker sp. nov.* in life can be seen in Tyler and Davies (1986) in the colour plates at number 27 and in Tyler *et al. (*1994) on plate 32 at bottom.

Photos of *L. yehbwudda sp. nov.* in life can be seen in Anstis (2013) on page 245 at top right.

Species within the genus *Llewellynura* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: they are tiny in size, being about 20 mm in body length as adults. Colour is variegated dark and brown dorsally; a row of widely spaced dorsolateral tubercles and ridges may be on each side, or alternatively just a few randomly scattered small tubercles on either side of upper flank; no pectoral fold; several conspicuous tubercles above each eye; tiny, slender and agile and with a sharply pointed snout. The dorsum may be grey, brown, yellow or red, often flecked or mottled with darker colour. There is usually a broad dark band from behind the eye to the groin and an even darker stripe along the snout, through the eye and over the base of the arm to the flank. Snout and upper surfaces of the limbs are peppered with dark brown. There is a conspicuous dark bar along the front edge of the arm. Ventral surface is white except for a fine peppering of brown on the throat, chest and limbs. Skin is smooth dorsally, with at least some small tubercles or warts or skin folds and usually several small subercles over each eye. Throat skin is smooth, but belly is granular. Finger and toe discs are moderate in size but distinct. Fingers lack webbing and toes are less than half webbed. The disc and nearly two phlanges are free on the outer side of the fourth toe. The inner metatarsal tubercle is prominent and there is no outer one. Tympanum ranges from small to indistinct. Second finger longer than first.

The three Australian species within *Llewellynura* as outlined in the description above, being of the nominate subgenus *Llewellynura* are separated from the New Guinea species herein placed in the subgenus *Microlitoria subgen. nov*. by lacking vomerine teeth. These are present in species of *Microlitoria subgen. nov*..

According to Duellman *et al*. (2016), the two subgenera diverged from one another 14.8 MYA.

Distribution: *L. fukker sp. nov.* appears to be restricted to the north-west Kimberley Division of Western Australia, centred around the Mitchell Plateau, Western Australia.

Etymology: The call is this species is a series of very high-pitched rapidly repeated whirring notes at the rate of about 3 per second. These are produced in bouts lasting about 6-10 seconds and increase in speed towards the end of the series. The call is like that of a small cicada insect. Frogs call in large choruses including dozens or even hundreds of males and individual males will call between notes of nearby males, making the general sound appear as a loud ear pearcing din.

The local Aboriginals in the area are called the Wunambal people. As they try to sleep adjacent to the swamps these frogs start calling from, they will wake up and yell “Fukker” and hence the species name.

LLEWELLYNURA* (*LLEWELLYNURA*) *YEHBWUDDA SP. NOV.

LSIDurn:lsid:zoobank.org:act:616665B3-A265-4CA7-A606-196085938E47

Holotype: A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen number R22599 collected from Howard Springs, an outer Darwin suburb, Darwin, Australia, Latitude -12.45 S., Longitude 131.05 E.

This government-owned facility allows access to its holdings.

Paratypes: Eleven preserved specimens at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen numbers R00129-R00135, R12063, R22600, R27707 and R27714 all collected from Howard Springs, an outer Darwin suburb, Darwin, Australia, Latitude -12.45 S., Longitude 131.05 E.

Diagnosis: The three species within the nominate subgenus *Llewellynura* Wells and Wellington, 1985 have until 2019 been treated as a single species, namely *L. microbelos* (Cogger, 1966). However this putative taxon in fact consists of three separate and widely allopatric species.

This has been known for many years and Anstis (2013) stated a view that more than one species was within putative *L. microbelos* as described in her book.

As a trio, they are found in the tropical parts of northern Australia from three main areas being:

1/ The north-west Kimberley Division of Western Australia, centred around the Mitchell Plateau (*L. fukker sp. nov.*), and:

2/ The top end of the Northern Territory, from Litchfield National Park in the west and extending east to include Groote Eylandt and also including the Tiwi Islands (*L. yehbwudda sp. nov.*), and:

3/ Cape York Queensland, extending as far south as Townsville (*L. microbelos*). Records south of there are almost certainly specimens inadvertently moved in recent times by humans, such as when being translocated in boxes of fruit via trucks and trains.

All three species would key out as *L. microbelos* in either Anstis (2013) or Cogger (2014).

The three species can however be readily separated from one another as follows:

L. microbelos with a type locality of Cairns in far north Queensland, and confined to the Cape York area, has an orange iris and tubercles on the flanks are mainly, but not entirely small, blunt and widely scattered and not in any well-defined longitudinal rows. The white labial marking under the eye does extend foreward beyond the nostril, but is ill-defined at this point.

L. fukker sp. nov. from the north-west Kimberley in Western Australia has an orange iris and very few widely scattered tubercles on the flanks. The white labial marking under the eye extends foreward beyond the nostril and is well defined at this point.

L. yehbwudda sp. nov. has a yellow-grey iris (rarely seen with a slight orange tinge) and a prominent well-defined row of skin folds and tubercles running in a line on either side of the back of the dorsum and a second similar well-defined row of smaller tubercles running along each side of the mid flank. The white labial marking under the eye does not extend as far foreward as the nostril.

Anstis (2013) on page 247, gives detail of differences between the tadpoles and metamorps of Queensland *L. microbelos*, and Northern Territory *L. yehbwudda sp. nov.* (which are treated by her provisionally as a separate population of *L. microbelos*).

Significantly the images of two metamorphs (one of each species) on page 247 bottom of Anstis (2013) readily shows the diagnostic differences also in the adults of both species as outlined herein.

Photos of *L. microbelos* in life can be seen in Vanderduys (2012) on page 54 in two images, Cogger (2014) on page 174 bottom left and Anstis (2013) on page 245 at top left and second from top on right.

Photos of *fukker sp. nov.* in life can be seen in Tyler and Davies (1986) in the colour plates at number 27 and in Tyler *et al. (*1994) on plate 32 at bottom.

Photos of *L. yehbwudda sp. nov.* in life can be seen in Anstis (2013) on page 245 at top right.

Species within the genus *Llewellynura* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: they are tiny in size, being about 20 mm in body length as adults. Colour is variegated dark and brown dorsally; a row of widely spaced dorsolateral tubercles and ridges may be on each side, or alternatively just a few randomly scattered small tubercles on either side of upper flank; no pectoral fold; several conspicuous tubercles above each eye; tiny, slender and agile and with a sharply pointed snout. The dorsum may be grey, brown, yellow or red, often flecked or mottled with darker colour. There is usually a broad dark band from behind the eye to the groin and an even darker stripe along the snout, through the eye and over the base of the arm to the flank. Snout and upper surfaces of the limbs are peppered with dark brown. There is a conspicuous dark bar along the front edge of the arm. Ventral surface is white except for a fine peppering of brown on the throat, chest and limbs. Skin is smooth dorsally, with at least some small tubercles or warts or skin folds and usually several small subercles over each eye. Throat skin is smooth, but belly is

granular. Finger and toe discs are moderate in size but distinct. Fingers lack webbing and toes are less than half webbed. The disc and nearly two phlanges are free on the outer side of the fourth toe. The inner metatarsal tubercle is prominent and there is no outer one. Tympanum ranges from small to indistinct. Second finger longer than first.

The three Australian species within *Llewellynura* as outlined in the description above, being of the nominate subgenus *Llewellynura* are separated from the New Guinea species herein placed in the subgenus *Microlitoria subgen. nov.* by lacking vomerine teeth. These are present in species of *Microlitoria subgen. nov.*.

According to Duellman *et al.* (2016), the two subgenera diverged from one another 14.8 MYA.

Distribution: *L. yehbwudda sp. nov.* occurs in the top end of the Northern Territory, from Litchfield National Park in the west, extending east to include Groote Eylandt and also including the Tiwi Islands near Darwin.

Etymology: These frogs are common on the outskirts of Darwin in the Northern Territory, including the type locality of Howard Springs. In the 1980's surviving native Australian Aboriginals, in this region known as the Larrakia people, were eking out a miserable existence after the British Empire stole their land and exterminated most of the population. Bored women and childen would scour the vegetation of the local swamp at Howard Springs looking for the small frogs to cook on the campfire, which they then ate whole.

When a Larrakia child would grab a frog he'd scream to his mates "*yehbwudda*" and hence the species name for this taxon.

***MAHONABATRACHUS* WELLS AND WELLINGTON, 1985**

Type species: *Hyla meiriana* Tyler, 1969.

Diagnosis: Known as the "Rock Hole Frogs", living frogs in the genus *Mahonabatrachus* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: In colour they are usually irregularly mottled above with metallic fawn, brown or reddish brown and dark brown, the small low tubercles on the back sometimes tending to be light-centered and/or dark edged. Sometimes these frogs are dominantly dark brown but with a gold-orange dorsolateral stripe from snout to eye and continuing above the eye above the tympanum along the body almost to the groin. Limbs of all specimens are always coloured with irregular dark brown cross bands and all frogs have barred or spotted lips to some degree and lower surfaces are whitish. The skin is leathery to finely granular above with numerous low, rounded or sometimes slightly pointed tubercles, that are fairly evenly spaced. No pectoral fold. Moderate sized but conspicuous diss on fingers and toes. Fingers free and toes with moderately developed webbing, including reaching the disc of the fifth toe. Adults average 20 mm in length.

According to Duellman *et al.* (2016), the species in this genus diverged from their nearest living relatives 20.9 MYA.

Until recently this genus as defined by Wells and Wellington (1985) and as defined herein (with a modified diagnosis) comprised just one species as in the type spcies. A morphologically similar species *M. aurifera* (Anstis, Tyler, Roberts, Price and Doughty, 2010) is clearly within this genus, as outlined by the authors in their description.

Anstis (2013) stated of *M. meiriana* "may include two species", but gave no indication as to which populations they referred to.

However in line with other biogeographical splits in northern Australia, the obvious presumption wold be she was referring to the morphologically distinct Kimberley (West Australia) specimens as being the putative new species.

Investigations showed a split within Kimberley animals into two distinctive groups as well as another distinctive form south of the Gulf of Carpentaria. Yet another distinctive and geographically isolated population occurs in the Victoria River area of the north-west Northern Territory. All four are formally named within this paper as new species on the basis of morphological differences and separation by well-known biogeographical barriers of known antiquity.

Hence the genus *Mahonabatrachus* now includes six species.

Distribution: Rock escarpment country of the top end of the Northern Territory and nearby Western Australia, including the Kimberley District of Western Australia and the southern edge of the Gulf of Carpentaria.

Content: *Mahonabatrachus meiriana* (Tyler, 1969) (type species); *M. aurifera* (Anstis, Tyler, Roberts, Price and Doughty, 2010); *M. chriswilliamsi sp. nov.*; *M. marionanstisae sp. nov.*; *M. pailsae sp. nov.*; *M. roypailsi sp. nov.*.

MAHONABATRACHUS CHRISWILLIAMSI SP. NOV.

LSIDurn:lsid:zoobank.org:act:D5398E68-EDB4-4F32-9EC8-86369DDFEEC3

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R15638 collected from the Admiralty Gulf area, North-west Kimberley Division, Western Australia, Australia. Latitude -14.50 S., Longitude 125.83 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R44319, collected from Crystal Creek at Crystal Head, from the Admiralty Gulf area in the North-west Kimberley Division of Western Australia, Australia, Latitude -14.5167 S., Longitude 125.7833 E.

Diagnosis: *Mahonabatrachus chriswilliamsi sp. nov.*, *M. marionanstisae sp. nov.*, *M. pailsae sp. nov.* and *M. roypailsi sp. nov.* have all been treated as populations of a widespread putative taxon *M. meiriana* (Tyler, 1969), originally described as "*Hyla meriana*", with a type locality of 98 miles north of Mainoru, Northern Territory (NT), Australia.

The five morphologically similar and obviously closely related species can be readily separated on the basis of differences in morphology and colour.

Nominate *M. meiriana* is herein confined to the Arnhemland Escarpment of the Northern Territory and immediately adjacent outliers in a region bound by the

type locality in Arnhemland (98 miles north of Mainoru, Northern Territory, Australia), west to Litchfield National Park, NT.

M. pailsae sp. nov. is the taxon in this species group found in the region generally bound by the Daly River in the north and West Baines/Victoria River in the south-west, including escarpment country within this zone.

M. marionanstisae sp. nov. is found generally around the Ord River region of the Kimberley District of Western Australia including immediately adjacent parts of North-west Northern Territory, including areas bounded by the West Baines/Victoria River in the east and Durack River in the West.

M. chriswilliamsi sp. nov. is confined to the north-west Kimberley division from Durack River in the east and generally north of the Mitchell Plateau. Specimens in the southern Kimberley are tentatively assigned to this species.

M. roypailsi sp. nov. is restricted to low escarpments south of the Gulf of Carpentaria in the Northern Territory.

All five species would be identified as *M. meiriana* by the diagnosis in Tyler (1969) or that of Cogger (2014).

All five species and a sixth species in this genus *M. aurifera* (Anstis, Tyler, Roberts, Price and Doughty, 2010) are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: They are an extremely small species with a maximum snout to vent length of 22.5 mm, characterised by an extremely high E-N/IN ratio (1.286-1.600), short and unwebbed fingers with prominent, transversely oval discs and extensively webbed toes (the webbing reaching the base of the discs of all toes except the fourth); vomerine teeth and outer metatarsal tubercles are present. In life there are striking post-femoral markings; the snout is evenly rounded and not particularly prominent or projecting.

I can report for the first time that *M. aurifera* (Anstis, Tyler, Roberts, Price and Doughty, 2010) is most simply separated from the other five species by having no more than five rounded tubercles in a row between front and hind leg on the flank (counted in a line and ignoring stray tubercles above or below the line), versus six or more in the other five species and the relevant tubercles are largeish, rounded and blunt in form in *M. aurifera*, versus smaller and tending towards being more pointed in the other five species. It also readily separated from the other five species by having an iris that is orange above and dull orange below with distinctive strips/patches of black pigment on each of the north-south-east-west axis.

M. aurifera is further separated from the other five species (all treated by the relevant authors as *M. meiriana*) by the suite of characters outlined in the original description of Anstis *et al.* (2010), including a slightly more pointed snout and tadpoles having a unique black, gold and red pigment pattern as well as a continuous papillary border around the oral disc (neither of which are seen in the other five species).

M. meiriana is readily separated from the other four species by the following suite of characters: The dorsum is generally dark reddish-brown with light grey blotches and marks occupying 15 to 40 percent of the dorsum. There is an average of 11 moderately enlarged tubercles with spikey edge of same colour as pigment below (either reddish-brown or grey). There are two well-defined white labial bars beneath the eye and at least one on the snout anterior to this (on each side).

Hind limbs have semi-distinct grey and brown bands and the forelimbs are of grey background colour with a strong light brown overlay. The front limbs also have a small number of well defined irregular shaped, dark brown spots or blotches. The iris is brilliant red/orange on the upper half and light grey below, with demarcation between both being well defined by a black midline.

In *M. meiriana* and the other species except for *M. pailsae sp. nov.*, the interdigital webbing reaches the base of the terminal discs of all toes except the fourth where it extends as far as the subarticular tubercle at the base of the penultimate phalanx and is united to the disc by a narrow lateral fringe.

M. pailsae sp. nov. is readily separated from the other four species by the following suite of characters: This species has more extensive webbing of the feet than all other species, in this taxon being unique among the five in reaching mid-way up the penultimate phalanx of the fourth toe.

In colour the dorsum is generally a dark brown, accentuated by the dark grey (rather than light grey) interspaces and blotches on the dorsum. The dorsal surface of the thigh is similar to the colour of the head and back (the light markings on the posterior face do not extend upon it). The ventral surfaces are much more heavily and extensively marked; the throat is usually a uniform dark brown and only

infrequently stippled with brown and the ventral surface of the thighs is suffused with brown in most specimens.The iris is a dull orange colour above and grey with an orange tinge below and there is either no border between upper and lower parts of the iris, or if present it is greyish, not black and peppered and indistinct. Dark labial bars or markings are prominent anterior to the eye.

Limbs are generally light brown with indistinct darker markings.

M. marionanstisae sp. nov. is readily separated from the other four species by the following suite of characters: A generally faded and indistinct colouration of the dorsum, which is a combination of indistinct dark brown and light brown markings (versus for example reddish-brown and light grey in *M. meiriana*). The demarkation between upper iris and lower iris by way of black border is either indistinct or absent. The upper eye is a dull orange-brown and extends well below half-way with only the very lower part of the eye either dark grey or greyish in colour, although in many specimens the entire eye is a dull orange-brown. Labial bars of any colour (dark or light) are generally indistinct. Forelimbs are yellowish-brown and generally unmarked, except for some scattered patches of darker peppering. Hindlimbs are light brown with heavy dark peppering giving them a marbled appearance.

The hind legs are relatively shorter in this species than in the other four. In this species there is a TL/S-V range of 0.476-0.556 with a mean of 0.515, versus TL/S-V range of 0.541-0.640 and the mean 0.554 in the other four species (derived from Tyler, 1969).

M. chriswilliamsi sp. nov. is readily separated from the other four species by the following suite of characters: A dorsum that is dark brown in colour with semi-distinct black spots and blotches of irregular shape, but generally scallered across the dorsum and limbs. On the limbs the black markings tend to form bars. Many of the tubercles on the body are white tipped.

In common with *M. marionanstisae sp. nov.* the pale light brown patch encompassing the upper heal of the upper back foot is well defined and prominent.

The upper iris is bright red, lower iris is grey and the black line demarcating the two halves of the eye is well defined.

In this species at the top of the iris is a large patch of dark pigment in the form of black peppering, forming a reasonably large blotch. In all other species there is either a tiny black dot or nothing at all at the same place in the eye.

M. chriswilliamsi sp. nov. is also unusual in that the tubercles on the upper surface of the back leg are large, pointed and white-tipped, numbering 6-9. Labial markings are distinct, but the white is either in the form of small spots or alternatively as very narrow bars. Between these white bits are areas of brown, the brown being the dominant colour of the labials and snout.

The upper surface of the head is brown with black spots and blotches (versus for example reddish-brown and light grey in *M. meiriana*).

M. roypailsi sp. nov. is similar in most respects to *M. meiriana* as described above, but the upper iris is dull orange in colour, labial markings and those on the limbs are indistinct; the anterior of the snout is brownish as opposed to purplish in colour and the dorsum has beige as opposed to light grey interspaces.

M. meiriana in life is depicted on page 173 of Cogger (2014) and Anstis (2013) on page 242 at top right and right middle and online at:
https://www.flickr.com/photos/stephenmahony/36225998011/
and:
https://www.flickr.com/photos/mattsummerville/40940670621/
and:
https://www.flickr.com/photos/ryanfrancis/26315692613/
and:
https://www.flickr.com/photos/euprepiosaur/7240116716/

M. chriswilliamsi sp. nov. in life is depicted online at:
https://www.flickr.com/photos/54876436@N08/19647295261/

M. marionanstisae sp. nov. is depicted on page 242 of Anstis (2013) at top left and online at:
https://www.flickr.com/photos/23031163@N03/8519050483/
and:
https://www.flickr.com/photos/14807473@N08/49397917677/

M. pailsae sp. nov. in life is depicted online at:
https://www.flickr.com/photos/68921296@N06/14697052000/

Distribution: *Mahonabatrachus chriswilliamsi sp. nov.* is found in the north Kimberley division of Western Australia, Australia, generally west of the Durack River and north of the Mitchell Plateau. Populations from the south-west Kimberley are tentatively referred to this taxon.

Etymology: Named in honour of Chris Williams, of New South Wales, Australia, a former president of the Australian Herpetological Society in Sydney, New South Wales, ex employee of Tarango Zoo in Sydney (poor thing) and John Weigel's Reptile Park business (same) in recognition of his many contributions to herpetology in Australia in often difficult circumstances.

MAHONABATRACHUS MARIONANSTISAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:C0D5E065-F72F-45BD-96A8-1DEC01B4EA86

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R14513 collected in the Lake Argyle area, Kimberley Division of Western Australia, Australia, Latitude -16.22 S., Longitude 128.90 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R162530-33 from Kununurra, Kimberley Division of Western Australia, Australia, Latitude 15.6049 S., Longitude 128.7655 E.

Diagnosis: *Mahonabatrachus chriswilliamsi sp. nov.*, *M. marionanstisae sp. nov.*, *M. pailsae sp. nov.* and *M. roypailsi sp. nov.* have all been treated as populations of a widespread putative taxon *M. meiriana* (Tyler, 1969), originally described as "*Hyla meriana*", with a type locality of 98 miles north of Mainoru, Northern Territory (NT), Australia.

The five morphologically similar and obviously closely related species can be readily separated on the basis of differences in morphology and colour.

Nominate *M. meiriana* is herein confined to the Arnhemland Escarpment of the Northern Territory and immediately adjacent outliers in a region bound by the type locality in Arnhemland (98 miles north of Mainoru, Northern Territory, Australia), west to Litchfield National Park, NT.

M. pailsae sp. nov. is the taxon in this species group found in the region generally bound by the Daly River in the north and West Baines/Victoria River in the south-west, including escarpment country within this zone.

M. marionanstisae sp. nov. is found generally around the Ord River region of the Kimberley District of Western Australia including immediately adjacent parts of North-west Northern Territory, including areas bounded by the West Baines/Victoria River in the east and Durack River in the West.

M. chriswilliamsi sp. nov. is confined to the north-west Kimberley division from Durack River in the east and generally north of the Mitchell Plateau. Specimens in the southern Kimberley are tentatively assigned to this species.

M. roypailsi sp. nov. is restricted to low escarpments south of the Gulf of Carpentaria in the Northern Territory.

All five species would be identified as *M. meiriana* by the diagnosis in Tyler (1969) or that of Cogger (2014).

All five species and a sixth species in this genus *M.*

aurifera (Anstis, Tyler, Roberts, Price and Doughty, 2010) are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: They are an extremely small species with a maximum snout to vent length of 22.5 mm, characterised by an extremely high E-N/IN ratio (1.286-1.600), short and unwebbed fingers with prominent, transversely oval discs, and extensively webbed toes (the webbing reaching the base of the discs of all toes except the fourth); vomerine teeth and outer metatarsal tubercles are present. In life there are striking post-femoral markings; the snout is evenly rounded and not particularly prominent or projecting.

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M. aurifera is further separated from the other five species (all treated by the relevant authors as *M. meiriana*) by the suite of characters outlined in the original description of Anstis *et al.* (2010), including a slightly more pointed snout and tadpoles having a unique black, gold and red pigment pattern as well as a continuous papillary border around the oral disc (neither of which are seen in the other five species).

M. meiriana is readily separated from the other four species by the following suite of characters: The dorsum is generally dark reddish-brown with light grey blotches and marks occupying 15 to 40 percent of the dorsum. There is an average of 11 moderately enlarged tubercles with spikey edge of same colour as pigment below (either reddish-brown or grey). There are two well-defined white labial bars beneath the eye and at least one on the snout anterior to this (on each side).

Hind limbs have semi-distinct grey and brown bands and the forelimbs are of grey background with a strong light brown overlay. The front limbs also have a small number of well defined irregular shaped, dark brown spots or blotches. The iris is brilliant red/orange on the upper half and light grey below, with demarcation between both being well defined by a black midline.

In *M. meiriana* and the other species except for *M. pailsae sp. nov.*, the interdigital webbing reaches the base of the terminal discs of all toes except the fourth where it extends as far as the subarticular tubercle at the base of the penultimate phalanx and is united to the disc by a narrow lateral fringe.

M. pailsae sp. nov. is readily separated from the other four species by the following suite of characters: This species has more extensive webbing of the feet than all other species, in this taxon being unique among the five in reaching mid-way up the penultimate phalanx of the fourth toe.

In colour the dorsum is generally a dark brown, accentuated by the dark grey (rather than light grey) interspaces and blotches on the dorsum. The dorsal surface of the thigh is similar to the colour of the head and back (the light markings on the posterior face do not extend upon it). The ventral surfaces are much more heavily and extensively marked; the throat is usually a uniform dark brown and only

infrequently stippled with brown and the ventral surface of the thighs is suffused with brown in most specimens.The iris is a dull orange colour above and grey with an orange tinge below and there is either no border between upper and lower parts of the iris, or if present it is greyish, not black and peppered and indistinct. Dark labial bars or markings are prominent anterior to the eye.

Limbs are generally light brown with indistinct darker markings.

