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ABSTRACT

An ongoing audit of Australian frogs, relying on morphological and molecular studies has identified a number of divergent lineages, including hitherto unnamed forms.

These most recent results are published in similar format to earlier cited papers of Hoser (2016a, 2016b, 2016c, 2019a, 2020a, 2020b, 2020c, 2020e and 2020f) that named frog taxa.

Adopting the taxonomy and nomenclature of Anstis (2013) and Cogger (2014) as the prevailing usage, the following taxonomic changes are made:

The genus *Philoria* Spencer, 1901 is split three ways with one new genus being erected.

The putative species *Philoria loveridgei* Parker, 1940, herein placed in a new genus is also split five ways, with four new species formally named for the first time.

The genus *Pseudophryne* Fitzinger, 1843 is split six ways using available names for two other groups and erecting genera for three other clades. Several new species within *Pseudophryne sensu lato* from four genera are also formally named.

The putative genera *Crinia* Tschudi, 1838 and *Ranidella* Girard, 1853 are rearranged as a single genus and split into six subgenera, with two groups formally named as new subgenera for the first time. New species within *Crinia* are also formally named.

The genus *Geocrinia* Blake, 1973 as currently recognized is formally split into two with the second genus formally named for the first time as *Wellingtondella gen. nov.*, with a type species of *Crinia rosea* Harrison, 1927. *Hesperocrinia* Wells and Wellington, 1985, type species: *Crinia leai* Fletcher, 1898 is resurrected as a subgenus within *Geocrinia*, but in a totally different concept to that originally conceived by Wells and Wellington (1985).

Two new species within subgenus *Hesperocrinia* and three new subspecies within *Geocrinia* are also formally named.

The putative species *Paracrinia haswelli* (Fletcher, 1894) is split into three well defined species on the basis of allopatry and morphological divergence, two formally named for the first time.

The until now monotypic genus *Metacrinia* Parker, 1940, with the type species *Pseudophryne nicholli* Harrison, 1927 is split into three species, each being morphologically and genetically divergent.

Uperoleia Gray, 1841 is divided into two genera while a further two subgenera within remaining *Uperoleia* are recognized. One subgenus *Quasiuperoleia subgen. nov.* is formally named for the first time, while available names, *Hosmeria* Wells and Wellington, 1985 (as a genus) and *Prohartia* Wells and Wellington, 1985 (as a subgenus) are resurrected. Two new species within genus *Hosmeria*, four new species and two new subspecies within subgenus *Prohartia* and four species and one subspecies in subgenus *Uperoleia* are formally named for the first time.

A subspecies of Barred River Frog, *Mixophyes hoserae* Hoser, 2020 (Oxyslopidae) from North-east Victoria and nearby New South Wales is formally named.

Myobatrachidae is also divided into four tribes and two further subtribes, all but the nominate tribe formally named for the first time.

Keywords: Frogs; Australia; New South Wales; Queensland; Western Australia; South Australia; Victoria; nomenclature; taxonomy; ICZN; *Philoria*; *Kyarranus*; *Pseudophryne*; *Bufo*; *Gradwellia*; *Kankanophryne*; *Crinia*; *Ranidella*; *Tylerdella*; *Metacrinia*; *Bryobatrachus*; *Geocrinia*; *Hesperocrinia*; *Uperoleia*; *Prohartia*; *Hosmeria*; *Mixophyes*; *Paracrinia*; *australis*; *bibroni*; *occidentalis*; *guentheri*; *robinsoni*; *douglasi*; *coriacea*; *corroboree*; *nicholli*; *pengilleyi*; *dendyi*; *semimarmorata*; *haswelli*; *raveni*; *major*; *covacevichae*; *borealis*; *laevigata*; *lithomoda*; new tribes; Myobatrachini; Uperoleiaini; Wellingtondellaini; Criniaini; new subtribes; Oxyphryneina; Spicospinaina; Paracriniaina; new genus; *Bogophryne*; *Sloppophryne*; *Crottyphryne*; *Oxyphryne*; *Wellingtondella*; new subgenus; *Oxydella*; *Lowingella*; *Quasiuperoleia*; new species; *uterbog*; *duboisii*; *breonnataylorae*; *naomiosakaae*; *crotalusei*; *maxinehoserae*; *katrinahoserae*; *marcdorsei*; *hoserae*; *woolfi*; *euanedwardsi*; *scottgranti*; *jasminegrantae*; *martinekae*; *wellsi*; *wellingtoni*; *oxeyi*; *crottyi*; *sloppi*; *lowingae*; *stevebennetti*; *maateni*; *merceicai*; *brettbarnetti*; *brianbarnetti*; *lenhoseri*; *funki*; *bettyswileae*; *wilhelminahughesae*; *shuddafakup*; *shirensbogensis*; *jadeharrisae*; *keilleri*; *lowryi*; *shanescarffi*; *margweeksae*; *grantturneri*; *gedyei*; *rossignolii*; new subspecies; *oxyi*; *sadlieri*; *mensforthi*; *burrelli*; *kaputarensis*; *otwaysensis*; *grampiansensis*; *logani*; *maximus*; *divergans*; *jackyae*.

INTRODUCTION

An ongoing audit into Australian frogs, has viewed previously named species and populations with a view to confirming that all were classified correctly, as in conformed to existing species and genus-level classifications.

In all relevant cases, putative genera and species were checked against morphological and molecular studies, with reference to living and preserved specimens of each taxon to confirm or refute the contention they were of the putative taxon.

When more than one taxon appeared to be lumped in a putative single taxon, they were further investigated to confirm A/ They were taxonomically divergent and distinct and B/ If so, whether or not they had an available name.

Earlier papers, arising from this audit, that formally named new taxa of frog include the following:

Hoser (2016a, 2016b, 2016c, 2019a, 2020a, 2020b, 2020c, 2020e and 2020f).

The purpose of this paper is to name further forms from taxonomically neglected genera of mainly small frogs within the Myobatrachidae (with one exception), not previously recognized by science at all relevant levels below that of family.

The exceptional taxon is a subspecies of Barred River Frog, *Mixophyes hoserae* Hoser, 2020 (Oxyslopidae) from North-east Victoria and nearby New South Wales that is formally named for the first time. Few specimens have been caught and it the subspecies is at risk of extinction.

Myobatrachidae was also assessed as a whole and was determined to warrant being split into four divergent tribes.

MATERIALS AND METHODS

These are as for Hoser (2020c) and general comments about the formal descriptions within that paper also apply herein, including that all relevant details are for normal adult specimens in good health and normal conditions by day unless otherwise stated.

Live specimens, including tadpoles, when available, were examined, as were dead specimens in museums, photographs and all relevant literature.

Relevant literature relied upon in terms of the taxonomic conclusions within this paper are best grouped by putative genera (at the outset of this paper being prepared) and relying on the widely accepted taxonomy and nomenclature of Cogger *et al.* (1983), Cogger (2014) and Anstis (2013) as the names applied to each species or genus prior to the publication of this paper. It should be noted that sources cited within each paper are also relied upon and to save space, most of these have not been explicitly cited.

In terms of the putative genus *Philoria* Spencer, 1901 and in particular the putative species *Philoria*

loveridgei Parker, 1940, key references of relevance included: Anstis (2013), Barker *et al.* (1995), Berger *et al.* (1999), Cogger (2014), Cogger *et al.* (1983), Donnellan *et al.* (2012), Ellis *et al.* (2017), Frank and Ramus (1995), Frost *et al.* (2006), Heyer and Liem (1976), Hoser (2007), Ingram and Corben (1975), Knowles *et al.* (2004), Moore (1958), Parker (1940), Pyron and Wiens (2011), Shea (2005), Spencer (1901), Stuart *et al.* (2008), Tyler and Knight (2009), Wells and Wellington (1984, 1985).

In terms of the putative genus *Pseudophryne* Fitzinger, 1843 *sensu lato* and newly identified taxa within this paper, key references of relevance included: Ananjeva *et al.* (1988), Andersson (1916), Anstis (2013), Barker *et al.* (1995), Boulenger (1882), Byrne and Silla (2020), Cochran (1961), Cogger (2014), Cogger *et al.* (1983), Colefax (1956), Coventry (1970), Donnellan *et al.* (2012a), Duméril and Bibron (1841, 1854), Eipper and Rowland (2018), Ellis *et al.* (2017), Fitzinger (1843), Fletcher (1898), Frank and Ramus (1995), Frost *et al.* (2006), Girard (1853), Gray (1835, 1845), Guibé (1950), Günther (1858), Harrison (1927), Heyer and Liem (1976), Hoser (1989), Howitt *et al.* (1891), Ingram and Corben (1994), Ingram *et al.* (1993), Iverson *et al.* (2001), Keferstein (1868), Lawrence *et al.* (2018), Loveridge (1933b, 1935), Lucas (1892), Main (1964), Martin and Littlejohn (1982), Moore (1953, 1961), Morgan *et al.* (2008a, 2008b), Osborne *et al.* (1996), Parker (1940), Péron (1807), Perry (2004), Pyron and Wiens (2011), Roberts and Maxson (1989), Stauber (1999, 2006), Shea (1988), Shea and Rowley (2018), Stuart *et al.* (2018), Thumm and Mahony (2002), Tyler (1978, 1992), Tyler and Davies (1980), Tyler and Doughty (2009), Tyler and Knight (2009), Tyler *et al.* (1994), Wells and Wellington (1984, 1985).

In terms of the putative genera *Crinia* Tschudi, 1838 and *Ranidella* Girard, 1853 *sensu lato* (as defined by earlier authors) and newly identified taxa within this paper, key references of relevance included: Ananjeva *et al.* (1988), Anstis (2013), Barbour and Loveridge (1929), Barendse (1984), Blackwell and Bull (1978), Blake (1973), Barker *et al.* (1995), Bauer *et al.* (1996), Bush *et al.* (2010), Bossuyt and Roelants (2009), Boulenger (1882), Cogger (2014), Cogger *et al.* (1983), Condon (1941), Cope (1865, 1866, 1867), Donnellan *et al.* (2012b), Doughty *et al.* (2009), Duméril and Bibron (1841), Edwards (2007), Eipper and Rowland (2018), Ellis *et al.* (2017), Frost *et al.* (2016), Girard (1853, 1858), Günther (1858, 1864, 1867, 1869), Heyer and Liem (1976), Heyer *et al.* (1982), Holthius (1988), Hoser (1989, 2007), Ingram *et al.* (1993), International Commission of Zoological Nomenclature (1991), Keferstein (1867, 1868), Liem and Ingram (1977), Littlejohn (1957, 1958, 2008), Littlejohn and Martin (1965), Loveridge (1933a, 1933b, 1934, 1935), Lütken (1864), Main (1957), Malnate (1971), Martin and Littlejohn (1982),

Martin *et al.* (1980), Menzies (2006), Moore (1954), Odendaal and Bull (1982), Odendaal *et al.* (1983), Parker (1940), Parker (1881), Péron (1807), Peters (1863), Pyron and Wiens (2011), Read *et al.* (2001), Reynolds (2007), Roberts (2010), Rounsevell *et al.* (1994), Shea (1987), Shea and Kraus (2007), Shea and Rowley (2018), Shea and Sadlier (1999), Shine (1987), Steindachner (1867), Straughan and Main (1966), Stuart *et al.* (2008), Symula *et al.* (2008), Thompson (1981), Tiedemann and Grillitsch (2000), Thompson (1981), Tschudi (1838), Tyler (1976, 1978, 1985), Tyler and Parker (1974), Tyler *et al.* (1984), Vanderduys (2012), Waite (1929), Wells and Wellington (1984, 1985).

In terms of the putative genus *Geocrinia* Blake, 1973 *sensu lato* as currently recognized by Anstis (2013) and Cogger (2014) key references of relevance included: Anstis (2010, 2013), Barker *et al.* (1995), Bauer *et al.* (1996), Blake (1973), Boulenger (1888), Bush *et al.* (2010), Cogger (1979, 2014), Cogger *et al.* (1983), Driscoll (1998), Edwards (2007), Fletcher (1891, 1898), Frank and Ramus (1975), Frost *et al.* (2016), Gollmann (1991), Günther (1864), Harrison (1927), Harrison and Littlejohn (1985), Hero *et al.* (1991), Heyer and Liem (1976), Holthius (1988), Hoser (2017), International Commission of Zoological Nomenclature (1991), Keferstein (1868), Littlejohn and Martin (1964), Loveridge (1935), Main (1963), Martin and Littlejohn (1982), Nieden (1923), Parker (1940), Pyron and Wiens (2011), Read *et al.* (2001), Roberts *et al.* (1990), Shea (1987), Shea and Sadlier (1999), Shine (1987), Stuart *et al.* (2008), Tyler (1988, 1992), Tyler and Doughty (2009), Tyler and Knight (2009), Tyler *et al.* (1994), Walker and Goonan (2000), Wardell-Johnson and Roberts (1989), Wells and Wellington (1984, 1985), Werner (1914).

Literature relevant to the putative species *Paracrinia haswelli* (Fletcher, 1894) *sensu lato* until now treated as a monotypic species for the genus as currently recognized by Anstis (2013) and Cogger (2014) included: Ananjeva *et al.* (1988), Anstis (2013), Cogger (2014), Cogger *et al.* (1983), Fletcher (1894), Frank and Ramus (1995), Frost *et al.* (2006), Heyer and Liem (1976), Loveridge (1935), Moore (1961), Parker (1940), Pyron and Wiens (2011), Shea and Sadlier (1999), Tyler and Knight (2009).

Key references relevant to the until now monotypic genus *Metacrinia* Parker, 1940, as currently recognized by Anstis (2013) and Cogger (2014) with the type species *Pseudophryne nichollsi* Harrison, 1927 include: Anstis (2013), Barker *et al.* (1995), Burton (2001), Bush *et al.* (2010), Cogger (2014), Cogger *et al.* (1983), Edwards (2007), Ellis *et al.* (2017), Frank and Ramus (1995), Frost *et al.* (2006), Harrison (1927), Heyer and Liem (1976), Parker (1940), Pyron and Wiens (2011), Read *et al.* (2001), Roberts and Maxson (1989), Shea and Sadlier

(1999), Tyler and Doughty (2009), Tyler and Knight (2009).

Key references relevant to the genus *Uperoleia* Gray, 1841 *sensu lato*, including the putative genera *Hosmeria* Wells and Wellington, 1985 (as a genus) and *Prohartia* Wells and Wellington, 1985 include: Agassiz (1846), Andersson (1916), Anstis (2013), Barker *et al.* (1995), Boulenger (1882), Bush *et al.* (2010), Catullo and Scott Keogh (2014), Catullo *et al.* (2011, 2014a, 2014b), Clulow *et al.* (2016), Cogger (2014), Cogger *et al.* (1983), Davies (1987), Davies and Littlejohn (1986), Davies and Martin (1988), Davies *et al.* (1985, 1986, 1992, 1993), Doughty and Roberts (2008), Eipper and Rowland (2018), Ellis *et al.* (2017), Frank and Ramus (1995), Frost *et al.* (2006), Gray (1841), Holthius (1988), Ingram *et al.* (1993), International Commission of Zoological Nomenclature (1991), Keferstein (1867), Loveridge (1933, 1935), Lynch (1971), Main (1965), Main and Storr (1966), Menzies (2006), Moore (1961), Parker (1940), Parker (1881), Pyron and Wiens (2011), Reynolds (2007), Shea (1987), Shine (1987), Tyler (1985, 1992), Tyler and Davies (1984), Tyler and Doughty (2009), Tyler and Knight (2009), Tyler *et al.* (1981a, 1981b, 1981c, 1983, 1994), Wells and Wellington (1984, 1985), Young *et al.* (2005).

References relevant to the species *Mixophyes hoseerae* Hoser, 2020 are listed in full in Hoser (2020b) and are not repeated here.

A pdf of that paper can be downloaded at:

<http://www.smuggled.com/issue-43-pages-15-26.pdf>

RESULTS

These are summarized in the abstract and given as follows taking Cogger (2014) as the prevailing usage of taxonomy and nomenclature for the relevant groups of genera and species.

The genus *Philoria* Spencer, 1901 is split three ways with one new genus being erected.

The genus *Kyarranus* Moore, 1958 is resurrected from the synonymy of *Philoria* Spencer, 1901, where it had been assigned by most recent authors since the publication of Cogger *et al.* (1983).

I note that Wells and Wellington (1985) correctly resurrected the genus *Kyarranus* and also correctly pointed out that putative *K. sphagnicolus* Moore, 1958 was “a species complex”.

Wells and Wellington (1985) were fully vindicated by the publication of Knowles *et al.* (2004), who effectively split the species *K. sphagnicolus* four ways, formally naming two new species based on molecular and morphological divergence and also recognizing the affiliated species *Kyarranus kundagungan* Ingram and Corben, 1975.

While evidently relying on Wells and Wellington (1985) as the basis for their further studies, Knowles *et al.* (2004) quite scandalously did not cite the work of Wells and Wellington (1985).

The putative species *Philoria loveridgei* Parker, 1940,

herein placed in a new genus is also split five ways, with four new species formally named for the first time. One of the new species is type for the new genus, as the true species level identity of the holotype of *P. loveridgei* is uncertain, save for the fact that it is not one of the four newly described forms, all of which until now have been treated by herpetologists as *P. loveridgei*.

These species have been separated in molecular studies and are also morphologically divergent from one another, as well as the type specimen of *Philoria loveridgei* Parker, 1940. The putative taxon *Philoria loveridgei* Parker, 1940 has long been recognized as being divergent from other members of the genus *Philoria*, morphologically, in terms of reproductive biology and in molecular studies, meaning the new genus-level assignment of this species will not come as a surprise to anyone who has worked with this putative species and the type species of *Philoria* (*P. frosti* Spencer, 1901 from Mount Baw Baw, Victoria) and those species from NSW and Queensland now placed in the genus *Kyarrannus*.

The genus *Pseudophryne* Fitzinger, 1843 is split six ways using available names for two groups of species and erecting three new genera.

The correction of the taxonomy of this putative genus was attempted in part by Wells and Wellington (1985) and with available names for most species past that date, it is a pity that at least some of these names have not been made widely known and used since. This paper takes that overdue step.

It is notable that I do not agree with the taxonomy of Wells and Wellington (1985), while also recognizing their valiant efforts in making sense of Australian frog taxonomy and nomenclature.

While it could be argued that *Pseudophryne* could have been left as a single morphologically conservative genus, with simple recognition of five other subgenera, this contention is rejected for several reasons.

As is evident from this paper, the species diversity of the group has been seriously underestimated, meaning the genus *sensu lato* includes a large number of species, in which some are clearly not particularly close to others. On top of that, the divergences between the groups, formally identified and named at the genus level are on par with, or greater than other genus-level splits, currently widely recognized in Australian frogs.

New species within *Pseudophryne sensu lato* are also formally named for the first time, these being within four of the six newly recognized genera. In effect this makes just one of the six relevant genera monotypic.

The genus name *Kankanophryne* Heyer and Liem, 1976, type species *Pseudophryne occidentalis* Parker, 1940 is resurrected.

The putative species *K. occidentalis* (Parker, 1940) is

split four ways, with three formally named for the first time. The species originally described as *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012 is placed in a new genus *Sloppophryne gen. nov.*

The species originally described as *Pseudophryne douglasi* Main, 1964 is divided into two and placed in a new genus *Crottyphryne gen. nov.*

An argument could be raised to place all eastern Australian *Pseudophryne sensu lato* into a single genus, based on lesser divergence as compared to western species, or alternatively treat the main 2 or 3 groups as subgenera.

The preceding arguments however still apply and this is rejected.

Hence the eastern Australian species are placed in three genera, namely *Pseudophryne*, *Buфонella* and *Oxyphryne gen. nov.* the last of which is clearly most closely associated with *Buфонella*, but so morphologically divergent from those species as to warrant their own genus.

Oxyphryne gen. nov. are the so-called Corroboree frogs from Alpine areas of south-east Australia.

Cogger *et al.* (1983) found that some of the syntype material of species *Pseudophryne bibronii* Günther, 1858 as originally described, included what was in fact a specimen of the species more recently known as *Pseudophryne guentheri* Boulenger, 1882, that single specimen being the only one available and known to still exist.

This meant that the later name could have been a junior synonym of *Pseudophryne bibronii*.

Cogger *et al.* (1983) repeated what was said by Moore (1961) and said they deferred from using the correct nomenclature on the alleged basis it would overturn existing usage. However a massive hole in that argument was raised by Wells and Wellington (1985), who wrote:

"*Pseudophryne bibronii* Günther, 1858. A complex of several undescribed species."

In 1989, they also described a new taxon in the same alleged complex as *P. barkeri* Wells and Wellington, 1989.

However Shea and Rowley (2018) dealt with the nomenclatural issues surrounding the name *P. bibronii* in an unusual way, by using a series of inferences and a potentially creative interpretation of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Most significantly, they effectively sank the name *P. barkeri*, by designating a lectotype for *P. bibronii*, that museum specimen being an alleged specimen from the type series, (by alleged literature reference) the same specimen being previously identified as "*Phryniscus australis*".

Both this lectotype and *P. barkeri* being of the form from the Cumberland Plain (Sydney), New South

Wales.

This action by Shea and Rowley (2018) assigned the name *P. bibronii* to the Sydney basin form of the species complex, thereby giving this name formal name priority over the now synonym name *P. barkeri*. A more sensible and ethical way to have dealt with the matter and without having to rely on a series of highly questionable inferences as published by Shea and Rowley (2018), would have been to simply synonymise *P. guentheri* Boulenger, 1882, with *P. bibroni*, by way of making the only available physical syntype specimen (as cited at time of original description) and referred to in Cogger *et al.* (1983) as the only logical lectotype.

In doing so, the name *P. barkeri* would have been the logical available and correct name for the Sydney form of putative *P. bibroni*.

The name *P. guentheri* Boulenger, 1882 would instead have been sunk into synonymy.

It goes without saying that Shea and Rowley (2018), engaged in their mental gymnastics including creative interpretations of the historical record and of the *International Code of Zoological Nomenclature* published in their paper in the notorious PRINO (Peer reviewed in name only) online "journal" called *Zootaxa* to designate a lectotype for *P. bibronii* with the clear intent of using it as a vehicle to formally sink the name *P. barkeri* Wells and Wellington, 1989. This was merely the most recent part of a long-going vendetta by Shea against Wells and Wellington, which goes as far back as the 1980's when he unsuccessfully petitioned the ICZN to formally suppress works of Wells and Wellington; see Shea (1987) and International Commission of Zoological Nomenclature (ICZN) (1991).

As this paper identifies regionally divergent forms previously incorrectly referred to *P. bibronii* as new species, these must invariably be assigned names. As the majority of these taxa have no available names, the unnamed ones must have new names assigned.

I note that in terms of nomenclatural stability within the ambit of the current (fourth) edition of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), the most logical solution to the problems of identification and naming of the relevant species of frog is by strict application of the code, including the rules of homonymy and priority.

However, taking steps to change the malicious nomenclatural actions of Shea and Rowley, will only worsen an already unsatisfactory situation and create new tensions which could easily be avoided.

Therefore in the interests of the stated aims of the Code, being nomenclatural stability, I accept their designation of assignment of a lectotype for *P. bibroni*, being the Sydney basin form of the putative species and herein for the purposes of this paper and the present date, do not recognize or use the name

P. barkeri on the basis of the unethical revisionary work by Shea and Rowley (2018).

All other known to be unnamed eastern Australian populations of putative *Pseudophryne bibronii* as identified in contemporary texts such as Cogger (2014 and Anstis (2013) are herein formally described as new species within the redefined genus *Pseudophryne* based on morphological and molecular divergence and presumed breeding allopatry.

In the relevant descriptions within this paper, all six genus groups within the previously defined genus *Pseudophryne sensu* Cogger (2014) and Anstis (2013) are properly defined and diagnosed, with species content also clearly identified.

This is done on the basis that this is the first formal revision of this sizeable assemblage based on both molecular data and morphology and it is likely that the genus-level arrangement will become widely used quite rapidly, including via identification manuals.

In terms of putative *P. bibroni*, the following is noted.

Two species described that are closely associated with putative *P. bibronii* are *P. dendyi* Lucas, 1892 and *P. semimarmorata* Lucas, 1892, both being recognized within this paper.

Some authors have regarded the preceding taxa as conspecific with *P. bibronii* and the molecular study of Donnellan *et al.* (2012) confirmed that some populations of putative *P. bibronii* are in fact more closely related to those species than they are to the nominate (Sydney) form of *P. bibroni*.

However it is also clear that recognition of both *P. dendyi* Lucas, 1892 and *P. semimarmorata* Lucas, 1892 as valid species is also appropriate.