M. marionanstisae sp. nov. is readily separated from the other four species by the following suite of characters: A generally faded and indistinct colouration of the dorsum, which is a combination of indistinct dark brown and light brown markings (versus for example reddish-brown and light grey in *M. meiriana*). The demarkation between upper iris and lower iris by way of black border is either indistinct or absent. The upper eye is a dull orange-brown and extends well below half-way with only the very lower part of the eye either dark grey or greyish in colour, although in many specimens the entire eye is a dull orange-brown. Labial bars of any colour (dark or light) are generally indistinct. Forelimbs are yellowish-brown and generally unmarked, except for some scattered patches of darker peppering. Hindlimbs are light brown with heavy dark peppering giving them a marbled appearance.

The hind legs are relatively shorter in this species than in the other four. In this species there is a TL/S-V range of 0.476-0.556 with a mean of 0.515, versus TL/S-V range of 0.541-0.640 and the mean 0.554 in the other four species (derived from Tyler, 1969).

M. chriswilliamsi sp. nov. is readily separated from the other four species by the following suite of characters: A dorsum that is dark brown in colour with semi-distinct black spots and blotches of irregular shape, but generally scallered across the dorsum and limbs. On the limbs the black markings tend to form bars. Many of the tubercles on the body are white tipped.

In common with *M. marionanstisae sp. nov.* the pale light brown patch encompassing the upper heal of the upper back foot is well defined and prominent.

The upper iris is bright red, lower iris is grey and the black line demarcating the two halves of the eye is well defined.

In this species at the top of the iris is a large patch of dark pigment in the form of black peppering, forming a reasonably large blotch. In all other species there is either a tiny black dot or nothing at all at the same place in the eye.

M. chriswilliamsi sp. nov. is also unusual in that the tubercles on the upper surface of the back leg are large, pointed and white-tipped, numbering 6-9. Labial markings are distinct, but the white is either in the form of small spots or alternatively as very narrow bars. Between these

white bits are areas of brown, the brown being the dominant colour of the labials and snout.

The upper surface of the head is brown with black spots and blotches (versus for example reddish-brown and light grey in *M. meiriana*).

M. roypailsi sp. nov. is similar in most respects to *M. meiriana* as described above, but the upper iris is dull orange in colour, labial markings and those on the limbs are indistinct; the anterior of the snout is brownish as opposed to purplish in colour and the dorsum has beige as opposed to light grey interspaces.

M. meiriana in life is depicted on page 173 of Cogger (2014) and Anstis (2013) on page 242 at top right and right middle and online at:
https://www.flickr.com/photos/stephenmahony/36225998011/
and:
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and:
https://www.flickr.com/photos/ryanfrancis/26315692613/
and:
https://www.flickr.com/photos/euprepiosaur/7240116716/

M. chriswilliamsi sp. nov. in life is depicted online at:
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and:
https://www.flickr.com/photos/14807473@N08/49397917677/

M. pailsae sp. nov. in life is depicted online at:
https://www.flickr.com/photos/68921296@N06/14697052000/

Distribution: *M. marionanstisae sp. nov.* is found generally around the Ord River region of the Kimberley District of Western Australia including immediately adjacent parts of North-west Northern Territory. It is found in the area bounded by the West Baines/Victoria River in the east and Durack River in the West.

Etymology: Named in honour of Marion Anstis of New South Wales, Australia, author of numerous books and papers on frogs and a past president of the Sydney-based Australian Herpetological Society, in recognition of her wide contributions to herpetology over more than 40 years.

MAHONABATRACHUS PAILSAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:28C5D12E-F360-4C85-961E-ACF32EE5882E

Holotype: A preserved specimen in the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D10811, collected at Japser Gorge, Northern Territory, Australia, Latitude -16.03 S., Longitude 130.68 E.

This government-owned facility allows access to its holdings.

Paratypes: 16 preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D10773-74, D10812-16 and D10818-26, also collected from the type locality (above).

Diagnosis: *Mahonabatrachus chriswilliamsi sp. nov.*, *M. marionanstisae sp. nov.*, *M. pailsae sp. nov.* and *M. roypailsi sp. nov.* have all been treated as populations of a widespread putative taxon *M. meiriana* (Tyler, 1969), originally described as "*Hyla meriana*", with a type locality of 98 miles north of Mainoru, Northern Territory (NT), Australia.

The five morphologically similar and obviously closely related species can be readily separated on the basis of differences in morphology and colour.

Nominate *M. meiriana* is herein confined to the Arnhemland Escarpment of the Northern Territory and immediately adjacent outliers in a region bound by the type locality in Arnhemland (98 miles north of Mainoru, Northern Territory, Australia), west to Litchfield National Park, NT.

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M. marionanstisae sp. nov. is found generally around the Ord River region of the Kimberley District of Western Australia including immediately adjacent parts of North-west Northern Territory, including areas bounded by the West Baines/Victoria River in the east and Durack River in the West.

M. chriswilliamsi sp. nov. is confined to the north-west Kimberley division from Durack River in the east and generally north of the Mitchell Plateau. Specimens in the southern Kimberley are tentatively assigned to this species.

M. roypailsi sp. nov. is restricted to low escarpments south of the Gulf of Carpentaria in the Northern Territory.

All five species would be identified as *M. meiriana* by the diagnosis in Tyler (1969) or that of Cogger (2014).

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pigment on each of the north-south-east-west axis.

M. aurifera is further separated from the other five species (all treated by the relevant authors as *M. meiriana*) by the suite of characters outlined in the original description of Anstis *et al.* (2010), including a slightly more pointed snout and tadpoles having a unique black, gold and red pigment pattern as well as a continuous papillary border around the oral disc (neither of which are seen in the other five species).

M. meiriana is readily separated from the other four species by the following suite of characters: The dorsum is generally dark reddish-brown with light grey blotches and marks occupying 15 to 40 percent of the dorsum. There is an average of 11 moderately enlarged tubercles with spikey edge of same colour as pigment below (either reddish-brown or grey). There are two well-defined white labial bars beneath the eye and at least one on the snout anterior to this (on each side).

Hind limbs have semi-distinct grey and brown bands and the forelimbs are of grey background with a strong light brown overlay. The front limbs also have a small number of well defined irregular shaped, dark brown spots or blotches. The iris is brilliant red/orange on the upper half and light grey below, with demarcation between both being well defined by a black midline.

In *M. meiriana* and the other species except for *M. pailsae sp. nov.*, the interdigital webbing reaches the base of the terminal discs of all toes except the fourth where it extends as far as the subarticular tubercle at the base of the penultimate phalanx and is united to the disc by a narrow lateral fringe.

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In colour the dorsum is generally a dark brown, accentuated by the dark grey (rather than light grey) interspaces and blotches on the dorsum. The dorsal surface of the thigh is similar to the colour of the head and back (the light markings on the posterior face do not extend upon it). The ventral surfaces are much more heavily and extensively marked; the throat is usually a uniform dark brown and only

infrequently stippled with brown, and the ventral surface of the thighs is suffused with brown in most specimens.The iris is a dull orange colour above and grey with an orange tinge below and there is either no border between upper and lower parts of the iris, or if present it is greyish, not black and peppered and indistinct. Dark labial bars or markings are prominent anterior to the eye.

Limbs are generally light brown with indistinct darker markings.

M. marionanstisae sp. nov. is readily separated from the other four species by the following suite of characters: A generally faded and indistinct colouration of the dorsum, which is a combination of indistinct dark brown and light brown markings (versus for example reddish-brown and light grey in *M. meiriana*). The demarkation between upper iris and lower iris by way of black border is either indistinct or absent. The upper eye is a dull orange-brown and extends well below half-way with only the very lower part of the eye either dark grey or greyish in colour, although in many specimens the entire eye is a dull orange-brown. Labial bars of any colour (dark or light) are generally indistinct. Forelimbs are yellowish-brown and generally unmarked, except for some scattered patches of darker peppering. Hindlimbs are light brown with heavy dark peppering giving them a marbled appearance.

The hind legs are relatively shorter in this species than in the other four. In this species there is a TL/S-V range of 0.476-0.556 with a mean of 0.515, versus TL/S-V range of 0.541-0.640 and the mean 0.554 in the other four species (derived from Tyler, 1969).

M. chriswilliamsi sp. nov. is readily separated from the other four species by the following suite of characters: A dorsum that is dark brown in colour with semi-distinct black spots and blotches of irregular shape, but generally scallered across the dorsum and limbs. On the limbs the black markings tend to form bars. Many of the tubercles on the body are white tipped.

In common with *M. marionanstisae sp. nov.* the pale light brown patch encompassing the upper heal of the upper back foot is well defined and prominent.

The upper iris is bright red, lower iris is grey and the black line demarcating the two halves of the eye is well defined.

In this species at the top of the iris is a large patch of dark pigment in the form of black peppering, forming a reasonably large blotch. In all other species there is either a tiny black dot or nothing at all at the same place in the eye.

M. chriswilliamsi sp. nov. is also unusual in that the tubercles on the upper surface of the back leg are large, pointed and white-tipped, numbering 6-9. Labial markings are distinct, but the white is either in the form of small spots or alternatively as very narrow bars. Between these white bits are areas of brown, the brown being the dominant colour of the labials and snout.

The upper surface of the head is brown with black spots and blotches (versus for example reddish-brown and light grey in *M. meiriana*).

M. roypailsi sp. nov. is similar in most respects to *M. meiriana* as described above, but the upper iris is dull orange in colour, labial markings and those on the limbs are indistinct; the anterior of the snout is brownish as opposed to purplish in colour and the dorsum has beige as opposed to light grey interspaces.

M. meiriana in life is depicted on page 173 of Cogger (2014) and Anstis (2013) on page 242 at top right and right middle and online at:
https://www.flickr.com/photos/stephenmahony/36225998011/
and:
https://www.flickr.com/photos/mattsummerville/40940670621/
and:
https://www.flickr.com/photos/ryanfrancis/26315692613/
and:
https://www.flickr.com/photos/euprepiosaur/7240116716/

M. chriswilliamsi sp. nov. in life is depicted online at:

https://www.flickr.com/photos/54876436@N08/19647295261/

M. marionanstisae sp. nov. is depicted on page 242 of Anstis (2013) at top left and online at:

https://www.flickr.com/photos/23031163@N03/8519050483/

and:

https://www.flickr.com/photos/14807473@N08/49397917677/

M. pailsae sp. nov. in life is depicted online at:

https://www.flickr.com/photos/68921296@N06/14697052000/

Distribution: *M. pailsae sp. nov.* is found in the region generally bound by the Daly River in the north and West Baines/Victoria River in the south-west, including escarpment country within this zone.

Etymology: Named in honour of Lyn Pails, wife of Roy Pails, a well-known herpetologist from Ballarat, Victoria, Australia, who along with her husband has made a valuable contribution to herpetology spanning many decades.

MAHONABATRACHUS ROYPAILSI SP. NOV.

LSIDurn:lsid:zoobank.org:act:AAF1E11E-E5B2-49E0-AE67-592D37998585

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.55405 collected at Glyde River, being about 10 km east of the Mcarthur River Camp, in the Northern Territory, Australia, Latitude -16.433 S., Longitude 136.150 E.

This government-owned facility allows access to its holdings.

Paratypes: Six preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.55414, R.55377, R.55387, R.55396, R.55406 and R.55429 all from the type locality (above).

Diagnosis: *Mahonabatrachus chriswilliamsi sp. nov.*, *M. marionanstisae sp. nov.*, *M. pailsae sp. nov.* and *M. roypailsi sp. nov.* have all been treated as populations of a widespread putative taxon *M. meiriana* (Tyler, 1969), originally described as "*Hyla meriana*", with a type locality of 98 miles north of Mainoru, Northern Territory (NT), Australia.

The five morphologically similar and obviously closely related species can be readily separated on the basis of differences in morphology and colour.

Nominate *M. meiriana* is herein confined to the Arnhemland Escarpment of the Northern Territory and immediately adjacent outliers in a region bound by the type locality in Arnhemland (98 miles north of Mainoru, Northern Territory, Australia), west to Litchfield National Park, NT.

M. pailsae sp. nov. is the taxon in this species group found in the region generally bound by the Daly River in the north and West Baines/Victoria River in the south-west, including escarpment country within this zone.

M. marionanstisae sp. nov. is found generally around the Ord River region of the Kimberley District of Western Australia including immediately adjacent parts of North-west Northern Territory, including areas bounded by the West Baines/Victoria River in the east and Durack River in the West.

M. chriswilliamsi sp. nov. is confined to the north-west Kimberley division from Durack River in the east and generally north of the Mitchell Plateau. Specimens in the southern Kimberley are tentatively assigned to this species.

M. roypailsi sp. nov. is restricted to low escarpments south of the Gulf of Carpentaria in the Northern Territory.

All five species would be identified as *M. meiriana* by the diagnosis in Tyler (1969) or that of Cogger (2014).

All five species and a sixth species in this genus *M. aurifera* (Anstis, Tyler, Roberts, Price and Doughty, 2010) are separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: They are an extremely small species with a maximum snout to vent length of 22.5 mm, characterised by an extremely high E-N/IN ratio (1.286-1.600), short and unwebbed fingers with prominent, transversely oval discs and extensively webbed toes (the webbing reaching the base of the discs of all toes except the fourth); vomerine teeth and outer metatarsal tubercles are present. In life there are striking post-femoral markings; the snout is evenly rounded and not particularly prominent or projecting.

I can report for the first time that *M. aurifera* (Anstis, Tyler, Roberts, Price and Doughty, 2010) is most simply separated from the other five species by having no more than five rounded tubercles in a row between front and hind leg on the flank (counted in a line and ignoring stray tubercles above or below the line), versus six or more in the other five species and the relevant tubercles are largeish, rounded and blunt in form in *M. aurifera*, versus smaller and tending towards being more pointed in the other five species. It also readily separated from the other five species by having an iris that is orange above and dull orange below with distinctive strips/patches of black pigment on each of the north-south-east-west axis.

M. aurifera is further separated from the other five species (all treated by the relevant authors as *M. meiriana*) by the suite of characters outlined in the original description of Anstis *et al.* (2010), including a slightly more pointed snout and tadpoles having a unique black, gold and red pigment pattern as well as a continuous papillary border around the oral disc (neither of which are seen in the other five species).

M. meiriana is readily separated from the other four species by the following suite of characters: The dorsum is generally dark reddish-brown with light grey blotches and marks occupying 15 to 40 percent of the dorsum. There is an average of 11 moderately enlarged tubercles with spikey edge of same colour as pigment below (either reddish-brown or grey). There are two well-defined white labial bars beneath the eye and at least one on the snout anterior to this (on each side).

Hind limbs have semi-distinct grey and brown bands and the forelimbs are of grey background with a strong light brown overlay. The front limbs also have a small number of well defined irregular shaped, dark brown spots or blotches. The iris is brilliant red/orange on the upper half and light grey below, with demarcation between both being well defined by a black midline.

In *M. meiriana* and the other species except for *M.*

pailsae sp. nov., the interdigital webbing reaches the base of the terminal discs of all toes except the fourth where it extends as far as the subarticular tubercle at the base of the penultimate phalanx and is united to the disc by a narrow lateral fringe.

M. pailsae sp. nov. is readily separated from the other four species by the following suite of characters: This species has more extensive webbing of the feet than all other species, in this taxon being unique among the five in reaching mid-way up the penultimate phalanx of the fourth toe.

In colour the dorsum is generally a dark brown, accentuated by the dark grey (rather than light grey) interspaces and blotches on the dorsum. The dorsal surface of the thigh is similar to the colour of the head and back (the light markings on the posterior face do not extend upon it). The ventral surfaces are much more heavily and extensively marked; the throat is usually a uniform dark brown and only

infrequently stippled with brown and the ventral surface of the thighs is suffused with brown in most specimens.The iris is a dull orange colour above and grey with an orange tinge below and there is either no border between upper and lower parts of the iris, or if present it is greyish, not black and peppered and indistinct. Dark labial bars or markings are prominent anterior to the eye.

Limbs are generally light brown with indistinct darker markings.

M. marionanstisae sp. nov. is readily separated from the other four species by the following suite of characters: A generally faded and indistinct colouration of the dorsum, which is a combination of indistinct dark brown and light brown markings (versus for example reddish-brown and light grey in *M. meiriana*). The demarkation between upper iris and lower iris by way of black border is either indistinct or absent. The upper eye is a dull orange-brown and extends well below half-way with only the very lower part of the eye either dark grey or greyish in colour, although in many specimens the entire eye is a dull orange-brown. Labial bars of any colour (dark or light) are generally indistinct. Forelimbs are yellowish-brown and generally unmarked, except for some scattered patches of darker peppering. Hindlimbs are light brown with heavy dark peppering giving them a marbled appearance.

The hind legs are relatively shorter in this species than in the other four. In this species there is a TL/S-V range of 0.476-0.556 with a mean of 0.515, versus TL/S-V range of 0.541-0.640 and the mean 0.554 in the other four species (derived from Tyler, 1969).

M. chriswilliamsi sp. nov. is readily separated from the other four species by the following suite of characters: A dorsum that is dark brown in colour with semi-distinct black spots and blotches of irregular shape, but generally scallered across the dorsum and limbs. On the limbs the black markings tend to form bars. Many of the tubercles on the body are white tipped.

In common with *M. marionanstisae sp. nov.* the pale light brown patch encompassing the upper heal of the upper back foot is well defined and prominent.

The upper iris is bright red, lower iris is grey and the black line demarcating the two halves of the eye is well defined.

In this species at the top of the iris is a large patch of dark pigment in the form of black peppering, forming a reasonably large blotch. In all other species there is either a tiny black dot or nothing at all at the same place in the eye.

M. chriswilliamsi sp. nov. is also unusual in that the tubercles on the upper surface of the back leg are large, pointed and white-tipped, numbering 6-9. Labial markings are distinct, but the white is either in the form of small spots or alternatively as very narrow bars. Between these white bits are areas of brown, the brown being the dominant colour of the labials and snout.

The upper surface of the head is brown with black spots and blotches (versus for example reddish-brown and light grey in *M. meiriana*).

M. roypailsi sp. nov. is similar in most respects to *M. meiriana* as described above, but the upper iris is dull orange in colour, labial markings and those on the limbs are indistinct; the anterior of the snout is brownish as opposed to purplish in colour and the dorsum has beige as opposed to light grey interspaces.

M. meiriana in life is depicted on page 173 of Cogger (2014) and Anstis (2013) on page 242 at top right and right middle and online at:
https://www.flickr.com/photos/stephenmahony/36225998011/

and:
https://www.flickr.com/photos/mattsummerville/40940670621/
and:
https://www.flickr.com/photos/ryanfrancis/26315692613/
and:
https://www.flickr.com/photos/euprepiosaur/7240116716/

M. chriswilliamsi sp. nov. in life is depicted online at:
https://www.flickr.com/photos/54876436@N08/19647295261/

M. marionanstisae sp. nov. is depicted on page 242 of Anstis (2013) at top left and online at:
https://www.flickr.com/photos/23031163@N03/8519050483/

and:
https://www.flickr.com/photos/14807473@N08/49397917677/

M. pailsae sp. nov. in life is depicted online at:
https://www.flickr.com/photos/68921296@N06/14697052000/

Distribution: *M. roypailsi sp. nov.* is restricted to low escarpments south of the Gulf of Carpentaria in the Northern Territory.

Etymology: *M. roypailsi sp. nov.* is named in honour of Roy Pails, a well-known herpetologist from Ballarat, Victoria, Australia in recognition for his many services to herpetology spanning many decades. He has been a world leader in breeding numerous species of reptile over many decades. His website at: http://www.pailsforscales.com.au/about/ describes himself as follows:

“There comes a time in your life when you meet a bloke and you’re convinced he’s lost his marbles. The man behind Pails For Scales!”

This is how Roy comes across to many people. He is thoroughly obsessed with reptiles and literally lives and breathes them every waking hour of his life. The man is a living legend!

His current enterprise “Pails for scales conservation” is fighting an immensely difficult campaign for wildlife conservation. Competing for funds against government-owned zoos and predatory property enterprises like the Terri Irwin business means that on the ground and “hands on” wildlife conservation enterprises like those of Pails are being literally starved of funds.

This is happening in 2020, while the government-owned and government backed fake conservation business enterprises masquerading as charities, squander cash in the form of donations from misguided donors and tax-payer funded hand outs in the name of wildlife conservation and literally do nothing significantly useful to save threatened species.

SALMOCULARANINA SUBTRIBE NOV.

SALMOCULARANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:44A0AE6A-A67A-48D8-9286-CDF304C066A4

Type species: *Litoria personata* Tyler, Davies and Martin, 1978.

Diagnosis: The three species in the genus *Salmocularana gen. nov.* are small species that breed in escarpment rock hills in Arnhemland, Northern Territory and also the Kimberley Ranges of north-west Australia.

The three known living species within the genus *Salmocularana gen. nov.* (one formally described within this paper) are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Pale grey-brown, fawn, reddish, orange or pink above, with dorsal markings ranging from nothing more than slight peppering at the anterior part of the dorsum as seen in *Salmocularana personata* (Tyler, Davies and Martin, 1978), indistinct marbling and blotches as seen in *S. staccato* (Doughty and Anstis, 2007) or an intense randomised configuration of dark brown pigment on a light beige to grey background in *S. saxacola sp. nov.*; specimens have a distinct or semi-distinct dark brownish or purple head stripe from just in front of the nostril, through the eye and ear to upper flank just behind the forelimbs. Lips are whitish to some extent, ranging from a distinct yellow bar, to merely light and peppered brown. Ventral surfaces whitish. Skin may be smooth, with extremely tiny scattered tubercles above as in *S. personata*, or with a very limited number of scattered small tubercles above the arm and on the upper flank and nearby dorsum in *S. staccato* to scattered medium sized tubercles above the arm and on the upper flank and nearby dorsum in *S. saxacola sp. nov.*. Underneath the skin is coarsely granular, except on the throat, where it is smooth. Vomerine teeth are in two short clumps between the choanae. Finger and toe discs are moderate, wider than the digits. Fingers lack webbing, toes being about half webbed, including not reaching the disc of the fifth toe but extending no more than half way along the penultimate phalanx. Second finger is longer than the first. There is a small oval inner metatarsal tubercle and a smaller outer metatarsal tubercle. Tympanum distinct.

Duellman *et al.* (2016) found that the three species in this genus grouping diverged from their nearest living relatives 20.8 MYA, which alone strongly supports the contention that these species should be placed in a separate genus. Morphological divergence of the said taxa further vindicates this contention.

Distribution: The three species are confined to escarpments of Arnhemland, Northern Territory, Australia *Salmocularana personata* (Tyler, Davies and Martin, 1978); the east Kimberley District of Western Australia *S. staccato* (Doughty and Anstis, 2007) and the north-west Kimberley District of Western Australia *S. saxacola sp. nov.*.

Etymology: In Latin *Salmocularana* is an abbreviation of the words “Salmon eyed frog” in reflection of the usual colour of the upper iris in these species.

Content: *Salmocularana personata* (Tyler, Davies and Martin, 1978) (type species); *S. saxacola sp. nov.*; *S. staccato* (Doughty and Anstis, 2007).

SALMOCULARANA SAXACOLA SP. NOV.

LSIDurn:lsid:zoobank.org:act:27E63C72-487A-4563-8FA9-96790A7F1193

Holotype: A preserved adult female specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R167737 collected at Little Mertens Falls, Mitchell Plateau, West Kimberley District, Western Australia, Australia, Latitude -14.8222 S., Longitude 125.7108 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R167738, R167739 and R167740 collected from Little Mertens Falls, Mitchell Plateau, West Kimberley District, Western Australia, Australia, Latitude -14.8222 S., Longitude 125.7108 E.

Diagnosis: Until now, *S. saxacola sp. nov.* would have been diagnosed and treated as a population of *S. staccato* (Doughty and Anstis, 2007) as defined by Anstis (2013) or Cogger (2014), under the name “*Litoria staccato*”.

The two geographically disjunct species and the closely related and morphologically similar species *S. personata* (Tyler, Davies and Martin, 1978) are however readily separated as follows: By colour they are separated as follows: All may be pale grey-brown, fawn, reddish, orange or pink above.

Each species has dorsal markings as follows:

1/ Nothing more than slight peppering at the anterior part of the dorsum as seen in *S. personata.*

2/ Indistinct marbling and blotches as seen in *S. staccato.*

3/ An intense randomised configuration of dark brown pigment on a light beige to grey background in *S. saxacola sp. nov.*.