With that in mind, all the preceding species were looked at collectively and in the descriptions that follow of unnamed forms, all are formally separated from one another.

In finality, two divergent forms of putative *P. bibronii* from South Australia are formally named as new species as originally indicated in Anstis (2013), being *P. scottgranti* sp. nov. and *P. jasminegrantae* sp. nov.. While flagged as unnamed species within the *P. bibronii* complex nearly a decade back, they have not been formally named on the basis that to do so would be a grudging admission that Wells and Wellington had got their summation of putative *P. bibronii* correct in 1985. In doing this, a number of noisy so-called herpetologists in Australia would have effectively had 35 years worth of hate and lies and ridicule against the taxonomic and nomenclatural judgements of Wells and Wellington shown up for what they were all along.

That is, without any basis of fact!

Pressure has been brought to bear on people to not recognise or formally name either taxon.

Quite simply, I put the scientific good and the needs of wildlife conservation ahead of a time-wasting war

against Wells and Wellington by ego-centric so-called scientists, who clearly would rather species become extinct, than dare admit that their nemesis Wells and Wellington had actually done some useful work in herpetology (see Hoser 2019b, 2019c).

I put conservation in front of hate campaigns and so have no hesitation in naming the two relevant species, noting that they were flagged as distinct as far back as 1985 (Wells and Wellington, 1985), again in 2013 (Anstis, 2013) and yet as of late 2020 remained unnamed and unrecognized by scientists and government wildlife conservation agencies alike! A population of putative *P. bibronii* from the Adelaide region is formally named as a subspecies of *P. semimarmorata*, based on its close phylogenetic relationship to that taxon, being *P. semimarmorata burrelli* sp. nov..

The population of putative *P. bibronii* from northern Victoria and nearby parts of South Australia is formally named as a new species *P. martinekae* sp. nov..

Putative *P. bibronii* from the lower elevations of the southern highlands of New South Wales and elevated locations north and west of there are formally named as a subspecies of *P. dendyi*, being *P. dendyi mensforthi* sp. nov..

Putative *P. bibronii* from the dunes and melaleuca swamps north of Newcastle on the New South Wales north coast are formally named *P. wellsii* sp. nov.. The New England Tableland form of putative *P. bibronii* is formally named *P. wellingtoni* sp. nov., while the divergent population from the Mount Kaputar outlier is herein formally named as *P. wellingtoni kaputarensis*.

Within the resurrected genus *Bufo* Girard, 1853, until now synonymised with *Pseudophryne* Fitzinger, 1843, the putative species *B. australis* (Gray, 1835) is divided into two, with the new species *B. hoserae* sp. nov. also split into two allopatric subspecies.

Putative *B. coriacea* Keferstein, 1868 is split three ways, with the new species *B. wolffi* sp. nov. and *B. euanedwardsi* sp. nov. formally named.

The putative genera *Crinia* Tschudi, 1838 and *Ranidella* Girard, 1853 are rearranged as a single genus and conservatively split into six subgenera, with one group formally named as new subgenus. There is a strong argument in favour of all six groups being recognized as separate genera as done to at least a limited extent by some authors (e.g. Cogger *et al.* 1983 or Wells and Wellington, 1985) and I leave this option available for later authors.

The genera resurrected from synonymy as subgenera are *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974 and *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus*

Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994.

A new subgenus *Oxydella* subgen. nov. including the complex of species associated with "*Ranidella deserticola* Liem and Ingram, 1977" is erected for the fifth clade in the the genus *Crinia*.

Until now, treated as a single putative species, *Crinia* (*Ranidella*) *deserticola* (Liem and Ingram, 1977), this obvious complex of species, is broken up four ways, with three obviously divergent forms formally named as new species. There may be others awaiting formal description, these being most likely in the Northern Territory.

To get a good indication as to how different the relevant species are, one simply needs to look at the image of the tadpole jaw for nominate *C. deserticola* from south-western Queensland, Australia in the original description on page 256 of Liem and Ingram (1977) and match it up with the image of the tadpole jaw for putative *C. deserticola* from Mareeba, Queensland, Australia herein treated as a new species *C. oxeyi* sp. nov. and note the obvious differences, including for example two well formed upper rows of teeth in *C. deserticola*, versus just one in *C. oxeyi* sp. nov..

The complex of divergent species including *Crinia parinsignifera* Main, 1957, *C. tinnula* Straughan and Main, 1966 and at least three until now undescribed species are formally placed into a new subgenus *Lowingdella* subgen. nov., type species *Crinia* (*Lowingdella*) *lowingae* sp. nov. from New South Wales.

In summary *C. tinnula* is effectively split 3 ways, noting genetic evidence for the split was published 19 years prior, with one of those species being *C. lowingae* sp. nov. and a northern population of putative *C. parinsignifera* is formally identified and named as a consistently morphologically divergent species.

I also note the audit of relevant species confirmed that the species *Crinia georgiana* Tschudi, 1838, as currently recognized (*sensu* Cogger 2014 or Anstis 2013) is in fact two well defined and allopatric species.

Their identification as two divergent species was confirmed by Edwards (2007), who found each diverged from one another about 1.5 MYA.

The western form from near Perth and found along the south-west coast of Western Australia to about Albany, Western Australia (including King George's Sound) is a frog with a mainly pinkish brown dorsum or alternatively has a distinct charcoal coloured hue in some southern populations and a generally whitish venter.

The second, morphologically divergent species, occurs along the southern coast of Western Australia from Cape Arid in the east, west to about Cheyne Bay, and then extending inland towards the Darling

Range near the south-side of Perth in Western Australia. These frogs, are yellowish brown (usually to light chocolate brown, with a yellowish venter, which has extensive markings and spots overlaying tubercles, especially anteriorly.

The three available synonyms for *C. georgiana* were checked.

Pterophrynus affinis Günther, 1864, is depicted with his description and that specimen is clearly of the western form, similar in appearance to the female depicted on page 554, centre right of Anstis (2013). The two frogs described by Cope, namely *Crinia insignata* Cope, 1866 and *C. stolata* Cope, 1867, both conform to common colour variants of the western form, *C. insignata* probably coming from near Perth and *C. stolata* matching the form from Denmark, Western Australia.

As a result, there is no available name for the eastern form of the putative species and it is herein named *Crinia merceicai* sp. nov..

The genus *Geocrinia* Blake, 1973 is formally split into two with the second genus formally named for the first time as *Wellingtondella* gen. nov.. *Hesperocrinia* Wells and Wellington, 1985, type species: *Crinia leai* Fletcher, 1898 is resurrected as a subgenus within *Geocrinia*.

However the concept of the genus is not as conceived by Wells and Wellington (1985).

They treated the genus as including all West Australian species of *Geocrinia*.

However, based on the molecular data of Read *et al.* (2001), their type species is more closely associated with the eastern Australian *Geocrinia*, including the type species *Pterophrynus laevis* Günther, 1864, which is why their type species is placed back into that genus.

The species originally described as *Crinia leai* Fletcher, 1898 is in my view on the cusp of genus-level separation from *Geocrinia* again based on the molecular results of Read *et al.* (2001), so it is therefore treated as subgenus level separation and the name *Hesperocrinia* is retained and used.

Two new species within the subgenus *Hesperocrinia* and three new subspecies within *Geocrinia* are also formally named.

One subspecies is associated with *G. laevis* (Günther, 1864) and the other two with *G. victoriana* (Boulenger, 1888).

The putative species *Paracrinia haswelli* (Fletcher, 1894), monotypic for the genus *Paracrinia* Heyer and Liem, 1976, originally described as *Crinia haswelli* Fletcher, 1894, with a type locality of Jervis Bay, New South Wales, Australia is split into three well defined species on the basis of allopatry and morphological divergence, the two newly identified forms being formally named for the first time.

Prior to this study, no other herpetologists had

indicated likelihood of the putative taxon *Paracrinia haswelli* including more than one species. However ever since arriving in Melbourne to live in 1985, I soon had the opportunity to view specimens from the Mornington Peninsula and immediately had no doubt that they were a different taxon to those specimens of *Paracrinia haswelli* that I had seen both in Darkes Forest just south of Sydney, in New South Wales and others I had caught on the New South Wales south coast near Nowra.

The until now monotypic genus *Metacrinia* Parker, 1940, with the type species *Pseudophryne nichollsi* Harrison, 1927, known only from south-west Western Australia, is split into three species, each being morphologically and genetically divergent.

Three genetically divergent populations in south-west Australia were identified by Edwards (2007).

Only the western, population, identified by here as the main population, has an available name, being type form for the species, with a type locality of Pemberton, Western Australia.

A second population from the south coast from Walpole in the west to Albany in the east is formally named as a new species as is another outlier population confined to the Stirling Range National Park north-east of this area.

Edwards (2007), gave various estimates for the divergences of each population, but at page 108 estimated the populations of the three clades (named herein as species) diverged from one another 2.6 to 3.4 million years before present. While recognizing each as distinct lineages, she did not formally name any.

Morphological and genetic divergence of each so-called lineage, made species level recognition the only logical step to take when reviewing the taxonomy of the group.

Uperoleia Gray, 1841 is divided into two genera, while a further two subgenera within remaining *Uperoleia* are recognized. One subgenus, *Quasiuperoleia* subgen. nov. is formally named for the first time, while available names, *Hosmeria* Wells and Wellington, 1985 (as a genus) and *Prohartia* Wells and Wellington, 1985 (as a subgenus) are resurrected. A new species, *H. shuddafakup* sp. nov. is formally named within the genus *Hosmeria*. That was until now treated as a Queensland, or northern population of the well-known species *H. laevigata* (Keferstein, 1867), with a type locality of Randwick, in New South Wales, now an inner eastern suburb of Sydney, Australia, with centre of distribution of that taxon being New South Wales.

A second new species associated with *H. fusca* (Davies, McDonald and Corben, 1986), with a type locality of Eungella, Queensland, from New South Wales and south-east Queensland is formally named *H. shireensbogensis* sp. nov..

Four new species in subgenus *Uperoleia* are formally

named for the first time. Of these, three are derived from a formal split of putative *U. borealis* Tyler, Davies and Martin, 1981 into four regionally distinctive species. Besides morphological divergence, the molecular study of Catullo and Scott Keogh (2014) confirmed species-level divergences within the original putative taxon.

The species *U. crassa* Tyler, Davies and Martin, 1981 is also split two ways, based on the fact that the newly described population is morphologically divergent and found in a biogeographically separated part of the Kimberley district from the type locality of *U. crassa* at Mitchell Plateau.

A northern population of *U. micra* Doughty and Roberts, 2011 is also formally named as a new subspecies *U. micra divergens* *subsp. nov.*

Two new species, both until now treated as populations of *U. lithomoda* Tyler, Davies and Martin, 1981 within subgenus *Prohartia* are formally named for the first time. One of these in turn is divided into two, with a new subspecies formally named. Another subspecies within *Prohartia* is formally named, this being a distinctive and divergent southern population of *U. minima* Tyler, Davies and Martin, 1981, from the Kimberley district of Western Australia.

Also within *Prohartia* a new species is formally named from southern Papua New Guinea. This taxon has been assigned to the species *U. lithomoda* Tyler, Davies and Martin (1981) by Tyler and Davies (1984), and then re-assigned to the species *U. mimula* Davies, McDonald and Corben, 1986 by Davies (1987).

However the relevant type material from Morehead in Papua New Guinea conforms to neither species and so it is treated herein as a new species and formally named *U. gedyei* *sp. nov.* It is however most closely related to *U. mimula*. Furthermore putative *U. mimula* from Townsville Common in Queensland are morphologically divergent from specimens from the type locality at Lakefield Ranger Station, far north Queensland, including specimens from almost the entirety of the known range of that taxon and so it too is named as a new species.

At the present time, the new species *U. rossignolii* *sp. nov.* is not known from anywhere else.

The southern Barred River Frog, *Mixophyes hoserae* Hoser, 2020, occurs from the lower north and central coast of New South Wales, southwards, east of the Great Dividing Range into north-east Victoria.

Morphologically divergent specimens from the far south in this range, from north-east Victoria and immediately adjacent New South Wales are formally named herein as a new subspecies, namely, *M. hoserae jackyae* *subsp. nov.*

Myobatrachidae is also formally divided into four newly identified tribes in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

These are Myobatrachini, with subtribe Oxyphryneina subtribe. *nov.*, Uperoleiaini tribe *nov.* including Spicospinaina subtribe *nov.*, with nomimate subtribe defined and diagnosed by default from the other subtribe description, Wellingtondellaini tribe *nov.* with subtribe Paracriniaina subtribe *nov.* and Criniaini tribe *nov.*

Based on the published phylogenies of Catullo and Scott Keogh (2014) and Pyron and Weins (2011) each tribe is divergent from one another by 25 MYA or more and so these tribe designations are in fact very conservative. Subtribes defined for the three genus groups are believed to have diverged more than 20 MYA.

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 (2019b, 2019c).

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 and quasi-government employees in the relevant part of the Australasian region over the past 200 years as detailed by Hoser (1989, 1991, 1993, 1996, 2019b and 2019c).

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 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 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.

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 10 September 2020, unless otherwise stated 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 and unless otherwise stated, not including hidden surfaces, not normally exposed by a frog in a resting position.

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 (2019b, 2019c) and sources cited therein.

Translocation of specimens may also cause problems as outlined in Hoser (1995).

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) or Wüster (2020) 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 (Cogger 2014, 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 Cogger (2014), Dubois *et al.* (2019), Hoser, (2007, 2009, 2012a, 2012b, 2013, 2015a-f, 2019b, 2019c) and the many other sources cited therein.

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, 2019b, 2019c), 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.

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 (Saunders 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 than in Australia 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 Indonesian 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 within Australasian frog genera 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 simply 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.

BOGOPHRYNE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:2EFDD999-93EF-4255-9F50-493821F84F02

Type species: *Bogophryne uterbog* sp. nov.

Diagnosis: Frogs of the genera *Philororia* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne* gen. nov. are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phlanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Philororia* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera (*Kyarranus* Moore, 1958 and *Bogophryne* gen. nov.) by the side and rump having numerous tiny tubercles giving a somewhat "prickly" appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Philororia* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne* gen. nov. is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude -29.28 South. Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Philororia*.

The placement of the species *Philororia loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from "McPherson Ranges, 3-4000 ft, south Queensland" is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne* gen. nov..

Distribution: Ranges along the Queensland and New South Wales border, north of Latitude 29.28 South and south of the Brisbane River Valley.

Etymology: The new genus name refers to where these frogs are found and occupy, being areas of "bog" or saturated wet ground and that they are like a small toad, in that the suffix is "*phryne*".

Hence the name "*Bogophryne*".

Content: *Bogophryne uterbog sp. nov.* (type species); *B. duboisi sp. nov.*; *B. breonnataylorae sp. nov.*; *B. loveridgei* (Parker, 1940); *B. naomiosakaae sp. nov.*.

BOGOPHRYNE UTERBOG SP. NOV.

LSIDurn:lsid:zoobank.org:act:4556A81B-70B5-48B4-BEBA-256C598EAC6E

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R133242 collected from the Eastern Border Ranges, New South Wales. Latitude -28.4 S., Longitude 153.1 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 R138936, R138938, R138939, R138942 and R138959 collected from the Eastern Border Ranges, New South Wales. Latitude -28.4 S., Longitude 153.1 E.

Diagnosis: Until now, all of *Bogophryne uterbog sp. nov.* (type species for the genus *Bogophryne gen. nov.*), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Phyloria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne gen. nov.* within this paper.

They are separated from one another as follows:

Bogophryne uterbog sp. nov. includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus by the following unique suite of characters: A dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axila of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper

lip is grey to brown and unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi sp. nov. from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae sp. nov. from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakaae sp. nov. from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae sp. nov.*, but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb. The dorsum of *B. naomiosakaae sp. nov.* is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae sp. nov.*. Upper

iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of “McPherson Ranges, 3-4000 ft, south Queensland” is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog sp. nov.* and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog sp. nov.*. Darker markings on the mid and lower dorsum of the back in *B. uterbog sp. nov.* are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Phyloria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne gen. nov.* are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phlanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat “prickly” appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne gen. nov.* is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum

brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Phyloria*.

The placement of the species *Phyloria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from “McPherson Ranges, 3-4000 ft, south Queensland” is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*.

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for “*Phyloria loveridgei*”.

Distribution: *B. uterbog sp. nov.* is known only from the type locality within the Border Ranges of northern New South Wales.

Etymology: In Latin, *uter* is a verb meaning to use, enjoy, employ, exploit or experience. This species inhabits and uses “bog” habitat, meaning areas of wet and saturated ground. Hence the name “*uterbog*”.

BOGOPHRYNE DUBOISI SP. NOV.

LSIDurn:lsid:zoobank.org:act:5E6EA417-38A5-4CB7-A949-8E2ED18CC6A6

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.131931, collected from near Urbenville, New South Wales, west McPherson Ranges, Latitude -28.4 S., Longitude 152.8 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.131933, R.131934, R.131935, R.131937 and R.64869, all collected from near Urbenville, New South Wales, west McPherson Ranges, Latitude -28.4 S., Longitude 152.8 E.

Diagnosis: Until now, all of *Bogophryne uterbog sp. nov.* (type species for the genus *Bogophryne gen. nov.*), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakae sp. nov.* have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Phyloria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field

trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne* *gen. nov.* within this paper.

They are separated from one another as follows:

Bogophryne uterbog *sp. nov.* includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus by a dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axila of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper lip is grey to brown and unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi *sp. nov.* from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae *sp. nov.* from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are

always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakae *sp. nov.* from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae* *sp. nov.*, but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb. The dorsum of *B. naomiosakae* *sp. nov.* is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae* *sp. nov.*. Upper iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of "McPherson Ranges, 3-4000 ft, south Queensland" is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog* *sp. nov.* and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog* *sp. nov.*. Darker markings on the mid and lower dorsum of the back in *B. uterbog* *sp. nov.* are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Philoria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne* *gen. nov.* are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or

indistinct. Terminal phalanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat “prickly” appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne gen. nov.* is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Phyloria*.

The placement of the species *Phyloria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from “McPherson Ranges, 3-4000 ft, south Queensland” is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for “*Phyloria loveridgei*”.

Distribution: *B. duboisi sp. nov.* occurs from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range.

Etymology: Named in honour of Alain Dubois of Paris, France, a herpetologist specializing in frogs, for services to science via his steadfast support for the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) against unscientific incursions by the likes of Wolfgang Wüster and his gang of thieves (e.g. Dubois *et al.* 2019) as referred

to by Cogger (2014) and Hoser (2007, 2009a, 20012a-b, 2013 and 2015a-f).

BOGOPHRYNE BREONNATAYLORAE SP. NOV.
LSIDurn:lsid:zoobank.org:act:3187DA03-644C-4A41-ABB5-D5949C7A0502

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R165027, collected from Lamington National Park, Queensland, Australia, Latitude -28.200 S., Longitude 153.050 E. This government-owned facility allows access to its holdings.

Paratypes: Ten preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J17361, J17362, J17364, J17365, J17368, J17369, J17370, J17373, J17375 and J17384 all collected at Lamington National Park, Queensland, Australia, Latitude -28.200 S., Longitude 153.083 E.

Diagnosis: Until now, all of *Bogophryne uterbog sp. nov.* (type species for the genus *Bogophryne gen. nov.*), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Phyloria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne gen. nov.* within this paper.

They are separated from one another as follows:

Bogophryne uterbog sp. nov. includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus as follows: By having a dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axila of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper lip is grey to brown and

unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi sp. nov. from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae sp. nov. from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakae sp. nov. from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae* sp. nov., but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb.

The dorsum of *B. naomiosakae* sp. nov. is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae* sp. nov.. Upper

iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of "McPherson Ranges, 3-4000 ft, south Queensland" is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog* sp. nov. and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog* sp. nov.. Darker markings on the mid and lower dorsum of the back in *B. uterbog* sp. nov. are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Phyloria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne* gen. nov. are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phlanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat "prickly" appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne* gen. nov. is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum

brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size.

Bogophryne gen. nov. species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Philoria*.

The placement of the species *Philoria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from "McPherson Ranges, 3-4000 ft, south Queensland" is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for "Philoria loveridgei".

Distribution: *B. breonnataylorae sp. nov.* is presently only known from Lamington National Park in Queensland, Australia.

Etymology: The species is named in honour of Breonna Taylor, a 26-year-old African-American emergency medical technician, who was fatally shot by Louisville Metro Police Department (LMPD) officers Jonathan Mattingly, Brett Hankison, and Myles Cosgrove on 13 March 2020.

Three plainclothes LMPD officers executing a no-knock search warrant entered her apartment in Louisville, Kentucky. Gunfire was exchanged between Taylor's boyfriend Kenneth Walker and the officers. Walker said that he believed that the officers were intruders. The LMPD officers fired over twenty shots. Taylor was shot eight times.

The death of Breonna Taylor and the conduct of police after the fact to play down their role in the unjustified killing, has become a symbol of police corruption and oppression of weak and vulnerable people by police worldwide, including in the United States, poor, unarmed black people who are shot and killed with impunity, because the police can get away with it.

Unfortunately the name Breonna Taylor has for most people, absolutely no connection with the woman killed by police, but instead the corruption in the police and the wider movement to stop police unnecessarily killing weak and vulnerable people including black people in the USA.

It is hoped that the naming of a frog in honour of a victim of police corruption and misconduct, will draw people's attention to this long-running problem in modern societies and remain a reminder in future years.

BOGOPHRYNE NAOMIOSAKAAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:33D4ED05-A7FC-4696-A1ED-421A6A4C6486

Holotype: A preserved female specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J17381 collected from Mount Warning in New South Wales, Australia, Latitude -28.4 S., Longitude 153.3 E. This government-owned facility allows access to its holdings.

Paratypes: Seven preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J17363, J17366, J17372, J17377, J17382, J17385 and J17387, as well as four preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.31695, R.78980, R.111208 and R.131932 all collected from Mount Warning in New South Wales, Australia, Latitude -28.4 S., Longitude 153.3 E.

Diagnosis: Until now, all of *Bogophryne uterbog sp. nov.* (type species for the genus *Bogophryne gen. nov.*), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* have all been treated as the same putative taxon, this being *B. loveridgei* (Parker, 1940), originally described as *Philoria loveridgei* Parker, 1940.

The molecular data of Knowles *et al.* (2004) confirms that four of the five preceding putative species are separate species-level taxa. Inspection of numerous living specimens of all four putative taxa during a field trip in 2019 confirmed this contention in that differences between populations are consistent and quantifiable. A fifth population from Mount Warning in New South Wales was divergent from the others and geographically isolated and so is also herein formally named as a new species.

All five species conform to the genus diagnosis for *Bogophryne gen. nov.* within this paper.

They are separated from one another as follows:

Bogophryne uterbog sp. nov. includes specimens from the Border Ranges National Park in New South Wales and is separated from the other species in the genus by a dorsum in adults that is light anteriorly, dark posteriorly and on the mid dorsum and flanks, the pattern is of dark brown marbling on a light brown background. The darker blotches are more-or-less circular, becoming more dense and merging on the posterior half of the dorsum, to become a general dark patch, which terminates before the anus, where pigment is again light brown. The lower flanks, at the posterior side have a large oval dark brown spot that extends at least half way along the flank and sometimes most of the way to the axila of the forelimb. The upper surfaces of the limbs are brownish and without even faint blotching or cross bands. Upper part of the pupil is bright orange. Upper

lip is grey to brown and unmarked, except for some indistinct white markings above the snout. The dark line running from snout, through nostril to eye and beyond to axila of forelimb is prominent.

B. duboisi sp. nov. from Levers Plateau, New South Wales and south-west of there, east of the western edge rain shadow of the higher parts of the Great Dividing Range, is separated from the other species by the following unique suite of characters: The dorsum is brownish with two distinctive dark brown crescents with irregular borders running across the centre of the back, both being well-spaced, the first being posterior to the forelimbs and the second anterior to the hind limbs. Darker markings on the lower flanks are indistinct. There are obvious dark spots and similar forming bands on the hind limbs and also dark brown spots on mid brown forelimbs. Lower parts of the upper snout are a distinctive chocolate-brown colour. White specks on the limbs are obvious.

Dorsal tubercles are small, evenly spaced and limited in number and always white tipped. Leg tubercles larger and mainly dark. Iris is dark orange.