The three species are further separated by one or other of the following dorsal skin configurations:

1/ Skin may be smooth, with extremely tiny scattered tubercles above as in *S. personata.*

2/ Skin is smooth with a very limited number of scattered small tubercles above the arm and on the upper flank and nearby dorsum in *S. staccato.*

3/ Skin is smooth with scattered medium sized tubercles above the arm and on the upper flank and nearby dorsum in *S. saxacola sp. nov.*.

S. personata has a well-defined, thick dark brown stripe running from snout, through eye, the entire tympanum and along the entire flank, although it tends to fade posteriorly to become a greyish purple colour.

By contrast the same stripe is indistinct in *S. staccato* and never goes midway along the flank.

In *S. saxacola sp. nov.* the same stripe is broken along the entire length, but the contrast between dark and light is sharp and the blotches of the line do run along the entire length of the flank of the body. The dark colour is usually purple to brown and the light of the dorsum is usually beige to light grey. There is a well-defined thin dark crescent running along the upper ridge of the tympanum in this species that is not seen in either other species.

Fingers and toes of *S. personata* and *S. staccato* are whitish and without obvious markings, at most having indistinct tinges in parts, versus whitish with obvious and well-defined purplish spots, bars, flecks or blotches.

The three species can also be differentiated by their tadpole stages. *S. personata* has large pre-metamorphosis tadpoles that are blackish grey in dorsal colour with two distinct yellow lines running down the dorsum on either side of the medial line and continuing down the upper sides of each side of most of the tail. By contrast the tadpoles of the other two species at the same stage of development are yellowish brown in colour.

In tadpoles of *S. staccato* the two distinct yellow lines running down the dorsum on either side of the medial line are effectively absent.

In *S. saxacola sp. nov.* the two distinct yellow lines running down the dorsum on either side of the medial line are present on the body, but not on the tail. They are nowhere near as brilliant in colour or contrast as those seen in *S. personata.*

Anstis (2013) provides comparative images of all of *S. personata*, *S. saxacola sp. nov.* and *S. staccato*, including images of tadpoles and metamorphosed frogs of each species, all of which clearly show the diagnostic differences between each species detailed herein.

In terms of *S. saxacola sp. nov.*, Anstis (2013) has images of this species in life on pages 315 (top right), 316, tadpoles at top and two images below on right, and page 317 at bottom left (young frog).

The three known living species within the genus *Pustulatarana gen. nov.* (one formally described within this paper) are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Pale grey-brown, fawn, reddish, orange or pink above, with dorsal markings ranging from nothing more than slight peppering at the anterior part of the dorsum as seen in *Salmocularana personata* (Tyler, Davies and Martin, 1978), indistinct marbling and blotches as seen in *S. staccato* (Doughty and Anstis, 2007) or an intense randomised configuration of dark brown pigment on a light beige to grey background in *S. saxacola sp. nov.*; specimens have a distinct or semi-distinct dark brownish or purple head stripe from just in front of the nostril, through the eye and ear to upper flank just behind the forelimbs. Lips are whitish to some extent, ranging from a distinct yellow bar, to merely light and peppered brown. Ventral surfaces whitish. Skin may be smooth, with extremely tiny scattered tubercles above as in *S. personata*, or with a very limited number of scattered small tubercles above the arm and on the upper flank and nearby dorsum in *S. staccato* to scattered medium sized tubercles above the arm and on the upper flank and nearby dorsum in *S. saxacola sp. nov.*. Underneath the skin is coarsely granular, except on the throat, where it is smooth. Vomerine teeth are in two short clumps between the choanae. Finger and toe discs are moderate, wider than the digits. Fingers lack webbing, toes being about half webbed, including not reaching the disc of the fifth toe but extending no more than half way along the penultimate phalanx. Second finger is longer than the first. There is a small oval inner metatarsal tubercle and a smaller outer metatarsal tubercle. Tympanum distinct.

Duellman *et al.* (2016) found that the three species in this genus grouping diverged from their nearest living relatives 20.8 MYA, which alone strongly supports the contention that these species should be placed in a separate genus. Morphological divergence of the said taxa further vindicates this contention.

Distribution: *S. saxacola sp. nov.* is known only from the escarpment country of the north-west Kimberley Division of Western Australia. More specifically the known range of this species is bound by Spring Creek, Latitude -15.1997 S., Longitude 126.0881 E. in the east, Katers Island, Latitude - 4.4666 S., Longitude 125.5333 E. in the north and Harding Range, Latitude -16.3231 S., Longitude 124.7589 E. in the south. The ocean to the west otherwise constrains the species.

Etymology: The species name derives from the rock-dwelling habits of these frogs, being confined to extremely rocky escarpment country.

GENUS *LITORIA* TSCHUDI, 1838

Type species: *Litoria freycineti* Tschudi, 1838.

Diagnosis: The genus *Litoria*, with type species *L. freycineti* Tschudi, 1838 is herein restricted to the type species and the closely related *L. latopalmata* Günther, 1867, which as a pair diverged from their nearest common ancestor 13.3 MYA according to Duellman *et al.* (2016).

This divergence and morphological differences are exactly why the species previously included in *Litoria* have been assigned to other genera.

Litoria as defined herein, are readily separated from all other Australasian Tree frogs (Pelodryadidae) by the following suite of characters: Species are a frog that is fawn to dark above, being either immaculate or with markings on the back, with or without a warty exterior, the warts if present being small and flattish, the markings if present typically being a series of darker blotches or variegations in either an irregular or regular pattern. There is a broad dark, canthal stripe, almost completely interrupted in front of the eye and continues behind the eye to effectively overwrite the tympanum and extend to the flanks where it invariably breaks up into a series of

black spots or blotches extending ro the groin. There is a pale glandular stripe from below the eye to the base of the forelimb. Limbs are variegated darker but usually with an irregular pattern of spots, blotches or bars. Lower jaw is variegated with yellow and dark brown, often forming a reticulum, often with a barred appearance. The venter is whitish. Ventral surface and flanks are granular. There is no dorsolateral skin fold. Finger and toe discs are small and project slightly but noticeably, beyond the lateral edges of the penultimate phlanges. Fingers are free, without webbing. Toes have well developed webbing, the webbing not reaching the disc of the fifth toe and extending no more than half way along the penultimate phalanx. There is a small inner and minute outer metatarsal tubercle. Vomerine teeth are in two clusters between the choanae. The tympanum is distinct and adults average 40-45 mm snout to rear.

Distribution: Most of the eastern third of Australia.

Content: *L. freycineti* Tschudi, 1838 (type species); *L. latopalmata* Günther, 1867.

PARALITORIA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:65126912-F61A-4380-9CD2-05592C940390

Type species: *Hyla nigrofrenata* Günther, 1867.

Diagnosis: The genus *Paralitoria gen. nov.* diverged from its nearest common ancestor, being that of the genera *Litoria* and *Quasilitoria gen. nov*. being the most closely related genera, some 15.5 MYA according to Duellman *et al.* (2016).

Paralitoria gen. nov. is separated from all other Australasian tree frogs (Pelodryadidae) by the following suite of characters, being one or other of the following:

1/ Fawn, grey or brown above, being immaculate; a conspicuous black stripe from the snout, through the nostril to the eye, where it is almost entirely broken by a pale vertical bar in front of the eye as a band continuing below the tympanum and extending back to the forearm with minimal loss of width along the length, where after a break, it continues obliquely along the mid flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. Lips are not spotted or barred. The groin and hind side of thighs are pale yellow, spotted and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and distinct, while toe discs are smaller and indistinct. Fingers are unwebbed and toes have moderate webbing between them. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 50 mm (subgenus *Paralitoria subgen. nov.*), or:

2/ Fawn, grey or brown above, with limited flecks or other markings, often as a peppering; a conspicuous narrow black stripe from the snout, through the nostril to the eye, continuing through the tympanum (effectively over-writing it) and extending past the forearm with minimal loss of width along the length to the anterior flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. The lower lips are faintly or partially barred. The groin and hind side of thighs are pale yellow, spotted and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and barely distinct, while toe discs are of similar size. Fingers are unwebbed and toes extensive webbing between them, with the webbing reaching the disc of the fifth toe. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 75 mm (subgenus *Ferelitoria subgen. nov.*).

Distribution: The subgenus *Paralitoria subgen. nov.* is found on the eastern third of Cape York Peninsula, Torres Strait islands and southern New Guinea. Subgenus *Ferelitoria subgen. nov*. is found in the dry tropics of northern Australia, being the top end of the Northern Territory and Western Australia.

Etymology: Para in Latin means “not quite” and hence the name “Paralitoria” meaning not quite Litoria.

Content: *Paralitoria nigrofrenata* (Günther, 1867) (type species); *P. spaldingi* (Hosmer, 1964); *P. watjulumensis* (Copland, 1957).

FERELITORIA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:45B26663-ECD5-46D7-B907-49C08FF6C5B8

Type species: *Hyla latopalmata watjulumensis* Copland, 1957.

Diagnosis: The genus *Paralitoria gen. nov.* diverged from its nearest common ancestor, being that also of the genera *Litoria* and *Quasilitoria gen. nov*. some 15.5 MYA according to Duellman *et al.* (2016).

Paralitoria gen. nov. is separated from all other Australasian tree frogs (Pelodryadidae) by the following suite of characters, being one or other of the following:

1/ Fawn, grey or brown above, with limited flecks or other markings, often as a peppering; a conspicuous narrow black stripe from the snout, through the nostril to the eye, continuing through the tympanum (effectively over-writing it) and extending past the forearm with minimal loss of width along the length to the anterior flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. The lower lips are faintly or partially barred. The groin and hind side of thighs are pale yellow, spotted and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and barely distinct, while toe discs are of similar size. Fingers are unwebbed and toes extensive webbing between them, with the webbing reaching the disc of the fifth toe. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 75 mm (subgenus *Ferelitoria subgen. nov.*), or:

2/ Fawn, grey or brown above, being immaculate; a conspicuous black stripe from the snout, through the nostril to the eye, where it is almost entirely broken by a pale vertical bar in front of the eye as a band continuing below the tympanum and extending back to the forearm with minimal loss of width along the length, where after a

break, it continues obliquely along the mid flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. Lips are not spotted or barred. The groin and hind side of thighs are pale yellow, spotted and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and distinct, while toe discs are smaller and indistinct. Fingers are unwebbed and toes have moderate webbing between them. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 50 mm (subgenus *Paralitoria subgen. nov.*).

Distribution: Subgenus *Ferelitoria subgen. nov.* is found in the dry tropics of northern Australia, being the top end of the Northern Territory and Western Australia.

Etymology: Fere in Latin means “Like”, which is accurate as these frogs are “like” *Litoria* frogs.

Content: *Paralitoria* (*Ferelitoria*) *watjulumensis* (Copland, 1957) (type species); *P.* (*Ferelitoria*) *spaldingi* (Hosmer, 1964).

PARALITORIA SUBGEN. NOV.

Type species: *Hyla nigrofrenata* Günther, 1867.

Diagnosis: As identified within the genus diagnosis within *Paralitoria gen. nov.* within this paper.

Distribution: The subgenus *Paralitoria subgen. nov.* is found on the eastern third of Cape York Peninsula, Torres Strait islands and southern New Guinea.

Content: *Paralitoria nigrofrenata* (Günther, 1867) (monotypic).

Etymology: As for the genus.

QUASILITORIA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:535D6B63-119D-414C-98F7-F83196290D9D

Type species: *Chiroleptes inermis* Peters, 1867.

Diagnosis: The genus *Quasilitoria gen. nov.* as defined herein, diverged from its nearest common ancestor with genus *Litoria* Tschudi, 1838, (as defined in this paper), being the next most closely related genus, some 13.3 MYA according to Duellman *et al.* (2016).

Species of *Quasilitoria gen. nov.* are separated from all other Australasian tree frogs (Pelodryadidae) by the following suite of characters:

The dorsum is smooth or with some scattered low round tubercles; front toe discs are no wider than the penultimate phalanx and toe discs only slightly wider, but otherwise also small.

Front edge of thigh has either a continous black stripe or alternatively an arrangement of broken black spots or blotches.

Lower surfaces white, throat with or without some mottling, smooth on the throat and chest and slightly granular on the belly.

Dorslolateral folds are either absent or very indistinct. Inner metatarsal tubercle is small and outer one is tiny. Prominent vomerine teeth.

Fingers unwebbed, while toes are half to three quarters webbed. Furthermore, one or other of the following character suites:

1/ Back is without darker markings or mottling, at most there being a slight peppering on the upper surfaces; anterior black head stripe when present is interrupted at least in part by a slight vertical bar in front of the eye; posterior dark head stripe is as wide as and overwriting the tympanum or not quite so and if not, then the lower part of the tympanum is not blackened and snout is only moderately pointed, (*Q. axillaris*, *Q. coplandi, Q. inermis*, *Q. pallida*, *Q. tornieri*) (subgenus *Quasilitoria subgen. nov.*), or alternatively:

2/ With darker markings and/or stripes on the dorsal surface, with some longitudinal folds on the back, a strongly pointed snout and a well defined yellow bar in front of the eye, breaking the black line from snout past eye, the yellow bar being blocked at the top by a small and well-defined area of black.

Forefingers light yellowish or white, peppering on the light surfaces of the snout. Tympanum has a distinctive pale rim (*Q. nasuta*, *Q. peninsulae*) (subgenus *Vultusamolitoria subgen. nov.*).

Distribution: Northern third of Australia, extending south along the east coast of Australia, to the New South Wales North coast.

Etymology: “Quasi” in Latin means “like” which sums up the species in the genus, as they are “like” *Litoria*.

Content: *Quasilitoria inermis* (Peters, 1867) (type species); *Q. pallida* (Davies, Martin and Watson 1983); *Q. coplandi* (Tyler, 1968); *Q. mickpughi sp. nov.*; *Q. mippughae sp. nov.*; *Q. nasuta* (Gray, 1842); *Q. peninsulae* (De Vis, 1884); *Q. tornieri* (Neiden, 1923); *Q. axillaris* (Doughty, 2011).

VULTUSAMOLITORIA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:26361CC4-C5D6-428C-A4B6-7BCC8F897A37

Type species: *Pelodytes nasutus* Gray, 1842.

Diagnosis: Frogs in the subgenus *Vultusamolitoria subgen. nov.* are separated from frogs in the nominate subgenus of *Quasilitoria subgen. nov.* by the following suite of characters: having darker markings and/or stripes on the dorsal surface, with some longitudinal folds on the back, a strongly pointed snout and a well defined yellow bar in front of the eye, breaking the black line from snout past eye, the yellow bar being blocked at the top by a small and well-defined area of black. Forefingers light yellowish or white, peppering on the light surfaces of the snout. Tympanum has a distinctive pale rim (*Q. nasuta*, *Q. peninsulae*) (subgenus *Vultusamolitoria subgen. nov.*).

In turn frogs of the nominate subgenus are separated from *Vultusamolitoria subgen. nov.* by the following suite of characters: Back is without darker markings or mottling, at most there being a slight peppering on the upper surfaces; anterior black head stripe when present is interrupted at least in part by a slight vertical bar in front of the eye; posterior dark head stripe is as wide as and overwriting the tympanum or not quite so and if not, then the lower part of the tympanum is not blackened, and snout is only moderately pointed, (*Q. axillaris*, *Q. coplandi, Q. inermis*, *Q. pallida*, *Q. tornieri*) (subgenus *Quasilitoria subgen. nov.*).

Common to both subgenera and when combined with the relevant characters above, species in this genus (*Quasilitoria gen. nov.*) are separated from all other

Australasian Tree Frogs (Pelodryadidae) by the following additional characters:

The dorsum is smooth or with some scattered low round tubercles; front toe discs are no wider than the penultimate phalanx and toe discs only slightly wider, but otherwise also small. Front edge of thigh has either a continous black stripe or alternatively an arrangement of broken black spots or blotches. Lower surfaces white, throat with or without some mottling, smooth on the throat and chest and slightly granular on the belly. Dorslolateral folds are either absent or very indistinct. Inner metatarsal tubercle is small and outer one is tiny. Prominent vomerine teeth. Fingers unwebbed, while toes are half to three quarters webbed.

According to Duellman *et al.* (2016) this subgenus diverged from the other 9.3 MYA.

Distribution: Northern third of Australia, extending south along the east coast of Australia, to the New South Wales North coast.

Etymology: "Vultusamo" in Latin means "looks like" which sums up the species in the genus, as they "look like" *Litoria*.

Content: *Quasilitoria* (*Vultusamolitoria*) *nasuta* (Gray, 1842) (type species); *Q.* (*Vultusamolitoria*) *peninsulae* (De Vis, 1884).

QUASILITORIA SUBGEN. NOV.

Type species: *Chiroleptes inermis* Peters, 1867.

Diagnosis: As identified within the genus diagnosis within *Paralitoria gen. nov.* within this paper.

Distribution: Northern tropics of Australia, mainly in the Northern Territory and Western Australia.

Etymology: As for the genus.

Content: *Quasilitoria* (*Quasilitoria*) *inermis* (Peters, 1867) (type species); *Q.* (*Quasilitoria*) *pallida* (Davies, Martin and Watson 1983); *Q.* (*Quasilitoria*) *coplandi* (Tyler, 1968); *Q. mickpughi sp. nov.*; *Q. mippughae sp. nov.*; *Q.* (*Quasilitoria*) *tornieri* (Neiden, 1923); *Q.* (*Quasilitoria*) *axillaris* (Doughty, 2011).

QUASILITORIA INERMIS DAVIDTRIBEI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:FC0A19BD-2B20-405E-A449-D56B6A0C1C68

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R23285, collected from the Jabiru Airstrip, Northern Territory, Australia, Latitude -12.6667 S., Longitude 132.8333 E.

This government-owned facility allows access to its holdings.

Paratypes: Preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R23286-300, R23343-52, R23312-25, R23352 and R23284 all collected from the Jabiru Airstrip, Northern Territory, Australia, Latitude -12.6667 S., Longitude 132.8333 E.

Diagnosis: The subspecies *Quasilitoria* (*Quasilitoria*) *inermis davidtribei subsp. nov.* and *Quasilitoria* (*Quasilitoria*) *inermis dunphyi subsp. nov.* have both until now been treated as regional populations of the species *Quasilitoria* (*Quasilitoria*) *inermis* (Peters, 1867), with a type locality of Rockhampton in coastal Queensland, Australia. Both relevant subspecies are highly divergent from the type form and would are almost certainly worthy of recognition as full species, but in the absence of molecular data for each form, I have conservatively named each as subspecies.

All three forms would identify as *Quasilitoria inermis*, identified as "*Litoria inermis*", using the key in Cogger (2014) as a basis to separate them from all other species of Australasian tree frog (Pelodryadidae).

All *Q. inermis* are further separated from morphologically similar species within Pelodryadidae where they occur by having noticeable warts or tubercles on the dorsum, poorly defined lateral headstripe and finely reticulated thigh markings.

Q. inermis dunphyi subsp. nov. restricted to the Kimberley District of Western Australia is readily separated from both other subspecies by having a generally dark purplish-brown dorsum, versus grey brown in *Q. inermis davidtribei subsp. nov.* and yellow-brown in *Q. inermis inermis.*

Q. inermis dunphyi subsp. nov. is further separated from both other subspecies by having a limited number of relatively small warts or tubercles on the dorsum and upper flanks, these being roundish in shape, versus numerous well-defined warts or tubercles, often squarish or rectangular in shape in both *Q. inermis inermis* and *Q. inermis davidtribei subsp. nov..*

Adult male *Q. inermis dunphyi subsp. nov.* have strong lightening of the upper lip, versus not so in *Q. inermis davidtribei subsp. nov.* and slight in *Q. inermis inermis.*

Q. inermis davidtribei subsp. nov. from the top end of the Northern Territory, is separated from both *Q. inermis inermis* and *Q. inermis dunphyi subsp. nov.* by having a limited amount of black pigment intruding on the upper tympanum, versus not so in the other two subspecies (none intrudes).

Q. inermis davidtribei subsp. nov. has significant dark barring or patches on the dorsum of the hind limbs, as well as patches of dark pigment bordering the upper lip, which is not seen in the other two subspecies.

Q. inermis inermis in life is depicted in Anstis (2013) on page 212 at top right and page 214 at top.
Q. inermis davidtribei subsp. nov. in life is depicted in Cogger (2014) on page 167 at bottom.
Q. inermis dunphyi subsp. nov. is depicted in Anstis (2013) on page 212 at top left.

Distribution: The subspecies *Q. inermis davidtribei subsp. nov.* appears to be confined to the top end of the Northern Territory, Australia.

Etymology: The subspecies *Q. inermis davidtribei subsp. nov.* is named in honour of David Tribe, program director at the New South Wales Gould League, a well-known wildlife conservation organisation.
In the 1990's this organisation had its income stream virtually annihilated by the predatory "donation stealing" practices of the Steve Irwin business.

Irwin took the business model of marketing his property empire to conservation-minded people to a low never previously seen in Australian history. The net result was that dozens of long-established grass-roots wildlife conservation organisations in Australia were effectively starved of funds and forced to shut down, with

enormously negative consequences for wildlife conservation in Australia.

The Irwin business also militarized State Wildlife departments and police forces to raid wildlife conservation organisations they saw as rivals to their own business.

QUASILITORIA INERMIS DUNPHYI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:A67D73DE-9699-46AA-ACE5-654618116D3F

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R81887 collected from Kununurra, Western Australia, Australia, Latitude -15.7667 S., Longitude 128.7333 S.

This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R81884, R81885, R81886, R81888**,** collected from Kununurra, Western Australia, Australia, Latitude -15.7667 S., Longitude 128.7333 S.

Diagnosis: The subspecies *Quasilitoria* (*Quasilitoria*) *inermis dunphyi subsp. nov.* and *Quasilitoria* (*Quasilitoria*) *inermis davidtribei subsp. nov.* have both until now been treated as regional populations of the species *Quasilitoria* (*Quasilitoria*) *inermis* (Peters, 1867), with a type locality of Rockhampton in coastal Queensland, Australia. Both relevant subspecies are highly divergent from the type form and would are almost certainly worthy of recognition as full species, but in the absence of molecular data for each form, I have conservatively named each as subspecies.

All three forms would identify as *Quasilitoria inermis*, identified as "*Litoria inermis*", using the key in Cogger (2014) as a basis to separate them from all other species of Australasian tree frog (Pelodryadidae).

All *Q. inermis* are further separated from morphologically similar species within Pelodryadidae where they occur by having noticeable warts or tubercles on the dorsum, poorly defined lateral headstripe and finely reticulated thigh markings.

Q. inermis dunphyi subsp. nov. restricted to the Kimberley District of Western Australia is readily separated from both other subspecies by having a generally dark purplish-brown dorsum, versus grey brown in *Q. inermis davidtribei subsp. nov.* and yellow-brown in *Q. inermis inermis.*

Q. inermis dunphyi subsp. nov. is further separated from both other subspecies by having a limited number of relatively small warts or tubercles on the dorsum and upper flanks, these being roundish in shape, versus numerous well-defined warts or tubercles, often squarish or rectangular in shape in both *Q. inermis inermis* and *Q. inermis davidtribei subsp. nov.*.

Adult male *Q. inermis dunphyi subsp. nov.* have strong lightening of the upper lip, versus not so in *Q. inermis davidtribei subsp. nov.* and slight in *Q. inermis inermis.*

Q. inermis davidtribei subsp. nov. from the top end of the Northern Territory, is separated from both *Q. inermis inermis* and *Q. inermis dunphyi subsp. nov.* by having a limited amount of black pigment intruding on the upper tympanum, versus not so in the other two subspecies.

Q. inermis davidtribei subsp. nov. has significant dark barring or patches on the dorsum of the hind limbs, as well as patches of dark pigment bordering the upper lip, which is not seen in the other two subspecies.

Q. inermis inermis in life is depicted in Anstis (2013) on page 212 at top right and page 214 at top.

Q. inermis davidtribei subsp. nov. in life is depicted in Cogger (2014) on page 167 at bottom.

Q. inermis dunphyi subsp. nov. is depicted in Anstis (2013) on page 212 at top left.

Distribution: The subspecies *Q. inermis dunphyi subsp. nov.* appears to be confined to the Kimberley District of North-western Australia.

Etymology: The subspecies is named in honour of Milo Dunphy, 1928-1996, the son of Myles Dunphy, in recognition for his political activism to preserve wilderness areas in New South Wales, Australia.

QUASILITORIA* (*QUASILITORIA*) *MICKPUGHI SP. NOV.

LSIDurn:lsid:zoobank.org:act:961A988F-9086-4AF2-9530-F1989D44D356

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R.43642 collected at Jabiluka, Northern Territory, Australia, Latitude -12.52 S., Longitude 132.88 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.88556 collected at Jabiluka, Northern Territory, Australia, Latitude -12.52 S., Longitude 132.88 E.

2/ A preserved specimen at the Northern Territory Art Gallery and Museum, specimen number R.02503 collected from 6.5 km south west of Oenpelli, Northern Territory, Australia, Latitude -12.367 S., Longitude 133.033 E.

Diagnosis: The two species *Quasilitoria mickpughi sp. nov.* and *Quasilitoria mippughae sp. nov*. were both until now treated as populations of *Q. coplandi* (Tyler, 1968), although at the time Tyler described *Q. coplandi* he did not inspect any specimens of either of these newly named putative species.

His relevant sample of frogs was confined to south-west Northern Territory and the nearby Kimberley Division of Western Australia animals (Tyler 1969).

All three species would be identified and diagnosed as *Q. coplandi* in both Cogger (2014) and Anstis (2013).

All three species are separated from all other similar species of tree frog (Pelodryadidae) in northern Australia by the following suite of characters: Webbing reaches the base of the terminal disc on the fifth toe.

The finger and toe discs are distinctly dilated and approximately twice the width of the penultimate phlanges. Lateral head stripe is absent. Snount-vent length is under 45 mm.

All of *Quasilitoria mickpughi sp. nov.*, *Q. mippughae sp. nov*. and *Q. coplandi* can be readily separated from one another on the basis of colouration.

Q. coplandi (Tyler, 1968) with a type locality of Inverway Station, Northern Territory, Australia, part of the Victoria River district, in the far north-west of the State, near the

Western Australian border, and including all populations from this general area and west into the Kimberley District of Western Australia, is a light fawn to beige colour on top without obvious or distinct markings. There are blotches, flecks or peppering on the back, but all are faded and generally merge with the overall dorsal colouration.

By contrast *Q. mickpughi sp. nov.* from the top end of the Northern Territory, with a centre of distribution on the Arnhemland Escarpment and including areas south-east of there including the southern shores of the Gulf of Carpentaria, has a well-defined dorsal colouration consisting of a light yellow to pinkish orange-background overlaid with numerous dark purple blotches and marks occupying about half the surface area, giving the frog a distinctly darker colour. The contrast between dark and light remains intense on the snout, versus only indistinct markings on *Q. coplandi.*

The species *Q. mippughae sp. nov.* with a centre of distribution on the Selwyn Ranges of North-west Queensland and nearby hilly aras, extending as far north as about Lawn Hill (still in Queensland), is characterised by having a yellow to beige coloured dorsum and well scattered irregular, but well defined blackish spots and blotches, with the region anterior to the eyes having either no darker pigment or only a very limited amount (in contrast to both other species).

All three species are generally light in a well-defined zone between the eyes, but have darker pigment both anterior and posterior to this, except in the case of *Q. mippughae sp. nov.* where there is generally no darker pigment anterior, or very little.

Anstis (2013) reports on differences in the jaw structure of tadpoles within the species herein defined as *Q. mickpughi sp. nov.* and *Q. coplandi.*

Q. coplandi in life is depicted in Anstis (2013) on page 175 at top right.

Q. mickpughi sp. nov. in life is depicted in Anstis (2013) on page 177 at top right and as a tadpole below that. The specimen depicted on page 159 of Cogger (2014) top right, is also referred to this taxon.

Q. mippughae sp. nov. in life is depicted on page 32 of Vanderduys (2012) in both photos.

Numerous photos of all three species can be found online at:
http://www.flickr.com
when doing a search for “Litoria coplandi”.

Distribution: *Q. mickpughi sp. nov.* is believed to be restricted to the Arnhemland region of the top-end of the Northern Territory, although specimens from the east of the Northern Territory, including those south of the Gulf of Carpentaria are also tentatively referred to this taxon on the basis of obvious morphological similarity.

Etymology: Named in honour of Mick Pugh of Geelong, Victoria, Australia, a former president of the Victorian Association of Amateur Herpetologists Incorporated, in recognition of his many decades of service to herpetology and wildlife conservation in general.

Mick Pugh was hounded out of herpetology by a corrupt and dysfunctional State wildlife department that saw his expertise and reputation as a “threat” to their own lesser “experts” employed at their business “Zoos Victoria”.

QUASILITORIA* (*QUASILITORIA*) *MIPPUGHAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:5AB69DE5-107A-46E1-8A55-3C57580F1089

Holotype: A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen number R25754 collected at Chinaman’s Waterhole, 35 km east of Mount Isa, Queensland, Australia, Latitude -20.725 S., Longitude 139.779 E.

This government-owned facility allows access to its holdings.

Paratypes: Preserved specimens at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen numbers R25755, R25756, R21713 and R21714 and specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R54356 and R54358, all collected at Chinaman’s Waterhole, 35 km east of Mount Isa, Queensland, Australia, Latitude -20.725 S., Longitude 139.779 E.

Diagnosis: The two species *Quasilitoria mippughae sp. nov*. and *Quasilitoria mickpughi sp. nov.* were both until now treated as populations of *Q. coplandi* (Tyler, 1968), although at the time Tyler described *Q. coplandi* he did not inspect any specimens of either of these newly named putative species. His relevant sample of frogs was confined to south-west Northern Territory and Kimberley Division of Western Australia animals (Tyler 1969).

All three species would be identified and diagnosed as *Q. coplandi* in both Cogger (2014) and Anstis (2013).

All three species are separated from all other similar species of tree frog (Pelodryadidae) in northern Australia by the following suite of characters: Webbing reaches the base of the terminal disc on the fifth toe. The finger and toe discs are distinctly dilated and approximately twice the width of the penultimate phlanges. Lateral head stripe is absent. Snount-vent length is under 45 mm.

All of *Quasilitoria mickpughi sp. nov.*, *Q. mippughae sp. nov*. and *Q. coplandi* can be readily separated from one another on the basis of colouration.

Q. coplandi (Tyler, 1968) with a type locality of Inverway Station, Northern Territory, Australia, part of the Victoria River district, in the far north-west of the State, near the Western Australian border, and including all populations from this general area and west into the Kimberley District of Western Australia, is a light fawn to beige colour on top without obvious or distinct markings. There are blotches, flecks or peppering on the back, but all are faded and generally merge with the overall dorsal colouration.

By contrast *Q. mickpughi sp. nov.* from the top end of the Northern Territory, with a centre of distribution on the Arnhemland Escarpment and including areas south-east of there including the southern shores of the Gulf of Carpentaria, has a well-defined dorsal colouration consisting of a light yellow to pinkish orange-background overlaid with numerous dark purple blotches and marks occupying about half the surface area, giving the frog a distinctly darker colour. The contrast between dark and light remains intense on the snout, versus only indistinct

markings on *Q. coplandi.*

The species *Q. mippughae sp. nov.* with a centre of distribution on the Selwyn Ranges of North-west Queensland and nearby hilly aras, extending as far north as about Lawn Hill (still in Queensland), is characterised by having a yellow to beige coloured dorsum and well scattered irregular, but well defined blackish spots and blotches, with the region anterior to the eyes having either no darker pigment or only a very limited amount (in contrast to both other species).

All three species are generally light in a well-defined zone between the eyes, but have darker pigment both anterior and posterior to this, except in the case of *Q. mippughae sp. nov.* where there is generally no darker pigment anterior, or very little.

Anstis (2013) reports on differences in the jaw structure of tadpoles within the species herein defined as *Q. mickpughi sp. nov.* and *Q. coplandi.*

Q. coplandi in life is depicted in Anstis (2013) on page 175 at top right.

Q. mickpughi sp. nov. in life is depicted in Anstis (2013) on page 177 at top right and as a tadpole below that. The specimen depicted on page 159 of Cogger (2014) top right, is also referred to this taxon.

Q. mippughae sp. nov. in life is depicted on page 32 of Vanderduys (2012) in both photos.

Numerous photos of all three species can be found online at:

http://www.flickr.com

when doing a search for “Litoria coplandi”.

Distribution: *Q. mippughae sp. nov.* is believed to be restricted to the Selywyn and nearby ranges in north-west Queensland, being a distribution centred on the town of Mount Isa, Queelsland, Australia.

Etymology: Named in honour of Mip Pugh of Geelong, Victoria, Australia, in recognition of her services to herpetology in Australia, especially with regards to the captive breeding of Australian agamid lizards and educating many others in terms of her expertise developed over many years.

QUASILITORIA TORNIERI SERVENTYI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:361FEC86-D280-46F6-B781-77F012216C06

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R50671 collected from Drysdale River National Park, Kimberley District, Western Australia, Australia, Latitude -14.73 S., Longitude 126.93 E.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R50670 collected from Drysdale River National Park, Kimberley District, Western Australia, Australia, Latitude -14.73 S., Longitude 126.93 E.

2/ A preserved male specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R99065 collected from 6 km north of Lake Gilbert, near Beverley Springs, West Kimberley District, Western Australia, Australia (in leaf litter around rocks), Latitude -16.5042 S., Longitude 125.275 E.

3/ A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R115931, collected from about 14 km north north-west of the junction of the Calder River and Bachsten Creek, West Kimberley District, Western Australia, Australia, Latitude-15.9833 S., Longitude 125.3167 E.

Diagnosis: Until now the subspecies *Quasilitoria tornieri serventyi subsp. nov*. has been treated as nominate *Quasilitoria tornieri tornieri* (Nieden, 1923) as defined and separated from other relevant species by Cogger (2014).

Both subspecies are separated from all other congeners by the fact the dorsum is usually smooth, the lateral head stripe is well defined, particularly before the eye, thigh markings are strongly reticulated and the stripe along the edge of tarsus is uninterrupted.

However *Q. tornieri serventyi subsp. nov*. is readily separated from that taxon (type locality of Port Essington, NT), by the following suite of characters:

Breeding adult males have a slight yellowish tinge on the whitish lips and groin, versus strong deep yellow in *Q. tornieri tornieri.* In both sexes of adult *Q. tornieri serventyi subsp. nov*. the upper hind limb are strongly peppered with grey or with faint darker markings or blotches, versus not so in *Q. tornieri tornieri.*

The (hind) toe pads of *Q. tornieri tornieri* are slightly larger than the lateral edges of the penultimate phlanges, versus not so in *Q. tornieri serventyi subsp. nov.*.

The tadpoles of both subspecies also differ.

Metamorphosing tadpoles of *Q. tornieri tornieri* have a large amount of blackish pigment in blotches on the outer edges and inner areas of the fins, versus only small amounts on the edges and inner areas in *Q. tornieri serventyi subsp. nov.*.

Images of both *Q. tornieri serventyi subsp. nov*. and *Q. tornieri tornieri* in life and their tadpoles can be seen on pages 321-324 of Anstis 2013.

Distribution: *Q. tornieri serventyi subsp. nov.* is found in the Kimberley District of Western Australia, extending to the Daly River region of the Northern Territory. *Q. tornieri tornieri* is found throughout the rest of the range of the species, this being the top end of the Northern Territory and the Gulf of Carpentaria into far north-west Queensland.

Etymology: The subspecies is named in honour of Vincent Serventy, born 6 January 1916, and died 8 September 2007, who authored many popular books about Australian wildlife and who was regarded as an avid conservationist in his active years. He lived in Western Australia and New South Wales.

SAGUNURINI TRIBE NOV.

***SAGANURA* WELLS AND WELLINGTON, 1985**

Type species: *Hyla burrowsae* Scott, 1942.

Diagnosis: Living frogs in the genus *Saganura* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: It is a uniform light green above, commonly with scattered light fawn spots, or dark brown with irregular bright green patches and light brown flecks.

There is a narrow, black canthal streak, widening behind the eye to form a dark broad band extending almost to the groin; this dark band often broken up by groups of

irregular white blotches and/or spots. There is an obscure, narrow light green zone along the supratympanic ridge. There is no pale line along the posterior edge of the upper jaw. Venter is pinkish-white, throat darker with a greyish tinge. Groin and hind side of thighs is a uniform pale brown. Dorsal surface smooth or with scattered small tubercles. Chin smooth and other lower surfaces are granular. Vomerine teeth are between or behind the choanae, with hind edge of vomerine teeth always further back than the choanae. Prectoral fold present. Finger and toe discs large. Fingers with conspicuous basal webbing, being nearly a third webbed, toes are about three quarters webbed. There is a large inner and small outer metatarsal tubercle. Tympanum is distinct. Second finger is much longer than first; when pressed together, the tip of the first finger reaches no further than the base of the disc of the second finger. Heel of adpressed hindlimb reaches to the eye or beyond. Adults attain about 55 mm in total length (adapted and modified from Cogger 2014).

According to Duellman *et al.* (2016), the species in this genus diverged from their nearest living relatives 27.6 MYA.

Distribution: South-west Tasmania, including highlands and coast.

Content: *Sagunura burrowsae* (Scott, 1942) (monotypic).

WOWRANAINI TRIBE NOV.

WOWRANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:9F436614-24BC-49DE-8AFB-FDFB8D8B5671

Type species: *Litoria dux* Richards and Oliver, 2006.

Diagnosis: Frogs in the genus *Wowrana gen. nov.* in the nominate subgenus are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Large size (adult males over 60 mm); uniform bright green dorsal colouration in life (blue in preservative). Fully webbed hands. No prominent and enlarged parotoid glands, no white labial stripe, SVL not over 85 mm and a call consisting of a single, relatively short (0.206-0.379 second) grunt with an unusual clumped pattern of pulses. The single species within the subgenus *Parawowrana subgen. nov.* is defined as above, except that it instead is slightly smaller than the preceding species (adult males 50-55 mm), has a white labial stripe (in common with the much larger species in *Sandyrana* Wells and Wellington, 1985, that grow to in excess of 100 mm in body length) and has a characteristically longer call than those in the nominate subgenus (0.69-0.9 second) (Richards *et al.* 2006).

Duellman *et al.* (2016) found that the species in the genus *Wowrana gen. nov.* diverged from their nearest living relatives 26.5 MYA, being species within *Sandyrana* Wells and Wellington, 1985. The type form of *Nyctimystes* Stejneger, 1916, namely *Nyctimantis papua* Boulenger, 1897 diverged from this genus 36.1 MYA, making genus level assignment of *Wowrana gen. nov.* an obvious choice.

Distribution: All species within *Wowrana gen. nov.* are confined to forested locations on the island of New Guinea and in general most species are currently known from relatively few specimens.

Etymology: The frogs in this genus are absolutely spectacular. They are big, bold and bright and herpetologists who set eyes on them invariably exclaim “Wow!”. Hence the simple and easy to remember genus name “Wowrana”.

Content: *Wowrana dux* (Richards and Oliver, 2006) (type species); *W. graminea* (Boulenger, 1905); *W. hunti* (Richards, Oliver, Dahl and Tjaturadi. 2006); *W. pallidofemora* (Kraus, 2018); *W. pterodactyla* (Oliver, Richards and Donnellan, 2018); *W. nullicedens* (Kraus, 2018); *W. sauroni* (Richards and Oliver, 2006).

PARAWOWRANA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:D130450F-D9D5-471B-B7A1-212F2774E134

Type species: *Litoria hunti* Richards, Oliver, Dahl, and Tjaturadi, 2006.

Diagnosis: Frogs in the genus *Wowrana gen. nov.* in the nominate subgenus are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Large size (adult males over 60 mm); uniform bright green dorsal colouration in life (blue in preservative). Fully webbed hands. No prominent and enlarged parotoid glands, no white labial stripe, SVL not over 85 mm and a call consisting of a single, relatively short (0.206-0.379 second) grunt with an unusual clumped pattern of pulses. The single species within the subgenus *Parawowrana subgen. nov.* is defined as above, except that it instead is slightly smaller than the preceding species (adult males 50-55 mm), has a white labial stripe (in common with the much larger species in *Sandyrana* Wells and Wellington, 1985, that grow to in excess of 100 mm in body length) and has a characteristically longer call than those in the nominate subgenus (0.69-0.9 second) (Richards *et al.* 2006).

Duellman *et al.* (2016) found that the species in the genus *Wowrana gen. nov.* diverged from their nearest living relatives 26.5 MYA, being species within *Sandyrana* Wells and Wellington, 1985. The type form of *Nyctimystes* Stejneger, 1916, namely *Nyctimantis papua* Boulenger, 1897 diverged from this genus 36.1 MYA, making genus level assignment of *Wowrana gen. nov.* an obvious choice.

Distribution: The sole species currently placed within the subgenus *Parawowrana subgen. nov. is* known only from the type locality (Utai, Sanduan Province, northern Papua New Guinea).

Etymology: “Para” in Latin, means “not quite” or “almost” and as this frog is not quite the same as nominate *Wowrana gen. nov.* the subgenus name makes sense.

Content: *Wowrana* (*Parawowrana*) *hunti* (Richards, Oliver, Dahl and Tjaturadi. 2006) (monotypic).

SANDYRANINA SUBTRIBE NOV.

SANDYRANA WELLS AND WELLINGTON, 1985

Type species: *Hyla infrafrenata* Günther, 1867.

Diagnosis: Frogs in the genus *Sandyrana* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Large frogs, which as adults

can grow to in excess of 100 mm. Dorsal colour of adults in life is usually uniform green above in normal circumstances, but may otherwise range from fawn, through green, purplish or even blue. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. Hind edge of forearm is smooth, or with at most a few low, discontinuous tubercles. Hind edge of feet is smooth. Hind side of thighs is more or less uniform, without black and yellow marbling, spots or blotches. Webbing reaching no further than the base of the penultimate phalanx of the fourth finger. A distinctive white or pink stripe along the edge of the lower jaw, extending back to the level of the forelimb and not in a configuration of blobs, spots or random markings otherwise tending to be in a linear manner. Vomerine teeth present.

Duellman *et al.* (2016) found that the species within the genus *Sandyrana* diverged from their nearest living relatives 26.5 MYA.

Distribution: Throughout New Guinea and west as far as Halmahera Island as well as New Britain, New Ireland, Aru Islands and north-east Queensland, Australia.

Content: *Sandyrana infrafrenata* (Günther, 1867) (type species); *S. militarius* (Ramsay, 1878); *S. multicolor* (Günther, 2004); *S. purpureolatus* (Oliver, Richards, Tjaturadi, and Iskandar, 2007); *S. sanguinolenta* (Van Kampen, 1909).

TRIBE AND SUBTRIBE DESCRIPTIONS

ADELYNHOSERHYLEINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:D4FD8FB3-7C85-423F-8ACB-3017A21AAE90

Type genus: *Adelynhoserhylea gen. nov.*

Diagnosis: The tribe Adelynhoserhyleini tribe nov. is best defined and diagnosed by defining the four component genera separately.

Species of tree frogs within the genus *Adelynhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Vomerine teeth present. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. A conspicuous serrated ridge along the forearm and another along the hind edge of the foot.

The morphologically similar genus *Jackyhoserhylea gen. nov.* with species confined to the New Guinea subregion is readily separated from *Adelynhoserhylea gen. nov.* as defined above, by having dermal fringes on limbs poorly defined, fingers only part-webbed and they do not not have a well-developed crenulated fold along the outer edge of the fore and hind-limbs, this always being either reduced or absent.

The monotypic species compring the entirety of the genus *Leucodigirana gen. nov.* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Brown to golden brown across most of the dorsum, the body and limbs with numerous scattered dark or light brown spots and blotches, among which are usually smaller pale brown or cream spots and blotches. Venter is white and lower flanks greyish-white, often with brown under the throat. Axilla and groin are flesh coloured. Hind side of thighs is mottled with pale and dark brown. Skin is smooth to leathery above, and granular on the venter. Vomerine teeth are present and between the choanae. There is no pectoral fold.

There is no enlarged tubercle or crenulated ridge along the hind edge of the forearm; Finger and toe discs are large. Fingers lack webbing and toes are nearly completely webbed, with webbing reaching the base of the penultimate phalanx of the fourth toe.

There is a prominent inner metatarsal tubercle and no outer one. Heel of adpressed hind limb goes well beyond the eye. Tympanum is large and obvious, with a well-developed supratympanic fold. Above this, there is a semidistinct beige coloured stripe, extending to form broken blotches along a line running along the margin of the upper flank. This is not however in the form of a distinct, well marked whitish stripe.

There is also no pale line along the posterior edge of the upper jaw, although this region of the head is usually a light bluey, purplish grey in colour. Second finger is much longer than the first, the tip of the first finger goes no further than the base of the disc of the second finger when they are pressed togeather.

Males get to 80 mm in body length and females 100 mm.

The genus *Euscelis* Fitzinger, 1843 is separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colouration is a pale fawn to dark brown above, usually immaculate, or with darker markings, ranging from flecks to blotches and including one that forms a transverse bar between the eyes; the tympanum has a pale rim; dorsal surface generally smooth or sometimes leathery, with one species having slight warts; webbing may reach the disc of the fifth toe, but usually not, and generally extending no more than halfway along the penultimate phalanx; discs on fingers and toes are small and inconspicuous and barely wider than digits; fingers unwebbed; second finger slightly longer than first; anterior head stripe is present, usually narrow but always continuous, but sometimes ill-defined, not interrupted by a vertical bar in front of the eye; posterior head stripe is narrow, no more than half as wide as and not enclosing the tympanum; there is a moderate inner metatarsal tubercle and a small outer metatarsal tubercle is present; vomerine teeth present; groin is yellow and heavily blotched with black. Whitish ventrally with granular skin. No dorsolateral skin fold.

Distribution: Most species are confined to New Guinea and Cape York, Australia, but one genus *Euscelis* Fitzinger, 1843 occurs in the wetter parts of the east coast of south-east Australia, extending, from Victoria, through New South Wales and south east Queensland and then to the wet tropics of north-east Queensland.

Content: *Adelynhoserhylea gen. nov.* (type genus); *Euscelis* Fitzinger, 1843; *Jackyhoserhylea gen. nov.*; *Leucodigirana gen. nov.*.

LEUCODIGIRANINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:41D58607-4C02-45E2-897E-9D87851B9004

Type genus: *Leucodigirana gen. nov.*

Diagnosis: The subtribe Leucodigiranina subtribe nov. is best defined and diagnosed by defining the two component genera separately.

The monotypic species compring the entirety of the genus *Leucodigirana gen. nov.* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Brown to golden brown across most of the dorsum, the body and limbs with numerous scattered dark or light brown spots and blotches, among which are usually smaller pale brown or cream spots and blotches. Venter is white and lower flanks greyish-white, often with brown under the throat. Axilla and groin are flesh coloured. Hind side of thighs is mottled with pale and dark brown. Skin is smooth to leathery above, and granular on the venter. Vomerine teeth are present and between the choanae. There is no pectoral fold. There is no enlarged tubercle or crenulated ridge along the hind edge of the forearm; Finger and toe discs are large. Fingers lack webbing and toes are nearly completely webbed, with webbing reaching the base of the penultimate phalanx of the fourth toe. There is a prominent inner metatarsal tubercle and no outer one. Heel of adpressed hind limb goes well beyond the eye. Tympanum is large and obvious, with a well-developed supratympanic fold. Above this, there is a semidistinct beige coloured stripe, extending to form broken blotches along a line running along the margin of the upper flank. This is not however in the form of a distinct, well marked whitish stripe. There is also no pale line along the posterior edge of the upper jaw, although this region of the head is usually a light bluey, purplish grey in colour. Second finger is much longer than the first, the tip of the first finger goes no further than the base of the disc of the second finger when they are pressed togeather. Males get to 80 mm in body length and females 100 mm.

The genus *Euscelis* Fitzinger, 1843 is separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colouration is a pale fawn to dark brown above, usually immaculate, or with darker markings, ranging from flecks to blotches and including one that forms a transverse bar between the eyes; the tympanum has a pale rim; dorsal surface generally smooth or sometimes leathery, with one species having slight warts; webbing may reach the disc of the fifth toe, but usually not, and generally extending no more than halfway along the penultimate phalanx; discs on fingers and toes are small and inconspicuous and barely wider than digits; fingers unwebbed; second finger slightly longer than first; anterior head stripe is present, usually narrow but always continuous, but sometimes ill-defined, not interrupted by a vertical bar in front of the eye; posterior head stripe is narrow, no more than half as wide as and not enclosing the tympanum; there is a moderate inner metatarsal tubercle and a small outer metatarsal tubercle is present; vomerine teeth present; groin is yellow and heavily blotched with black. Whistish ventrally with granular skin. No dorsolateral skin fold.