B. breonnataylorae sp. nov. from Lamington National Park in Queensland is separated from the other species by the following suite of characters: A dorsum with distinctive longitudinal folds and corresponding dark lines running down the body, which may be either distinct or indistinct. Yellow seen in the groin of all species in the genus, does in this species extend anteriorly to include an obvious flush around the axila of the forelimbs. The flanks are always yellowish or at least with a yellowish tinge and there are no obvious dark blotches or markings on the lower flanks, any dark pigment merely being either peppering or dark heavily overlain with yellow or light (whitish).

Upper hindlimbs always have dark markings forming crossbands, but these are always indistinct. Markings are either absent or indistinct on the upper forelimbs. Dark and light tipped tubercles on the dorsum. Upper iris is yellowish to dull orange.

Colour on sides and top of head more-or-less the same, but evenly peppered in some specimens.

The dark stripe running from the eye to the axila of the forelimb is bounded by a thick whitish boundary on the upper surface, this whitish boundary noticeably thickening at the rear, this trait being unique to this species.

B. naomiosakaae sp. nov. from Mount Warning in New South Wales, is externally similar in most respects to *B. breonnataylorae* sp. nov., but separated from that species by the absence of a thickened white upper boundary in the dark stripe running from the eye to the axila of the forelimb.

The dorsum of *B. naomiosakaae* sp. nov. is generally unmarked and lacks the longitudinal lines or blotching seen in *B. breonnataylorae* sp. nov.. Upper

iris is light orange.

B. loveridgei (Parker, 1940) with a given type locality of "McPherson Ranges, 3-4000 ft, south Queensland" is not of the previously described species. The exact distribution of *B. loveridgei* is not known, due to the vagueness of the original description. In fact it may not have even come from the McPherson ranges as known in 2020, although this suggestion is largely conjecture.

B. loveridgei is similar in most respects to *Bogophryne uterbog* sp. nov. and it is separated from that species by having generally dark lower flanks with a patch extending from the hind limb to almost the forelimb that is not obviously ovoid in shape as seen in *B. uterbog* sp. nov.. Darker markings on the mid and lower dorsum of the back in *B. uterbog* sp. nov. are obvious and prominent, versus not so in the type form of *B. loveridgei*.

Frogs of the genera *Phyloria* Spencer, 1901, *Kyarranus* Moore, 1958 and *Bogophryne* gen. nov. are separated from all other Australian frogs in the family Limnodynastidae as defined by Cogger (2014) by the following suite of characters:

Maxillary teeth present; no bright red patches in the groin; no dentary pseudo-teeth; vomerine teeth behind the level of the choanae; toes free and without any trace of webbing; digits without terminal discs; a large frontoparietal foramen in adults.

The relevant species in the three genera are further defined as follows: Moderate to stout in build. Tongue large and oval. First finger not opposed to the second. Pupil horizontal. Tympanum is hidden or indistinct. Terminal phlanges are simple. Tips of digits are not or only slightly dilated. Breeding females have flattened spatula or flanges on the first and second fingers. Breeding males usually have a small nuptial pad on the first finger. A small inner metatarsal tubercle, but no outer metatarsal tubercle.

The genus *Phyloria* Spencer, 1901, type species *P. frosti* Spencer, 1901, is readily separated from the other two genera by the side and rump having numerous tiny tubercles giving a somewhat "prickly" appearance and a conspicuous parotoid gland (versus a smooth dorsum and sides with scattered tubercles or skin ridges and no conspicuous parotoid gland in the other genera).

In *Phyloria* the subarticular tubercles on the hands and feet are usually the same colour as surrounding areas, versus much lighter than the surrounding colour in the other genera.

The genus *Bogophryne* gen. nov. is separated from *Kyarranus* Moore, 1958 by the following unique suite of characters: Small adult size (27 to 30 mm); males with a poorly developed nuptial pad; lower back without distinct black band or patches on the lower dorsum; found north of Latitude 29.28 South.

Head stripe well developed; abdomen not yellow or red with smaller patches of other colour. Dorsum

brown, reddish-brown, bronze or light grey; flanks entirely black or with a black mark of variable size. *Bogophryne gen. nov.* species lay eggs in a small non-foamy clump, versus a small foamy clump in both *Kyarranus* and *Philoria*.

The placement of the species *Philoria loveridgei* Parker, 1940, based on the holotype BMNH 1947.2.19.94 from "McPherson Ranges, 3-4000 ft, south Queensland" is tentative. See the relevant comments in Knowles *et al.* (2004).

What is certain is that it is not conspecific with the four newly described forms within *Bogophryne gen. nov.*

Colour photos of *Bogophryne uterbog sp. nov.* (type species), *B. duboisi sp. nov.*, *B. breonnataylorae sp. nov.*, *B. loveridgei* (Parker, 1940) and *B. naomiosakaae sp. nov.* in life showing the diagnostic features of each as referred to in this description can be found at:

<http://www.flickr.com>

by doing a search for "Philoria loveridgei".

Distribution: *B. naomiosakaae sp. nov.* appears to be endemic to Mount Warning in New South Wales, Australia. Specimens previously treated as *P. loveridgei* Parker, 1940 from Nightcap National Park, including Peach Mountain were not inspected and may be one or other of *B. naomiosakaae sp. nov.*, *B. loveridgei* Parker, 1940, *B. uterbog sp. nov.* or perhaps an unnamed species.

Etymology: The new species is named in honour of Naomi Osaka, a well-known professional tennis player who won her first-round match at the USA Open Tennis Tournament in 2020 and wanted to ensure people didn't forget about Breonna Taylor. In the middle of the Covid-19 pandemic, she wore a black mask that had the name Breonna Taylor (shot dead by police) emblazoned across the mask to highlight the plight of vulnerable black people in the face of endemic police corruption.

She honoured Breonna Taylor before her first-round match against Misaki Doi, another victim Elijah McClain during her match against Camila Giorgi during the second round and yet another victim Ahmaud Arbery during her third-round match against Marta Kostyuk.

She progressed to win the Grand Final of the 2020 USA Open Tennis Tournament, also wearing masks to commemorate 7 victims of police killings in the USA at the start of each round.

I am not into the game of tennis, but have honoured Naomi Osaka with the species name in recognition of her use of her public position to highlight the extremely serious issue of endemic police corruption in many parts of the world, including the untold damage done to lives of innocent victims, including African Americans killed by coward police, preying on weak and vulnerable

SLOPPOPHRYNE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:B903DA79-29AF-4297-A033-E27F68F16150

Type species: *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

Diagnosis: Until now (year 2020), the putative genera *Bufo* Girard, 1853, *Kankanophryne* Heyer and Liem, 1976 and *Gradwellia* Wells and Wellington, 1985 have been treated as synonyms of the earlier named genus *Pseudophryne* Fitzinger, 1843 (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013).

In spite of the preceding, the molecular results published by Donnellan, Mahony and Bertozzi (2012), gave strong support for the contention that the genus *Pseudophryne* as currently understood (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013), should be divided six ways to better reflect the six divergent lineages or species groups.

In for the first time ever, formally recognizing the six obviously divergent species groups as new genera, the following nomenclatural acts are required or affirmed:

The genus *Pseudophryne*, with a type species of *Phrynosoma australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) is herein restricted to the clade including the type species and other similar forms from eastern Australia and south-eastern Australia.

The genus *Gradwellia* Wells and Wellington, 1985, with a type species of *Pseudophryne major* Parker, 1940, does represent a clade, with the associated species *Pseudophryne covacevichae* Ingram and Corben, 1994, but these two species in turn are (in my view) not sufficiently divergent genetically or morphologically from type *Pseudophryne* to warrant being placed in a separate genus or even subgenus and hence the name is synonymised within *Pseudophryne*. I do note however that the name *Gradwellia* is available according to provisions of relevant ICZN Codes as published.

The genus *Bufo* Girard, 1853, type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835) is resurrected to include that species and other related forms from coastal eastern Australia.

Closely related to *Bufo*, but sufficiently divergent both morphologically and in terms of time divergence, the so-called Corroboree Frogs, *Pseudophryne corroboree* Moore, 1953 and *Pseudophryne pengilleyi* Wells and Wellington, 1985, being closely related species, are placed within the newly erected genus *Oxyphryne gen. nov.*

The genus *Kankanophryne* Heyer and Liem, 1976, with a type species of *Pseudophryne occidentalis* Parker, 1940 is resurrected from synonymy of

Pseudophryne. It includes five species, three of which are formally named for the first time.

The new monotypic genus *Sloppophryne gen. nov.* is formally erected to accommodate the divergent central Australian species, *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

The new genus *Crottyphryne gen. nov.* is formally erected to accommodate the newly described species *Crottyphryne crotalusei sp. nov.* and the closely related *Pseudophryne douglasi* Main, 1964, both from Western Australia.

All six preceding genera, all formerly treated as being *Pseudophryne sensu lato* are separated from all other Myobatrachid frogs as defined by Cogger (2014), by the following unique suite of characters: Pupil horizontal; tongue does not adhere to the floor of the mouth posteriorly; tongue is small and narrowly oval; prevomer is reduced or absent; vomerine teeth absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; maxillary teeth are absent; a large frontoparietal foramen in adults; phalanges are simple and there are no terminal discs on fingers or toes; no webbing; belly smooth and with black and white marbling; limbs are short, but otherwise more-or-less normal, adpressed hindlimb reaches the tympanic region or beyond; tympanum and middle ear structures are absent.

Furthermore, the species in the six preceding genera usually have moderately developed parotoid glands and their call is usually a short, harsh "squelch" sound.

The genus *Sloppophryne gen. nov.* is separated from the other five genera by the following suite of characters: No gland behind the thigh; inner metatarsal tubercle is moderate, low and not shovel-shaped; the outer metatarsal tubercle is small to moderate; inner toe has two phalanges.

The genus *Crottyphryne gen. nov.* is separated from the other five genera by the following suite of characters: Inner metatarsal tubercle is large and shovel-shaped; inner toe has two phalanges; outer metatarsal tubercle is small and conical; inner toe has two phalanges; skin dorsally has small conical warts.

The genus *Kankanophryne* Heyer and Liem, 1976 is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:
1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx; or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges.

The genus *Pseudophryne* is separated from the other five genera by the following suite of characters:

Inner and outer metatarsal tubercles are small to moderate and not shovel-shaped; inner toe has two phalanges; there is a gland on the distal half of the hind side of the thigh; and one or other of the following:

1/ Snout somewhat pointed and prominent; internarial distance is shorter than the distance between the nostril and the tip of the snout, or;

2/ The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface is as dark or darker than the sides and without a bright red or orange triangular patch on the crown (versus reddish dorsum, paler than sides or alternatively dark on top and with a bright red or orange triangular patch on the crown as seen for genus *Bufo* Girard, 1853).

The genus *Bufo* Girard, 1853 is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

The genus *Oxyphryne gen. nov.* is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; and there is a distinctive dorsal pattern of irregular alternate stripes of black and yellow unlike seen in any other Australian frogs. Both species are from Alpine areas of New South Wales and the Australian Capital Territory (ACT), with no specimens recorded from nearby parts of Victoria.

Distribution: The monotypic genus is only known from ranges in the far north-west of South Australia.

Etymology: The new genus is named in honour of an eight year old as of 2020 (born August 2012) Great Dane dog, named Slopp. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years and it is appropriate his services to science be recognized. The "phryne", suffix reflects the Latin word for toad. The "o" joining the two parts is deliberate as otherwise speaking the name would be difficult for some people. Hence "*Sloppophryne*".

Content: *Sloppophryne robinsoni* (Donnellan, Mahony and Bertozzi, 2012) (monotypic).

CROTTYPHRYNE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:C7D57988-4847-41F0-AA1F-A9695B0A52C1

Type species: *Crottyphryne crotalusei* sp. nov.

Diagnosis: Until now (year 2020), the putative genera *Bufonella* Girard, 1853, *Kankanophryne* Heyer and Liem, 1976 and *Gradwellia* Wells and Wellington, 1985 have been treated as synonyms of the earlier named genus *Pseudophryne* Fitzinger, 1843 (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013).

In spite of the preceding, the molecular results published by Donnellan, Mahony and Bertozzi (2012), gave strong support for the contention that the genus *Pseudophryne* as currently understood should be divided six ways to better reflect the six divergent lineages or species groups.

In for the first time ever, formally recognizing the six obviously divergent species groups as new genera, the following nomenclatural acts are required or affirmed:

The genus *Pseudophryne*, with a type species of *Phrynos(us) australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) is herein restricted to the clade including the type species and other similar forms from eastern Australia and south-eastern Australia.

The genus *Gradwellia* Wells and Wellington, 1985, with a type species of *Pseudophryne major* Parker, 1940, does represent a clade, with the associated species *Pseudophryne covacevichae* Ingram and Corben, 1994, but these two species in turn are (in my view) not sufficiently divergent genetically or morphologically from type *Pseudophryne* to warrant being placed in a separate genus or even subgenus and hence the name is synonymised within *Pseudophryne*. I do note however that the name *Gradwellia* is available according to provisions of relevant ICZN Codes as published.

The genus *Bufonella* Girard, 1853, type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835) is resurrected to include that species and other related forms from coastal eastern Australia.

Closely related to *Bufonella*, but sufficiently divergent both morphologically and in terms of time divergence, the so-called Corroboree Frogs, *Pseudophryne corroboree* Moore, 1953 and *Pseudophryne pengilleyi* Wells and Wellington, 1985, being closely related species, are placed within the newly erected genus *Oxyphryne* gen. nov..

The genus *Kankanophryne* Heyer and Liem, 1976, with a type species of *Pseudophryne occidentalis* Parker, 1940 is resurrected from synonymy of *Pseudophryne*. It includes five species, three of which are formally named for the first time.

The new monotypic genus *Sloppophryne* gen. nov. is

formally erected to accommodate the divergent central Australian species, *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

The new genus *Crottyphryne* gen. nov. is formally erected to accommodate the newly described species *Crottyphryne crotalusei* sp. nov. and the closely related *Pseudophryne douglasi* Main, 1964, (including one newly named subspecies), both from the Pilbara region in Western Australia including some hilly areas immediately south.

All six preceding genera, all formerly treated as being *Pseudophryne sensu lato* are separated from all other Myobatrachid frogs as defined by Cogger (2014), by the following unique suite of characters: Pupil horizontal; tongue does not adhere to the floor of the mouth posteriorly; tongue is small and narrowly oval; prevomer is reduced or absent; vomerine teeth absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; maxillary teeth are absent; a large frontoparietal foramen in adults; phalanges are simple and there are no terminal discs on fingers or toes; no webbing; belly smooth and with black and white marbling; limbs are short, but otherwise more-or-less normal, adpressed hindlimb reaches the tympanic region or beyond; tympanum and middle ear structures are absent.

Furthermore, the species in the six preceding genera usually have moderately developed parotoid glands and their call is usually a short, harsh "squelch" sound.

The genus *Sloppophryne* gen. nov. is separated from the other five genera by the following suite of characters: No gland behind the thigh; inner metatarsal tubercle is moderate, low and not shovel-shaped; the outer metatarsal tubercle is small to moderate; inner toe has two phalanges.

The genus *Crottyphryne* gen. nov. is separated from the other five genera by the following suite of characters: Inner metatarsal tubercle is large and shovel-shaped; inner toe has two phalanges; outer metatarsal tubercle is small and conical; inner toe has two phalanges; skin dorsally has small conical warts.

The genus *Kankanophryne* Heyer and Liem, 1976 is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters: 1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx; or:

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges.

The genus *Pseudophryne* is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are small to

moderate and not shovel-shaped; inner toe has two phalanges; there is a gland on the distal half of the hind side of the thigh; and one or other of the following:

1/ Snout somewhat pointed and prominent; internarial distance is shorter than the distance between the nostril and the tip of the snout, or;

2/ The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface is as dark or darker than the sides and without a bright red or orange triangular patch on the crown (versus reddish dorsum, paler than sides or alternatively dark on top and with a bright red or orange triangular patch on the crown as seen for genus *Bufo* Girard, 1853).

The genus *Bufo* Girard, 1853 is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

The genus *Oxyphryne gen. nov.* is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; and there is a distinctive dorsal pattern of irregular alternate stripes of black and yellow unlike seen in any other Australian frogs. Both species are from Alpine areas of New South Wales and the Australian Capital Territory (ACT), with no specimens recorded from nearby parts of Victoria.

Distribution: The genus is only known from the Pilbara region of Western Australia, including hilly areas to the immediate south.

Etymology: The new genus *Crottyphryne gen. nov.* is named in honour of a deceased Great Dane / Rottweiler Cross named Crotalus (AKA Crotty), himself named after a North American genus of Pitviper, *Crotalus* Linnaeus, 1758, in recognition of nearly 13 years services in guarding our valuable wildlife breeding and research facility.

The “phryne”, suffix reflects the Latin word for toad. Hence “*Crottyphryne*”.

Content: *Crottyphryne crotalusei sp. nov.* (type species); *C. douglasi* (Main, 1964) (including one newly named subspecies, *C. douglasi oxyi subsp. nov.*).

OXYPHRYNE GEN. NOV.

LSIDurn:lsid:zoobank.org:act:D7F270AB-5D65-4C41-9AA7-C2BB25DA8825

Type species: *Pseudophryne corroboree* Moore, 1953.

Diagnosis: Until now (year 2020), the putative genera *Bufo* Girard, 1853, *Kankanophryne* Heyer and Liem, 1976 and *Gradwellia* Wells and Wellington, 1985 have been treated as synonyms of the earlier named genus *Pseudophryne* Fitzinger, 1843 (e.g. Donnellan, Mahony and Bertozzi 2012, Cogger, 2014, Anstis 2013).

In spite of the preceding, the molecular results published by Donnellan, Mahony and Bertozzi (2012), gave strong support for the contention that the genus *Pseudophryne* as currently understood should be divided six ways to better reflect the six divergent lineages or species groups.

In for the first time ever, formally recognizing the six obviously divergent species groups as new genera, the following nomenclatural acts are required or affirmed:

The genus *Pseudophryne*, with a type species of *Phrynosoma australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) is herein restricted to the clade including the type species and other similar forms from eastern Australia and south-eastern Australia.

The genus *Gradwellia* Wells and Wellington, 1985, with a type species of *Pseudophryne major* Parker, 1940, does represent a clade, with the associated species *Pseudophryne covacevichae* Ingram and Corben, 1994, but these two species in turn are (in my view) not sufficiently divergent genetically or morphologically from type *Pseudophryne* to warrant being placed in a separate genus or even subgenus and hence the name is synonymised within *Pseudophryne*. I do note however that the name *Gradwellia* is available according to provisions of relevant ICZN Codes as published.

The genus *Bufo* Girard, 1853, type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835) is resurrected to include that species and other related forms from coastal eastern Australia.

Closely related to *Bufo*, but sufficiently divergent both morphologically and in terms of time divergence, the so-called Corroboree Frogs, *Pseudophryne corroboree* Moore, 1953 and *Pseudophryne pengilleyi* Wells and Wellington, 1985, being closely related species, are placed within the newly erected genus *Oxyphryne gen. nov.*

The genus *Kankanophryne* Heyer and Liem, 1976, with a type species of *Pseudophryne occidentalis* Parker, 1940 is resurrected from synonymy of *Pseudophryne*. It includes five species, three of which are formally named for the first time.

The new monotypic genus *Sloppophryne gen. nov.* is formally erected to accommodate the divergent central Australian species, *Pseudophryne robinsoni* Donnellan, Mahony and Bertozzi, 2012.

The new genus *Crottyphryne gen. nov.* is formally erected to accommodate the newly described species *Crottyphryne crotalusei sp. nov.* and the closely related *Pseudophryne douglasi* Main, 1964, both from Western Australia.

All six preceding genera, all formerly treated as being *Pseudophryne sensu lato* are separated from all other Myobatrachid frogs as defined by Cogger (2014), by the following unique suite of characters: Pupil horizontal; tongue does not adhere to the floor of the mouth posteriorly; tongue is small and narrowly oval; prevomer is reduced or absent; vomerine teeth absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; maxillary teeth are absent; a large frontoparietal foramen in adults; phalanges are simple and there are no terminal discs on fingers or toes; no webbing; belly smooth and with black and white marbling; limbs are short, but otherwise more-or-less normal, adpressed hindlimb reaches the tympanic region or beyond; tympanum and middle ear structures are absent.

Furthermore, the species in the six preceding genera usually have moderately developed parotoid glands and their call is usually a short, harsh "squelch" sound.

The genus *Sloppophryne gen. nov.* is separated from the other five genera by the following suite of characters: No gland behind the thigh; inner metatarsal tubercle is moderate, low and not shovel-shaped; the outer metatarsal tubercle is small to moderate; inner toe has two phalanges.

The genus *Crottyphryne gen. nov.* is separated from the other five genera by the following suite of characters: Inner metatarsal tubercle is large and shovel-shaped; inner toe has two phalanges; outer metatarsal tubercle is small and conical; inner toe has two phalanges; skin dorsally has small conical warts.

The genus *Kankanophryne* Heyer and Liem, 1976 is separated from the other five genera by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx; or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges.

The genus *Pseudophryne* is separated from the other five genera by the following suite of characters:

Inner and outer metatarsal tubercles are small to moderate and not shovel-shaped; inner toe has two

phalanges; there is a gland on the distal half of the hind side of the thigh; and one or other of the following:

1/ Snout somewhat pointed and prominent; internarial distance is shorter than the distance between the nostril and the tip of the snout, or;

2/ The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface is as dark or darker than the sides and without a bright red or orange triangular patch on the crown (versus reddish dorsum, paler than sides or alternatively dark on top and with a bright red or orange triangular patch on the crown as seen for genus *Bufo* Girard, 1853).

The genus *Bufo* Girard, 1853 is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

The genus *Oxyphryne gen. nov.* is separated from the other five genera by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; and there is a distinctive dorsal pattern of irregular alternate stripes of black and yellow unlike seen in any other Australian frogs.

Distribution: Both species in the genus *Oxyphryne gen. nov.* are allopatric and from Alpine areas of New South Wales and the Australian Capital Territory (ACT), with no specimens recorded from nearby parts of Victoria.

Etymology: The new genus *Oxyphryne gen. nov.* is named in honour of a deceased Great Dane dog, named Oxyranus or "Oxy" for short. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. The "phryne", suffix reflects the Latin word for toad.

Oxyranus Kinghorn, 1923 is also a well known genus name for a group of highly venomous elapid snakes in Australasia, after which the dog was originally named.

Content: *Oxyphryne corroboree* (Moore, 1953) (type species); *O. pengillyi* (Wells and Wellington, 1985).

PSEUDOPHRYNE FITZINGER, 1843.

Type species: *Phrynisc(us) australis* (non Gray) Duméril and Bibron, 1841.

Diagnosis: See diagnosis for this genus within the preceding diagnosis for *Sloppophryne gen. nov.*

Distribution: Eastern Australia.

Content: *Pseudophryne semimarmorata* Lucas (1892) (type species) (including subspecies); *P. covacevichae* Ingram and Corben (1994); *P. bibronii* Günther, 1858; *P. dendyi* Lucas, 1892 (including subspecies); *P. jasminegranti sp. nov.*; *P. major* Parker, 1940; *P. martinekae sp. nov.*; *P. scottgranti sp. nov.*; *P. wellingtoni sp. nov.*; *P. wellsii sp. nov.* (including subspecies).

BUFONELLA GIRARD, 1853.

Type species: *Bufoella crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835).

Diagnosis: See diagnosis for this genus within the preceding diagnosis for *Sloppophryne gen. nov.*

Distribution: Eastern Australia.

Content: *Bufoella australis* (Gray, 1835) (type species); *B. coriacea* (Keferstein, 1868); *B. euanedwardsi sp. nov.*; *B. hoserae sp. nov.*; *B. raveni* (Ingram and Corben, 1994); *B. woolfi sp. nov.*

KANKANOPHRYNE HEYER AND LIEM, 1976.

Type species: *Pseudophryne occidentalis* Parker, 1940.

Diagnosis: See diagnosis for this genus within the preceding diagnosis for *Sloppophryne gen. nov.*

Distribution: South-western Western Australia, Australia.

Content: *Kankanophryne occidentalis* (Parker, 1940) (type species); *K. guentheri* (Boulenger, 1882); *K. katrinahoserae sp. nov.*; *K. marcdorsei sp. nov.*; *K. maxinehoserhoserae sp. nov.*

CROTTYPHRYNE CROTALUSEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:37243D61-3C4E-4E96-A836-2C1288533980

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R125741 collected from 200 metres south-east of Python Pool, Western Australia, Australia, Latitude -21.3392 S., Longitude 117.2366 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 R125741 collected from 200 metres south-east of Python Pool, Western Australia, Australia, Latitude -21.3392 S., Longitude 117.2366 E.