Distribution: All species are confined to Australia or potentially southern New Guinea with the genus occurring in the wetter parts of the east coast of south-east Australia, extending, from Victoria, through New South Wales and south east Queensland and then to the wet tropics of north-east Queensland.

Content: *Leucodigirana gen. nov.* (type genus); *Euscelis* Fitzinger, 1843.

COGGERDONIANI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:342B883B-E1C6-4D69-8019-3096C62A9FEE

Type genus: *Coggerdonia* Wells and Wellington, 1985.

Diagnosis: The tribe Coggerdoniaini tribe nov. is monotypic for the genus *Coggerdonia* Wells and Wellington, 1985. Living frogs in the genus *Coggerdonia* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: A slender frog being light brown, fawn or light green above, with dark brown patches or flecks arranged in distinct longitudinal lines. There is a dark brown to black stripe running from the tip of the snout below the canthus to the eye, somewhat triangular in shape as it widens towards the eye and then remaining broad as it extends across the tympanum and beyond along the flank to the rear of the body.

This dark coloured stripe is bordered on the lower edge with a well-defined line of white, also running from the upper lip. Sometimes this stripe will break up into a series of adjacent spots. The hind parts of the thighs are dark brown with orange or reddish spots. Belly is whitish to light brown. Skin is smooth above and coarsely granular below, except under the throat, which is also smooth. Vomerine teeth are prominent between and behind the choanae. There is a distinct pectoral fold. Finger and toe discs are small and not much wider than the digits. Fingers have basal webbing only and toes are about three quarters webbed. Inner metatarsal tubercle is large and there is no outer one. Tympanum is large and distinct and the second finger is longer than the first. Adult size 50 60 mm (derived from Cogger, 2014).

According to Duellman *et al.* (2016), the single living member of this genus diverged from its nearest living relatives 30.8 MYA, supporting tribe level classification for this (currently) monotypic genus.

Distribution: Wetter parts of south-western Western Australia, Australia.

Content: *Coggerdonia* Wells and Wellington, 1985 (monotypic).

CYCLORANININI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:2A17B806-9DFA-4BC0-B4BA-7E2231EC4756

Type genus: *Cyclorana* Steindachner, 1867.

Diagnosis: The tribe Cycloraninini tribe nov. is best defined by separately diagnosing each of the eight component genera.

Species within the genera *Cyclorana*, *Mitrolysis* and *Neophractops* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

They are heavily built, often rotund, frogs; Inner metatarsal tubercle is shovel-shaped; no fronto-parietal

foramen in adults; vomerine teeth are present and largely between the choanae; tongue large and oval-shaped; Pupil horizontal; tympanum distinct in all but one species group (*Invisibiliaauris subgen. nov.*); phlanges are simple and tips with tiny discs or none at all; first finger opposed to remainder and toes are webbed.

The genus *Cyclorana* is readily separated from the genera *Mitrolysis* and *Neophractops* by having a marked, straight dorsolateral skin fold and a very stout build; toes one third webbed; hind side of thighs lacking white spots.

The genus *Neophractops* is readily separated from the genera *Mitrolysis* and *Cyclorana* by having no definite straight dorsolateral skin fold and toes that are three quarters webbed.

The genus *Mitrolysis* is separated from the genera *Cyclorana* and *Neophractops* by one or other of:

1/ Having no definite straight dorsolateral skin fold and toes that are less than half webbed, or:

2/ Having a marked, straight dorsolateral skin fold and a very slender build; toes half webbed; hind side of thighs has numerous white spots.

The subgenus *Paramitrolysis subgen. nov.* with the type species of *Cyclorana verrucosa* Tyler and Martin, 1977 is readily separated from the nominate subgenus (of *Mitrolysis*) by having the following unique combination of characters: A blunt snout with nostril distinctly nearer to the tip than to the eye; a blackish stripe on the side of the head from the snout through the eye and distinct tympanum to the forelimb; a dorsum with numerous skin folds or large tubercles, with either: 1/ Many being white-tipped, highlighted by being surrounded by dark blackish pigment as well as a dorsal colouration dominated by brilliant dark lime green or large patches of brilliant dark lime green, or 2/ A dorsum with numerous skin folds or large tubercles not marked in any way and a dorsal colouration of beige, overlain with scattered and faded light olive green patches or blotches in irregular fashion.

The subgenus *Invisibiliaauris subgen. nov*. with the type species *Cyclorana cryptotis* Tyler and Martin, 1977 is readily separated from the other two subgenera by having a hidden ear, being covered by skin, in stark contrast to the other subgenera which have an obvious and exposed tympanum.

The genus *Crottyanura gen. nov.* consists of two species, namely *C. dahlii* (Boulenger, 1896), with a type locality of Daly River, Northern Territory and found in the general region of the type locality, being the western half of the top end of the Northern Territory and into immediately adjacent north-west Western Australia, as well as the newly named species *Crottyanurua crottyi sp. nov*. from the eastern side of the Gulf of Carpentaria and the western side of Cape York in Queensland.

Both species are readily separated from other Australasian Tree Frogs (Pelodryadidae) by the following diagnosis.

Ranoidea Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the genus *Chirodryas* and the tropical species *Chiroleptes dahlii* Boulenger, 1896 herein placed in the new genus *Crottyanura gen. nov.*.

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold.

In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles. By contrast subgenus *Sandgroperanura subgen. nov*. has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

The build of *Crottyanura gen. nov.* while solid, is slender when compared to both *Ranoidea* and *Chirodryas.* The species in *Crottyanura gen. nov.* are further diagnosed by being olive green with brownish tinge above and a distinctive light mid-vertebral line (in *C dahlii* but not often in *C. crottyi sp. nov*.); having the hind side of the thighs mottled, marbled or spotted with white (in *C dahlii* but not in *C. crotty sp. nov*.); a finely granular dorsum; smooth white-coloured venter; no dorsolateral skin fold; fully webbed toes; no outer metatarsal tubercle and inner metatarsal tubercle is not shovel-shaped.

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold. In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the

skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles.

By contrast subgenus *Sandgroperanura subgen. nov.* has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

Gedyerana gen. nov. is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by being the only Australasian Tree Frog species having a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines and a horizontally elliptical pupil.

All other species within this region with a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines have a vertically elliptical pupil, including species within *Nyctimystes* Stejneger, 1916 *sensu lato*, as defined by other authors including Cogger (2014) at page 197 under the heading "genus *Nyctimystes* Stejneger, 1916".

Both species within the genus *Gedyerana gen. nov.* would be diagnosed as either "*Litoria dayi*" in Anstis (2013) or "*Nyctimystes dayi*" in Cogger (2014).

These frogs have large protruding eyes, with a dark iris, a broad head and a slender body.

Males get to about 45 mm in body length, but females are considerably larger and get to about 60 mm in length. Their tadpoles have large sucker mouths.

Dorsal colour ranges from grey, brown, yellow, orange or red, with or without mottling, spots or flecks and with or without discrete white or cream blotches or ocelli on the upper surfaces.

Snout is moderately rounded or acuminate (tending to be pointed) and the genus occurs in rainforest stream habitats.

The genus *Mosleyia* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by one or other of the two unique suites of characters:

1/ Vomerine teeth prominent and largely between the choanae. No pectoral fold; A series of small enlarged tubercles along the hind edge of the forearm forming a low but distinct crenulated ridge; fingers with strong basal webbing; toes nearly fully webbed; a prominent inner metatarsal tubercle and a small outer one. Heel of adpressed hind limb reaches to eye or beyond; first finger much smaller and shorter than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; tympanum indistinct; no pale stripe along the supratympanic ridge or along posterior edge of upper jaw; adult snout-vent length 65 mm; dorsal pattern is mostly grey or dull green, almost blackish and consists of a series of relatively narrow dark lines and spots forming a fine, continuous reticulum over the back, head and limbs. The flanks have a bluish metal sheen. White below, commonly with brown on the throat; axilla and groin flesh coloured; hind side of thighs are dark brown. Skin leathery, finely granular, or with numerous small scattered warts. Granular below (*M. nannotis* (Andersson, 1916), *M. cottoni sp. nov. M. lorica* (Davies and McDonald, 1979)) (nominate subgenus), or:

2/ Vomerine teeth conspicuous in two rows on a line with the hind edge of the choanae; with or without pectoral fold; fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth or with at most a few, low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs more or less uniform and without black and yellow markings or marbling; colour brown to blackish above, never green, with or without a broad, darker vertebral patch and other contrasting markings; a dark dorsal patch, if present, is inconspicuous and commencing from a line joining the centre of each eye; tympanum covered by skin (adult size is 35-50 mm body length) (*M. michaelsmythi sp. nov.*; *M. nyakalensis* (Liem, 1974); *M. pilloti sp. nov.*; *M. rheocola* (Liem, 1974)) (subgenus *Amnisrana subgen. nov.*).

Distribution: Most parts of continental Australia including the tropics and the arid zone.

Content: *Cyclorana* Steindachner, 1867 (type genus); *Chirodryas* Keferstein, 1867; *Crottyanura gen. nov.*; *Gedyerana gen. nov.*; *Mitrolysis* Cope, 1889; *Mosleyia* Wells and Wellington, 1985; *Neophractops* Wells and Wellington, 1985; *Ranoidea* Tschudi, 1838.

RANOIDEINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:2CEAF103-5F6F-4B55-993B-7026C0498838

Type genus: *Ranoidea* Tschudi, 1838.

Diagnosis: The subtribe Ranoideina subtribe nov. (comprising the two genera *Ranoidea* Tschudi, 1838 (type genus) and *Chirodryas* Keferstein, 1867) is best defined by disgnosing and defining the two component genera. *Ranoidea* Tschudi, 1838 as defined herein includes only the Bell Frog group of species, excluding the species associated with the *Chirodryas raniformis* Keferstein, 1867 species group, herein placed in the genus *Chirodryas* and the tropical species *Chiroleptes dahlii* Boulenger, 1896 herein placed in the new genus *Crottyanura gen. nov.*.

All species within *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* as defined herein, while morphologically similar, are sufficiently divergent from one another to warrant beling treated as separate genera. *Crottyanura gen. nov.* is morphologically convergent, but is in fact placed in the nominate subtribe of Cycloranina subtribe nov. (formally defined in this paper by elimination of other subtribes) instead of the subtribe Ranoideina subtribe nov..

All species within the genera *Ranoidea*, *Chirodryas* and *Crottyanura gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

Vomerine teeth are present; fingers are free or webbed only at the base; first finger is longer than, equal to or only slightly shorter than the second finger; no outer metatarsal tubercle.

The genera *Ranoidea* and *Chirodryas* are separated from the genus *Crottyanura gen. nov.* by having flanks that are strongly granular below a distinct, glandular dorso-lateral skin fold with densely packed, large, rounded, usually pale coloured granules, contrasting with the smooth tubercular skin on the back above the skin fold.

In contrast *Crottyanura gen. nov.* has flanks that are smooth or with a few scattered granules, not contrasting with the skin on the back.

Ranoidea species are readily separated from species within the genus *Chirodryas* by having either a smooth dorsum with few if any rounded warts or tubercles, or if present in any number or size, are arranged in regular longitudinal rows near the vertebral line.

By contrast *Chirodryas* species have large warts on the back that are irregularly scattered and not configured in regular longitudinal rows.

The two subgenera within *Ranoidea* are separated as follows: Subgenus *Ranoidea* has a generally smooth dorsum with at most a few scattered, low tubercles. By contrast subgenus *Sandgroperanura subgen. nov*. has obvious flat warts on the back that are arranged in regular longitudinal rows near the vertebral line.

The build of *Crottyanura gen. nov.* while solid, is slender when compared to both *Ranoidea* and *Chirodryas.* The species in *Crottyanura gen. nov.* are further diagnosed by being olive green with brownish tinge above and a distinctive light mid-vertebral line (in *C dahlii* but not often in *C. crottyi sp. nov*.); having the hind side of the thighs mottled, marbled or spotted with white (in *C dahlii* but not in *C. crotty sp. nov*.); a finely granular dorsum; smooth white-coloured venter; no dorsolateral skin fold; fully webbed toes; no outer metatarsal tubercle and inner metatarsal tubercle is not shovel-shaped.

Distribution: Wetter parts of south-east and south-west Australia.

Content: *Ranoidea* Tschudi, 1838 (type genus); *Chirodryas* Keferstein, 1867.

GEDYERANINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:032114B1-C75A-4721-B3D0-A56EF6704859

Type genus: *Gedyerana gen. nov*.

Diagnosis: The subtribe Gedyeranina subtribe nov. is best defined by disgnosing and defining the two component genera.

Gedyerana gen. nov. is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by being the only Australasian Tree Frog species having a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines and a horizontally elliptical pupil.

All other species within this region with a lower eyelid with a characteristic reticulatum or palpebral venation of fine, pigmented lines have a vertically elliptical pupil, including species within *Nyctimystes* Stejneger, 1916 *sensu lato*, as defined by other authors including Cogger (2014) at page 197 under the heading “genus *Nyctimystes* Stejneger, 1916”.

Both species within the genus *Gedyerana gen. nov.* would be diagnosed as either “*Litoria dayi*” in Anstis (2013) or “*Nyctimystes dayi*” in Cogger (2014).

These frogs have large protruding eyes, with a dark iris, a broad head and a slender body. Males get to about 45 mm in body length, but females are considerably larger and get to about 60 mm in length. Their tadpoles have large sucker mouths. Dorsal colour ranges from grey, brown, yellow, orange or red, with or without mottling, spots or flecks and with or without discrete white or cream blotches or ocelli on the upper surfaces. Snout is moderately rounded or acuminate (tending to be pointed) and the genus occurs in rainforest stream habitats.

The genus *Mosleyia* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by one or other of the two unique suites of characters:

1/ Vomerine teeth prominent and largely between the choanae. No pectoral fold; A series of small enlarged tubercles along the hind edge of the forearm forming a low but distinct crenulated ridge; fingers with strong basal webbing; toes nearly fully webbed; a prominent inner metatarsal tubercle and a small outer one. Heel of adpressed hind limb reaches to eye or beyond; first finger much smaller and shorter than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; tympanum indistinct; no pale stripe along the supratympanic ridge or along posterior edge of upper jaw; adult snout-vent length 65 mm; dorsal pattern is mostly grey or dull green, almost blackish and consists of a series of relatively narrow dark lines and spots forming a fine, continuous reticulum over the back, head and limbs. The flanks have a bluish metal sheen. White below, commonly with brown on the throat; axilla and groin flesh coloured; hind side of thighs are dark brown. Skin leathery, finely granular, or with numerous small scattered warts. Granular below (*M. nannotis* (Andersson, 1916), *M. cottoni sp. nov*. *M. lorica* (Davies and McDonald, 1979)) (nominate subgenus), or:

2/ Vomerine teeth conspicuous in two rows on a line with the hind edge of the choanae; with or without pectoral fold; fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth or with at most a few, low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs more or less uniform and without black and yellow markings or marbling; colour brown to blackish above, never green, with or without a broad, darker vertebral patch and other contrasting markings; a dark dorsal patch, if present, is inconspicuous and commencing from a line joining the centre of each eye; tympanum covered by skin (adult size is 35-50 mm body length) (*M. michaelsmythi sp. nov.*; *M. nyakalensis* (Liem, 1974); *M. pilloti sp. nov.*; *M. rheocola* (Liem, 1974)) (subgenus *Amnisrana subgen. nov.*).

Distribution: North-east Australia.

Content: *Gedyerana gen. nov*. (type genus); *Mosleyia* Wells and Wellington, 1985.

DARANINANURINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:E6C1197B-B538-443D-996F-9AA74B74A1BE

Type genus: *Daraninanura gen. nov.*

Diagnosis: The tribe Daraninanurini tribe nov. is best defined by diagnosing and defining the single genus.

The genus *Daraninanura gen. nov.* monotypic for the type

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species *D. brevipalmata* (Tyler, Martin and Watson, 1972) is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Rich brown to chocolate brown above, occasionally with scattered small black flecks. There is a wide canthal stripe running from snout to eye, continuing past the eye as a wide black band, almost over-writing the standard (for frogs) sized tympanum, continuing to the flank and sometimes bordered above with white or yellow. The upper lip has a narrow white or yellow stripe, narrowly edged below with brown, which continues as a glandular stripe from the angle of the mouth to the base of the forearm. The lower flanks are yellowish with scattered black spots, flecks or peppering. Groin is green or blue green. There are no red or orange spots on the hind side of the thighs. There is a dark stripe along the front edge of the hindlimb. Venter is white to light yellow. Top of iris is silver to gold in colour. Skin is smooth to slightly leathery above and coarsely granular below. Snout is rounded in shape. Vomerine teeth are prominent between the choanae. There is no pectoral fold. Finger and toe discs are of medium size, fingers are unwebbed and toes about one third webbed. There is a prominent inner metatarsal tubercle and an indistinct small outer tubercle. The second finger is longer than the first, the first finger being so short that when pressed together with the second, it reaches no further than the base of the disc of the second.

Duellman *et al.* (2016) found the type and only species in the genus *Daraninanura gen. nov.* to have diverged from its nearest living relative 35.1 MYA, necessitating the transfer of the species *D. brevipalmata* (Tyler, Martin and Watson, 1972) to a new genus and also a monotypic tribe.

Photos of *Daraninanura brevipalmata* (Tyler, Martin and Watson, 1972), can be found in Cogger (2014) on page 153 (two images), Vanderduys (2012) on page 27, Eipper and Rowland (2018) on page 119 at top and Anstis (2013) on pages 156 (right side), 157 and 158.

Distribution: Known only from wet sclerophyll forests of the north coast of New South Wales, north from about Gosford and into the wetter parts of south-east Queensland, Australia.

Content: *Daraninanura gen. nov.* (monotypic).

FIACUMMINGANURINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:846EAAC5-5DCD-4A61-969E-AA8CC9E2C3A8

Type genus: *Fiacumminganura gen. nov.*

Diagnosis: The tribe Fiacumminganurini tribe nov. is best defined by disgnosing the two component genera.

The three morphologically similar species within *Fiacumminganurea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

A colouration that is grey to green above, with irregular darker mottling, marbling or flecks, the latter often forming irregular cross-bands on the limbs. Ventral surface white or yellow, or white becoming yellow towards the rear. Lower and concealed surface of limbs are yellowish.

Skin is somewhat leathery, with a few tiny whitish tubercles on the back becoming numerous on the sides. Skin below is granular. Small but prominent vomerine teeth are located mostly behind the choanae. A pectoral fold is indistinct. Finger and toes discs are moderate, being only a little wider than the digits. Fingers with distinct basal webbing and the toes are fully webbed. There is a small but prominent inner metatarsal tubercle, no outer one. Tympanum is indistinct. Second finger is larger than the first; adult size to 45 mm in lenth.

The tadpole is free-swimming, elongated and flattened, and reaches a total length of 40 mm prior to metamorphosis. The body is dark brown to black above, with fine silver chromatophores extending onto the flanks. Darker spots may be present on the dorsal surface, while the ventral surface is darkly pigmented. The tail fin and muscle are covered with fine melanophores. The tail is moderately thick and has a rounded tip. The eyes are dorso-lateral, and the mouth is ventral.

The oral disc is large relative to closely-related species, and the oral papillae have a wide anterior gap. There are two rows of anterior labial teeth and three posterior rows (Hero *et al.* 1995; Anstis 2013).

In terms of morphologically similar and potentially sympatric species the warty back of *Fiacumminganurea gen. nov.* distinguishes species in this genus from the morphologically similar species *Dryopsophus nudidigita* (Copland, 1962) and its lack of a distinct tympanum distinguishes it from *Dryopsophus citropa* (Dümeril and Bibron, 1841).

Frogs in the genus *Dryopsophus* Fitzinger, 1843 as defined herein, are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present and the hind edge is behind the choanae; fingers are free or only webbed at the base; the first finger is much shorter and smaller than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; the heel of the adpressed hindlimb reaches to the eye or beyond; and one or other of the following three suites of characters:

1/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is distinct; the tympanic annulus is clearly visible (subgenus *Dryopsophus*), or:

2/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is indistinct; the tympanic annulus is indistinct, (subgenus *Leucolatera*), or:

3/ There is no light line along the posterior edge of the upper jaw; there is a narrow light green, white or gold stripe, sometimes with indefinite edges, but always bordered below with dark brown or black along the supra-tympanic ridge; fingers have barely a trace of webbing and the white or gold supratympanic streak is sharp edged (subgenus *Ausverdarana subgen. nov.*)

Distribution: Wetter parts of the east coast of Australia, mainly near the coast.

Content: *Fiacumminganurea gen. nov.* (type genus); *Dryopsophus* Fitzinger, 1843.

DRYOPSOPHINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:A85B6140-C767-49C9-9543-A5BD1A806823

Type genus: *Fiacumminganura gen. nov.*

Diagnosis: The subtribe Dryopsophina subtribe nov. is best defined by disgnosing the the component generus. Frogs in the genus *Dryopsophus* Fitzinger, 1843 as defined herein, are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present and the hind edge is behind the choanae; fingers are free or only webbed at the base; the first finger is much shorter and smaller than the second and when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger; the heel of the adpressed hindlimb reaches to the eye or beyond; and one or other of the following three suites of characters:

1/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is distinct; the tympanic annulus is clearly visible (subgenus *Dryopsophus*), or:

2/ There is a narrow light line along at least the posterior edge of the upper jaw, from below the eye to the glandular region behind the angle of the mouth; the tympanum is indistinct; the tympanic annulus is indistinct, (subgenus *Leucolatera*), or:

3/ There is no light line along the posterior edge of the upper jaw; there is a narrow light green, white or gold stripe, sometimes with indefinite edges, but always bordered below with dark brown or black along the supra-tympanic ridge; fingers have barely a trace of webbing and the white or gold supratympanic streak is sharp edged (subgenus *Ausverdarana subgen. nov.*).

Distribution: Wetter parts of the east coast of Australia, mainly near the coast.

Content: *Dryopsophus* Fitzinger, 1843 (monotypic).

KUMANJAYIWALKERINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:F7FA4EDF-1AC8-47B8-B0BA-0B54DE669D22

Type genus: *Kumanjayiwalkerus gen. nov.*

Diagnosis: The tribe *Kumanjayiwalkerini tribe nov.* is best diagnosed by way of defining each of the six component genera.

The genera *Pengilleyia* Wells and Wellington, 1985 as defined within this paper, and *Kumanjayiwalkerus gen. nov.* are as a pair, both readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Vomerine teeth present; fingers with conspicuous webbing reaching at least as far as the base of the penultimate phalanx of the fourth finger; hind edge of forearm is smooth, or with at most a few low, discontinuous tubercles; hind edge of foot is smooth; hind side of thighs with contrasting black and yellow bars or marbling, at least dorsally.

The genus *Pengilleyia* Wells and Wellington, 1985 is readily separated from the genus *Kumanjayiwalkerus gen. nov.* by having a back that is either very warty or moderately warty, versus virtually smooth or with well scattered small pointed tubercles on an otherwise smooth body in *Kumanjayiwalkerus gen. nov.*. Furthermore species within *Pengilleyia* invariably have green spots, flecks or blotches on the back versus none in *Kumanjayiwalkerus gen. nov.*.

Kumanjayiwalkerus gen. nov.. has a strongly contrasting reddish-brown upper iris, with grey below, versus either weakly contrasting reddish-brown upper iris or the iris being grey all over in *Pengilleyia.*

The genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots. Groin is usually lemon-yellow. Ventral surface white, cream or yellowish.

Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large. Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct. Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Within *Colleeneremia* the two subgenera are separated as follows:

1/ Fingers with only rudimentary webbing, being the subgenus *Colleeneremia*, or:

2/ With conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger being the subgenus *Balatusrana subgen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera.

Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

The nine known living species within the genus *Rawlinsonia* Wells and Wellington, 1985 (one formally described within this paper) are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: smallish frogs usually about 35 mm in body length. Fingers are free or only webbed at the base. First finger is much shorter and smaller than the second, when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger. Hind edge of vomerine teeth are between the choanae. Usually one or a pair of semidistinct mid dorsal patches, darker than the ground colour, extending from a line joining the centre of the eyes; white stripe below eye, if present does not extend beyond the anterior edge of the base of the forelimb.

Distribution: Most parts of continental Australia and New Guinea.