Diagnosis: Until now, *Crottyphryne crotalusei sp. nov.* was treated as a northern population of *C. douglasi* (Main, 1964). *C. crotalusei sp. nov.* is found north of the Fortescue River biogeographical barrier, whereas *C. douglasi* has a centre of distribution in

the Pilbara region south of the Fortescue River. Molecular results of Donnellan *et al.* (2012) confirm the species-level divergence of these two populations and it is in accordance with other hill dwelling taxa in the region, including monitors, pygopodids and elapids.

Examples include *Worrellisaurus acanthurus* (Boulenger, 1885) north of the Fortescue River and *W. dannybrowni* Hoser, 2018 (Hoser, 2018) south of the Fortescue River, *Pilbaravaranus pilbarensis* (Storr, 1980) north of the Fortescue River and *P. hamersleyensis* (Maryan *et al.* 2014) south of the Fortescue River, *Wellsopus elegans* (Kluge, 1974) to the south of the Fortescue River and *W. robwatsoni* Hoser, 2017 (Hoser, 2017) to the north of the Fortescue River, *Vermicella snelli* (Storr, 1967) to the south of the Fortescue River and *V. sloppi* Hoser, 2020 (Hoser, 2020d) to the north.

The taxon *C. douglasi oxyi subsp. nov.* from the Cape Range of Western Australia, while morphologically divergent and distributionally disjunct from the main Pilbara population of *C. douglasi* and speculated by Anstis (2013) to be a separate species, was shown by Donnellan *et al.* (2012) not to be particularly genetically divergent and is therefore conservatively described herein as a new subspecies.

Breeding isolation of the Cape Range population, means it will continue to evolve separately as a species and so by some definitions should already be treated as such.

The three preceding taxa, *Crottyphryne crotalusei sp. nov.*, *C. douglasi* (Main, 1964) and *C. douglasi oxyi subsp. nov.* herein comprising the entirety of the genus *Crottyphryne gen. nov.* are separated from one another, by the following three suites of characters:

1/ The type form of *C. douglasi* is characterised by having numerous large raised white or generally white tipped tubercles on the flanks and upper surfaces of the limbs and similar prominent white spotting on the underside of the gular region as well as beneath the eye and posterior to it, where the white spots are prominent. The iris is a bright orange colour. The orange patch on the snout between and anterior to the eyes is prominent and extends in some form to the supraciliary (above eye) region. Upper surfaces of the fore and hind limbs are dark brown with orange interspaces, with the scattered white spots referred to previously. White spotting on upper and lower lips is prominent and obvious.

The dorsum has a somewhat mottled colouration being a combination of ill defined areas of brick red to orange alternating with dark brown, being generally of a dark purplish or reddish colouration.

At the rear of the dorsum is an area of orange that is more or less triangular in shape and posterior to the forelimbs on the dorsum is a medium-sized semi-

distinct orange blotch of roughly circular shape on either side of the midline on the upper body. Upper arms are mainly orange and feet are mainly purplish. The type form of *C. douglasi* (*C. douglasi douglasi*) is depicted in life on page 649, bottom photo in Anstis (2013) and page 77, at top of Tyler (1992).

2/ *C. douglasi oxyi subsp. nov.* has limited raised white tubercles on the posterior lower flanks, but these are not distinct or well defined. Anterior to the eye and in stark contrast to *C. douglasi* there are no white spots of any form. The dorsum is a generally clean and well-defined pattern of mainly dark brown broken by a series of large orange blotches of irregular shape, but invariably including a large triangle at the rear and two large patches at the front of the body, each occupying the area above the axilla of the arms, with each patch being separated by darker pigment near the mid-dorsal area.

While *C. douglasi* also have the large triangle at the rear of the body on the dorsum in some form, anteriorly, *C. douglasi oxyi subsp. nov.* is readily separated from that species by the fact that the orange blotches posterior to the arms on the upper flank and nearby dorsum are large, well-defined and prominent. Upper arms of *C. douglasi oxyi subsp. nov.* are mainly light grey or pinkish, versus mainly orange in *C. douglasi douglasi*. Feet of *C. douglasi oxyi subsp. nov.* are mainly pink.

C. douglasi oxyi subsp. nov. is depicted in life on page 649, top photo in Anstis (2013).

3/ *C. crotalusei sp. nov.* differs from both *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* by being mainly pinkish dorsally, rather than mainly a dark or dull dark purple. The orange patch at the rear of the dorsum is elongate, rather than in the shape of a triangle with the broad edge at the anterior side as seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.*. In the area posterior to the forelimbs on the dorsum, the orange patches seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* are reduced to be simply tiny spots, usually in the form of raised orange tubercles, or alternatively are absent. Tubercles on the body, including the lower flanks tend to be the same colour as the surrounding skin, or if lighter are usually pinkish, rather than white as seen in *C. douglasi douglasi*.

C. douglasi douglasi and *C. crotalusei sp. nov.* have obvious raised orange patches on the upper surfaces of the forearms, which are absent in *C. douglasi oxyi subsp. nov.*

C. crotalusei sp. nov. have pink feet with strong purple peppering, giving them a pinkish-purple hue, somewhat intermediate between that seen in *C. douglasi oxyi subsp. nov.* (mainly pink) and *C. douglasi douglasi* (mainly purple).

The dorsum of *C. crotalusei sp. nov.* is a combination of areas of pink and purple forming an irregular and indistinct pattering. Anterior the colour is mainly pink,

becoming mainly purple at the rear, excluding the light orange region at the centre of the posterior part of the back.

Both *C. douglasi oxyi subsp. nov.* and *C. douglasi douglasi* have obvious orange colour on the upper snout anterior to the eyes. This is not the case in *C. crotalusei sp. nov.*. The snout of *C. crotalusei sp. nov.* is greyish pink, heavily peppered with dull purple.

C. crotalusei sp. nov. is depicted in life on plate 27 at top (image one) of Tyler, Smith and Johnstone (1994).

Photos of all three taxa, *Crottyphryne crotalusei sp. nov.*, *C. douglasi oxyi subsp. nov.* and *C. douglasi douglasi* can also be found on the website <http://www.flickr.com> by doing a search for "Pseudophryne douglasi".

Distribution: *Crottyphryne crotalusei sp. nov.* is known only from a limited area near the type locality, being north of the Fortescue River in the western part of the Pilbara Region. This area includes the Millstream Chichester National Park, including the region of the Upper Harding River.

Etymology: As for the genus *Crottyphryne gen. nov.*. The new species *C. crotalusei sp. nov.* is named in honour of a deceased Great Dane /Rottweiler Cross named Crotalus (AKA Crotty), himself named after a North American genus of Pitviper, *Crotalus* Linnaeus, 1758, in recognition of nearly 13 years services in guarding our valuable wildlife breeding and research facility. The addition of the letter "e" in the name (after the word "crotalus" and preceding the suffix "i") is deliberate and should not be removed.

CROTTYPHRYNE DOUGLASI OXYI SUBSP. NOV.
LSIDurn:lsid:zoobank.org:act:3DDDD5E6-52F9-4E77-B9F3-9AA2F85A25AC

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R104966 collected from 21 km north of Learmonth, Western Australia, Australia, Latitude -22.05 S., Longitude 114.0833 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 R104967, R104968, R104969, R104970, collected from 21 km north of Learmonth, Western Australia, Australia, Latitude -22.05 S., Longitude 114.0833 E.

Diagnosis: Until now, *Crottyphryne crotalusei sp. nov.* was treated as a northern population of *C. douglasi* (Main, 1964). *C. crotalusei sp. nov.* is found north of the Fortescue River biogeographical barrier, whereas *C. douglasi* has a centre of distribution in the Pilbara region south of the Fortescue River. Molecular results of Donnellan *et al.* (2012) confirm the species-level divergence of these two populations and it is in accordance with other hill dwelling taxa in

the region, including monitors, pygopodids and elapids.

Examples include *Worrellisaurus acanthurus* (Boulenger, 1885) north of the Fortescue River and *W. dannybrowni* Hoser, 2018 (Hoser, 2018) south of the Fortescue River, *Pilbaravaranus pilbarensis* (Storr, 1980) north of the Fortescue River and *P. hamersleyensis* (Maryan *et al.* 2014) south of the Fortescue River, *Wellsopus elegans* (Kluge, 1974) to the south of the Fortescue River and *W. robwatsoni* Hoser, 2017 (Hoser, 2017) to the north of the Fortescue River, *Vermicella snelli* (Storr, 1967) to the south of the Fortescue River and *V. sloppi* Hoser, 2020 (Hoser, 2020d) to the north.

The taxon *C. douglasi oxyi subsp. nov.* from the Cape Range of Western Australia, while morphologically divergent and distributionally disjunct from the main Pilbara population of *C. douglasi* and speculated by Anstis (2013) to be a separate species, was shown by Donnellan *et al.* (2012) not to be particularly genetically divergent and is therefore conservatively described herein as a new subspecies.

Breeding isolation of the Cape Range population, means it will continue to evolve separately as a species and so by some definitions should already be treated as such.

The three preceding taxa, *Crottyphryne crotalusei sp. nov.*, *C. douglasi* (Main, 1964) and *C. douglasi oxyi subsp. nov.* herein comprising the entirety of the genus *Crottyphryne gen. nov.* are separated from one another, by the following three suites of characters:

1/ The type form of *C. douglasi* is characterised by having numerous large raised white or generally white tipped tubercles on the flanks and upper surfaces of the limbs and similar prominent white spotting on the underside of the gular region as well as beneath the eye and posterior to it, where the white spots are prominent. The iris is a bright orange colour. The orange patch on the snout between and anterior to the eyes is prominent and extends in some form to the supraciliary (above eye) region. Upper surfaces of the fore and hind limbs are dark brown with orange interspaces, with the scattered white spots referred to previously. White spotting on upper and lower lips is prominent and obvious.

The dorsum has a somewhat mottled colouration being a combination of ill defined areas of brick red to orange alternating with dark brown, being generally of a dark purplish or reddish colouration.

At the rear of the dorsum is an area of orange that is more or less triangular in shape and posterior to the forelimbs on the dorsum is a medium-sized semi-distinct orange blotch of roughly circular shape on either side of the midline on the upper body. Upper arms are mainly orange and feet are mainly purplish.

The type form of *C. douglasi* (*C. douglasi douglasi*) is

depicted in life on page 649, bottom photo in Anstis (2013) and page 77, at top of Tyler (1992).

2/ *C. douglasi oxyi subsp. nov.* has limited raised white tubercles on the posterior lower flanks, but these are not distinct or well defined. Anterior to the eye and in stark contrast to *C. douglasi* there are no white spots of any form. The dorsum is a generally clean and well-defined pattern of mainly dark brown broken by a series of large orange blotches of irregular shape, but invariably including a large triangle at the rear and two large patches at the front of the body, each occupying the area above the axilla of the arms, with each patch being separated by darker pigment near the mid-dorsal area.

While *C. douglasi* also have the large triangle at the rear of the body on the dorsum in some form, anteriorly, *C. douglasi oxyi subsp. nov.* is readily separated from that species by the fact that the orange blotches posterior to the arms on the upper flank and nearby dorsum are large, well-defined and prominent. Upper arms of *C. douglasi oxyi subsp. nov.* are mainly light grey or pinkish, versus mainly orange in *C. douglasi douglasi*. Feet of *C. douglasi oxyi subsp. nov.* are mainly pink.

C. douglasi oxyi subsp. nov. is depicted in life on page 649, top photo in Anstis (2013).

3/ *C. crotalusei sp. nov.* differs from both *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* by being mainly pinkish dorsally, rather than mainly a dark or dull dark purple. The orange patch at the rear of the dorsum is elongate, rather than in the shape of a triangle with the broad edge at the anterior side as seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.*. In the area posterior to the forelimbs on the dorsum, the orange patches seen in *C. douglasi douglasi* and *C. douglasi oxyi subsp. nov.* are reduced to be simply tiny spots, usually in the form of raised orange tubercles, or alternatively are absent. Tubercles on the body, including the lower flanks tend to be the same colour as the surrounding skin, or if lighter are usually pinkish, rather than white as seen in *C. douglasi douglasi*.

C. douglasi douglasi and *C. crotalusei sp. nov.* have obvious raised orange patches on the upper surfaces of the forearms, which are absent in *C. douglasi oxyi subsp. nov.*

C. crotalusei sp. nov. have pink feet with strong purple peppering, giving them a pinkish-purple hue, somewhat intermediate between that seen in *C. douglasi oxyi subsp. nov.* (mainly pink) and *C. douglasi douglasi* (mainly purple).

The dorsum of *C. crotalusei sp. nov.* is a combination of areas of pink and purple forming an irregular and indistinct patterning. Anterior the colour is mainly pink, becoming mainly purple at the rear, excluding the light orange region at the centre of the posterior part of the back.

Both *C. douglasi oxyi subsp. nov.* and *C. douglasi*

douglasi have obvious orange colour on the upper snout anterior to the eyes. This is not the case in *C. crotalusei* sp. nov. The snout of *C. crotalusei* sp. nov. is greyish pink, heavily peppered with dull purple.

C. crotalusei sp. nov. is depicted in life on plate 27 at top (image one) of Tyler, Smith and Johnstone (1994).

Photos of all three taxa, *Crottyphryne crotalusei* sp. nov., *C. douglasi oxyi* subsp. nov. and *C. douglasi douglasi* can also be found on the website <http://www.flickr.com> by doing a search for "Pseudophryne douglasi".

Distribution: The newly described subspecies *C. douglasi oxyi* subsp. nov. is believed to be confined to the Cape Range of Western Australia. It is apparently separated from the main population of *C. douglasi douglasi* in the nearby Pilbara region by an apparently impenetrable barrier of generally sand dune habitat and/or flats.

Etymology: The new subspecies is named in honour of a deceased Great Dane dog, named Oxyuranus or "Oxy" for short. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. *Oxyuranus* Kinghorn, 1923 is also a well known genus name for a group of highly venomous elapid snakes in Australasia, after which the dog was originally named.

KANKANOPHRYNE MAXINEHOSERAE SP. NOV.
LSIDurn:lsid:zoobank.org:act:C0B8F846-BF5D-4B82-94EB-A0C3D4E3065E

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, specimen number R113774 collected from 66 km north of Leonora, Western Australia, Australia, Latitude -28.2 S., Longitude 121.3333 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, specimen numbers R113775 and R113776 collected from 66 km north of Leonora, Western Australia, Australia, Latitude -28.2 S., Longitude 121.3333 E.

Diagnosis: The species *Kankanophryne maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. have until now all been treated as populations of the widespread putative mainly south west Australian species *K. occidentalis* (Parker, 1940).

All can be readily separated from the only other species in the genus *K. guentheri* (Boulenger, 1882) known in most contemporary texts as "*Pseudophryne guentheri* Boulengeri, 1882", including in Cogger *et al.* (1983), Cogger (2014), Anstis (2013), Tyler *et al.* (1994) and Eipper and Rowland (2018), by the fact

that they lack the large shovel-shaped outer metatarsal tubercle seen in that species and that the inner toe has two phalanges, versus a single phalanx in *K. guentheri*.

K. occidentalis (Parker, 1940) is herein restricted to drier parts of the wheat belt in south-west Australia, excluding drier areas to the north and north east.

K. marcdorsei sp. nov. is generally confined to hilly and otherwise elevated areas north-east of Geraldton, Western Australia.

K. maxinehoserae sp. nov. occurs in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

K. katrinahoserae sp. nov. is currently only known from the area of the type locality, near Mount West, Western Australia, in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

The four species *K. occidentalis* (Parker, 1940), *K. maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. are separated from one another by the following unique suites of characters:
 1/ *K. occidentalis* (Parker, 1940) is has a generally dark chocolate brown to dark grey dorsum, overlain with indistinct reddish, reddish-brown or brown patches of pigment in an irregular manner. Anterior to the eyes and between them is a semidistinct lighter triangle of the lighter pigment colour. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are dark and with obvious pointed white-tipped tubercles. Tubercles on the upper hind limbs may or may not be white-tipped. Upper iris is dull orange. The dorsum has a large number of closely spaced relatively blunt tubercles, often darker than the nearby skin, with the entire dorsum more-or-less granular.

Upper lip, sides of snout (not dorsum) and below the eye are generally dark in colour, save for a few widely spaced tiny white-flecks or spots on upper jawline.

Toes are brownish.

2/ *K. marcdorsei* sp. nov. is readily identified by its dorsum being an irregular mixture of salmon pink and dark greyish-purple-brown. The percentages of each varies depending on the specimen, but is generally in the vicinity of fifty percent of each. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are darker, but could not be described as being dark, like in *K.*

occidentalis. Any pointed white-tipped tubercles if present on the forearms are few in number and tiny. Upper iris is bright orange. The light marking on the dorsum on the snout anterior to the eye is a distinctive salmon pink colour.

Toes are pink, with purplish speckling.

Tubercles on the back are dense and low.

3/ *K. maxinehoserae* sp. nov. is a lighter coloured frog with a yellowish and washed out greyish colouration. The light pigment anterior to the eye is beige in colour and expanded to occupy the entire area of the dorsum of the snout anterior to the eyes. The upper surface of the upper arm is yellow, yellowish-brown or also beige, not orange. Fore-feet are whitish.

The dorsum is mainly a light brownish-grey in colouration with scattered irregular patches of light yellow or beige on the upper surface, these not occupying most of the dorsum. Flanks are a light greyish colour and mainly uniform in texture. On both dorsum and flanks are scattered large pointed tubercles, usually lighter tipped, while the rest of the skin is more-or-less smooth (versus the mainly granular skin seen in both *K. marcdorsei* sp. nov. and *K. occidentalis*).

Upper iris a light yellowish-orange. Lower iris bright orange.

A live specimen of *K. maxinehoserae* sp. nov. is depicted in Cogger (2014) on page 107 (top, right) or online at:

<https://www.flickr.com/photos/toddburrows/6458477317/>

and

<https://www.flickr.com/photos/toddburrows/6458478511/>

4/ *K. katrinahoserae* sp. nov. is similar in most respects to *K. maxinehoserae* sp. nov. as described immediately above, and separated from the other species in the genus accordingly.

However *K. katrinahoserae* sp. nov. is separated from *K. maxinehoserae* sp. nov. by being a distinctively reddish coloured frog (versus yellowish-grey).

Lighter pigment areas on the upper snout and upper surfaces of the upper arms are pinkish-red, as opposed to being beige, yellow or yellowish-brown. Fore-feet are whitish-pink.

Upper and lower iris orange-red in colour.

Colour images of all five species within the genus *Kankanophryne* Heyer and Liem, 1976 can be found online on the website <http://www.flickr.com> by doing a search for "Pseudophryne occidentalis" for the four species previously treated as *K. occidentalis* and "Pseudophryne guentheri" for *K. guentheri* as defined within this paper.

The five species within the genus *Kankanophryne* Heyer and Liem, 1976 are separated from the other five genera formerly all treated as being within *Pseudophryne* Fitzinger, 1843 by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the

following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx (*K. guentheri*); or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges (*K. katrinahoserae* sp. nov., *K. marcdorsei* sp. nov., *K. maxinehoserae* sp. nov. and *K. occidentalis*).

Distribution: *Kankanophryne maxinehoserae* sp. nov. is known to occur in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

Etymology: Named in honour of Maxine Hoser of Margate, United Kingdom in recognition of her services to herpetology in my formative years in the 1960's.

KANKANOPHRYNE KATRINAHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:01A8B3E9-CD27-497B-9701-89B83FD87688

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, specimen number R115171 collected from 5 km south west of Mount West, Western Australia, Australia, Latitude -26.3038 S., Longitude 128.7966 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, specimen numbers R115170 and R115172 collected from 5 km south west of Mount West, Western Australia, Australia, Latitude -26.3038 S., Longitude 128.7966 E.

Diagnosis: The species *Kankanophryne maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. have until now all been treated as populations of the widespread putative mainly south west Australian species *K. occidentalis* (Parker, 1940).

All can be readily separated from the only other species in the genus *K. guentheri* (Boulenger, 1882) known in most contemporary texts as "*Pseudophryne guentheri* Boulengeri, 1882", including in Cogger *et al.* (1983), Cogger (2014), Anstis (2013), Tyler *et al.* (1994) and Eipper and Rowland (2018), by the fact that they lack the large shovel-shaped outer metatarsal tubercle seen in that species and that the inner toe has two phalanges, versus a single phalanx in *K. guentheri*.

K. occidentalis (Parker, 1940) is herein restricted to drier parts of the wheat belt in south-west Australia, excluding drier areas to the north and north east.

K. marcdorsei sp. nov. is generally confined to hilly and otherwise elevated areas north-east of Geraldton, Western Australia.

K. maxinehoserae sp. nov. occurs in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

K. katrinahoserae sp. nov. is currently only known from the area of the type locality, near Mount West, Western Australia, in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

The four species *K. occidentalis* (Parker, 1940), *K. maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. are separated from one another by the following unique suites of characters:

1/ *K. occidentalis* (Parker, 1940) is has a generally dark chocolate brown to dark grey dorsum, overlain with indistinct reddish, reddish-brown or brown patches of pigment in an irregular manner. Anterior to the eyes and between them is a semidistinct lighter triangle of the lighter pigment colour. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are dark and with obvious pointed white-tipped tubercles. Tubercles on the upper hind limbs may or may not be white-tipped. Upper iris is dull orange. The dorsum has a large number of closely spaced relatively blunt tubercles, often darker than the nearby skin, with the entire dorsum more-or-less granular.

Upper lip, sides of snout (not dorsum) and below the eye are generally dark in colour, save for a few widely spaced tiny white-flecks or spots on upper jawline.

Toes are brownish.

2/ *K. marcdorsei* sp. nov. is readily identified by its dorsum being an irregular mixture of salmon pink and dark greyish-purple-brown. The percentages of each varies depending on the specimen, but is generally in the vicinity of fifty percent of each. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are darker, but could not be described as being dark, like in *K.*

occidentalis. Any pointed white-tipped tubercles if present on the forearms are few in number and tiny. Upper iris is bright orange. The light marking on the dorsum on the snout anterior to the eye is a distinctive salmon pink colour.

Toes are pink, with purplish speckling.

Tubercles on the back are dense and low.

3/ *K. maxinehoserae* sp. nov. is a lighter coloured frog with a yellowish and washed out greyish colouration. The light pigment anterior to the eye is beige in colour and expanded to occupy the entire area of the dorsum of the snout anterior to the eyes. The upper surface of the upper arm is yellow, yellowish-brown or also beige, not orange. Fore-feet are whitish.

The dorsum is mainly a light brownish-grey in colouration with scattered irregular patches of light yellow or beige on the upper surface, these not occupying most of the dorsum. Flanks are a light greyish colour and mainly uniform in texture. On both dorsum and flanks are scattered large pointed tubercles, usually lighter tipped, while the rest of the skin is more-or-less smooth (versus the mainly granular skin seen in both *K. marcdorsei* sp. nov. and *K. occidentalis*).

Upper iris a light yellowish-orange. Lower iris bright orange.

4/ *K. katrinahoserae* sp. nov. is similar in most respects to *K. maxinehoserae* sp. nov. as described immediately above, and separated from the other species in the genus accordingly.

However *K. katrinahoserae* sp. nov. is separated from *K. maxinehoserae* sp. nov. by being a distinctively reddish coloured frog (versus yellowish-grey).

Lighter pigment areas on the upper snout and upper surfaces of the upper arms are pinkish-red, as opposed to being beige, yellow or yellowish-brown. Fore-feet are whitish-pink.

Upper and lower iris orange-red in colour.

Colour images of all five species within the genus *Kankanophryne* Heyer and Liem, 1976 can found online on the website <http://www.flickr.com> by doing a search for "Pseudophryne occidentalis" for the four species previously treated as *K. occidentalis* and "Pseudophryne guentheri" for *K. guentheri* as defined within this paper.

The five species within the genus *Kankanophryne* Heyer and Liem, 1976 are separated from the other five genera formerly all treated as being within *Pseudophryne* Fitzinger, 1843 by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx (*K. guentheri*); or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges (*K. katrinahoserae* sp. nov., *K. marcdorsei* sp. nov., *K. maxinehoserae* sp. nov. and *K. occidentalis*).

Distribution: *Kankanophryne katrinahoserae* sp. nov. is known only from the type locality in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

Etymology: Named in honour of my mother, Katrina Hoser originally of Dagenham, Essex, United Kingdom, but for most of her life, Sydney, New South

Wales, Australia (mainly Lane Cove, North Shore), in recognition of her many contributions to herpetology and wildlife conservation worldwide.

KANKANOPHRYNE MARCDORSEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:E082BC71-8D87-45CF-AB90-51B89B16FFDE

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R132638 collected from under some loose rocks in a soak at Koolanooka Spring, Western Australia, Australia, Latitude -29.1869 S., Longitude 116.6867 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 R132639, R132640, R132641 and R132642 all collected from under some loose rocks in a soak at Koolanooka Spring, Western Australia, Australia, Latitude -29.1869 S., Longitude 116.6867 E.

Diagnosis: The species *Kankanophryne maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. have until now all been treated as populations of the widespread putative mainly south west Australian species *K. occidentalis* (Parker, 1940).

All can be readily separated from the only other species in the genus *K. guentheri* (Boulenger, 1882) known in most contemporary texts as "*Pseudophryne guentheri* Boulengeri, 1882", including in Cogger *et al.* (1983), Cogger (2014), Anstis (2013), Tyler *et al.* (1994) and Eipper and Rowland (2018), by the fact that they lack the large shovel-shaped outer metatarsal tubercle seen in that species and that the inner toe has two phalanges, versus a single phalanx in *K. guentheri*.

K. occidentalis (Parker, 1940) is herein restricted to drier parts of the wheat belt in south-west Australia, excluding drier areas to the north and north east.

K. marcdorsei sp. nov. is generally confined to hilly and otherwise elevated areas north-east of Geraldton, Western Australia.

K. maxinehoserae sp. nov. occurs in a general line from Mount Magnet in the west, eastwards to near Leonora in Western Australia with a known distribution not extending far north or south of this line (as in no more than 200 km north or south of this line).

K. katrinahoserae sp. nov. is currently only known from the area of the type locality, near Mount West, Western Australia, in the western Tomkinson Ranges in the far east of Western Australia. It presumably occurs also in immediately adjacent parts of the range in the Northern Territory, Australia.

The four species *K. occidentalis* (Parker, 1940), *K. maxinehoserae* sp. nov., *K. katrinahoserae* sp. nov. and *K. marcdorsei* sp. nov. are separated from one

another by the following unique suites of characters: 1/ *K. occidentalis* (Parker, 1940) is has a generally dark chocolate brown to dark grey dorsum, overlain with indistinct reddish, reddish-brown or brown patches of pigment in an irregular manner. Anterior to the eyes and between them is a semidistinct lighter triangle of the lighter pigment colour. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are dark and with obvious pointed white-tipped tubercles. Tubercles on the upper hind limbs may or may not be white-tipped. Upper iris is dull orange. The dorsum has a large number of closely spaced relatively blunt tubercles, often darker than the nearby skin, with the entire dorsum more-or-less granular.

Upper lip, sides of snout (not dorsum) and below the eye are generally dark in colour, save for a few widely spaced tiny white-flecks or spots on upper jawline. Toes are brownish.

2/ *K. marcdorsei* sp. nov. is readily identified by its dorsum being an irregular mixture of salmon pink and dark greyish-purple-brown. The percentages of each varies depending on the specimen, but is generally in the vicinity of fifty percent of each. Upper forearms have a wide orange band occupying most of the upper surface. Lower forearms are darker, but could not be described as being dark, like in *K. occidentalis*. Any pointed white-tipped tubercles if present on the forearms are few in number and tiny. Upper iris is bright orange. The light marking on the dorsum on the snout anterior to the eye is a distinctive salmon pink colour.

Toes are pink, with purplish speckling.

Tubercles on the back are dense and low.

K. marcdorsei sp. nov. is depicted in life online at: https://www.flickr.com/photos/zimny_anders/37199032955

and

https://www.flickr.com/photos/zimny_anders/37199035155/

3/ *K. maxinehoserae* sp. nov. is a lighter coloured frog with a yellowish and washed out greyish colouration. The light pigment anterior to the eye is beige in colour and expanded to occupy the entire area of the dorsum of the snout anterior to the eyes. The upper surface of the upper arm is yellow, yellowish-brown or also beige, not orange. Fore-feet are whitish.

The dorsum is mainly a light brownish-grey in colouration with scattered irregular patches of light yellow or beige on the upper surface, these not occupying most of the dorsum. Flanks are a light greyish colour and mainly uniform in texture. On both dorsum and flanks are scattered large pointed tubercles, usually lighter tipped, while the rest of the skin is more-or-less smooth (versus the mainly granular skin seen in both *K. marcdorsei* sp. nov. and

K. occidentalis).

Upper iris a light yellowish-orange. Lower iris bright orange.

4/ *K. katrinahoseræ* sp. nov. is similar in most respects to *K. maxinehoseræ* sp. nov. as described immediately above, and separated from the other species in the genus accordingly.

However *K. katrinahoseræ* sp. nov. is separated from *K. maxinehoseræ* sp. nov. by being a distinctively reddish coloured frog (versus yellowish-grey).

Lighter pigment areas on the upper snout and upper surfaces of the upper arms are pinkish-red, as opposed to being beige, yellow or yellowish-brown. Fore-feet are whitish-pink.

Upper and lower iris orange-red in colour.

Colour images of all five species within the genus *Kankanophryne* Heyer and Liem, 1976 can found online on the website <http://www.flickr.com> by doing a search for "Pseudophryne occidentalis" for the four species previously treated as *K. occidentalis* and "Pseudophryne guentheri" for *K. guentheri* as defined within this paper.

The five species within the genus *Kankanophryne* Heyer and Liem, 1976 are separated from the other five genera formerly all treated as being within *Pseudophryne* Fitzinger, 1843 by the following suite of characters: Inner and outer metatarsal tubercles are large to moderate, often shovel-shaped; inner toe has one or two phalanges and one or other of the following suites of characters:

1/ Outer metatarsal tubercle large and shovel-shaped, a large inguinal gland; inner toe with a single phalanx (*K. guentheri*); or;

2/ Inner and outer metatarsal tubercles are moderate and not shovel-shaped; no gland behind the thigh; inner toe with two phalanges (*K. katrinahoseræ* sp. nov., *K. marcdorsei* sp. nov., *K. maxinehoseræ* sp. nov. and *K. occidentalis*).

Distribution: *Kankanophryne marcdorsei* sp. nov. is known only from hilly and otherwise elevated areas mainly north-east of Geraldton, Western Australia.

Etymology: Named in honour of Marc Dorse of Toowoomba, Queensland, Australia, previously of Mount Tamborine, Queensland, Australia, a wildlife demonstrator of some decades (Business name "Deadly Australians", Australian Registered Trademark number 797420, registered in 1999), in recognition of his services to education and wildlife conservation in Australia.

Dorse was the first person in the world to breed in captivity the little known freshwater turtle species *Wollumbinia purvisi* (Wells and Wellington, 1985). The more recent and widely posted claim by John Weigel and his privately owned zoo business, trading as the "Australian Reptile Park" to be the first in the world to breed this species (*Wollumbinia purvisi*) (e.g.

as posted at: <https://reptilepark.com.au/animals/reptiles/turtles-tortoises/manning-river-turtle/> is nothing more than a scam to entice well-meaning gullible people to donate money to his privately owned business masquerading as a charity. Trading on the plight of endangered wildlife by making false claims for personal profit, in order to scam cash from well-meaning but otherwise ill-informed people is ethically and morally repugnant!

BUFONELLA HOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:83D166B4-6E5B-4D8B-A991-2D12F7B39D59

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.155209, collected at Garrawarra Track, Royal National Park, New South Wales, Australia, Latitude -34.1750 S., Longitude 151.0442 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.155208 collected at Karloo Track, Royal National Park, at Heathcote, New South Wales, Australia, Latitude -34.0928 S., Longitude 151.0117 E.

2/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.148292 collected at Lady Carrington Drive, Royal National Park, Latitude -34.116 S., Longitude 151.050 E.

Diagnosis: The molecular evidence of Donnellan *et al.* (2012) supports the contention that *Bombinator australis* Gray, 1835, better known as *Pseudophryne australis* (Gray, 1835) and associated species from eastern Australia form a genus-level clade sufficiently divergent from the type species of *Pseudophryne* Fitzinger, 1843, namely *Phrynisc(us) australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) and species most closely related to this taxon, to be placed in a separate genus.

The genus name *Bufonella* Girard, 1853, with the type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835), from the sandstone regions within a 250 km radius of Sydney, New South Wales, Australia is resurrected to include that species and other related forms from coastal eastern Australia and therefore that name (*Bufonella*) is used herein. Since at least the 1970's it has been common knowledge that putative *Bufonella australis* (Gray, 1835) varies significantly between the three main sandstone bioregions surrounding Sydney.

Those from the North Shore, Northern Beaches and north, through the escarpments of the central coast to the south side of the Hunter Valley have long been known to differ from those from south in the Royal National Park, Heathcote State Park and adjoining

areas.

Specimens from the Blue Mountains, are most similar to those from the south, but appear to be potentially distributionally disjunct from them in a zone equating to the south-western Cumberland Plain and the elevated country to the south-west.

The northern population is apparently separated from the Blue Mountains population in the region of the Grose River Valley, Colo River, or Putty Road intrusion.

Morphological differences and/or distributional trends in putative species along similar lines to those seen in putative *Bufo* *australis* are seen in other species, such as Death Adders *Acanthopis antarcticus* (Shaw and Nodder, 1802), which are readily identified by region of origin (North, south or Blue Mountains), simply by appearance, or Broad-headed Snakes *Hoplocephalus bungaroides* (Schlegel, 1837), found in the southern area, consisting of the Royal National Park and Blue Mountains south-west, west and north-west of Sydney, but not in the northern sandstone regions of the North Shore, Northern Beaches, Central Coast or south of the Hunter Valley.

Stauber (1999) found significant genetic and morphological differences between the main populations of putative *Bufo* *australis* and this was confirmed by the molecular study of Donnellan *et al.* (2012).

Two synonym names are also available for *B. australis* and so with the decision made to formally name the three main populations, the issue became which names could be assigned to known populations and which if any needed to be formally named.

Viewing the very aged type of *Bufo* *australis* (from photos provided) indicate that it is from somewhere between Sydney and Newcastle and therefore applies to the northern form. The published history relating to the obtaining of the original type specimen also confirms this.

Bufo *crucifera* Girard, 1853 is also clearly of the northern form based on Girard's original published description of what is self-evidently a faded preserved specimen.

He wrote:

"17. *BUFONELLA CRUCIFERA*, G. Deep brown above; back dotted with yellow; a yellow spot at the origin of the arms; a yellow band across the head, over the eyelid, sending off a medial branch to the snout; a yellow dorsal vitta on the posterior half of the body. Beneath blackish brown, with large yellowish maculae under the head, belly and leg. Tip of fingers and toes yellow. Head and body elongated; former depressed; latter subcylindrical. First finger shorter than the second. Toes free. Metatarsal tubercles indistinct."

I draw attention to the words "back dotted with

yellow", the yellow being the orange colour seen in life, the dotting being a trait associated with the northern form.

The specimen of *Phrynosoma albifrons* Duméril, Bibron, and Duméril, 1854, (Erp. Gen., 9: plate 100 and p. 413) is also of the northern form.

This can be seen by the configuration of red on the back of the specimen in the illustration, being a configuration unique to the northern form.

On the basis of the preceding, it is the southern form and Blue Mountains form which are hitherto unnamed and herein formally described and named for the first time.

The three relevant taxa are separated from one another as follows:

1/ *B. australis* is readily separated from the other two taxa by having large prominent orange-red spots or larger markings all over the back, including the anterior region.

Little if any red is on the upper surface of the lower part of the forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband without any orange. The dorsum is generally dark and gun-metal greyish. The distinctive orange-red markings are strongly contrasting. Anterior and posterior to the eye is dark and the region between the jawline and the eye is nearly as dark.

The nominate form of *B. australis* is depicted on page 31 (top) of Hoser (1989) and Cogger (2014) on page 102 (bottom).

2/ *B. hoserae* *sp. nov.* is the species from the Royal National Park, Heathcote State Park and nearby areas, being the so-called southern form. It is readily separated from *B. australis* and the subspecies *B. hoserae sadlieri* *subsp. nov.* by having a mainly greyish-black back, with scattered black welts, sometimes tipped with tiny orange spots. Some specimens may have a broken orange medial line. There is rarely, if ever, any red on the lower forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a flush of orange on the distal side. The dorsum is generally greyish and any orange-red markings are not strongly contrasting, with the exception of any on the mid-dorsal line. Anterior and posterior to the eye is dark at the level of the top two thirds of the eye and the region between the jawline and the eye is much lighter, the boundary between the dark and light, being well defined and obvious.

3/ The subspecies *B. hoserae sadlieri* *subsp. nov.* from the Blue Mountains region is most easily separated from the other two taxa by having a large amount of orange on the upper surfaces of the limbs. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a prominent well-defined orange spot at the distal side. The back is generally a light grey with a strong

reddish-orange tinge throughout and the raised tubercles are a dull, rather than bright orange colour.

B. australis sometimes has red on the upper surfaces of the hind limbs, but this is always strictly restricted to the tubercles, which may be moderate in size.

B. hoserae sp. nov. sometimes has a small number of tiny red tubercles on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has both red tubercles (in this case, best defined as dull orange in colour as a means to differentiate it from *B. australis*) and brown markings or peppering on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has a light coloured upper lip and adjoining labial region, including the side of the snout anterior to the eye.

B. hoserae sp. nov. and *B. hoserae sadlieri* subsp. nov. both have a mid-flank noticeably lighter than the dorsum, versus not so in *B. australis*.

Numerous photos of all three taxa *B. australis*, *B. hoserae* sp. nov. and *B. hoserae sadlieri* subsp. nov. can be found at <http://www.flickr.com> by doing a search for “*Pseudophryne australis*”.

The genus *Bufo* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* gen. nov.); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *B. hoserae* sp. nov. occurs in the Royal National Park, Heathcote State Park and nearby areas of sandstone escarpment, generally south of the urbanized parts of the city of Sydney, New South Wales, Australia.

Etymology: This species is named in honour of my magnificent wife, Shireen Hoser, in recognition of more than 20 years of valuable contributions to herpetology in Australia and elsewhere.

BUFONELLA HOSERAE SADLIERI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:00623CCA-FB98-4970-AFFC-4C67090FBC7F

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.144613 collected at Valley Heights, lower Blue Mountains, New South Wales, Australia, Latitude -33.700 S., Longitude 150.583 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.149230, R.149231 and R.149232 collected from Tallwood Garden, Blaxland, New South Wales, Australia, Latitude -33.750 S., Longitude 150.616 E.

Diagnosis: The molecular evidence of Donnellan *et al.* (2012) supports the contention that *Bombinator australis* Gray, 1835, better known as *Pseudophryne australis* (Gray, 1835) and associated species from eastern Australia form a genus-level clade sufficiently divergent from the type species of *Pseudophryne* Fitzinger, 1843, namely *Phrynisc(us) australis* (non Gray) Duméril and Bibron, 1841 (= *Pseudophryne semimarmorata* Lucas, 1892) and species most closely related to this taxon, to be placed in a separate genus.

The genus name *Bufo* Girard, 1853, with the type species *B. crucifera* Girard, 1853 (= *Bombinator australis* Gray, 1835), better known as *Pseudophryne australis* (Gray, 1835), from the sandstone regions within a 250 km radius of Sydney, New South Wales, Australia is resurrected to include that species and other related forms from coastal eastern Australia and therefore that name (*Bufo*) is used herein. Since at least the 1970's it has been common knowledge that putative *Bufo australis* (Gray, 1835) varies significantly between the three main sandstone bioregions surrounding Sydney.

Those from the North Shore, Northern Beaches and north, through the escarpments of the central coast to the south side of the Hunter Valley have long been known to differ from those from south in the Royal National Park, Heathcote State Park and adjoining areas.

Specimens from the Blue Mountains, are most similar to those from the south, but appear to be potentially distributionally disjunct from them in a zone equating to the south-western Cumberland Plain and the elevated country to the south-west.

The northern population is apparently separated from the Blue Mountains population in the region of the Grose River Valley, Colo River, or Putty Road intrusion.

Morphological differences and/or distributional trends in putative species along similar lines to those seen in putative *Bufo australis* are seen in other species, such as Death Adders *Acanthopis antarcticus* (Shaw and Nodder, 1802), which are readily identified by region of origin (North, south or Blue Mountains), simply by appearance, or Broad-headed Snakes *Hoplocephalus bungaroides* (Schlegel, 1837), found in the southern area, consisting of the Royal National Park and Blue Mountains south-west, west and north-west of Sydney, but not in the northern sandstone regions of the North Shore, Northern Beaches, Central Coast or south of the Hunter Valley.

Stauber (1999) found significant genetic and morphological differences between the main populations of putative *Bufo australis* and this was confirmed by the molecular study of Donnellan *et al.* (2012).

Two synonym names are also available for *B. australis* and so with the decision made to formally name the three main populations, the issue became which names could be assigned to known populations and which if any needed to be formally named.

Viewing the very aged type of *Bufo australis* (from photos provided) indicate that it is from somewhere between Sydney and Newcastle and therefore applies to the northern form. The published history relating to the obtaining of the original type specimen also confirms this.

Bufo crucifera Girard, 1853 is also clearly of the northern form based on Girard's original published description of what is self-evidently a faded preserved specimen.

He wrote:

"17. *BUFONELLA CRUCIFERA*, G. Deep brown above; back dotted with yellow; a yellow spot at the origin of the arms; a yellow band across the head, over the eyelid, sending off a medial branch to the snout; a yellow dorsal vitta on the posterior half of the body. Beneath blackish brown, with large yellowish maculae under the head, belly and leg. Tip of fingers and toes yellow. Head and body elongated; former depressed; latter subcylindrical. First finger shorter than the second. Toes free. Metatarsal tubercles indistinct."

I draw attention to the words "back dotted with yellow", the yellow being the orange colour seen in life, the dotting being a trait associated with the northern form.

The specimen of *Phrynosoma albifrons* Duméril, Bibron, and Duméril, 1854, (Erp. Gen., 9: plate 100 and p. 413) is also of the northern form.

This can be seen by the configuration of red on the back of the specimen in the illustration, being a configuration unique to the northern form.

On the basis of the preceding, it is the southern form and Blue Mountains form which are hitherto unnamed and herein formally described and named for the first time.

The three relevant taxa are separated from one another as follows:

1/ *B. australis* is readily separated from the other two taxa by having large prominent orange-red spots or larger markings all over the back, including the anterior region.

Little if any red is on the upper surface of the lower part of the forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband without any orange. The dorsum is

generally dark and gun-metal greyish. The distinctive orange-red markings are strongly contrasting. Anterior and posterior to the eye is dark and the region between the jawline and the eye is nearly as dark.

The nominate form of *B. australis* is depicted on page 31 (top) of Hoser (1989) and Cogger (2014) on page 102 (bottom).

2/ *B. hoserae sp. nov.* is the species from the Royal National Park, Heathcote State Park and nearby areas, being the so-called southern form. It is readily separated from *B. australis* and the subspecies *B. hoserae sadlieri subsp. nov.* by having a mainly greyish-black back, with scattered black welts, sometimes tipped with tiny orange spots. Some specimens may have a broken orange medial line. There is rarely, if ever, any red on the lower forearm. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a flush of orange on the distal side. The dorsum is generally greyish and any orange-red markings are not strongly contrasting, with the exception of any on the mid-dorsal line. Anterior and posterior to the eye is dark at the level of the top two thirds of the eye and the region between the jawline and the eye is much lighter, the boundary between the dark and light, being well defined and obvious.

3/ The subspecies *B. hoserae sadlieri subsp. nov.* from the Blue Mountains region is most easily separated from the other two taxa by having a large amount of orange on the upper surfaces of the limbs. On the upper surface of the proximal part of the forearm is a wide white bar or crossband with a prominent well-defined orange spot at the distal side. The back is generally a light grey with a strong reddish-orange tinge throughout and the raised tubercles are a dull, rather than bright orange colour.

B. australis sometimes has red on the upper surfaces of the hind limbs, but this is always strictly restricted to the tubercles, which may be moderate in size.

B. hoserae sp. nov. sometimes has a small number of tiny red tubercles on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has both red tubercles (in this case, best defined as dull orange in colour as a means to differentiate it from *B. australis*) and brown markings or peppering on the upper surfaces of the hind limbs.

B. hoserae sadlieri subsp. nov. has a light coloured upper lip and adjoining labial region, including the side of the snout anterior to the eye.

B. hoserae sp. nov. and *B. hoserae sadlieri subsp. nov.* both have a mid-flank noticeably lighter than the dorsum, versus not so in *B. australis*.

Numerous photos of all three taxa *B. australis*, *B. hoserae sp. nov.* and *B. hoserae sadlieri subsp. nov.* can be found at <http://www.flickr.com> by doing a

search for "*Pseudophryne australis*".

The genus *Bufonella* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* *gen. nov.*); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *B. hoserae sadlieri* *sp. nov.* occurs in the sandstone escarpment country of the Blue Mountains in New South Wales, apparently bounded by the region of the Grose and Colo rivers and the Putty Road intrusion in the north-west and the Cumberland Plain in the south-west.

Etymology: The subspecies *B. hoserae sadlieri* *sp. nov.* is named in honour of Ross Sadlier of Sydney, New South Wales, who provided invaluable services to herpetologists over many years as collection manager at the Australian Museum in Sydney and also in recognition of his many other valuable contributions to herpetology globally, including in particular his extensive works on New Caledonian reptiles and more recently with John Cann (of La Perouse, New South Wales), doing important works on Australasian freshwater turtles (AKA terrapins).

BUFONELLA WOOLFI SP. NOV.

LSIDurn:lsid:zoobank.org:act:26CD52D2-C2E6-4B77-B77B-B49BCBCECF23A

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184192 collected from End Gap Creek Road, in the Watagan National Park, New South Wales, Australia, Latitude -33.0133 S., Longitude 151.4306 E. This government-owned facility allows access to its holdings.

Paratypes: 13 preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.184189, R.184190, R.184194, R.184195, R.184196, R.184197, R.184198, R.184199, R.184200, R.184201, R.184221, R.184913 and R.184915 all collected from near End Gap Creek Road, in the Watagan National Park, New South Wales, Australia, Latitude -33.0133 S., Longitude 151.4306 E.

Diagnosis: *Bufonella woolfi* *sp. nov.* from the Watagan ranges south of the Hunter River in New South Wales, generally situated between the upper Hunter River catchment and the Tuggerah Lakes and *B. euanedwardsi* *sp. nov.* from far south-east

Queensland, north or west of the Scenic Rim, have both until now been treated as putative *B. coriacea* Keferstein, 1868 with a type locality of Clarence River (Northern) New South Wales, and treated here as extending from north of Newcastle, New South Wales along the coast and nearby ranges to the McPherson Ranges on the Queensland and New South Wales border.

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

B. coriacea has a dark charcoal black colour on the flanks, with the lower flank becoming a light grey. By contrast the entire flank is jet black in *B. woolfi* *sp. nov.*. The flank is dark blackish brown in *B. euanedwardsi* *sp. nov.*.

If present, any orange patches on the sides of the body of *B. woolfi* *sp. nov.* are well defined, sometimes being all or partially bounded by white, versus ill defined in both *B. coriacea* and *B. euanedwardsi* *sp. nov.*.

The dorsum of *B. coriacea* is reddish-brown with a large number of medium sized dark brownish black spots and blotches scattered across most parts of the dorsum. *B. woolfi* *sp. nov.* has few if any such spots or blotches and if present, they are invariably very small.

B. euanedwardsi *sp. nov.* has an orange-red or brownish back, punctuated with a series of carbuncles or ridges on the dorsum away from the mid-dorsal line. These raised areas are a dull brownish colour with ill defined boundaries in terms of color fading into that of the otherwise orange-red or brownish dorsum.

In *B. euanedwardsi* *sp. nov.* the numerous tiny tubercles on the upper body are similarly a dull brownish colour (not being white tipped at all), giving the appearance of numerous tiny brown spots on the upper surface of the body. In *B. coriacea* these tubercles are tipped in various colours in a single specimen, while in *B. woolfi* *sp. nov.* the tiny tubercles are all white tipped, giving the frog an appearance of being covered in tiny white specks.

The upper-lip area of the snout anterior to the eye, is almost entirely black in *B. woolfi* *sp. nov.*, heavily peppered charcoal in *B. coriacea* and brown in *B. euanedwardsi* *sp. nov.*.

On the upper surface of the upper arm, *B. woolfi* *sp. nov.* has well defined areas of white near the axilla and dark reddish orange distally, *B. coriacea* has a tiny amount of white near the axilla and brownish orange distally, while *B. euanedwardsi* *sp. nov.* has yellow near the axilla and an ill defined area of dull orange-brown distally.