Content: *Kumanjayiwalkerus gen. nov.* (type genus); *Pengilleyia* Wells and Wellington, 1985; *Audaxura gen. nov.*; *Brevicrusyla gen. nov.*; *Colleeneremia* Wells and Wellington, 1985; *Rawlinsonia* Wells and Wellington, 1985.

AUDAXURINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:CF7BDF2F-FFF5-4B08-AAB9-DE506607B437

Type genus: *Audaxura gen. nov.*

Diagnosis: The subtribe Audaxurina subtribe nov. comprises three genera, being *Audaxura gen. nov.*, *Brevicrusyla gen. nov.* and *Colleeneremia* Wells and Wellington, 1985.

All species in this subtribe are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Grey, brown or fawn above, usually with a broad, darker vertebral band, bounded on either side by a lighter brown zone. There is a blackish stripe along the side of the head, continuing behind the eye, over the base of the forelimb and along the side of the body almost to the groin. Dorsal surface of the body and limbs is flecked with dark brown or black and sometimes small to medium sized patches of darker pigment. Hind side of thighs brown with fine white spots.

Groin is usually lemon-yellow. Ventral surface white, cream or yellowish. Dorsal surface usually smooth or with numerous tiny granules above and coarsely granular below. Vomerine teeth almost entirely behind the choanae. Pectoral fold prominent. Finger and toe discs large.

Toes about two thirds webbed. Inner metatarsal tubercle moderate and elongated, outer tubercle is small and rounded. Tympanum is large, rounded and distinct.

Second finger longer than first. Average adult size 35 mm in length.

Species within the genus *Colleeneremia* are separated from the morphologically similar species within the genus *Audaxura gen. nov.*, their closest living relatives as follows: *Colleeneremia* species always exhibits a very broad, dark stripe on the side of the head and body. This is not found in species within *Audaxura gen. nov.*. Furthermore *Audaxura gen. nov.* have pale regular or irregular stripes or patches on the dorsal surface of the body not exhibited in the same configuration or form in any *Colleeneremia* species. *Colleeneremia* have shorter limbs than *Audaxura gen. nov.*. The TL/S-V ratios provides a means of distinguishing the genera, this being 0.335-0.432 for *Colleeneremia* and 0.477-0.520 for *Audaxura gen. nov.*.

Within *Colleeneremia* the two subgenera are separated as follows:

1/ Fingers with only rudimentary webbing, being the subgenus *Colleeneremia*, or:

2/ With conspicuous webbing on the fingers, reaching at least as far as the base of the penultimate phalanx of the fourth finger being the subgenus *Balatusrana subgen. nov.*.

Brevicrusyla gen. nov. includes two species from the Indonesian side of New Guinea that are morphologically similar to species within the genera *Colleeneremia* Wells and Wellington, 1985 and *Audaxura gen. nov.* as detailed above, but are readily separated from them in that adults of *Brevicrusyla gen. nov.* while having a smooth dorsum on the body like the other two genera, instead has tubercles on the head, that is not seen in the other two genera. Tadpoles of *Brevicrusyla gen. nov.* have a long muscular tail, with narrow dorsal and ventral fins, versus a relatively short tail, with broad fins in species within *Audaxura gen. nov.* and *Colleeneremia.*

Duellman *et al.* (2016) found that the genera *Colleeneremia* and *Audaxura gen. nov.* diverged from one another 17 MYA, with a similar divergence indicated by Pyron and Weins (2011).

Distribution: Species in this tribe are found in most parts of Australia and New Guinea.

Content: *Audaxura gen. nov.* (type species); *Brevicrusyla gen. nov.*; *Colleeneremia* Wells and Wellington, 1985.

RAWLINSONINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:FD2468BD-A21E-4F61-BBA8-A97170185AB3

Type genus: *Rawlinsonia* Wells and Wellington, 1985.

Diagnosis: Rawlinsonina subtribe nov. is monotypic for the genus *Rawlinsonia* Wells and Wellington, 1985 and so the genus diagnosis is the same as that for the tribe. The nine known living species within the genus *Rawlinsonia* Wells and Wellington, 1985 (one formally described within this paper) are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: smallish frogs usually about 35 mm in body length. Fingers are free or only webbed at the base.

First finger is much shorter and smaller than the second, when pressed together the tip of the first finger reaches no further than the base of the disc of the second finger. Hind edge of vomerine teeth are between the choanae. Usually one or a pair of semidistinct mid dorsal patches, darker than the ground colour, extending from a line joining the centre of the eyes; white stripe below eye, if present does not extend beyond the anterior edge of the base of the forelimb.

Duellman *et al.* (2016) found that the living species in the

genus *Rawlinsonia* diverged from their nearest living relatives 23.2 MYA, giving support to the erection of this genus by Wells and Wellington, 1985 and this is before one considers the significant morphological divergence of the species group.

Distribution: Wetter parts of south-east Australia, ranging from South Australia, through Victoria and Tasmania, along the New South Wales coast to south-east Queensland, with outlier populations at Eungella, west of Mackay and the Atherton Tableland and adjacent mountains in the southern wet tropics of North Queensland.

Content: *Rawlinsonia* Wells and Wellington, 1985 (monotypic).

MAXINEHOSERRANINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:876587D4-4B6A-4CA2-86B6-44504B5B98C7

Type genus: *Maxinehoserranae gen. nov.*

Diagnosis: The tribe Maxinehoserranini tribe nov. is extremely speciose and contains 13 morphologically divergent, but phylogenetically close genera. Therefore the most sensible way to define and diagnose this tribe is by way of doing so by defining and diagnosing each genus as a group.

Species within *Maxinehoserranae gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

No vomerine teeth (Australian species) or in two small patches between the choanae (New Guinea species); dorsal colour is usually green, or occasionally fawn or a mixture of green and bronze; dorsal surface has a broad vertebral band of bronze bordered on either side by green; in terms of flecks or blotches, there are at most a few dark flecks on the dorsal surface; dorsal surface is smooth; at least one strong pectoral fold; no tubercles above the eye; brown head streak present; tympanum brown; internarial distance/eye-naris distance ratio is less than 1.0.

Frogs within the subgenus *Vegrandihyla subgen. nov.* are separated from the nominate subgenus *Maxinehoserranae subgen. nov.* by having concealed surfaces of the legs being bright red in colour (in life), versus blue-black, brown, yellow to orange in colour in all other species.

Vegrandihyla subgen. nov. are further separated from New Guinea species within *Maxinehoserranae subgen. nov.* by their non-overlapping HL/HW ratios, 1.027-1.189 versus 1.243-1.254. In terms of the Australian species in *Maxinehoserranae subgen. nov.* the magnitude of the difference is less, being a mean HL/HW for *Vegrandihyla subgen. nov.* 1.04, versus 1.10 in the Australian species in *Maxinehoserranae subgen. nov.*.

The described species in the genus *Angularanta gen. nov.* are most easily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by separation of each of the relevant subgenera.

Frogs in the nominate subgenus *Angularanta subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by one of the two following suites of characters:

1/ Small to medium sized, stream-breeding species with unwebbed or slightly webbed, long fingers, large finger discs and fully webbed toes. Intercalary structures are broad or elongate and ossified. Straight canthus rostralis. The hyoid plate lacks alary processes. The eggs are large and unpigmented, or alternatively:

2/ Medium to large species wlth long and variously webbed fingers, long hindlimbs, pigmented or unpigmented bones and very highly variable dorsal coloration. The intercalary stiuctures are small and cartilaginous. The hyoid plate bears pedunculate alary processes. The ova are small and pigmented.

Frogs in the subgenus *Alliuma subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are medium-sized montane tree frogs with spiniform tubercles on the hindlimbs, but no spiniform tubercles on the body, a green and brown blotched dorsum, and yellow colouration on the hidden surfaces of the thighs.The ventral surface is variegated with dark pigments. Moderate to extensive finger webbing. Vocal slits present in males; strongly curved canthus rostralis.

Frogs in the subgenus *Naveosrana subgen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: A small (under 50 mm snout-vent in both sexes) grey or brown species of frog with broad half-webbed fingers bearing large discs and having a strongly curved canthus rostralis. The intercalary structures are elongate and cartilaginous. The hyoid plate lacks alary processes. Ova are small and unpigmented. Further diagnostic characters of this subgenus are as follows: The dorsum varies from grey to dark brown with pale markings including light pigment over the site of the cutaneous blood vessels. The snout is gently rounded and the canthus rostralis sharply curved. The fingers have broad discs and are approximately half webbed. The toes are webbed to the base of the discs. Tubercles occur commonly on the upper eyelids, below the anus, on the back of the thighs and on the heels.

The cranial elements are reduced. The nasals are small and very widely separated medially. They do not articulate with the sphenethmoid, which appears to be lobulated anteriorly in retaining a double condition, and does not extend between the nasals. The frontoparietal fontanelle is large and ovoid. The squamosal has a short zygomatic ramus and slightly longer otic ramus. The quadratojugal is not developed. The pars facialis is shallow and the short posterior process does not articulate with the maxillary process of the nasal. The alary processes of the premaxillaries are well developed, bifurcated at their extremities, widely separated medially and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are reduced. The sacral diapophyses are broadly expanded and the ilia extend one third along their length. No flange is present on the third metacarpal and the intercalary structures are long and cartilaginous. Alary processes of the hyoid plate are lacking. The adductor mandibulae externus superficialis is absent.

Frogs within the subgenus *Scelerisqueanura subgen.*

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nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small (adult males 25.8-30.3 mm) frogs. Dorsum is chocolate brown, with or without paler patches. Short, narrow fringed, half-webbed fingers and webbed toes. The finger lengths are as follows 3>4>2>1. The webbing between the third and fourth fingers extends to a point slightly below the paired subarticular tubercles at the base of the penultimate phalanx on the fourth toe. Broadly spaced nares (E-N/IN 0.657-0.758). No vomerine teeth. The head is slightly longer than broad (HL/HW 1.031), its length equivalent to more than one-third of the snout to vent length (HL/S-V 0.356). The snout is not prominent; abrupt and truncate when viewed from above and very slightly rounded in profile. The nostrils are lateral, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.694). The canthus rostralis is well defined and very slightly curved. The eye is large and conspicuous, its diameter greater than the eye to naris distance. The tympanum is covered with skin and very small, its diameter equivalent to one-third of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue is broadly cordiform with weakly indented posterior border.

The terminal discs are prominent. Long and slender hindlimbs with a TL/S-V ratio of 0.584.

Toe lengths 4>5=3>2>1. The webbing of all toes except for the fourth reaches the base of the discs, while on the fourth toes the webbing reaches the subarticular tubercle at the base of the penultimate phalanx and continues to the disc via a narrow fringe. The dorsal and lateral surfaces of the body are finely pitted and striated. There is an inconspicuous supratympanic fold. The throat and chest are smooth. Abdomen and nearby halves of the ventral surface of the thighs are coarsely granular. There is a small pigmented nuptial pad at the base of the first finger. Vocal sac openings are exceptionally long, extending from the base of the tongue to the angles of the jaw.

Ventrally the frogs are a pale creamish colour, stippled with dark brown on the throat.

Frogs within the subgenus *Longuscrusanura subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small size with male maximum length 23 mm, female 28 mm. Fingers are slightly fringed and slightly less than half webbed and of moderate length. The toes are fully webbed and the hindlimbs are particularly long, with a ratio of tibia length to snout-vent length of 0.59-0.68.

The dorsum is greyish (in preservative) and marked with pale, cryptic markings resembling lichens.

The snout is short and very slightly pointed.

Ovarian eggs are unpigmented.

Vomerine teeth are present in some individuals and absent in others.

The snout is prominent, slightly projecting and obtusely pointed when viewed from above and slightly projecting in profile. The nostrils are more lateral than superior, their distance from the end of the snout approximately two thirds that from the eye. The distance from the eye and the naris is less than the internarial span. The canthus rostralis is well defined and strongly rounded. The eyes are large and prominent the eye diameter being greater than the eye to naris distance.

The tympanum is covered with skin, only the inferior half of the annulus is visible. The tympanum diameter approximates the equivalent of two fifths of the eye diameter, separated from the eye by a distance greater than its own diameter.

The tongue shape is somewhat distorted and roughly cordiform in shape with a very slightly indented posterior margin.

The two species *Angularanta impura* and *A. oxyeei sp. nov.* constitute the entirety of the subgenus *Raucus subgen. nov.* and are separated from all other species within *Angularanta gen. nov.* and all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: unpigmented bones; single subarticular tubercle on fourth finger; reduced toe webbing; reduced hand webbing (versus moderate to extensive in one or both in all species of *Angularanta gen. nov.*), narrow lateral fringes on fingers; dark brown to blackish chin in males; dark brown to reddish brown dorsum; dark brown canthal stripe; upper-lip may be white, with a very thin white line bordered by black or brown; concealed surfaces of thighs are brown with yellow spots; yellow to orange iris, sometimes with a green upper margin; ventrum white; slightly pointed snout when viewed from above, side on or below; a raucous call; IN/SV 0.072-0.08, TY/SV 0.067-0.075, HW/SV 0.34-0.3, HL/SV 0.34-0.3, EN/IN 1.1-1.2.

The five described species in the genus *Bellarana gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: The head is high and usually broader than long (average HL/HW 0.878-1.012), its length usually less than one-third of the snout to vent length (average HL/S-V 0.300-0.347). The snout is not prominent; when viewed from above it is evenly rounded or obtusely angular; in profile it is rounded or acutely angular. The nostrils are more lateral than superior, their distance from the end of the snout less than that from the eye. The distance between the eye and the naris is either more or less than the internarial span (average E-N/IN 0.509-0.884). The canthus rostralis may be curved, slightly defined or straight. The eye is moderate to large, its diameter greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to one-third to one-quarter of the eye diameter. The vomerine teeth are in two short oblique series situated between the choanae. The tongue is cordiform wih a slightly indented posterior border.

The fingers are moderately long and are equipped with narrow lateral fringes; in decreasing order of length 3>4>2>1; the webbing is not extensive, not reaching the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are moderate.

The hind limbs are long with a moderate to high TL/S-V ratio (0.524-0.689). Toes in decreasing order of length 4>3>or= 5>2>1. The toes are webbed to the discs with

the exception of the fourth which is webbed to the sub-articular tubercle at the base of the penultimate phalanx.

The skin on the dorsal surfaces is smooth or at most slightly tubercular with very small and widely scattered tubercles distributed evenly across the upper body and upper surfaces of the limbs. The throat is smooth and the chest, abdomen and lower femora granular. There is a prominent, curved supra-tympanic fold extending from the posterior corner of the eye to the shoulder. On the posterior surface of the forearm are tubercles which are widely separated from one another, in juxtaposition in a distinct row, or replaced by a continuous fold. There is a poorly defined dermal ridge on the posterior surface of the heel and tarsus.

The colouration is very highly variable, including at times, strong sexual dimorphism in many locations.

Fluvirana gen. nov. are a genus of stream-dwelling frogs only known from the north-west New Guinea (Indonesia) separated from all other similar species in New Guinea (including those sympatric in northern New Guinea) by having a stout build, only slightly pointed snout from above or below, also being slightly truncate; distinctive finger webbing on otherwise short, thick fingers, an absence of distinctive markings on the dorsum; brownish or grey dorsum; limited markings on upper limbs, and usually in the form of scattered flecks or indistinct bars or spots; white to whitish underparts; dorsal skin that is either smooth or only moderately granular or tuberculate; short thick limbs which are greyish in colour and spotted with white; relatively dull concealed areas of limbs; moderate tympanic fold that covers the top section of the otherwise exposed tympanum.

The species in the genus *Hopviridi gen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small, montane species. They are uniformly green, sometimes lacking flash markings on the undersides of limbs or alternatively pink with yellow spots in *H. leucova* (Tyler, 1968) or otherwise bright orange in *H. chloronota* (Boulenger, 1911). Short, slightly fringed, half-webbed fingers, fully webbed toes and eggs unpigmented, 2 mm in diameter ova. Maximum size of females is 30 mm snout-vent. The snout is short with a low internarial span. Vomerine teeth are absent.

The genus *Incertanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: A long (up to at least 2.8 mm) erectile rostral spike in males that is circular in cross section; relatively small size (SVL up to 30.5 mm); slender build (HW/SVL 0.22-0.26); tibia approximately half length of the body (TL/SVL 0.049-0.053); moderately large eyes (EYE/SVL 0.10-0.12); moderately small tympanum (TYM/SVL 0.42-0.53); small, rounded and often green tubercles extending across the mid-dorsum in life; brown to yellowish-brown dorsal colouration with, or without, distinct green transverse bands; and orange colouration in concealed areas of the thighs and axilla.

The five species within *Incertanura gen. nov*. are further defined as follows: Body very slender and elongate, tibia approximately half length of body; head wider than body in dorsal profile, clearly distinct from neck. Snout rounded in dorsal view and truncate in lateral view. Rostral spike in males extending from tip of upper jaw; mean spike length varies among populations and species from different localities. Canthus rostralis moderately well defined, slightly curved; loreal region concave. Nares closer to tip of snout (excluding spike) than to eye, oriented laterally. Eyes moderately large, protruding in both dorsal and lateral views; pupil horizontal. Upper jaw protruding marginally beyond lower jaw. Tympanum small with distinct to indistinct annulus, bordered dorsally by a fleshy supratympanic fold extending to the superior edge of the insertion of the upper arm. Choanae small and circular, situated close to anterior and lateral edge of palate; no vomerine teeth visible; tongue

fleshy and ovoid and usually with a slightly indented posterior edge. Vocal slits present in males. Dorsal skin tuberculate; ventral skin finely to coarsely granular on throat, abdomen and tibia; remaining ventral surfaces of limbs smooth; additional tubercles also present in clusters around the vent, and to a variable extent on sides of ankles and upper forearms.

Fingers with relative lengths 3>4>2>1; fleshy, whitish to translucent webbing between all digits, forming a narrow basal strip between 1 and 2, extending to disc on distal edge of 2 and proximal edge of 4 and to penultimate phalanx on both sides on 3. Terminal finger discs expanded or narrower (depending on species) and usually wider than toe discs and with distinct circum-marginal grooves. Nuptial pads dark brown, roughly tear-shaped with point of tear oriented in posteroventral direction. Indistinct unpigmented bifid subarticular tubercles usually visible at the base of penultimate phalanx on all fingers, further indistinct unpigmented subarticular tubercles in series on finger four, indistinct proximal metacarpal tubercles at base of finger one, and small distal metacarpal tubercles at base of three and four.

Toes moderately long, relative lengths 4>3>5>2>1. All digits with extensive fleshy, opaque webbing, basal between 1 and 2, extending to anterior end of penultimate phalanx on distal edge of 2 and 3 and proximal edge of five, to halfway along penultimate phalanx on proximal edge of three and four, and base of penultimate tubercle on distal edge of four. Terminal discs slightly expanded to not really expanded and otherwise, narrower than finger discs and with distinct circum-marginal grooves. Indistinct unpigmented subarticular tubercles on penultimate phalanx of all toes, single on 1-3, bifid on 4 and 5. No other tubercles clearly apparent. Small, indistinct unpigmented metatarsal tubercle at base of 1.

In preservative, ground colour of all dorsal surfaces is medium brown, with extensive blueish green and darker brown flecking, maculations, vermiculations and/or blotches across all dorsal surfaces, blueish pattern elements sometimes coalesce into three indistinct transverse blotches, overall darker pigmentation elements tend to be densest on body, and less concentrated and more finely reticulated towards distal extremities of limbs.

Rostral spike is usually light brown, with extensive darker brown flecking at base, tending towards unpatterned at

tip. White or yellow patches often, but not always, present on either side of head, extending from posterolateral edge of eye, below tympanum and around axilla. Venter predominantly buff, internal organs sometimes visible, throat sometimes offwhite, and/or with two clusters of dark brown maculations laterally, tubercles around vent and sometimes those along outer edge of limbs, off-white.

Appearance in life is as follows: Dorsal base colouration is light to dark brown, with variable amounts of green and darker brown spotting, mottling or banding on the body, limbs and head. Dorsal and lateral tubercles on torso and limbs often, but not always, green and contrasting against the brown base colouration. Head brown, often with extensive green pigmentation, usually including a ring

around the eyes and more variably a green transverse band between the eyes. Dense clusters of dark-brown to almost black maculations extend to a variable degree across the limbs, lateral portions of torso and in patches across the back. Off-white patches sometimes present below tympanum and on exposed surfaces of lower hindlimbs. Iris pattern complex; base colouration is usually light brownish, with extensive darker brown vermiculations; rim of pupil orange. Hidden regions of axilla and groin orange (adapted from Oliver *et al.* 2019a).

The genus *Inlustanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: The known species are characterised by fully webbed outer fingers, a large rounded head with inconspicuous to large eyes (depending on the species), and distinctive well developed dermal folds on the posterior surface of the forearm, anus, tibia, tarsus and fifth toe. Although in at least one species the development of the fold on the tarsus may be reduced. These frogs have a distinctive dorsal colouration of green intersperced with yellow spots in life (in preservative a distinctive colouration in which blue and violet are the predominant pigments), with yellow spots absent in at least some specimens of one species. These frogs are moderately sized species. Females attain a maximum snout to vent length of 35-48 mm and males 39-42 mm.

Species within *Moechaeanura gen. nov*. are morphologically similar to those species in the genus *Variabilanura gen. nov.*, with some differences between the two detailed in this description.

Moechaeanura gen. nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small to medium species (male maximum snout-vent length 34 mm, female maximum snout-vent length 38 mm with short, three webbed fingers and almost fully webbed toes.

The webbing of the fourth toe extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx, (versus reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger in the genus *Variabilanura gen. nov.*). The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth except for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Predominantly green in life and may be marked with gold and black. The intercalary structures are elongate and ossified. The hyoid plate lacks alary processes. The ova are small and pigmented (see below).

The dorsum is green, stippled with black and occasionally marked quite extensively with gold. The fingers are short and slender, with about one third webbing; the toes are almost fully webbed. The snout is slightly rounded in profile.

The cranial elements are poorly developed. The nasals are widely separated medially and do not articulate with the sphenethmoid. The sphenethmoid remains double in the adult. The frontoparietal foramen is large and ovoid. The squamosals have short zygomatic rami and very much longer otic rami. The pars facialis of the maxillary is shallow and the posterior process does not make contact with the maxillary process of the nasal. The alary processes of the premaxillary are broad, widely separated medially, and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are very much reduced.

A phlange is present on the distal surface of the 3rd metacarpal. The sacral diapophyses are broadly dilated, and the intercalary structures are elongate and ossified. There are no alary processes on the hyoid plate. The adductor mandibulae externus superficialis is absent.

The ova are small and pigmented (brown animal pole) and laid in stagnant marshes. The mean ovidiameters are 1.2-1.7 mm. Tadpoles have moderately developed fins and the labial teeth comprise 2 upper and 3 lower rows (Tyler 1963; Menzies 1972). The chromosome number is 26.

Moechaeanura gen. nov. is further separated from a number of morphologically similar New Guinea species within the genus *Variabilanura gen. nov.* by its very different reproductive mode. *Moechaeanura gen. nov*. species have small brown pigmented eggs (average ova size of 1.2-1.7 mm) that are deposited in water, while species in the genus *Variabilanura gen. nov.* attach a mass of large green eggs with an average ova size of 2.5 mm to vegetation overhanging slow moving streams.

In *Variabilanura gen. nov.* the ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water. The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements (Tyler 1978).

Frogs within the subgenus *Aspercutis subgen. nov.* (within *Moechaeanura gen. nov.*) conform to the above diagnosis for the genus *Moechaeanura gen. nov.*, except for their more extensive finger webbing, highly

tuberculate dorsum (versus smooth to slightly tuberculate in the nominate subgenus), distinctively crenulated ridges following the outer surfaces of the lower limbs, silvery-gold and heavily veined iris and fully truncate snout (versus normal to slightly truncate in the nominate subgenus) which as a full diagnosis separates them from all other New Guinea frogs.

Frogs within the subgenus *Telaater subgen. nov*. are separated from all other New Guinea tree frogs by having full black webbing on hands and feet, the venter with extensive areas of black, white and yellow and a transparent periphery on the tympanic membrane combined with a small adult size of less than 30 mm. the placement of these species within a subgenus within a greater *Moechaeanura gen. nov.* is tentative and elevation to full genus may be required as further evidence is obtained.