B. woolfi *sp. nov.* is further separated from the other two species by having prominent, tiny white tipped tubercles on the upper surfaces of the dark coloured lower forearm, giving the appearance of tiny, white spots.

All three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. are readily separated from all other species of *Bufo* Girard, 1853 by lacking a bright red or orange triangular patch on the crown (*B. australis* (Gray, 1835), *B. hoserae* sp. nov. including one subspecies) and having generally dark flanks, versus one that has a thick black line at the upper part and light grey below as seen in *B. raveni* (Ingram and Corben, 1994).

Photos of all three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. can be found online at <http://www.flickr.com> by typing in the search term "Pseudophryne coriacea".

The genus *Bufo* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* gen. nov.); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *Bufo woolfi* sp. nov. is only known from the Watagan ranges south of the Hunter River in New South Wales, generally situated between the upper Hunter River catchment and the Tuggerah Lakes.

Etymology: *Bufo woolfi* sp. nov. is named in honour of Paul Woolf of Walloon in Queensland, Australia, foundation president of the Herpetological Society of Queensland, in recognition of many largely unrecognized contributions to herpetology in Australia over a time frame exceeding three decades.

BUFONELLA EUANEDWARDSI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:839F7291-C5BD-4DDB-97E2-7EEF6180984C

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R33655, collected from 23 km east of Emu Vale, south-east Queensland, Australia, Latitude -28.20 S., Longitude 152.47 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R33653, R33654 and R33656, all collected from 23 km east of Emu Vale, south-east Queensland, Australia, Latitude -28.20 S., Longitude 152.47 E.

Diagnosis: *Bufo woolfi* sp. nov. from the Watagan ranges south of the Hunter River in New

South Wales, generally situated between the upper Hunter River catchment and the Tuggerah Lakes and *B. euanedwardsi* sp. nov. from far south-east Queensland, north or west of the Scenic Rim, have both until now been treated as putative *B. coriacea* Keferstein, 1868 with a type locality of Clarence River (Northern) New South Wales, and treated here as extending from north of Newcastle, New South Wales along the coast and nearby ranges to the McPherson Ranges on the Queensland and New South Wales border.

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

B. coriacea has a dark charcoal black colour on the flanks, with the lower flank becoming a light grey. By contrast the entire flank is jet black in *B. woolfi* sp. nov.. The flank is dark blackish brown in *B. euanedwardsi* sp. nov..

If present, any orange patches on the sides of the body of *B. woolfi* sp. nov. are well defined, sometimes being all or partially bounded by white, versus ill defined in both *B. coriacea* and *B. euanedwardsi* sp. nov..

The dorsum of *B. coriacea* is reddish-brown with a large number of medium sized dark brownish black spots and blotches scattered across most parts of the dorsum. *B. woolfi* sp. nov. has few if any such spots or blotches and if present, they are invariably very small.

B. euanedwardsi sp. nov. has an orange-red or brownish back, punctuated with a series of carbuncles or ridges on the dorsum away from the mid-dorsal line. These raised areas are a dull brownish colour with ill defined boundaries in terms of color fading into that of the otherwise orange-red or brownish dorsum.

In *B. euanedwardsi* sp. nov. the numerous tiny tubercles on the upper body are similarly a dull brownish colour (not being white tipped at all), giving the appearance of numerous tiny brown spots on the upper surface of the body. In *B. coriacea* these tubercles are tipped in various colours in a single specimen, while in *B. woolfi* sp. nov. the tiny tubercles are all white tipped, giving the frog an appearance of being covered in tiny white specks.

The upper-lip area of the snout anterior to the eye, is almost entirely black in *B. woolfi* sp. nov., heavily peppered charcoal in *B. coriacea* and brown in *B. euanedwardsi* sp. nov..

On the upper surface of the upper arm, *B. woolfi* sp. nov. has well defined areas of white near the axilla and dark reddish orange distally, *B. coriacea* has a tiny amount of white near the axilla and brownish orange distally, while *B. euanedwardsi* sp. nov. has yellow near the axilla and an ill defined area of dull orange-brown distally.

B. woolfi sp. nov. is further separated from the other two species by having prominent, tiny white tipped

tubercles on the upper surfaces of the dark coloured lower forearm, giving the appearance of tiny, white spots.

All three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. are readily separated from all other species of *Bufo* Girard, 1853 by lacking a bright red or orange triangular patch on the crown (*B. australis* (Gray, 1835), *B. hoserae* sp. nov. including one subspecies) and having generally dark flanks, versus one that has a thick black line at the upper part and light grey below as seen in *B. raveni* (Ingram and Corben, 1994).

Photos of all three species, *B. coriacea*, *B. woolfi* sp. nov. and *B. euanedwardsi* sp. nov. can be found online at <http://www.flickr.com> by typing in the search term "Pseudophryne coriacea".

The genus *Bufo* Girard, 1853 as defined in this paper, is separated from the other five genera (all formerly treated as being within *Pseudophryne* Fitzinger, 1843 (*sensu* Cogger 2014 or Anstis 2013) by the following suite of characters: The snout is rounded, not prominent; internarial distance is greater than the distance between the nostril and the tip of the snout; there is not a dorsal pattern of irregular alternate stripes of black and yellow (as seen in genus *Oxyphryne* gen. nov.); dorsal surface reddish dorsum, paler than the sides or alternatively dark on top and with a bright red or orange triangular patch on the crown, (versus as dark or darker on top than on the sides and without a bright red or orange triangular patch on the crown in genus *Pseudophryne*).

Distribution: *B. euanedwardsi* sp. nov. is currently only known from far south-east Queensland, Australia, north or west of the Scenic Rim.

Etymology: The species *B. euanedwardsi* sp. nov. is named in honour of Euan Edwards, who in year 2020 is a licensed wildlife demonstrator based on the Gold Coast, Queensland, Australia in appreciation of his largely unrecognized significant contributions to herpetology globally, spanning more than 30 years.

PSEUDOPHRYNE SCOTTGRANTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:A2C19FB5-8375-47DA-81F0-53FEF3292035

Holotype: A preserved male specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R39881 collected from 2.5 km west of Kelly Hill Caves, Kangaroo Island, South Australia, Australia, Latitude -35.98 S., Longitude 136.85 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R11690 collected from 17 miles west of Parndana, Kangaroo Island, South Australia, Australia, Latitude -35.80 S., Longitude 136.97 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibroni* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a

few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:
<https://www.flickr.com/photos/hierofalco/49910594073/>

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New

South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at: <https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum

and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axila, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/> and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni subsp. nov.*), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. scottgranti sp. nov.* is known only from Kangaroo Island in South Australia, where it appears to be common.

Etymology: *P. scottgranti sp. nov.* is named in honour of Scott Grant, owner of the Eyre Reptile and Wildlife Park, Lincoln Hwy, Whyalla, South Australia, Australia, formerly of Victoria, Australia in recognition of his services to wildlife conservation and education in Australia.

Scott Grant, along with wife Jasmine Grant operates his tourist attraction in a business space dominated by dysfunctional government-owned and government-backed zoos who operate in a ruthless manner to hobble and disable those businesses they see as competing against them. Scandalously, these government-backed businesses masquerade as wildlife charities to scam money from well-meaning members of the public, often including deceased estates and other large bequeathments, with most of these funds actually being diverted away from wildlife conservation purposes.

By using excessive corrupt over-regulation by the wildlife authority departments they control, the government backed zoo businesses, make running any successful form of wildlife education or conservation business, including that of Scott and Jasmine Grant, in an ethical way near impossible in Australia.

PSEUDOPHRYNE JASMINEGRANTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:E1AD47B3-FD15-4B21-A6E2-FD1B08A26DC6

Holotype: A preserved male specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R39894, collected from Mookra Tower, northern Flinders Ranges, South Australia, Australia, Latitude -32.38 S., Longitude 138.40 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 R39892 and R39893, collected from Mookra Tower, northern Flinders Ranges, South Australia, Australia, Latitude -32.38 S., Longitude 138.40 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti sp. nov.* from Kangaroo Island in South Australia and *P. jasminegrantae sp. nov.* from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti sp. nov.*; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti sp. nov.* and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely

spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegranta* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegranta* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov.

which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegranta* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegranta sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegranta* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded

tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump.

Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A

bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at: <https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of

snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at: <https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/> and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is

separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi sp. nov.*. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni (P. wellingtoni wellingtoni subsp. nov.)*, but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. jasminegrantae sp. nov.* occurs from the the Adelaide Hills in the south, north to include most of the Flinders Ranges in South Australia.

Etymology: *P. jasminegrantae sp. nov.* is named in honour of Jasmine Grant, wife of Scott Grant, the owner of the Eyre Reptile and Wildlife Park, Lincoln Hwy, Whyalla, South Australia, Australia, formerly of Victoria, Australia in recognition of her appreciated services to wildlife conservation and education in Australia.

PSEUDOPHRYNE MARTINEKAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:D6E3EF26-48FD-4BB8-AE80-14A226A1B600

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R45983, collected from 2.8 km west south-west of the Duck Island Homestead, South Australia, Australia, Latitude -36.2453 S., Longitude 140.0908 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 R27772 and R27773, collected from the Gum Lagoon Conservation Park, South Australia, Australia, Latitude -36.30 S., Longitude 140.08 E. This government-owned facility allows access to its holdings.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti sp. nov.* from Kangaroo Island in South Australia and *P. jasminegrantae sp. nov.* from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti sp. nov.*; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti sp. nov.* and all other species previously treated as *P. bibroni* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large

and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov.

which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered

with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump.

Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South

Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-

brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsii sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsii* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/> and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. martinekae* sp. nov. occurs in the sandy swamp areas of south-east South Australia and nearby parts of north-west and northern Victoria, through areas such as Bendigo and into south-west New South Wales, mainly on the western slopes and as far north as about Dubbo in central western New South Wales.

Etymology: *P. martinekae* sp. nov. is named in honour of Maryann Martinek of Bendigo, Victoria,

Australia for services to crime investigation and wildlife conservation in Australia as detailed by Hoser (2010).

PSEUDOPHRYNE WELLSI SP. NOV.

LSIDurn:lsid:zoobank.org:act:42371255-3C1E-4E04-A421-B8B28FBC61D1

Holotype: A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.158010 collected from Robinsons Crossing, North of Hawks Nest, Myall Lakes National Park, New South Wales, Australia, Latitude -32.6036 S., Longitude 152.2339 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ Two preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.158011 and R.158012 collected from Robinsons Crossing, North of Hawks Nest, Myall Lakes National Park, New South Wales, Australia, Latitude -32.6036 S., Longitude 152.2339 E. 2/ Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.184183, R.184184 and R.184395 all collected from Napiac, New South Wales, Australia, Latitude -32.1487 S., Longitude 152.4108 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of

upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region

between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an

obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange.

Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at:

<https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a

longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi sp. nov.*. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni (P. wellingtoni wellingtoni subsp. nov.)*, but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. wellsi sp. nov.* is found in and around

coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour in New South Wales, Australia.

Etymology: *P. wellsi sp. nov.* is named in honour of Richard W. Wells of Lismore, New South Wales, Australia, formerly of Cowra, New South Wales and previous to that Sydney, New South Wales, in recognition of his immense services to herpetology in Australia. While best known for his landmark publications Wells and Wellington (1984 and 1985) his contributions to herpetology go well beyond these papers both before and since the time they were published. Over many years he donated many thousands of valuable reptile specimens to the Australian Museum in Sydney, Australia, those specimens having been lynchpins of countless herpetological studies in the last 4 decades.

PSEUDOPHRYNE WELLINGTONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:7A5D6A2D-1FA5-4BB4-A546-7FEC9AF42015

Holotype: A preserved specimen at the American Museum of Natural History, on the Upper West Side of Manhattan, New York City, USA, specimen number AMNH 65160 collected at an elevation of about 1,364 m from Ben Lomond in New South Wales, Australia, Latitude 30.0210 S., Longitude 151.659° E. This facility allows access to its holdings.

Paratypes: 1/ Six preserved specimens at American Museum of Natural History, on the Upper West Side of Manhattan, New York City, USA, specimen numbers AMNH 65161-65166 from the same location as the holotype. 2/ Five preserved specimens at American Museum of Natural History, on the Upper West Side of Manhattan, New York City, USA, specimen numbers AMNH 65155-65159 collected from Booroolong Creek, 20 miles northwest of Armidale, New South Wales, Australia, Latitude 30.285 S., Longitude 151.556 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus

heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a

unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibronii*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-

brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at:

<https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey.

Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>
and

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/23031163@N03/11061312714>
and

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish

white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>
and

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. wellingtoni* sp. nov. is found in the New England tablelands region of northern New South Wales, Australia and believed to occur in hilly regions to the immediate west.

Etymology: *P. wellingtoni* sp. nov. is named in honour of Cliff Ross Wellington of Ramornie, New South Wales, Australia, (about 485 km north of Sydney), previously of Woy Woy, New South Wales, Australia in recognition of his immense services to herpetology in Australia. While best known for his co-authorship of landmark publications Wells and Wellington (1984 and 1985) his contributions to herpetology go well beyond these papers both before and since the time they were published, including numerous other important published works and services to conservation.

They include his petitioning the ICZN to stamp out the nefarious and dishonest practice of taxonomic vandalism and numerous conservation programs for rare and threatened species in New South Wales, especially in relation to frogs.

Wellington was also the first herpetologist in the world to demonstrate the significance of toxic chemicals in waterways inhibiting the spread of Chytrid fungus and thereby inadvertently helping vulnerable species of frogs evade extinction caused by the same fungus. This included several species from the Sydney and Blue Mountains regions of New South Wales.

PSEUDOPHRYNE WELLINGTONI KAPUTARENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:830305AB-97EE-459C-8D39-658B7501E8B4

Holotype: A preserved male specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184786 collected from Mount Kaputar National Park, New South Wales, Australia, Latitude -30.2825 S., Longitude 150.1715 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.112846, R184636 and R.184787 (a male), all collected from Mount Kaputar National Park, NSW, Australia, with an approximate Latitude -30.2825 S., Long. 150.1715 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a

few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibroni*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New

South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum

and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axila, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>
and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axila of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axila of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>
and

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. wellingtoni kaputarensis* sp. nov. is presently only known from the Mount Kaputar National Park in northern (inland) New South Wales. Though range restricted, it is not believed to be under any existential threat and all specimens found to date have been within a National Park.

Etymology: The subspecies *P. wellingtoni kaputarensis* sp. nov. is named in reflection of where it comes from, being Mount Kaputar National Park or Kaputar as it is often referred to.

PSEUDOPHYRNE DENDYI MENSFORTHI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:3A7011B4-EE41-460B-8E25-F5537E2985D0

Holotype: A preserved male specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R40871 collected from 32km North of the Abercrombie River, on the Oberon/Taralga Road, New South Wales, Australia. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.68462, R.68463, R.68464 and R.68465 all collected 6.4 km north of Shooters Hill on the Oberon Road, New South Wales, Australia, Lat. -33.866 S., Long. 149.866 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov..

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a

few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibroni*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump. Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New

South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange. Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at: <https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum

and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>
and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged into any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axilla of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at: <https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axilla of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. dendyi mensforthi* subsp. nov. until now treated as putative *P. bibronii*, occurs in high elevation areas north of the alpine areas of Victoria and New South Wales as far north as at least Lithgow in New South Wales (see Hoser, 1989 at page 31), generally west of the coastal strip and east of the lower western slopes.

Etymology: *P. dendyi mensforthi* subsp. nov. is named in honour of Tim Mensforth of Ultimate Reptile Suppliers, Burton (Adelaide), South Australia, Australia, for services to herpetology over many decades, including through captive breeding of large numbers of sought after reptiles for the Australian pet trade, thereby reducing collecting pressure on wild animals.

His business Ultimate Reptile Suppliers, better known as URS has pioneered the commercialization and mass sale of important aids for reptile keepers, thereby improving welfare of captive animals and thereby improving the collective efforts of many otherwise disconnected people in breeding and conserving the relevant species including at times for re-release into the wild of severely depleted populations.

PSEUDOPHRYNE SEMIMARMORATA BURRELLI SUBSP, NOV.

LSIDurn:lsid:zoobank.org:act:8D16E354-1C65-4895-91DC-0845271CD0EF

Holotype: A preserved female specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R39942, collected from the Beetaloo Reservoir Catchment, north-west of the reservoir, South Australia, Australia, Latitude -33.18 S., Longitude 138.20 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 R16258 and R16259 collected from Horsnell Gully Conservation Park, South Australia, Australia, Latitude -34.93 S., Longitude 138.72 E.

Diagnosis: The putative species, *Pseudophryne bibronii* Günther, 1858 has sometimes been treated as including the closely related species *P. dendyi* Lucas, 1872 from alpine areas in Victoria and New South Wales and *P. semimarmorata* Lucas, 1872 from southern Victoria and Tasmania.

As a species complex they are found in south-eastern Australia in a crescent from south-east Queensland, south to include Tasmania and across to south-east South Australia.

All are separated from the rest of the genus (as defined in this paper), namely *P. covacevichae* Ingram and Corben, 1994 and the closely related *P. major* Parker, 1940, with a distribution centred on eastern Queensland, intruding into the far north of New South Wales, by having dorsolaterally directed nostrils (versus nostrils pointing up vertically), belly and throat granular in males (versus not so) and lower limbs not heavily spotted with white (versus heavily spotted with white).

Both *P. scottgranti* sp. nov. from Kangaroo Island in South Australia and *P. jasminegrantae* sp. nov. from the Adelaide Hills and Flinders Ranges in South Australia are separated from all other species previously included in putative *P. bibronii* by the following unique suite of characters: Border of orange marking on upper surfaces of upper arm is not well defined; body pattern is brown to beige with light orange welts on the dorsum arranged in a series of at least five broken lines, running down the dorsum, these being reduced to mainly tight spaced unevenly shaped tubercles in *P. scottgranti* sp. nov.; anterior of upper snout is light orange; upper lip is light in colour and peppered; males with large and prominent spikey tubercles on the lower forearms.

P. jasminegrantae sp. nov. is separated from both *P. scottgranti* sp. nov. and all other species previously treated as *P. bibronii* by having a thick, dark well defined or moderately defined line running from the snout, through the nostril to the eye, but not proceeding posterior to it; welts on the back are large

and spaced, versus small, numerous and closely spaced in *P. scottgranti* sp. nov., where most welts are reduced to become a series of tiny and unevenly shaped tubercles.

P. scottgranti sp. nov. has a yellow to yellow-orange upper iris, versus bright orange in *P. jasminegrantae* sp. nov.

The entire region bound by the eyes and tip of the snout on the upper snout is more-or-less entirely light orange in colour in *P. jasminegrantae* sp. nov., versus only at the tip of the snout in *P. scottgranti* sp. nov. which has most of the front of the upper snout a beige colour. Most welts or tubercles in *P. jasminegrantae* sp. nov. are surrounded by dark blackish-brown pigment. In *P. scottgranti* sp. nov. most tubercles and welts are not surrounded by dark blackish-brown pigment, this being restricted to just a few or none.

P. scottgranti sp. nov. is depicted in Anstis (2013) on page 635 at top right.

P. jasminegrantae sp. nov. is depicted in Anstis (2013) on page 635 at top left and the photo beneath it.

Pseudophryne semimarmorata Lucas, 1872 of the nominate form, with a type locality of the Grampians in Western Victoria is found throughout southern Victoria, Tasmania and far south-eastern South Australia. It is readily separated from all other species in the *P. bibronii* complex as described herein by the following suite of characters: Snout is prominent and pointed (versus rounded) and internarial distance is shorter than the distance between the nostril and the snout; dorsolaterally facing nostrils; belly and throat smooth in females or coarsely granular in males; lower surfaces of limbs are uniformly flesh coloured or orange. Dorsum is a unique combination of being dark olive-green to dark brown above, with irregular darker flecks or small spots. Chest and anterior part of the belly is boldly marked with black and white. Prominent on each hindlimb is a large light brown or orange gland. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsii* sp. nov.).

P. semimarmorata is depicted in life in Cogger (2014) on page 109 top right and Anstis (2013) on page 665 (on right).

P. semimarmorata burrelli subsp. nov. from a region between Adelaide and Port Pirie, in South Australia in close proximity to *P. jasminegrantae* sp. nov. (but usually occupying areas of lower elevation) is morphologically similar to the type form of *P. bibronii*, but is most readily separated from that species and all others in the species complex by the following suite of characters: The dorsal colour is a more-or-less chocolate brown to grey, any markings are invariably very indistinct. The dorsum is also covered

with red, orange or simply darker coloured rounded tubercles which are evenly close spaced across the surface. Orange-brown iris. Inner metatarsal tubercle is small and flat (versus rounded in *P. bibronii*, *P. dendyi* (including subspecies), *P. martinekae* sp. nov., *P. wellingtoni* sp. nov. (including subspecies) and *P. wellsi* sp. nov.).

While this population appears to be disjunct from the main population of *P. semimarmorata* from south-east South Australia, Victoria and Tasmania and is also very morphologically divergent, the genetic evidence of Donnellan *et al.* (2012) indicates recent divergence and so they are treated herein as a subspecies.

P. semimarmorata burrelli subsp. nov. in life is depicted online at:

https://www.flickr.com/photos/hierofalco_/49910594073/

and

<https://www.flickr.com/photos/23031163@N03/28352838155/>

Pseudophryne martinekae sp. nov. includes putative *P. bibroni*, from drier areas of north-west Victoria and south-west New South Wales, generally south of Dubbo and including the south-western slopes, including nearby parts of south-east South Australia. It is readily separated from all other species in the complex by the following suite of characters: A dorsum that is mainly beige or light yellow-brown, with a limited amount of medium brown pigment in the form of large irregularly shaped blotches, which are mainly on the posterior part of the rump.

Overlaying this are irregular tubercles and welts, the large ones being orange in colour. The upper flank has a series of indistinct darker brown blotches extending from above the forearm along the upper flank towards the groin. Arms and legs are yellowish-brown or beige, with a limited number of small dark brown spots or blotches and widely scattered tiny orange spots. No obvious tubercles on forearms. Moderate-sized tubercles on the upper surfaces of the middle hindlimbs are not coloured in any way, save for some scattered tiny ones which are nothing more than orange specks. Iris is yellow. Toes are light translucent yellow.

Snout and sides of head are beige with limited amounts of dark or orange flecks.

While the upper surface of the upper arm is a slightly more brilliant yellowish brown than the lower forearms or the dorsum, this is not in the form of an obvious band, bar or colour patch in that the demarcation is not well defined.

Pseudophryne martinekae sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/88708273@N03/18232780929/>

Pseudophryne dendyi Lucas, 1892 from high elevation areas of Victoria and adjacent New South

Wales is readily separated from all other species in the complex by the following suite of characters: A bright yellow patch covering the top of the upper arm, and extending to the elbow; usually some yellow spots or patches on the upper lips or sides of the face; a bright yellow patch extending from the cloaca along each hind leg, but not usually reaching the femoral gland. The dorsum is dark and blackish with numerous welts of the same colour. Lower flanks are also dark and blackish but with distinctive ivory white spots at the posterior part of the flank.

P. dendyi Lucas, 1892 in life is depicted in Anstis (2013) on page 647 and Cogger (2014) on page 105 at bottom right, or online at:

<https://www.flickr.com/photos/14807473@N08/26759919706/>

P. dendyi mensforthi subsp. nov. from high elevation areas north of the alpine areas of Victoria and New South Wales has until now been treated as putative *P. bibroni*, but is in fact most closely related to *P. dendyi* (Donnellan *et al.* 2012) and sufficiently so as to be treated as a subspecies of that taxon. *P. dendyi mensforthi* subsp. nov. is readily separated from *P. dendyi* by having a dark grey, purplish grey or dark brown dorsum (versus charcoal black) and a relatively smooth dorsum, with scattered small tubercles, versus numerous large, black, blunt welts. Markings that are bright yellow in *P. dendyi* are reduced in size and orange instead. The body is overlain with tiny orange specks. Limbs are mainly smooth, dark grey and with scattered tiny (usually orange) flecks. The vertical line at the front of the snout, facing towards the medial line is orange.

Lower flanks do not have distinctive ivory white spots and are generally the same colour as the dorsum.

P. dendyi mensforthi subsp. nov. is depicted in life in Hoser (1989) on page 31 at bottom or online at:

<https://www.flickr.com/photos/23031163@N03/16448192514/>

P. bibroni, as defined by Shea and Rowley (2018) with a type locality of Sydney's Cumberland plain, New South Wales, Australia is the taxon found on the New South Wales coastal plain generally south of the Hunter Valley to about the Victorian border. It is separated from all other species in the complex by the following unique suite of characters: Dark greyish on top, becoming noticeably lighter on the flanks. Underlying this is an indistinct configuration or near black spots or joined spots forming a series of wavy lines running down the dorsum roughly in a longitudinal direction; upper surfaces of limbs are light grey in colour and evenly spotted with black flecks. Fingers and toes are light grey. On the dorsum and upper surfaces of the limbs are numerous scattered tiny, pointed tubercles, many of which have tiny dull orange tips. These sometimes configure to form a series of longitudinally arranged orange tipped welts. Throat is dark. Iris is grey-

brown.

Front and sides of snout are light grey. From tip of snout to top of eye is a moderately distinct and well defined black stripe. Upper arm has light orange on the upper surface, not forming a well defined patch. There is a prominent brick red spot on the post-femoral gland, although this is faded to a dull salmon colour in some specimens.

P. bibroni in life is depicted online at:

<https://www.flickr.com/photos/23031163@N03/13832134303/>

P. wellsi sp. nov. is a species generally found in and around coastal wallum swamps and wet heathlands in a zone from north of the Hunter River, along the coast at least as far north as Coffs Harbour. It is separated from all other species in the complex by the following unique suite of characters: Colour is a uniform light bluish grey above, both on the dorsum and the flanks. On the dorsum is an arrangement of raised tubercles and carbuncles, underlain with blackish pigment and rising to blunt orange points. These form broken wavy lines, longitudinal running and broken lines, usually consisting of one line on either side of the mid-dorsal line, commencing at the eye and going most of the way down the back as well as a lesser broken line at the posterior end of the dorsum, running to a small orange line running into the tail end. There are also some scattered and reduced dark patches on the upper flanks, which may or may not also be tipped with orange. On the upper surface of the proximal arm is a bright orange patch near the axilla, which is not distinctively demarcated from the otherwise mainly bluey-grey arm.

The upper surface of the main part of the hind limb has about five blunted tubercles that are slightly darker than the adjoining blue-grey skin and may or may not have a tip of orange. Toes are bluish grey. Iris is brown. Along the rear of the upper and lower lip region are distinct, closely spaced (sometimes merged) white spots.

From tip of snout, through nostril to top of eye is a moderately distinct narrow line that is greyish brown in colour and may have one or more flecks of light orange. There is indistinct dark grey flecks and mottling on the upper surfaces of the otherwise light bluish-grey limbs.

There is a prominent orange spot on the post-femoral gland.

Images of *P. wellsi* sp. nov. in life can be found online at:

<https://www.flickr.com/photos/eyeweed/3553105919/>
and

<https://www.flickr.com/photos/23031163@N03/38352106256/>

and

<https://www.flickr.com/photos/14807473@N08/48335859541/>

P. wellingtoni sp. nov. from the New England tablelands region of northern New South Wales is separated from the other species in the complex as follows: Dorsal colour is generally a light grey with a large number of large blackish or darker coloured, indistinct spots across the dorsum and upper flanks, most of which are raised, but only have tiny orange tips on a limited number, with others having no coloured tips in any way. These are not arranged in any obvious rows, or arrangements and do not form wavy lines down the sides of the medial line of the back as seen in *P. wellsi* sp. nov.. At the axilla of the upper arm is a bright yellow flush, extending across the upper arm and onto the elbow. The lower half of the flanks are noticeably lighter in colour than above. There is a prominent yellow spot on the post-femoral gland. The throat is usually mottled in the same way as the abdomen.

The iris is a light yellowish brown.

Fingers and toes are yellowish-grey.

P. wellingtoni sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/23031163@N03/11061312714>

and

<https://www.flickr.com/photos/14807473@N08/23241157945/>

P. wellingtoni kaputarensis sp. nov. from Mount Kaputar is similar in most respects to nominate *P. wellingtoni* (*P. wellingtoni wellingtoni* subsp. nov.), but is separated from that taxon by having a grey dorsum without any obvious large orange tipped tubercles. Any orange spots, if present are not connected to the limited number of largeish indistinct black spots on the back and upper flanks, but instead are apparently randomly distributed across the body in a widely scattered configuration.

There is a tiny and relatively indistinct dull yellowish white flush in the axilla of the upper arm which does not extend to the elbow.

Fingers and toes are purplish-pink.

Iris is a dark chestnut brown, or slightly lighter.

P. wellingtoni kaputarensis sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/ryanfrancis/27063768238/>

and

<https://www.flickr.com/photos/23031163@N03/34289611486/>

Distribution: *P. semimarmorata burrelli* subsp. nov. occurs in the region between Adelaide and Port Pirie, in South Australia in close proximity to *P.*

jasminegranta sp. nov. (but usually occupying areas of lower elevation to the west of the higher elevation areas, or alternatively in wetter zones and not the rain shadow mainly to the east).

Continues in *Australasian Journal of Herpetology* Issue 51 (pages 65-128) ...

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Hoser, R. T. 2020. 3 new tribes, 3 new subtribes, 5 new genera, 3 new subgenera, 39 new species and 11 new subspecies of mainly small ground-dwelling frogs from Australia. *Australasian Journal of Herpetology* 50-51:1-128.

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CONTINUED FROM AUSTRALASIAN JOURNAL OF HERPETOLOGY ISSUE 50 ...

Etymology: *P. semimarmorata burrelli subsp. nov.* is named in honour of Roly Burrell, formerly of Ultimate Reptile Suppliers, Burton (Adelaide), South Australia, Australia, for services to herpetology over many decades, including through captive breeding of large numbers of sought after reptiles for the Australian pet trade, thereby reducing collecting pressure on wild animals. Burrell has also run one of Adelaide's best known snake catcher businesses for some decades.

A NEW SUBGENUS WITHIN CRINIA TSCHUDI, 1838**OXYODELLA SUBGEN. NOV.**

LSIDurn:lsid:zoobank.org:act:BD9E973A-9F29-4EFA-8745-A75248EB057B

Type species: *Crinia (Oxyodella) oxeyi sp. nov.*

Diagnosis: Frogs in the subgenus *Oxyodella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lowingdella subgen. nov.*, type species *Crinia (Lowingdella) lowingae sp. nov.*), by the following unique suite of characters:

Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered darker grey (not black) flecks; adults usually less than 18 mm (body length) and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits

are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular, rarely coarsely granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: Most of Queensland and adjoining parts of north-west New South Wales and the top third of the Northern Territory, possibly extending to Western Australia.

Etymology: The new subgenus *Oxyodella subgen. nov.* is named in honour of a deceased Great Dane dog, named Oxyuranus or "Oxy" for short. This "Noble" "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. The "della", suffix reflects the Latin word for noble or distinguished, as this dog was!

Oxyuranus Kinghorn, 1923 is also a well known genus name for a group of highly venomous elapid snakes in Australasia, after which the dog was originally named.

Content: *Crinia (Oxyodella) oxeyi sp. nov.* (type species); *C. (Oxyodella) crottyi sp. nov.*; *C. (Oxyodella) deserticola* (Liem and Ingram, 1977); *C. (Oxyodella) sloppi sp. nov.*

CRINIA (OXYODELLA) OXEYI SP. NOV.

LSIDurn:lsid:zoobank.org:act:1F1C1FEE-83F5-41C1-BF3B-A5F63DC867D7

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J29359 collected from Annan River, 5.7 km south on the Cooktown-Lakeland Downs Road, far north Queensland, Australia, Latitude -15.6833 S., Longitude 145.1667 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J29491 collected from Annan River, 5.7 km south on Cooktown-Lakeland Downs Road, far north Queensland, Australia, Latitude -15.6833 S., Longitude 145.1667 E.

Diagnosis: The three species *Crinia (Oxyodella) oxeyi sp. nov.* from the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula, *C. crottyi sp. nov.* from Townsville / Charters Towers and nearby areas south along the Queensland Coast and *C. sloppi sp. nov.* from the Gulf of Carpentaria region (all in Australia) have until now been treated as northern populations of the putative species *C. (Oxyodella) deserticola* (Liem and Ingram, 1977), with a type locality of Charleville, South-west Queensland, Australia.

The four species are readily separated from one another as follows:

1/ *C. (Oxyodella) deserticola* (Liem and Ingram, 1977) is a frog with a generally mud brown to greyish

brown dorsum with indistinct markings. Behind the eyes is an indistinct dark brown triangle, the tip (at the posterior end) in turn meeting a broad dark patch which has flankward extensions giving an ill-defined lighter v-shaped patch in the neck region. Behind the second dark patch is a wide lighter, beige to grey zone followed by another indistinct broad darker band across the lower back, with light colouration beyond that to the anal region. Mid to lower flanks are whitish and without any obvious markings. There is no obvious colour or flush of colour in the area of the upper arm pit.

There is no obvious dark patch or marking behind the eye. Upper surface of the thigh is light grey with ill-defined dark grey bands.

The tadpole has two upper rows of teeth and three lower rows (depicted in Liem and Ingram, 1977) on page 256, Fig 1 F.

C. (Oxyodella) deserticola (Liem and Ingram, 1977) is depicted in life in Anstis (2013) on page 545 at top left and Cogger (2014) on page 76 at bottom right.

2/ *C. (Oxyodella) oxeyi sp. nov.* is readily separated from the other three species by the following characters: There is an obvious and well defined and well bounded, dark marking or patch, more-or-less rectangular in shape and deflecting downwards at the posterior end, situated behind the eye. Dark markings on the dorsum are well defined. The skin on the dorsum has a large number of blunt tubercles across the surface. The upper surface of the upper arm has a well defined and obvious orange patch. The upper surface of the upper thigh is also orange in colour, with thick dark brown cross-bands. Darker markings on the otherwise pale lower forelimbs are obvious.

Tadpoles have one row of upper teeth and three rows of lower teeth as shown in Anstis (2013) on page 547 at bottom.

C. (Oxyodella) oxeyi sp. nov. is depicted in life on page 545 of Anstis (2013) at right top and centre.

3/ *C. (Oxyodella) crottyi sp. nov.* is readily separated from the other three species by the following characters: Most of the dorsum is beige in colour, with well-defined medium brown markings on the upper body. Besides the preceding, the dorsum is characterised by the presence of large irregular patches of bright yellow overlaying the other sections, this character alone separating this species from the other three. Other than a slight and barely discernable peppering, there is no obvious or well-marked rectangle or patch behind the eye.

Many specimens have tiny orange spots and tubercles scattered across the dorsum, in particular on the head between the eyes.

Upper arm either has a yellow patch on the upper surface, or at least a yellow flush. There are either no markings or no obvious markings on the lower forelimbs.

C. (Oxyodella) crottyi sp. nov. in life is depicted in

Vanderduys (2012) on page 137 at bottom left.

4/ *C. (Oxyodella) sloppi sp. nov.* is readily separated from the other three species by the following characters: A dark reddish-brown frog with ill-defined markings on the dorsum. The anterior of the snout, from the top of the eyes forward is light brown. Behind that is a single large area of chocolate brown, the being equivalent to the two dark areas and intervening light v-shape seen in *C. (Oxyodella) deserticola*. Behind the large dark area is a broad band of medium brown followed by more chocolate brown which occupies most of the rear of the upper body, save for a small ill-defined lighter triangle in the centre of this zone, with the tip pointing posteriorly. The entirety of the area from the side of the snout, posterior to the eye and the flanks is a distinctive lead grey colour. There is no obvious square or shape of any form behind the eye.

Markings on the forelimbs are indistinct, but on the upper surfaces of the hindlimbs are a distinctive combination of chocolate brown and charcoal black cross bands. The dorsum is smooth save for scattered blunt orange coloured tubercles of moderate to large size, being most prominent on the upper flanks and adjacent dorsum.

Upper surfaces of the upper arms are a light brown colour.

A photo of *C. (Oxyodella) sloppi sp. nov.* in life, taken by Matt Clancy of Victoria can be found online at: <https://www.flickr.com/photos/88708273@N03/24330380469/>

Photos of all four preceding species can also be found online at:

<http://www.flickr.com>

by typing in the search term "Crinia deserticola".

The four preceding species constitute the entirety of the subgenus *Oxyodella subgen. nov.*

Frogs in the subgenus *Oxyodella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lowingdella subgen. nov.*, type species *Crinia (Lowingdella) lowingae sp. nov.*), by the following unique suite of characters: Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered

darker grey (not black) flecks; adults usually less than 18 mm and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: *Crinia (Oxydella) oxeyi sp. nov.* occurs in the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula.

Etymology: The new species *Crinia (Oxydella) oxeyi sp. nov.* is named in honour of a deceased Great Dane dog, named Oxyuranus or "Oxy" for short. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. The spelling "oxeyi" is deliberate and chosen to ensure there is no risk of any homonym with other species names being created or already created.

Oxyuranus Kinghorn, 1923 is also a well known genus name for a group of highly venomous elapid snakes in Australasia, after which the dog was originally named.

I should also mention that designation of the scientific names "oxeyi", "crotty" and "sloppi" are also made in view of the fact they are short and easy to remember and are part of my overall intent to make science and nomenclature more user friendly and available to as wide an audience as possible.

CRINIA (OXYODELLA) CROTTYI SP. NOV.

LSIDurn:lsid:zoobank.org:act:FB988E5E-EDE2-414F-AA30-E908EA9C2BA1

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J66090 collected from Townsville Common, Townsville, Queensland, Australia, Latitude -19.2417 S., Longitude 146.7583 E. This facility allows access to its holdings.

Paratypes: 14 preserved specimens at the

Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J65549, J65685, J66086, J66087, J66088, J66089, J66091, J82311, J82312, J82313, J68241, J68242, J94433 and J94434 all collected from Townsville, Queensland, Australia, Latitude -19.2417 S., Longitude 146.7583 E.

Diagnosis: The three species *Crinia (Oxydella) oxeyi sp. nov.* from the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula, *C. crottyi sp. nov.* from Townsville / Charters Towers and nearby areas south along the Queensland Coast and *C. sloppi sp. nov.* from the Gulf of Carpentaria region (all in Australia) have until now been treated as northern populations of the putative species *C. (Oxydella) deserticola* (Liem and Ingram, 1977), with a type locality of Charleville, South-west Queensland, Australia.

The four species are readily separated from one another as follows:

1/ *C. (Oxydella) deserticola* (Liem and Ingram, 1977) is a frog with a generally mud brown to greyish brown dorsum with indistinct markings. Behind the eyes is an indistinct dark brown triangle, the tip (at the posterior end) in turn meeting a broad dark patch which has flankward extensions giving an ill-defined lighter v-shaped patch in the neck region. Behind the second dark patch is a wide lighter, beige to grey zone followed by another indistinct broad darker band across the lower back, with light colouration beyond that to the anal region. Mid to lower flanks are whitish and without any obvious markings. There is no obvious colour or flush of colour in the area of the upper arm pit.

There is no obvious dark patch or marking behind the eye. Upper surface of the thigh is light grey with ill-defined dark grey bands.

The tadpole has two upper rows of teeth and three lower rows (depicted in Liem and Ingram, 1977) on page 256, Fig 1 F.

C. (Oxydella) deserticola (Liem and Ingram, 1977) is depicted in life in Anstis (2013) on page 545 at top left and Cogger (2014) on page 76 at bottom right.

2/ *C. (Oxydella) oxeyi sp. nov.* is readily separated from the other three species by the following characters: There is an obvious and well defined and well bounded, dark marking or patch, more-or-less rectangular in shape and deflecting downwards at the posterior end, situated behind the eye. Dark markings on the dorsum are well defined. The skin on the dorsum has a large number of blunt tubercles across the surface. The upper surface of the upper arm has a well defined and obvious orange patch. The upper surface of the upper thigh is also orange in colour, with thick dark brown cross-bands. Darker markings on the otherwise pale lower forelimbs are obvious.

Tadpoles have one row of upper teeth, three rows of lower teeth as seen in Anstis (2013), p. 547 bottom.

C. (Oxyodella) oxeyi sp. nov. is depicted in life on page 545 of Anstis (2013) at right top and centre.

3/ *C. (Oxyodella) crottyi sp. nov.* is readily separated from the other three species by the following characters: Most of the dorsum is beige in colour, with well-defined medium brown markings on the upper body. Besides the preceding, the dorsum is characterised by the presence of large irregular patches of bright yellow overlaying the other sections, this character alone separating this species from the other three. Other than a slight and barely discernable peppering, there is no obvious or well-marked rectangle or patch behind the eye.

Many specimens have tiny orange spots and tubercles scattered across the dorsum, in particular on the head between the eyes.

Upper arm either has a yellow patch on the upper surface, or at least a yellow flush. There are either no markings or no obvious markings on the lower forelimbs.

C. (Oxyodella) crottyi sp. nov. in life is depicted in Vanderduys (2012) on page 137 at bottom left.

4/ *C. (Oxyodella) sloppi sp. nov.* is readily separated from the other three species by the following characters: A dark reddish-brown frog with ill-defined markings on the dorsum. The anterior of the snout, from the top of the eyes forward is light brown. Behind that is a single large area of chocolate brown, the being equivalent to the two dark areas and intervening light v-shape seen in *C. (Oxyodella) deserticola*. Behind the large dark area is a broad band of medium brown followed by more chocolate brown which occupies most of the rear of the upper body, save for a small ill-defined lighter triangle in the centre of this zone, with the tip pointing posteriorly. The entirety of the area from the side of the snout, posterior to the eye and the flanks is a distinctive lead grey colour. There is no obvious square or shape of any form behind the eye.

Markings on the forelimbs are indistinct, but on the upper surfaces of the hindlimbs are a distinctive combination of chocolate brown and charcoal black cross bands. The dorsum is smooth save for scattered blunt orange coloured tubercles of moderate to large size, being most prominent on the upper flanks and adjacent dorsum.

Upper surfaces of the upper arms are a light brown colour.

A photo of *C. (Oxyodella) sloppi sp. nov.* in life taken by Matt Clancy of Victoria can be found online at: <https://www.flickr.com/photos/88708273@N03/24330380469/>

Photos of all four preceding species can also be found online at:

<http://www.flickr.com>

by typing in the search term "Crinia deserticola".

The four preceding species constitute the entirety of

the subgenus *Oxyodella subgen. nov.*.

Frogs in the subgenus *Oxyodella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lovingdella subgen. nov.*, type species *Crinia (Lovingdella) lovingae sp. nov.*), by the following unique suite of characters: Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered darker grey (not black) flecks; adults usually less than 18 mm and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: *Crinia (Oxyodella) crottyi sp. nov.* occurs from Townsville / Charters Towers and nearby areas south along the Queensland Coast.

Etymology: The new species *Crinia (Oxyodella) crottyi sp. nov.* is named in honour of a deceased Great Dane /Rottweiler Cross named Crotalus (AKA Crotty), himself named after a North American genus of Pitviper, *Crotalus* Linnaeus, 1758, in recognition of nearly 13 years services in guarding our valuable wildlife breeding and research facility.

CRINIA (OXYODELLA) SLOPPI SP. NOV.

LSIDurn:lsid:zoobank.org:act:E2245953-1303-45E7-BEE3-D1461D17E418

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27223 collected from Wills Creek, Karumba Rd, Normanton, Queensland, Australia, Latitude - 17.5667 S., Longitude 140.9667 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ Nine preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J27221, J27222, J27224, J67813, J67827, J70677, J75740, J84199 and J84200 all collected from immediately adjacent to Normanton, Queensland, Australia, Latitude - 17.655 S., Longitude 141.1319 E. 2/ Two preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J55814 and J55815, both collected from 1.6 km south of Burketown, Queensland, Australia, Latitude -17.7167 S., Longitude 139.55 S.

Diagnosis: The three species *Crinia (Oxyodella) oxeyi sp. nov.* from the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula, *C. crottyi sp. nov.* from Townsville / Charters Towers and nearby areas south along the Queensland Coast and *C. sloppi sp. nov.* from the Gulf of Carpentaria region (all in Australia) have until now been treated as northern populations of the putative species *C. (Oxyodella) deserticola* (Liem and Ingram, 1977), with a type locality of Charleville, South-west Queensland, Australia.

The four species are readily separated from one another as follows:

1/ *C. (Oxyodella) deserticola* (Liem and Ingram, 1977) is a frog with a generally mud brown to greyish brown dorsum with indistinct markings. Behind the eyes is an indistinct dark brown triangle, the tip (at the posterior end) in turn meeting a broad dark patch which has flankward extensions giving an ill-defined lighter v-shaped patch in the neck region. Behind the second dark patch is a wide lighter, beige to grey zone followed by another indistinct broad darker band across the lower back, with light colouration beyond that to the anal region. Mid to lower flanks are whitish and without any obvious markings. There is no obvious colour or flush of colour in the area of the upper arm pit.

There is no obvious dark patch or marking behind the eye. Upper surface of the thigh is light grey with ill-defined dark grey bands.

The tadpole has two upper rows of teeth and three lower rows (depicted in Liem and Ingram, 1977) on page 256, Fig 1 F.

C. (Oxyodella) deserticola (Liem and Ingram, 1977) is depicted in life in Anstis (2013) on page 545 at top left and Cogger (2014) on page 76 at bottom right.

2/ *C. (Oxyodella) oxeyi sp. nov.* is readily separated

from the other three species by the following characters: There is an obvious and well defined and well bounded, dark marking or patch, more-or-less rectangular in shape and deflecting downwards at the posterior end, situated behind the eye. Dark markings on the dorsum are well defined. The skin on the dorsum has a large number of blunt tubercles across the surface. The upper surface of the upper arm has a well defined and obvious orange patch. The upper surface of the upper thigh is also orange in colour, with thick dark brown cross-bands. Darker markings on the otherwise pale lower forelimbs are obvious. Tadpoles have one row of upper teeth and three rows of lower teeth as shown in Anstis (2013) on page 547 at bottom.

C. (Oxyodella) oxeyi sp. nov. is depicted in life on page 545 of Anstis (2013) at right top and centre.

3/ *C. (Oxyodella) crottyi sp. nov.* is readily separated from the other three species by the following characters: Most of the dorsum is beige in colour, with well-defined medium brown markings on the upper body. Besides the preceding, the dorsum is characterised by the presence of large irregular patches of bright yellow overlaying the other sections, this character alone separating this species from the other three. Other than a slight and barely discernable peppering, there is no obvious or well-marked rectangle or patch behind the eye. Many specimens have tiny orange spots and tubercles scattered across the dorsum, in particular on the head between the eyes.

Upper arm either has a yellow patch on the upper surface, or at least a yellow flush. There are either no markings or no obvious markings on the lower forelimbs.

C. (Oxyodella) crottyi sp. nov. in life is depicted in Vanderduys (2012) on page 137 at bottom left.

4/ *C. (Oxyodella) sloppi sp. nov.* is readily separated from the other three species by the following characters: A dark reddish-brown frog with ill-defined markings on the dorsum. The anterior of the snout, from the top of the eyes forward is light brown. Behind that is a single large area of chocolate brown, the being equivalent to the two dark areas and intervening light v-shape seen in *C. (Oxyodella) deserticola*. Behind the large dark area is a broad band of medium brown followed by more chocolate brown which occupies most of the rear of the upper body, save for a small ill-defined lighter triangle in the centre of this zone, with the tip pointing posteriorly. The entirety of the area from the side of the snout, posterior to the eye and the flanks is a distinctive lead grey colour. There is no obvious square or shape of any form behind the eye.

Markings on the forelimbs are indistinct, but on the upper surfaces of the hindlimbs are a distinctive combination of chocolate brown and charcoal black cross bands. The dorsum is smooth save for

scattered blunt orange coloured tubercles of moderate to large size, being most prominent on the upper flanks and adjacent dorsum.

Upper surfaces of the upper arms are a light brown colour.

A photo of *C. (Oxydella) sloppi* sp. nov. in life taken by Matt Clancy of Victoria can be found online at: <https://www.flickr.com/photos/88708273@N03/24330380469/>

Photos of all four preceding species can also be found online at:

<http://www.flickr.com>

by typing in the search term "Crinia deserticola".

The four preceding species constitute the entirety of the subgenus *Oxydella subgen. nov.*.

Frogs in the subgenus *Oxydella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lowingdella subgen. nov.*, type species *Crinia (Lowingdella) lowingae* sp. nov.), by the following unique suite of characters: Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered darker grey (not black) flecks; adults usually less than 18 mm and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the

larger sex (derived from Cogger 2014 with errors corrected).

Distribution: *Crinia (Oxydella) sloppi* sp. nov. is only known from the Gulf of Carpentaria in Queensland, Australia but may include populations to the west into the Northern Territory, Australia.