The species in the genus *Ornatanura gen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suites of characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818). The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling. The anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being 1/ Liberally spotted with white, 2/ Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

Species within the genus *Nasuscuspis gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are montane species, growing to a maximum of 50 mm snout vent length in females and males to 45 mm. The dorsum is a mixture of greys, greenish greys and ochres. The fingers and toes are extensively webbed. There are highly developed dermal appendages including crenulated ridges on the posterior surfaces of the radius and tarsus, prominent dermal folds above the vent; a row of very large tubercles on the undersurface of the mandible, and an elongate rostral, dermal spike always in males and females although in some reduced form in females of some species.

Rotundaura gen. nov. is separated from all other

Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: A very high E-N/IN ratio (average 1.435), short limbs with a low TL/S-V ratio (average 0.482), wholly unwebbed fingers and incompletely webbed toes characterise this species.

The head is long and flattened and longer than broad (average HL/HW 1.073), its length more than one-third of the snout to vent length (average HL/S-V 0.355). The snout is rather prominent, gently rounded when viewed from above and strongly rounded in profile. The nostrils are more superior than lateral, their distance from the end of the snout about one-half that from the eye, and separated from each other by a distance which is equivalent to approximately two-thirds of the eye to naris distance (average E-N/IN 1.435). The canthus rostralis is straight and inconspicuous and the loreal region oblique. The eye is small, its diameter less than the eye to naris distance. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter and separated from the eye by a distance equivalent to approximately one-half its own diameter. The vomerine teeth are in two obliquely oval series in juxtaposition on the midline between the small, obliquely oval choanae. The tongue is small, triangular and very feebly indented on its posterior border. The fingers are long, slender and unwebbed. The terminal discs are large and the sub-articular tubercles prominent. The fingers in decreasing order of length 3>4>2>1. The hind limbs are short with a TL/S-V ratio of 0.482. The toes are incompletely webbed, the webbing reaching the base of the penultimate phalanx on the fourth toe and half-way up the penultimate phalanx of the fifth. Toes in decreasing order of length 4>5=3>2>1. The skin on the dorsal surfaces of the head and body is smooth but for a few flattened tubercles on the back. The throat is smooth and the chest, abdomen and back of the thighs are coarsely granular. There is an inconspicuous supratympanic fold barely obscuring any of the tympanum and a pronounced skin fold across the chest. There is neither a tarsal ridge nor a dermal appendage on the heel. Dimensions: of gravid female holotype are snout-vent 33.2 mm; tibia length 15.8 mm; head length 11.8 mm; head width 11.0 mm; eye to naris distance 3.3 mm; internarial span 2.3 mm; eye diameter 3.1 mm; tympanum diameter 2.0 mm. The dorsal surfaces of the head and body and limbs are a very pale brown with indistinct darker and lighter marbling. Marbling is present and most conspicuous on the dorsal surface of the thigh and tibia. The ventral surfaces of the body and limbs are dull cream with an irregular brown patch on the throat (modified from Tyler 1978).

Specimens of the morphologically similar *Llewellynura* Wells and Wellington, 1985 are readily separated by their much smaller adult size of less than 25 mm body length.

Species of *Rotundaura gen. nov*. are separated from the genus *Summaviridis gen. nov.* (and in turn all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae)), by the tympanum being fully exposed and round, versus the upper surface being cut at the rear by a well-defined and prominent skin fold forming a straight line and a significantly blunter snout in *Rotundaura gen. nov.* versus pointed, when both are viewed in profile side on.

The genus *Variabilanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small montane species (males 24.3-34.1 mm; females 30.1-43 mm). In life they are green, usually with yellow spots or markings (in preservative the dorsal surface is blue, usually with darker and occasionally lighter markings). There is usually a deep violet, orange, yellow or red patch in the groin and similarly coloured markings occur on the axilla, posterior surface of the thighs, tibia and tarsus. The head is as broad as long or longer than broad (HL/HW 0.910-1.192), its length less than or greater than one-third of the snout to vent length (HL/S-V 0.328-0.384). The shape of the snout is highly variable, being from prominent to inconspicuous and strongly or only slightly rounded when viewed from above and in profile. The nostrils are lateral in specimens with prominent snouts and more lateral than superior in specimens with inconspicuous snouts. The nares are very much nearer the eye than the tip of the snout in the latter individuals and almost equidistant in the former. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.667-0.965). The canthus rostralis is curved and slightly or well defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-third to slightly less than one-half the eye diameter. Vomerine teeth are present in the majority of specimens, and confined to small circular series on slight elevations between the choanae. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with very slight lateral fringes; in decreasing order of length 3>4>2>1. The webbing reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are prominent. The hind limbs are variable with a TL/S-V ratio of 0.485-0.587. Toes in decreasing order of length 4>5>3>2>1. The webbing between the toes reaches the base of the disc of all toes, except the fourth where it reaches the tubercle at the base of the penultimate phalanx. The skin on the dorsal surface of the head, body and limbs is minutely roughened. The throat and chest are slightly granular. There are a row of tubercles on the posterior surface of the forearm, and conspicuous tubercles below the anus. Femoral tubercles are usually present. The supra-tympanic fold is inconspicuous. In preservative and in life, dull orange patches may extend on to the dorsum in the axillary region.

The lateral surfaces of the body are frequently heavily pigmented with black or deep yellow (in life, being violet in preservative), marked with large white patches. There is invariably a yellow, orange, red or violet patch in the groin (in life) and the same colouration may be present in the axilla and on the posterior surface of the tibia and tarsus. There is a white patch beneath the eye extending to the angle of the jaws or on the lateral surfaces of the body. The ventral surface of the body is cream to white (white in subgenus *Sudesanura subgen. nov.*), with or without sparse blue stippling on the throat near the angle of the jaws. The lower surface of the hind limbs is creamish yellow or dull yellow. These species are often

beautifully pigmented in life being marked with cream, orange, yellow, green, violet and black (Tyler, 1962).

The ovum is pale green in colour and has a diameter of approximately 2.5 mm. The ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water. The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump and the tadpole emerges possessing internal gills, being capable of coordinated movements.

The mouth is anterior in position, and surrounded by a band of papillae on the inferior and lateral borders. There are two upper and three lower rows of labial teeth.

Species in the subgenus *Sudesanura subgen. nov*. (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

Species within *Sudesanura subgen. nov*. are further defined as follows: Small (SV max. 30.05 mm); head narrow (average HL/HW 1.08); Head always longer than wide (average HL/HW>1.0) except in females, which lack the rostral spike, where HL=HW; canthus rounded, concave, lores oblique, nostrils more or less lateral, widely placed (average EN/IN 0.63 in males and EN/IN 0.54 in females); snout with a prominent pointed rostral spike; vomerine teeth absent; eye large (average EY/SV 0.11); tympanum visible, upper margin covered by skin fold. Fore limb with indistinct row of raised tubercles down outer side; hind limb without heel lappets or other dermal appendages; fingers half-webbed, toes fully webbed; subarticular tubercles poorly developed. Legs always long (average TL/SV>0.54). Dorsum usually immaculate, bright pale green, yellow or fawn brown reduced to a very narrow band on the thighs and ceasing at ankle and wrist, leaving hands and feet virtually colourless; concealed thighs and axillae bright cherry-red; white band on upper lip, snout to axilla; raised tubercles on fore limb white; ventral surfaces pure white.

Frogs in the genus *Drymomantis* Peters, 1882 this single genus being the sole member of the subtribe Drymomantina subtribe nov. (being the only other subtribe in the tribe) are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: These are small elongated and agile frogs averaging about 25 mm in body length with moderately pointed snouts, varying somewhat between species; brown head streak present or absent; dorsal surface is uniform green or fawn, sometimes with darker flecks and with at most a paler vertebral zone; there is not a broad vertebral band of bronze bordered on either side with green; skin is smooth above; finely granular on the throat and coarsely granular below; at least one strong pectoral fold, no dorsolateral fold and no tubercles above each eye; fingers webbed at the base and toes moderately webbed. A moderate oval inner and small rounded outer metatarsal tubercle; vomerine teeth absent, or if present, the hind edge of vomerine teeth are between the choanae; first finger is much smaller than the second when pressed together, the top of the first finger reaching no further than the base of the disc of the second finger.

Distribution: New Guinea and tropical parts of northern Australia.

Content: *Maxinehoserranae gen. nov.* (type genus); *Angularanta gen. nov.*; *Bellarana gen. nov.*; *Drymomantis* Peters, 1882**;** *Fluvirana gen. nov.*; *Hopviridi gen. nov.*; *Incertanura gen. nov.*; *Inlustanura gen. nov.*; *Moechaeanura gen. nov.*; *Ornatanura gen. nov.*; *Nasuscuspis gen. nov.*; *Rotundaura gen. nov.*; *Variabilanura gen. nov.*.

DRYMONTANTINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:14F658D7-CE72-464A-B24A-C8371BB6A549

Type genus: *Drymomantis* Peters, 1882.

Diagnosis: The subtribe Drymomantina subtribe nov. is monotypic for the genus *Drymomantis* Peters, 1882 and therefore the subtribe diagnosis is the same as for the genus.

Frogs in the subtribe Drymomantina subtribe nov. thereby including genus *Drymomantis* Peters, 1882 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

These are small elongated and agile frogs averaging about 25 mm in body length with moderately pointed snouts, varying somewhat between species; brown head streak present or absent; dorsal surface is uniform green or fawn, sometimes with darker flecks and with at most a paler vertebral zone; there is not a broad vertebral band of bronze bordered on either side with green; skin is smooth above; finely granular on the throat and coarsely granular below; at least one strong pectoral fold, no dorsolateral fold and no tubercles above each eye; fingers webbed at the base and toes moderately webbed. A moderate oval inner and small rounded outer metatarsal tubercle; vomerine teeth absent, or if present, the hind edge of vomerine teeth are between the choanae; first finger is much smaller than the second when pressed together, the top of the first finger reaching no further than the base of the disc of the second finger.

According to Duellman *et al*. (2016), the members of this genus diverged from their nearest living relatives 21.5 MYA confirming tribe-level recognition as being appropriate.

Content: *Drymomantis* Peters, 1882 (monotypic).

NYCTIMYSTINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:D093F148-149A-4BB1-973B-E0C3B72AF48B

Type genus: *Nyctimystes* Stejneger, 1916.

Diagnosis: The tribe Nyctimystini tribe nov. includes a total of six genera, until recently placed by many authors within an expanded version of the putative genus *Nyctimystes* Stejneger, 1916, *sensu* Cogger (2014), excluding Australian species previously treated as being within *Nyctimystes* but having a horizontally elliptical pupil.

However the diagnosis of *Nyctimystes* has been expanded (e.g. Duellman *et al*. 2016) and now shrunk significantly in this (2020) paper.

All genera within this tribe, namely *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*,

Magnumoculus gen. nov., *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

In further detail, the relevant genera are separated from one another as follows:

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Webpede subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique “reticulated” palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel

tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc.

The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

Distribution: New Guinea including nearby offshore islands on the continental shelf.

Content: *Nyctimystes* Stejneger, 1916 (type genus); *Albogibba gen. nov.*; *Occultatahyla gen. nov.*; *Nigreosoculus gen. nov.*; *Badiohyla gen. nov.*; *Magnumoculus gen. nov.*.

BADIOHYLINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:97DD93A0-93D2-43A1-9776-EFF15C005132

Type genus: *Badiohyla gen. nov.*

Diagnosis: This tribe includes two genera, namely *Badiohyla gen. nov.* and *Magnumoculus gen. nov..*

Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique “reticulated” palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc. The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

In terms of the nominate subtribe Nyctimystina subtribe nov. the four component genera are defined as stated below.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov.* are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov.* by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in

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life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

Distribution: New Guinea, including offshore islands on the continental shelf.

Content: *Badiohyla gen. nov.* (type species); *Magnumoculus gen. nov.*.

PELODRYANINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:35805C8F-3448-4565-995C-D9BFA707C3CD

Type genus: *Pelodryas* Günther, 1858.

Diagnosis: The tribe *Pelodryanini tribe nov.* is best diagnosed by way of defining each of the three component genera.

Species in the genus *Pelodryas* Günther, 1858 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Colour in life is usually a near unform emerald-green in life, but varies from dark purplish-green to fawn or at times even blue, often with scattered white or yellow spots or dots; there is no obvious white stripe running along the edge of the lower jaw; the hind side of thighs lacks black or yellow marbling, either being plain or sometimes pinkish or orangeish; hind edge of forearm is smooth, or with at most a few, low, discontinuous tubercles; the skin on top is smooth or slightly leathery; venter is white and coarsely granular; hind edge of foot is smooth; fingers have conspicuous webbing, but reaching no further than the base of the penultimate phalanx of the fourth finger; toes are about 2/3 webbed; finger and toe discs are large and obvious; vomerine teeth present and prominent, between and behind the choanae; there is obvious thick, supratympanic gland and the tympanum is large and obvious.

Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

The genus *Summaviridis gen. nov.* is monotypic for a West Papuan species, *S. vagabunda* that does not appear to have close affinities to any other species or

genus. Tyler (1968) placed it in a group on its own, although Menzies (2006) associated it with his so-called "*Litoria gracielenta* complex". However *S. vagabunda* has unwebbed hands, versus heavily webbed in the other species, which in effect scuttles any close association at the genus level.

Summaviridis gen. nov. is therefore only tentatively placed in the tribe Pelodryanini tribe nov. and subtribe Shireenhoserhylina subtribe nov..

Summaviridis gen. nov. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following unique suite of characters: A broad head, short limbs, unwebbed fingers, a prominent fold of skin across the chest and (in life) a dark green dorsal colouration.

In further detail the *Summaviridis gen. nov.* is separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) as follows: The head is broader than long (HL/HW 0.951), its length slightly less than one-third of the snout to vent length (HL/S-V 0.310). The snout is rounded when viewed from above and in profile. The nostrils are more lateral than superior, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is greater than the internarial span (E-N/IN 1.154). The canthus rostralis is straight and poorly defined. The eye is large, its diameter greater than the distance separating it from the nostril. Three-quarters of the tympanum is visible, the superior rim of the tympanic annulus is hidden beneath the supra-tympanic fold. The tympanal diameter is equivalent to two-thirds of the eye diameter. The vomerine teeth are in two broadly oval series situated between the choanae. The tongue is broadly cordiform with a deeply indented posterior border. The fingers are very long and slender with narrow lateral fringes; in decreasing order of length 3>4>2>1; unwebbed. The terminal discs and sub-articular tubercles are large and prominent. The hind limbs are short and slender with a TL/S-V ratio of 0.513. Toes in decreasing order of length 4>5>3 >2>1. The webbing between the outer and fourth toe reaches half-way up the penultimate phalanx on the fifth toe, and the sub-articular tubercle at the base of the penultimate phalanx on the fourth. The skin on the dorsal surfaces is smooth with a few minute flattened tubercles. The throat and chest are slightly tubercular; the abdomen, sides of the body and lower surface of the thighs are extremely granular. There is a conspicuous curved supra-tympanic fold, and a prominent skin fold across the chest. The dorsal surfaces are in life dark green and in preservative dark blue. There is a faint trace of a narrow white line above a broader brown line on the canthus rostralis, upper eyelid and supra-tympanic fold. The backs of the thighs are pale brown and marked with small irregularly-shaped, pale yellow spots. The backs of the tarsus and forearm are pale brown. The ventral surfaces are pale yellow with leaden blue patches at the angles of the jaws, and small faint brown spots on the remainder of the mandibular border and on the throat. Adult females are about 37 mm in body length (modified from Tyler, 1978).

Specimens of the morphologically similar *Llewellynura* Wells and Wellington, 1985 are readily separated by their much smaller adult size of less than 25 mm body length.

The species within the morphologically similar genus *Rotundaura gen. nov.* are separated from this genus (*Summaviridis gen. nov.*) by the tympanum being fully exposed and round, versus the upper surface being cut at the rear by a skin fold forming a straight line and a significantly blunter snout in *Rotundaura gen. nov.*.

Distribution: Most parts of continental Australia, except the coldest regions as well as most parts of New Guinea.

Content: *Pelodryas* Günther, 1858 (type genus); *Shireenhoserhylea gen. nov.*; *Summaviridis gen. nov.*.

SHIREENHOSERHYLINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:5315C7D8-DADE-4350-BB70-8F144939DD39

Type genus: *Shireenhoserhylea gen. nov.*

Diagnosis: The subtribe Shireenhoserhylina subtribe nov. is best diagnosed by way of defining each of the two component genera.

Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

The genus *Summaviridis gen. nov.* is monotypic for a West Papuan species, *S. vagabunda* that does not appear to have close affinities to any other species or genus. Tyler (1968) placed it in a group on its own, although Menzies (2006) associated it with his so-called "*Litoria gracielenta* complex". However *S. vagabunda* has unwebbed hands, versus heavily webbed in the other species, which in effect scuttles any close association at the genus level.

Summaviridis gen. nov. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following unique suite of characters: A broad head, short limbs, unwebbed fingers, a prominent fold of skin across the chest and (in life) a dark green dorsal colouration.

In further detail the *Summaviridis gen. nov.* is separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) as follows: The head is broader than long (HL/HW 0.951), its length slightly less than one-third of the snout to vent length (HL/S-V 0.310). The snout is rounded when viewed from above and in profile. The nostrils are more lateral than superior, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris

is greater than the internarial span (E-N/IN 1.154). The canthus rostralis is straight and poorly defined. The eye is large, its diameter greater than the distance separating it from the nostril. Three-quarters of the tympanum is visible, the superior rim of the tympanic annulus is hidden beneath the supra-tympanic fold. The tympanal diameter is equivalent to two-thirds of the eye diameter. The vomerine

teeth are in two broadly oval series situated between the choanae. The tongue is broadly cordiform with a deeply indented posterior border. The fingers are very long and slender with narrow lateral fringes; in decreasing order of length 3>4>2>1; unwebbed. The terminal discs and sub-articular tubercles are large and prominent. The hind limbs are short and slender with a TL/S-V ratio of 0.513. Toes in decreasing order of length 4>5>3 >2>1. The webbing between the outer and fourth toe reaches half-way up the penultimate phalanx on the fifth toe, and the sub-articular tubercle at the base of the penultimate phalanx on the fourth. The skin on the dorsal surfaces is smooth with a few minute flattened tubercles. The throat and chest are slightly tubercular; the abdomen, sides of the body and lower surface of the thighs are extremely granular. There is a conspicuous curved supra-tympanic fold, and a prominent skin fold across the chest. The dorsal surfaces are in life dark green and in preservative dark blue. There is a faint trace of a narrow white line above a broader brown line on the canthus rostralis, upper eyelid and supra-tympanic fold. The backs of the thighs are pale brown and marked with small irregularly-shaped, pale yellow spots. The backs of the tarsus and forearm are pale brown. The ventral surfaces are pale yellow with leaden blue patches at the angles of the jaws, and small faint brown spots on the remainder of the mandibular border and on the throat. Adult females are about 37 mm in body length (modified from Tyler, 1978).

Specimens of the morphologically similar *Llewellynura* Wells and Wellington, 1985 are readily separated by their much smaller adult size of less than 25 mm body length.

The species within the morphologically similar genus *Rotundaura gen. nov.* are separated from this genus (*Summaviridis gen. nov.*) by the tympanum being fully exposed and round, versus the upper surface being cut at the rear by a skin fold forming a straight line and a significantly blunter snout in *Rotundaura gen. nov.*.

Distribution: Wetter parts of the east coast of Australia, excluding colder parts of the far south, New Guinea and offshore islands. The nominate subgenus *Shireenhoserhylea subgen. nov.* is restricted to the East Coast of Australia, south of the northern wet tropics in Queensland.

The subgenus *Emeraldhyla subgen. nov.* occurs in New Guinea and offshore islands as well as the far north of Cape York, Queensland.

The type species for the monotypic genus *Summaviridis gen. nov.* is only known from the two types, a male and a female, being from Vogelkop Peninsula, Papua (New Guinea) (female) and Seram (= Ceram) Island, Molucca Islands, Indonesia.

Content: *Shireenhoserhylea gen. nov.* (type species); *Summaviridis gen. nov.*.

PUSTULATARANINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:C57E50A3-84EC-4921-A71A-A0F1B28D4305

Type genus: *Pustulatarana gen. nov.*

Diagnosis: The tribe Pustulataranini tribe nov. is best diagnosed by way of defining each of the seven component genera.

The single known living species within the genus *Pustulatarana gen. nov.* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters:

A smallish sized tree frog being 27 mm in body length. Brown to greenish brown or even yellow above, with obscure and irregular darker flecks and blotches. Creamy-white below, finely peppered with dark blackish-brown or shading of other lighter colour on the throat, with heavy concentrations of stippling on chin, chest and flanks of some specimens. Underside of thighs have irregular darker patches and hind isde of thigh has irregular fine creamish coloured stripes. Skin is leathery and with numerous scattered tubercles which may or not be arranged in well-defined longitudinal rows, including sometimes some of medium to large size and a prominent one on the eyelid. Belly is smooth except for some granular skin on the lower belly and thighs. Vomerine teeth present, but weakly developed and between the choanae. Fingers lack webbing but have large oval discs. Toes poorly to moderately webbed. A minute rounded outer metatarsal tubercle and a moderate-zied oval inner metatarsal tubercle. Tympanum distinct.

Pustulatarana gen. nov. are separated from the genus *Llewellynura* Wells and Wellington, 1985 by the large oval discs on the forelimbs and larger body size (27 mm vs 20 mm). *Pustulatarana gen. nov*. are from the genus *Mahoneybatrachus* Wells and Wellington, 1985, by having reduced toe webbing, versus well developed webbing on the feet.

Species within the genus *Llewellynura* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: they are tiny in size, being about 20 mm in body length as adults. Colour is variegated dark and brown dorsally; a row of widely spaced dorsolateral tubercles and ridges may be on each side, or alternatively just a few randomly scattered small tubercles on either side of upper flank; no pectoral fold; several conspicuous tubercles above each eye; tiny, slender and agile and with a sharply pointed snout. The dorsum may be grey, brown, yellow or red, often flecked or mottled with darker colour. There is usually a broad dark band from behind the eye to the groin and an even darker stripe along the snout, through the eye and over the base of the arm to the flank. Snout and upper surfaces of the limbs are peppered with dark brown. There is a conspicuous dark bar along the front edge of the arm. Ventral surface is white except for a fine peppering of brown on the throat, chest and limbs. Skin is smooth dorsally, with at least some small tubercles or warts or skin folds and usually several small subercles over each eye. Throat skin is smooth, but belly is granular. Finger and toe discs are moderate in size but

distinct. Fingers lack webbing and toes are less than half webbed. The disc and nearly two phlanges are free on the outer side of the fourth toe. The inner metatarsal tubercle is prominent and there is no outer one. Tympanum ranges from small to indistinct. Second finger longer than first.

The Australian species within *Llewellynura* being of the nominate subgenus *Llewellynura* are separated from the New Guinea species herein placed in the subgenus *Microlitoria subgen. nov*. by lacking vomerine teeth.

Known as the “Rock Hole Frogs”, living frogs in the genus *Mahonabatrachus* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: In colour they are usually irregularly mottled above with metallic fawn, brown or reddish brown and dark brown, the small low tubercles on the back sometimes tending to be light-centered and/or dark edged. Sometimes these frogs are dominantly dark brown but with a gold-orange dorsolateral stripe from snout to eye and continuing above the eye above the tympanum along the body almost to the groin. Limbs of all specimens are always coloured with irregular dark brown cross bands and all frogs have barred or spotted lips to some degree and lower surfaces are whitish. The skin is leathery to finely granular above with numerous low, rounded or sometimes slightly pointed tubercles, that are fairly evenly spaced. No pectoral fold. Moderate sized but conspicuous diss on fingers and toes. Fingers free and toes with moderately developed webbing, including reaching the disc of the fifth toe. Adults average 20 mm in length.

The three species in the genus *Salmocularana gen. nov.* are small species that breed in escarpment rock hills in Arnhemland, Northern Territory and also the Kimberley Ranges of north-west Australia.

The three known living species within the genus *Salmocularana gen. nov.* (one formally described within this paper) are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Pale grey-brown, fawn, reddish, orange or pink above, with dorsal markings ranging from nothing more than slight peppering at the anterior part of the dorsum as seen in *Salmocularana personata* (Tyler, Davies and Martin, 1978), indistinct marbling and blotches as seen in *S. staccato* (Doughty and Anstis, 2007) or an intense randomised configuration of dark brown pigment on a light beige to grey background in *S. saxacola sp. nov.*; specimens have a distinct or semi-distinct dark brownish or purple head stripe from just in front of the nostril, through the eye and ear to upper flank just behind the forelimbs. Lips are whitish to some extent, ranging from a distinct yellow bar, to merely light and peppered brown. Ventral surfaces whitish. Skin may be smooth, with extremely tiny scattered tubercles above as in *S. personata*, or with a very limited number of scattered small tubercles above the arm and on the upper flank and nearby dorsum in *S. staccato* to scattered medium sized tubercles above the arm and on the upper flank and nearby dorsum in *S. saxacola sp. nov.*. Underneath the skin is coarsely granular, except on the throat, where it is smooth. Vomerine teeth are in two short clumps between the choanae. Finger and toe discs are moderate, wider than the digits. Fingers lack webbing, toes being about half webbed, including not reaching the disc of the fifth toe but extending no more than half way along the penultimate phalanx. Second finger is longer than the first. There is a small oval inner metatarsal tubercle and a smaller outer metatarsal tubercle. Tympanum distinct.

The genus *Litoria*, with type species *L. freycineti* Tschudi, 1838 is herein restricted to the type species and the closely related *L. latopalmata* Günther, 1867, which as a pair diverged from their nearest common ancestor 13.3 MYA according to Duellman *et al.* (2016).

This divergence and morphological differences are exactly why the species previously included in *Litoria* have been assigned to other genera.

Litoria as defined herein, are readily separated from all other Australasian Tree frogs (Pelodryadidae) by the following suite of characters: Species are a frog that is fawn to dark above, being either immaculate or with markings on the back, with or without a warty exterior, the warts if present being small and flattish, the markings if present typically being a series of darker blotches or variegations in either an irregular or regular pattern. There is a broad dark, canthal stripe, almost completely interrupted in front of the eye and continues behind the eye to effectively overwrite the tympanum and extend to the flanks where it invariably breaks up into a series of black spots or blotches extending ro the groin. There is a pale glandular stripe from below the eye to the base of the forelimb. Limbs are variegated darker but usually with an irregular pattern of spots, blotches or bars. Lower jaw is variegated with yellow and dark brown, often forming a reticulum, often with a barred appearance. The venter is whitish. Ventral surface and flanks are granular. There is no dorsolateral skin fold. Finger and toe discs are small and project slightly but noticeably, beyond the lateral edges of the penultimate phlanges. Fingers are free, without webbing. Toes have well developed webbing, the webbing not reaching the disc of the fifth toe and extending no more than half way along the penultimate phalanx. There is a small inner and minute outer metatarsal tubercle. Vomerine teeth are in two clusters between the choanae. The tympanum is distinct and adults average 40-45 mm snout to rear.

The genus *Paralitoria gen. nov.* diverged from its nearest common ancestor, being that of the genera *Litoria* and *Quasilitoria gen. nov*. being the most closely related genera, some 15.5 MYA according to Duellman *et al.* (2016).

Paralitoria gen. nov. is separated from all other Australasian tree frogs (Pelodryadidae) by the following suite of characters, being one or other of the following: 1/ Fawn, grey or brown above, being immaculate; a conspicuous black stripe from the snout, through the nostril to the eye, where it is almost entirely broken by a pale vertical bar in front of the eye as a band continuing below the tympanum and extending back to the forearm with minimal loss of width along the length, where after a break, it continues obliquely along the mid flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. Lips are not spotted or barred. The groin and hind side of thighs are pale yellow, spotted

and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and distinct, while toe discs are smaller and indistinct. Fingers are unwebbed and toes have moderate webbing between them. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 50 mm (subgenus *Paralitoria subgen. nov.*), or:

2/ Fawn, grey or brown above, with limited flecks or other markings, often as a peppering; a conspicuous narrow black stripe from the snout, through the nostril to the eye, continuing through the tympanum (effectively over-writing it) and extending past the forearm with minimal loss of width along the length to the anterior flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. The lower lips are faintly or partially barred. The groin and hind side of thighs are pale yellow, spotted and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and barely distinct, while toe discs are of similar size. Fingers are unwebbed and toes extensive webbing between them, with the webbing reaching the disc of the fifth toe. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 75 mm (subgenus *Ferelitoria subgen. nov.*).

Species of *Quasilitoria gen. nov.* are separated from all other Australasian tree frogs (Pelodryadidae) by the following suite of characters:

The dorsum is smooth or with some scattered low round tubercles; front toe discs are no wider than the penultimate phalanx and toe discs only slightly wider, but otherwise also small. Front edge of thigh has either a continous black stripe or alternatively an arrangement of broken black spots or blotches. Lower surfaces white, throat with or without some mottling, smooth on the throat and chest and slightly granular on the belly. Dorslolateral folds are either absent or very indistinct. Inner metatarsal tubercle is small and outer one is tiny. Prominent vomerine teeth. Fingers unwebbed, while toes are half to three quarters webbed.

Furthermore, one or other of the following character suites:

1/ Back is without darker markings or mottling, at most there being a slight peppering on the upper surfaces; anterior black head stripe when present is interrupted at least in part by a slight vertical bar in front of the eye; posterior dark head stripe is as wide as and overwriting the tympanum or not quite so and if not, then the lower part of the tympanum is not blackened, and snout is only moderately pointed, (*Q. axillaris*, *Q. coplandi, Q. inermis*, *Q. pallida*, *Q. tornieri*) (subgenus *Quasilitoria subgen. nov.*), or alternatively:

2/ With darker markings and/or stripes on the dorsal surface, with some longitudinal folds on the back, a strongly pointed snout and a well defined yellow bar in front of the eye, breaking the black line from snout past eye, the yellow bar being blocked at the top by a small and well-defined area of black. Forefingers light yellowish or white, peppering on the light surfaces of the snout. Tympanum has a distinctive pale rim (*Q. nasuta*, *Q. peninsulae*) (subgenus *Vultusamolitoria subgen. nov.*).

Distribution: Most parts of Australia and New Guinea, although the majority of species are in northern Australia.

Content: *Pustulatarana gen. nov.* (type species); *Llewellynura* Wells and Wellington, 1985; *Mahonabatrachus* Wells and Wellington, 1985; *Salmocularana gen. nov.*; *Litoria* Tschudi, 1838; *Paralitoria gen. nov.*; *Quasilitoria gen. nov.*.

SALMOCULARANINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:F925B9F0-D4E1-4663-A618-8FC4120624B0

Type genus: *Salmocularana gen. nov.*

Diagnosis: The subtribe Salmocularanina subtribe nov. is best diagnosed by way of defining each of the four component genera.

The three species in the genus *Salmocularana gen. nov.* are small species that breed in escarpment rock hills in Arnhemland, Northern Territory and also the Kimberley Ranges of north-west Australia.

The three known living species within the genus *Salmocularana gen. nov.* (one formally described within this paper) are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Pale grey-brown, fawn, reddish, orange or pink above, with dorsal markings ranging from nothing more than slight peppering at the anterior part of the dorsum as seen in *Salmocularana personata* (Tyler, Davies and Martin, 1978), indistinct marbling and blotches as seen in *S. staccato* (Doughty and Anstis, 2007) or an intense randomised configuration of dark brown pigment on a light beige to grey background in *S. saxacola sp. nov.*; specimens have a distinct or semi-distinct dark brownish or purple head stripe from just in front of the nostril, through the eye and ear to upper flank just behind the forelimbs. Lips are whitish to some extent, ranging from a distinct yellow bar, to merely light and peppered brown. Ventral surfaces whitish. Skin may be smooth, with extremely tiny scattered tubercles above as in *S. personata*, or with a very limited number of scattered small tubercles above the arm and on the upper flank and nearby dorsum in *S. staccato* to scattered medium sized tubercles above the arm and on the upper flank and nearby dorsum in *S. saxacola sp. nov.*. Underneath the skin is coarsely granular, except on the throat, where it is smooth. Vomerine teeth are in two short clumps between the choanae. Finger and toe discs are moderate, wider than the digits. Fingers lack webbing, toes being about half webbed, including not reaching the disc of the fifth toe but extending no more than half way along the penultimate phalanx. Second finger is longer than the first. There is a small oval inner metatarsal tubercle and a smaller outer metatarsal tubercle. Tympanum distinct.

The genus *Litoria*, with type species *L. freycineti* Tschudi, 1838 is herein restricted to the type species and the closely related *L. latopalmata* Günther, 1867, which as a pair diverged from their nearest common ancestor 13.3

MYA according to Duellman *et al.* (2016).
This divergence and morphological differences are exactly why the species previously included in *Litoria* have been assigned to other genera.

Litoria as defined herein, are readily separated from all other Australasian Tree frogs (Pelodryadidae) by the following suite of characters: Species are a frog that is fawn to dark above, being either immaculate or with markings on the back, with or without a warty exterior, the warts if present being small and flattish, the markings if present typically being a series of darker blotches or variegations in either an irregular or regular pattern. There is a broad dark, canthal stripe, almost completely interrupted in front of the eye and continues behind the eye to effectively overwrite the tympanum and extend to the flanks where it invariably breaks up into a series of black spots or blotches extending ro the groin. There is a pale glandular stripe from below the eye to the base of the forelimb. Limbs are variegated darker but usually with an irregular pattern of spots, blotches or bars. Lower jaw is variegated with yellow and dark brown, often forming a reticulum, often with a barred appearance. The venter is whitish. Ventral surface and flanks are granular. There is no dorsolateral skin fold. Finger and toe discs are small and project slightly but noticeably, beyond the lateral edges of the penultimate phlanges. Fingers are free, without webbing. Toes have well developed webbing, the webbing not reaching the disc of the fifth toe and extending no more than half way along the penultimate phalanx. There is a small inner and minute outer metatarsal tubercle. Vomerine teeth are in two clusters between the choanae. The tympanum is distinct and adults average 40-45 mm snout to rear.

The genus *Paralitoria gen. nov.* diverged from its nearest common ancestor, being that of the genera *Litoria* and *Quasilitoria gen. nov*. being the most closely related genera, some 15.5 MYA according to Duellman *et al*. (2016).

Paralitoria gen. nov. is separated from all other Australasian tree frogs (Pelodryadidae) by the following suite of characters, being one or other of the following:
1/ Fawn, grey or brown above, being immaculate; a conspicuous black stripe from the snout, through the nostril to the eye, where it is almost entirely broken by a pale vertical bar in front of the eye as a band continuing below the tympanum and extending back to the forearm with minimal loss of width along the length, where after a break, it continues obliquely along the mid flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. Lips are not spotted or barred. The groin and hind side of thighs are pale yellow, spotted and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and distinct, while toe discs are smaller and indistinct. Fingers are unwebbed and toes have moderate webbing between them. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 50 mm (subgenus *Paralitoria subgen. nov.*), or:

2/ Fawn, grey or brown above, with limited flecks or other markings, often as a peppering; a conspicuous narrow black stripe from the snout, through the nostril to the eye, continuing through the tympanum (effectively over-writing it) and extending past the forearm with minimal loss of width along the length to the anterior flank. There is a pale glandular stripe from below the eye to the forearm. There is a conspicuous dark brown stripe along the front edge of the tibial region. The lower lips are faintly or partially barred. The groin and hind side of thighs are pale yellow, spotted and variegated with dark brown. Venter is whitish. Dorsal surface is smooth and leathery, throat is smooth and the venter granular. Vomerine teeth are between the choanae. Finger discs are small and barely distinct, while toe discs are of similar size. Fingers are unwebbed and toes extensive webbing between them, with the webbing reaching the disc of the fifth toe. There is a small inner and tiny outer metatarsal tubercle. Tympanum is distinct and second finger is slightly shorter than the first. Body length averages 75 mm (subgenus *Ferelitoria subgen. nov.*).

Species of *Quasilitoria gen. nov.* are separated from all other Australasian tree frogs (Pelodryadidae) by the following suite of characters:

The dorsum is smooth or with some scattered low round tubercles; front toe discs are no wider than the penultimate phalanx and toe discs only slightly wider, but otherwise also small. Front edge of thigh has either a continous black stripe or alternatively an arrangement of broken black spots or blotches. Lower surfaces white, throat with or without some mottling, smooth on the throat and chest and slightly granular on the belly. Dorslolateral folds are either absent or very indistinct. Inner metatarsal tubercle is small and outer one is tiny. Prominent vomerine teeth. Fingers unwebbed, while toes are half to three quarters webbed.

Furthermore, one or other of the following character suites:

1/ Back is without darker markings or mottling, at most there being a slight peppering on the upper surfaces; anterior black head stripe when present is interrupted at least in part by a slight vertical bar in front of the eye; posterior dark head stripe is as wide as and overwriting the tympanum or not quite so and if not, then the lower part of the tympanum is not blackened, and snout is only moderately pointed, (*Q. axillaris*, *Q. coplandi, Q. inermis*, *Q. pallida*, *Q. tornieri*) (subgenus *Quasilitoria subgen. nov.*), or alternatively:

2/ With darker markings and/or stripes on the dorsal surface, with some longitudinal folds on the back, a strongly pointed snout and a well defined yellow bar in front of the eye, breaking the black line from snout past eye, the yellow bar being blocked at the top by a small and well-defined area of black. Forefingers light yellowish or white, peppering on the light surfaces of the snout. Tympanum has a distinctive pale rim (*Q. nasuta*, *Q. peninsulae*) (subgenus *Vultusamolitoria subgen. nov.*).

Distribution: Most parts of Australia and parts of southern New Guinea, although the majority of species are in northern Australia.

Content: *Salmocularana gen. nov.* (type species); *Litoria* Tschudi, 1838; *Paralitoria gen. nov.*; *Quasilitoria gen. nov.*.

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SAGUNURINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:55665C91-6E14-4F47-AE34-E3E87D4FAC05

Type genus: *Saganura* Wells and Wellington, 1985.

Diagnosis: The tribe Saganurini tribe nov. is monotypic for the type genus and therefore the tribe diagnosis is the same as for the genus *Saganura* Wells and Wellington, 1985.

Living frogs in the genus *Saganura* Wells and Wellington, 1985 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

It is a uniform light green above, commonly with scattered light fawn spots, or dark brown with irregular bright green patches and light brown flecks. There is a narrow, black canthal streak, widening behind the eye to form a dark broad band extending almost to the groin; this dark band often broken up by groups of irregular white blotches and/or spots. There is an obscure, narrow light green zone along the supratympanic ridge. There is no pale line along the posterior edge of the upper jaw. Venter is pinkish-white, throat darker with a greyish tinge. Groin and hind side of thighs is a uniform pale brown. Dorsal surface smooth or with scattered small tubercles. Chin smooth and other lower surfaces are granular. Vomerine teeth are between or behind the choanae, with hind edge of vomerine teeth always further back than the choanae. Prectoral fold present. Finger and toe discs large. Fingers with conspicuous basal webbing, being nearly a third webbed, toes are about three quarters webbed. There is a large inner and small outer metatarsal tubercle. Tympanum is distinct. Second finger is much longer than first; when pressed together, the tip of the first finger reaches no further than the base of the disc of the second finger. Heel of adpressed hindlimb reaches to the eye or beyond. Adults attain about 55 mm in total length (adapted and modified from Cogger 2014).

According to Duellman *et al.* (2016), the species in this genus diverged from their nearest living relatives 27.6 MYA being more than sufficient justification for erecting this new tribe.

Distribution: South-west Tasmania, including highlands and coast.

Content: *Sagunura burrowsae* (Scott, 1942) (monotypic).

WOWRANAINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:5756C747-7B83-47E0-95CE-F3AB9E9C3341

Type genus: *Wowrana gen. nov.*

Diagnosis: The tribe Wowranaini tribe nov. includes two genera. It is best defined by diagnosing each, noting that each genus also occupies one subtribe each.

Frogs in the genus *Wowrana gen. nov.* in the nominate subgenus are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Large size (adult males over 60 mm); uniform bright green dorsal colouration in life (blue in preservative). Fully webbed hands.

No prominent and enlarged parotoid glands, no white labial stripe, SVL not over 85 mm and a call consisting of a single, relatively short (0.206-0.379 s) grunt with an unusual clumped pattern of pulses. The single species within the subgenus *Parawowrana subgen. nov.* is defined as above, except that it instead is slightly smaller than the preceding species (adult males 50-55 mm), has a white labial stripe (in common with the much larger species in *Sandyrana* Wells and Wellington, 1985, that grow to in excess of 100 mm in body length) and has a characteristically longer call than those in the nominate subgenus (0.69-0.9 second) (Richards *et al.* 2006).

Duellman *et al.* (2016) found that the species in the genus *Wowrana gen. nov.* diverged from their nearest living relatives 26.5 MYA, being species within *Sandyrana* Wells and Wellington, 1985. The type form of *Nyctimystes* Stejneger, 1916, namely *Nyctimantis papua* Boulenger, 1897 diverged from this genus 36.1 MYA, making genus level assignment of *Wowrana gen. nov.* an obvious choice.

Frogs in the genus *Sandyrana* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Large frogs, which as adults can grow to in excess of 100 mm. Dorsal colour of adults in life is usually uniform green above in normal circumstances, but may otherwise range from fawn, through green, purplish or even blue. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. Hind edge of forearm is smooth, or with at most a few low, discontinuous tubercles. Hind edge of feet is smooth. Hind side of thighs is more or less uniform, without black and yellow marbling, spots or blotches.

Webbing reaching no further than the base of the penultimate phalanx of the fourth finger. A distinctive white or pink stripe along the edge of the lower jaw, extending back to the level of the forelimb and not in a configuration of blobs, spots or random markings otherwise tending to be in a linear manner. Vomerine teeth present.

Distribution: All species within *Wowrana gen. nov.* are confined to forested locations on the island of New Guinea and in general most species are currently known from relatively few specimens.

Species within the genus *Sandyrana* Wells and Wellington, 1985 are found throughout New Guinea and west as far as Halmahera Island as well as New Britain, New Ireland, Aru Islands and north-east Queensland, Australia.

Content: *Wowrana gen. nov.* (type genus); *Sandyrana* Wells and Wellington, 1985.

SANDYRANINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:4B9B0AAD-FDD5-4EE7-AC3B-DFE5893944C8

Type genus: *Sandyrana* Wells and Wellington, 1985.

Diagnosis: The subtribe Sandyranina subtribe nov. is monotypic for the type genus and therefore the tribe diagnosis is the same as for the genus *Sandyrana* Wells and Wellington, 1985.

Frogs in the genus *Sandyrana* Wells and Wellington, 1985 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Large frogs, which as adults can grow to in

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excess of 100 mm. Dorsal colour of adults in life is usually uniform green above in normal circumstances, but may otherwise range from fawn, through green, purplish or even blue. Fingers with conspicuous webbing, reaching at least as far as the base of the penultimate phalanx of the fourth finger. Hind edge of forearm is smooth, or with at most a few low, discontinuous tubercles. Hind edge of feet is smooth. Hind side of thighs is more or less uniform, without black and yellow marbling, spots or blotches. Webbing reaching no further than the base of the penultimate phalanx of the fourth finger. A distinctive white or pink stripe along the edge of the lower jaw, extending back to the level of the forelimb and not in a configuration of blobs, spots or random markings otherwise tending to be in a linear manner. Vomerine teeth present.

Duellman *et al.* (2016) found that the species within the genus *Sandyrana* diverged from their nearest living relatives 26.5 MYA making subtribe level classification for the group wholly appropriate.

Distribution: Throughout New Guinea and west as far as Halmahera Island as well as New Britain, New Ireland, Aru Islands and north-east Queensland, Australia.

Content: *Sandyrana* Wells and Wellington, 1985.

SUMMARY

For the first time ever, the Australian and New Guinean frog family Pelodryadidae have a robust classification at all levels. The classification of the group has effectively been brought up to date.

Well known but hitherto unnamed species have been formally named, which is an important first step for some which are already facing extinction.

The tribe and genus-level classification of the family is also based on simple logic and common sense, which also happen to be core principles of science. When the smoke, mirrors and lies of the Wolfgang Wüster gang of thieves clears after the death of the key members of the gang, there is little doubt that the classification within this paper will be derided as both logical and self evident. One hopes that for the sake of the frogs themselves and their ultimate long-term survival, as outlined by Hoser (2019a, 2019b), that the classification system within this paper is in fact adopted sooner, rather than later.

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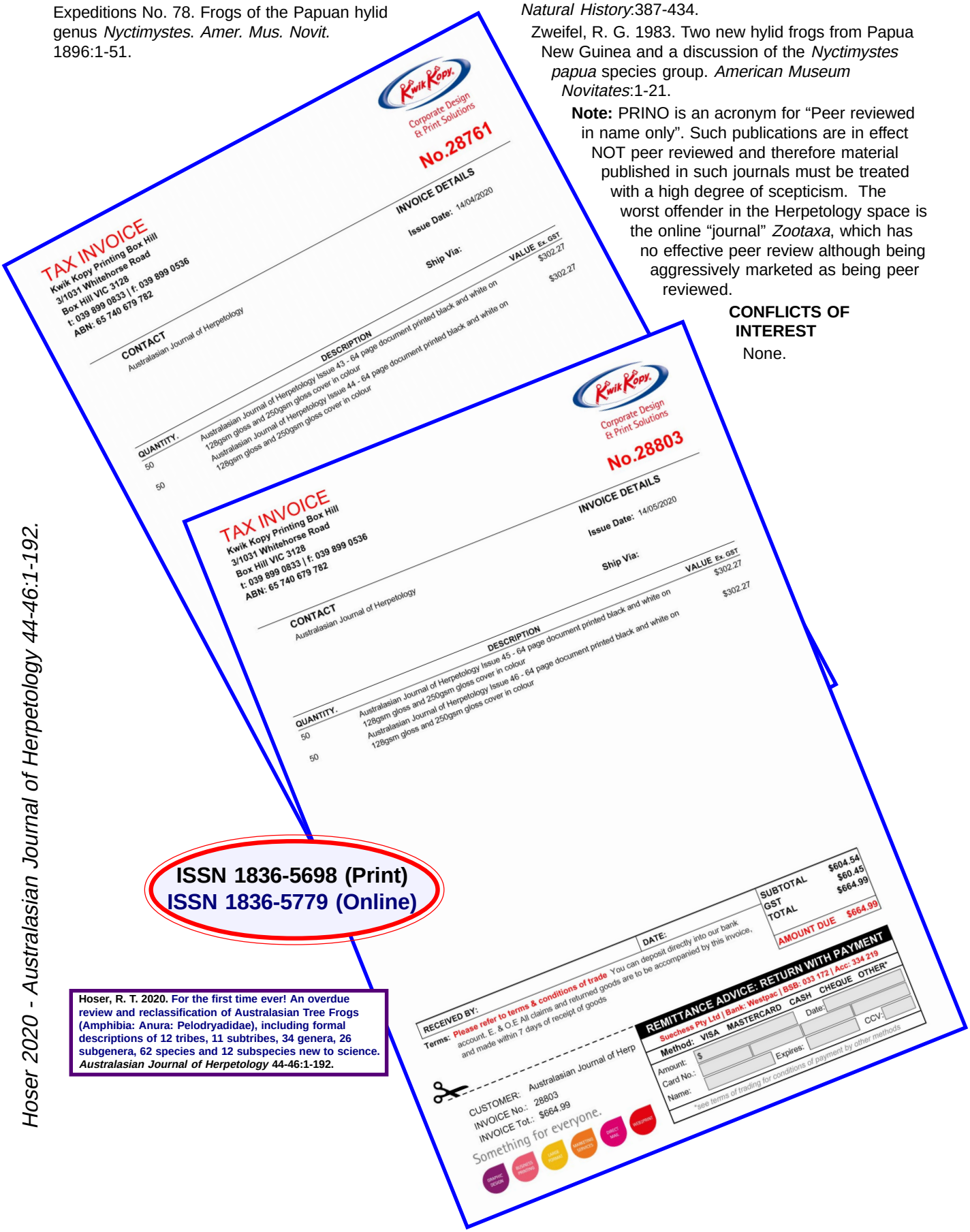
Note: PRINO is an acronym for "Peer reviewed in name only". Such publications are in effect NOT peer reviewed and therefore material published in such journals must be treated with a high degree of scepticism. The worst offender in the Herpetology space is the online "journal" *Zootaxa*, which has no effective peer review although being aggressively marketed as being peer reviewed.

CONFLICTS OF INTEREST

None.



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Australasian Tree Frog (Family Pelodryadidae Günther, 1858), genus and species list (incl. page numbers for descriptions).

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