Etymology: The new species *Crinia (Oxydella) sloppi* sp. nov. is named in honour of an eight year old as of 2020 (born August 2012) Great Dane dog, named Sloop. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years and it is appropriate his services to science be recognized.

A SECOND NEW SUBGENUS WITHIN CRINIA TSCHUDI, 1838

LOWINGDELLA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:DF3BA4F6-AC21-4F99-845E-FBA53B8E7216

Type species: *Crinia (Lowingdella) lowingae* sp. nov..

Diagnosis: Frogs in the subgenus *Lowingdella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella subgen. nov.*, type species *Crinia (Oxydella) oxeyi* sp. nov.), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on the toes; hind side of thighs is not bright pink or red.

In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black

markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: South-east Australia in an arc generally including the moist parts of south-east Queensland, the adjoining coast of Queensland and northern New South Wales and the Murray Darling Basin, including most of New South Wales, northern Victoria and south-east South Australia.

Etymology: *Lowingdella* subgen. nov. is named in honour of Vicki Lowing of Rockbank, Victoria, Australia, better known as the Crocodile lady for her work over some decades educating people about Crocodiles. This has included correcting the devastatingly damaging message put out by the Steve and Terri Irwin business via their TV shows, their message being that you can be a rich and famous hero by attacking and abusing crocodiles for the purposes of cheap entertainment and making a fast income.

In 2020, the Victorian Wildlife Department has conducted numerous raids on Lowing's facility at Rockback with a view to ending her good work with crocodiles as it allegedly impedes and competes with the Irwin business and that of the Melbourne Zoo / Zoos Victoria business, who also send the anti-conservation message to people that Crocodiles are to be feared and loathed.

Both see Lowing as a competitor in the "crocodile business" and would prefer to have themselves seen as the only "experts" in the Crocodile space and the income stream this brings them.

Content: *Crinia (Lowingdella) lowingae* sp. nov. (type species); *C. (Lowingdella) maateni* sp. nov.; *C. (Lowingdella) parinsignifera* (Main, 1957); *C. (Lowingdella) stevebennetti* sp. nov.; *C. (Lowingdella) tinnula* (Straughan and Main, 1956).

CRINIA (LOWINGDELLA) LOWINGAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:6C29885D-CF99-43D8-942A-3BE0EA5C02EF

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.165529 collected from 2.5km along Digger's Camp Road in Yuraygir National Park, New South Wales, Australia, Latitude -29.8292 S., Longitude 153.2719 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.165524, collected at the Double Crossing Creek, Pacific Hwy. South Woolgoolga, New South Wales, Australia, Latitude -30.1361 S., Longitude 153.1930 E. 2/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.183128 collected at Red Rock, New South Wales, Australia, Latitude -29.983 S., Longitude 153.233 E.

Diagnosis: The two species *Crinia (Lowingdella) lowingae* sp. nov. from coastal swamps in a region between Woody Head and Coffs Harbour in New South Wales and *C. (Lowingdella) stevebennetti* sp. nov. from coastal swamps south of Port Macquarie to as far south as the central coast of New South Wales have both until now been generally treated as southern populations of *C. (Lowingdella) tinnula* (Straughan and Main, 1956), with a type locality of Rose Creek, Beerburum, (between Brisbane and the Sunshine Coast) in South-east Queensland, Australia, being a species inhabiting coastal swamps from south-east Queensland and far northern New South Wales.

That more than one species had been lumped under the label *C. tinnula* has been known for many years. Read *et al.* (2001) showed species level genetic distinctions between a putative population of *C. tinnula* from Myall Lakes, National Park, just north of Newcastle, New South Wales and what they called an undescribed species from Coffs Harbour, New South Wales.

With these two species being allopatric and clearly morphologically divergent from south-east Queensland *C. tinnula* (being the type for the genus), it is somewhat scandalous that with all the money ostensibly being spent by the NSW State Government on scientific research on wildlife, with literally hundreds of so-called scientists on the government gravy train payroll, that these two vulnerable species have remained effectively quarantined from science by being unnamed for two decades.

Hence, while taking pleasure in bringing two new species to the attention of the global scientific community, I must state that I would have preferred someone else had done this task 20 years earlier! The three species, *C. (Lowingdella) tinnula* (Straughan and Main, 1956), *C. lowingae* sp. nov. and *C. stevebennetti* sp. nov. are readily separated from one another as follows:

1/ *C. tinnula* (Straughan and Main, 1956), is a frog with distinctive dorsal pattern, including well-defined yellowish-white line on the rear upper lip region, numerous tiny black specks are on the upper parts of upper forelimbs. In males, the belly is peppered heavily grey, with a distinctive thin white line running down the medial line from the snout, under the throat to level with the forearms. This is broken by a thin white cross line running to the forelimbs and the longitudinally running white line runs posterior to this point to the end of the body. Most of the gular area is mainly white, although with heavy peppering on the edges.

In both sexes, there are distinct dark brown markings interposed with white or light brown markings on the upper labial area. Most specimens (but not all) have a dark orange-red stripe down the middle of back. Iris is reddish.

C. tinnula (Straughan and Main, 1956) is depicted on page 141 of Vanderduys (2012) in the bottom two images, Anstis (2013) on page 587 (top two images) and Cogger (2014) on page 86, in bottom two images (dorsum and venter of male).

2/ *C. lowingae* sp. nov. is separated from the other two species by having an ill-defined dorsal pattern. Colour is whitish grey under eye and there are no well defined markings on upper labial area.

There is usually no dark orange-red-stripe down the middle of the back.

Iris is brown.

Ventrally, males have a completely greyish gular region, with an indistinct row of somewhat merged tiny white dots forming a line down the centre to the level of the upper arms. The line ends here as does the greyish colour. The belly of the frog is otherwise whitish, but not an immaculate colour, being lightly flecked or specked with a semi-translucent grey.

Undersides of limbs are greyish purple.

There is no discernable line under the belly running between the arms.

In both sexes there is a brown iris, and ill defined dorsal pattern.

Colour is whitish grey under eye and there are no well defined markings on upper labial area.

Usually there is no dark orange-red-stripe down middle of the back.

A dorsal shot of *C. lowingae* sp. nov. is depicted in life at:

<https://www.flickr.com/photos/14807473@N08/27624337911>

and venter of a male at:

<https://www.flickr.com/photos/14807473@N08/27086354354/>

3/ *C. stevebennetti* sp. nov. is similar in most respects to *C. tinnula* but is separated from that species as follows: Orange-yellow iris and well defined dorsal pattern; beige under eye. Moderate to

well-defined pattern on upper labial area. There is usually a dark orange-red-stripe down middle of back. No numerous tiny black specks are on the upper parts of upper forelimbs.

The venter of males is characterised by a mainly white gular region and a belly that is mainly whitish but with a patchwork of semi-distinctive dark brownish grey markings away from the medial line extending to the flanks. Unique to males of this species is the presence of numerous bright yellow spots on a greyish brown background on the undersurfaces of the upper arms and upper hindlimbs.

Under the body, running from the snout to the rear is a thick wide line of whitish-yellow, and a somewhat thinner, but still thick whitish-yellow line running to the axilla of each forearm.

Darkening of the gular region is restricted to the sides of the broad median line and not the jawline as seen in *C. tinnula*. It is also in the form of marbling rather than peppering.

A photo of the dorsum of *C. stevebennetti* sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/14807473@N08/3914008567/>

and

<https://www.flickr.com/photos/14807473@N08/3558441336/>

and

<https://www.flickr.com/photos/pokerchampdaniel/3568281077/>

A photo of the ventral surface of a male is depicted in Anstis (2013) on page 587 at bottom right.

The three preceding species are separated from the other two members of the subgenus *Lowingdella* subgen. nov., namely *C. (Lowingdella) parinsignifera* (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. by the presence in one form or other of a median white line down the centre of the throat, versus an absence.

Frogs in the subgenus *Lowingdella* subgen. nov. a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella* subgen. nov., type species *Crinia (Oxydella) oxeyi* sp. nov.), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on

the toes; hind side of thighs is not bright pink or red. In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: *Crinia (Lowingdella) lowingae sp. nov.* appears to be restricted to coastal swamps in a region between Woody Head and south along the coast to about Coffs Harbour in New South Wales

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

CRINIA (LOWINGDELLA) STEVBENNETTI SP. NOV.

LSIDurn:lsid:zoobank.org:act:0C1924BB-B69A-4AB1-AA8A-4604B59DB8F1

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.165449 collected from Myall Quays Estate, Tea Gardens, New South Wales, Australia, Latitude -32.6467 S., Longitude 152.1644 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.147106 and R.148261 collected from Tea Gardens, New South Wales, Australia, Latitude -32.6467 S., Longitude 152.1644 E.

Diagnosis: The two species *Crinia (Lowingdella) lowingae sp. nov.* from coastal swamps in a region between Woody Head and Coffs Harbour in New South Wales and *C. (Lowingdella) stevbennetti sp. nov.* from coastal swamps south of Port Macquarie to as far south as the central coast of New South Wales have both until now been generally treated as southern populations of *C. (Lowingdella) tinnula* (Straughan and Main, 1956), with a type locality of Rose Creek, Beerburum, (between Brisbane and the Sunshine Coast) in South-east Queensland, Australia, being a species inhabiting coastal swamps from south-east Queensland and far northern New South Wales.

That more than one species had been lumped under the label *C. tinnula* has been known for many years. Read *et al.* (2001) showed species level genetic distinctions between a putative population of *C. tinnula* from Myall Lakes, National Park, just north of Newcastle, New South Wales and what they called an undescribed species from Coffs Harbour, New South Wales.

With these two species being allopatric and clearly morphologically divergent from south-east Queensland *C. tinnula* (being the type for the genus), it is somewhat scandalous that with all the money ostensibly being spent by the NSW State Government on scientific research on wildlife, with literally hundreds of so-called scientists on the government gravy train payroll, that these two vulnerable species have remained effectively quarantined from science by being unnamed for two decades.

Hence, while taking pleasure in bringing two new species to the attention of the global scientific community, I must state that I would have preferred someone else had done this task 20 years earlier! The three species, *C. (Lowingdella) tinnula* (Straughan and Main, 1956), *C. lowingae sp. nov.* and *C. stevbennetti sp. nov.* are readily separated from one another as follows:

1/ *C. tinnula* (Straughan and Main, 1956), is a frog with distinctive dorsal pattern, including well-defined yellowish-white line on the rear upper lip region, numerous tiny black specks are on the upper parts of upper forelimbs. In males, the belly is peppered heavily grey, with a distinctive thin white line running down the medial line from the snout, under the throat to level with the forearms. This is broken by a thin white cross line running to the forelimbs and the longitudinally running white line runs posterior to this point to the end of the body. Most of the gular area is

mainly white, although with heavy peppering on the edges.

In both sexes, there are distinct dark brown markings interposed with white or light brown markings on the upper labial area. Most specimens (but not all) have a dark orange-red-stripe down the middle of back. Iris is reddish.

C. tinnula (Straughan and Main, 1956) is depicted on page 141 of Vanderduys (2012) in bottom two images, Anstis (2013) on page 587 (top two images) and Cogger (2014) on page 86, in bottom two images (dorsum and venter of male).

2/ *C. lowingae* sp. nov. is separated from the other two species by having an ill-defined dorsal pattern. Colour is whitish grey under eye and there are no well defined markings on upper labial area.

There is usually no dark orange-red-stripe down the middle of the back.

Iris is brown.

Ventrally, males have a completely greyish gular region, with an indistinct row of somewhat merged tiny white dots forming a line down the centre to the level of the upper arms. The line ends here as does the greyish colour. The belly of the frog is otherwise whitish, but not an immaculate colour, being lightly flecked or specked with a semi-translucent grey.

Undersides of limbs are greyish purple.

There is no discernable line under the belly running between the arms.

In both sexes there is a brown iris, and ill defined dorsal pattern.

Colour is whitish grey under eye and there are no well defined markings on upper labial area.

Usually there is no dark orange-red-stripe down middle of the back.

A dorsal shot of *C. lowingae* sp. nov. is depicted in life at:

<https://www.flickr.com/photos/14807473@N08/27624337911>

and venter of a male at:

<https://www.flickr.com/photos/14807473@N08/27086354354/>

3/ *C. stevebennetti* sp. nov. is similar in most respects to *C. tinnula* as defined above, but is separated from that species as follows: Orange-yellow iris and well defined dorsal pattern; beige under eye. Moderate to well-defined pattern on upper labial area. There is usually a dark orange-red-stripe down middle of back. No numerous tiny black specks are on the upper parts of upper forelimbs.

The venter of males is characterised by a mainly white gular region and a belly that is mainly whitish but with a patchwork of semi-distinctive dark brownish grey markings away from the medial line extending to the flanks. Unique to males of this species is the presence of numerous bright yellow spots on a greyish brown background on the

undersurfaces of the upper arms and upper hindlimbs.

Under the body, running from the snout to the rear is a thick wide line of whitish-yellow, and a somewhat thinner, but still thick whitish-yellow line running to the axilla of each forearm.

Darkening of the gular region is restricted to the sides of the broad median line and not the jawline as seen in *C. tinnula*. It is also in the form of marbling rather than peppering.

A photo of the dorsum of *C. stevebennetti* sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/14807473@N08/3914008567/>

and

<https://www.flickr.com/photos/14807473@N08/3558441336/>

and

<https://www.flickr.com/photos/pokerchampdaniel/3568281077/>

A photo of the ventral surface of a male is depicted in Anstis (2013) on page 587 at bottom right.

The three preceding species are separated from the other two members of the subgenus *Lowingdella* subgen. nov., namely *C. (Lowingdella) parinsignifera* (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. by the presence in one form or other of a median of white line down the centre of the throat, versus an absence.

Frogs in the subgenus *Lowingdella* subgen. nov. a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella* subgen. nov., type species *Crinia (Oxydella) oxeyi* sp. nov.), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on the toes; hind side of thighs is not bright pink or red. In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is

uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: *Crinia (Lowingdella) stevebennetti* sp. nov. appears to be restricted to coastal swamps in a region between Port Macquarie and south to the central coast region of New South Wales.

Etymology: *C. stevebennetti* sp. nov. is named in honour of Steve Bennett of Narre Warren South, Victoria, Australia in recognition of valuable contributions to herpetology by way of assisting myself in numerous research projects over more than three decades. He has also worked extensively in the relevant region immediately north of Newcastle in New South Wales which is where this species first became known.

CRINIA (LOWINGDELLA) MAATENI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:311C6908-A58F-46BF-B8D8-20FC3A1FF05A

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J33313 collected from Mimosa Creek, Blackdown Tableland, Queensland, Australia, Latitude -23.7833 S., Longitude 149.0833 E. This government-owned facility allows access to its holdings.

Paratypes: 16 preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J33314- J33329 collected from Mimosa Creek, Blackdown Tableland, Queensland, Australia, Latitude -23.7833 S.,

Longitude 149.0833 E.

Diagnosis: Until now *Crinia (Lowingdella) maateni* sp. nov. from coastal Queensland, south of about Rockhampton, including east flowing drainage basins, and nearby coastal parts of northern New South Wales, has been treated as a northern population of *Crinia (Lowingdella) parinsignifera* (Main, 1957), with a distribution otherwise centred on the Murray Darling Basin in south-west Queensland, New South Wales, northern Victoria and south-east South Australia, including the type locality of Kingston on Murray, South Australia.

The east coast specimens are sufficiently divergent to be treated as a separate species in line with other frog taxa similarly affected by the Great Dividing Range in this same region as seen for example in *Ranaster salmini* (Steindachner, 1867) from the Murray Darling basin and *R. snakemansbogensis* Hoser, 2020, which were shown to be different species based on morphology and previously published genetic studies as cited by Hoser (2020). *C. maateni* sp. nov. is most readily separated from *C. parinsignifera* by the presence of two or more large and extended lines of folded skin running longitudinally down the mid-back in a wavy line on either side of the central median.

By contrast most specimens of *C. parinsignifera* have a dorsum punctuated by large tubercles or at best small and irregular folds of skin.

C. maateni sp. nov. has a dorsum that consists more-or-less of a pattern incorporating reasonably well-defined longitudinal lines running down the sides of the top of the dorsal surface and near striped pattern in the central region of the back as well, versus an obviously blotched appearance on the mid dorsum and an irregular light zone on the sides of the dorsum, not appearing as any sort of line.

Spines on the upper surface of the middle hind legs are large and close together in *C. maateni* sp. nov., versus well spaced apart in *C. parinsignifera*. Upper surface of upper arm in *C. maateni* sp. nov. is light orange, versus light yellow in *C. parinsignifera* (as seen in the image of a specimen of that species from Kangaroo Ground, Victoria published with this paper on the front cover of *Australasian Journal of Herpetology* Issue 51). In *C. maateni* sp. nov. the dark patch behind the eye is prominent and well defined, versus usually (but not always), not so in *C. parinsignifera* (again as seen in the image of a specimen of that species from Kangaroo Ground, Victoria published with this paper on the front cover of *Australasian Journal of Herpetology* Issue 51). *C. maateni* sp. nov. usually has a reddish or chocolate brown dorsum, versus usually yellowish-brown in *C. parinsignifera*.

Photos of *C. maateni* sp. nov. in life can be found in Anstis (2013) on page 564 at top right and online at: <https://www.flickr.com/photos/euprepiosaur/>

8471986011/

and

<https://www.flickr.com/photos/smacdonald/15087966295/>

Photos of *C. parinsignifera* in life can be found in Anstis (2013) on page 565 bottom left, Cogger (2014) on page 80 at top and online at:

<https://www.flickr.com/photos/23031163@N03/3838947107/>

and

<https://www.flickr.com/photos/14807473@N08/3095373682/>

and

<https://www.flickr.com/photos/88708273@N03/15026834515/>

and

<https://www.flickr.com/photos/136643623@N03/28073098163/>

and the front cover of *Australasian Journal of Herpetology* Issue 51.

C. (Lowingdella) parinsignifera (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. are depicted side by side in Vanderduys (2012) on page 138, with *C. parinsignifera* on the right and *C. maateni* sp. nov. on the left.

C. (Lowingdella) parinsignifera (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. are separated from the three other species in the subgenus *Lowingdella* subgen. nov., namely *Crinia (Lowingdella) lowingae* sp. nov. from coastal swamps in a region between Woody Head and Coffs Harbour in New South Wales, *C. (Lowingdella) stevebennetti* sp. nov. from coastal swamps south of Port Macquarie to as far south as the central coast of New South Wales and *C. (Lowingdella) tinnula* (Straughan and Main, 1956) from coastal south-east Queensland and the very far north-east of New South Wales by the absence in one form or other of a median white line down the centre of the throat, versus a presence.

Frogs in the subgenus *Lowingdella* subgen. nov. a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella* subgen. nov., type species *Crinia (Oxydella) oxeyi* sp. nov.), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on the toes; hind side of thighs is not bright pink or red.

In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phalanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: *Crinia (Lowingdella) maateni* sp. nov. is found in coastal Queensland, south of about Rockhampton, including east flowing drainage basins, such as the Fitzroy River System, and nearby coastal parts of northern New South Wales, Australia.

Crinia (Lowingdella) parinsignifera (Main, 1957) is confined to west-flowing drainage basins of the Murray-Darling Basin in Queensland, New South Wales, Victoria and South Australia, Australia and south of the Great Dividing Range in the outer northern suburbs of Melbourne (e.g. Kangaroo Ground).

Potentially contrary to the preceding, *C. maateni* sp. nov. are found in the Barakula State Forest in south-east Queensland, north-west of Miles in South-east Queensland.

Etymology: Named in honour Frits Maaten, former co-owner (with Andy Stevens) of a successful wildlife

conservation business in the form of the Monbulk Animal Kingdom in Victoria, Australia in the 1970's and 1980's. They were victims of their own success and as a result had their enterprise shut down at gunpoint by the State Government wildlife department who also happened to own a dysfunctional animal abusing zoo down the road from the Maaten's.

That facility, the loss-making Healesville Sanctuary, besides having a shocking record with respect to wildlife keeping and even public safety, only continues to operate as a business enterprise because the suffering Victorian taxpayer bails out their never ending financial mismanagement. But when competitor and government regulator are the same entity (State Government Wildlife Department owns and controls Healesville Sanctuary), there is no place for a successful and properly run wildlife conservation business such as that owned and operated by Maaten and Stevens.

The wildlife department and their Healesville Sanctuary saw Maaten and Stevens as taking clients they thought they have a right to own. Maaten and Stevens also managed to breed species of wildlife that staff at Healesville Sanctuary were incapable of breeding. They saw Maaten and Stevens as stealing favourable publicity that they would otherwise liked to have had.

By shutting down the Monbulk Animal Kingdom at gunpoint, the Healesville Sanctuary were given their long desired monopoly in the zoo business space east of Melbourne, Australia.

That situation remains the case, more than two decades later in year 2020.

CRINIA (CRINIA) MERCEICAI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:61237DD7-9967-4E8B-BBF9-5EE6A9316B29

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R97665 collected from Hellfire Bay, Cape Le Grand National Park, Western Australia, Australia, Latitude -34.0167 S., Longitude 122.1833 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R97633 and R67734 collected from Hellfire Bay, Cape Le Grand National Park, Western Australia, Australia, Latitude -34.0167 S., Longitude 122.1833 E.

Diagnosis: Until now, *C. merceicai sp. nov.* found along the southern coast of Western Australia from Cape Arid in the east, west to about Cheyne Bay, and then extending inland towards the Darling Range near the south-side of Perth in Western Australia, but away from the coast has been treated as an eastern population of putative *Crinia georgiana* Tschudi, 1838, as currently recognized (*sensu* Cogger 2014 or

Anstis 2013).

The identification of *C. merceicai sp. nov.* as a divergent species from *C. georgiana* was confirmed by Edwards (2007), who found each diverged from one another about 1.5 MYA.

The western form of the two species, being *C. georgiana* from near Perth and found along the south-west coast of Western Australia to about Albany, Western Australia (including King George's Sound) is a frog with a mainly pinkish brown dorsum or alternatively has a distinct charcoal coloured hue in some southern populations and as a rule a generally whitish venter.

The second, morphologically divergent species, *C. merceicai sp. nov.* is readily separated from the preceding species by being generally yellowish brown (usually) to light chocolate brown, with a yellowish white venter, which has extensive markings and spots overlaying tubercles, especially anteriorly.

C. merceicai sp. nov. has a yellow-brown iris, versus light orange in *C. georgiana*.

The upper lip below the eye is always striped in *C. merceicai sp. nov.*, versus striped or spotted in *C. georgiana*. The broken red or orange line running around the top of the eye is prominent in *C. georgiana* versus not so, or absent in *C. merceicai sp. nov.*

Dorsal pattern in both species varies in both sexes and may be with or without obvious dorsal striping.

The three available synonyms for *C. georgiana* with a type locality of King George's Sound (Albany), Western Australia, were checked.

Pterophrynus affinis Günther, 1864, is depicted with his description and that specimen is clearly of the western form, similar in appearance to the female depicted on page 554, centre right of Anstis (2013). The two frogs described by Cope, both with a given type locality of Western Australia, namely *Crinia insignata* Cope, 1866 and *C. stolata* Cope, 1867, both conform to common colour variants of the western form, *C. insignata* probably coming from near Perth and *C. stolata* matching the charcoal form from Denmark, Western Australia.

As a result, there is no available name for the eastern form of the putative species as recognised to date and it is herein named *Crinia merceicai sp. nov.*

C. merceicai sp. nov. from Esperance is depicted in life online at:

<http://esperancewildlife.blogspot.com/2008/05/quacking-frog-crinia-georgiana.html> (several images).

C. georgiana in life is depicted in Tyler *et al.* (1994), Anstis (2013) on page 554 (all images) and Cogger (2014) on page 79 top left.

Both *C. merceicai sp. nov.* and *C. georgiana* are readily separated from all other species in the genus *Crinia* Tschudi, 1838 (including all subgenera) by the

following unique suite of characters: Belly granular; adults sometimes with lateral seams but without distinct dermal fringes on the toes; hind side of thighs bright pink or red.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

Distribution: *C. merceicai* sp. nov. is found along the southern coast of Western Australia from Cape Arid in the east, west to about Cheyne Bay and then extending inland towards the Darling Range near the south-side of Perth (Harvey and Waroona area) in Western Australia, but otherwise away from the coast (see Fig. 3.2 on page 73 of Edwards (2007) for detail).

Etymology: *C. merceicai* sp. nov. is named in honour of Dave Merceica of the Sunshine Coast, Queensland, Australia, previously of Bacchus Marsh and Hillside in Victoria, an avid reptile keeper for many years in recognition of his services to other herpetologists and wildlife research as part of his long-term conservation ethic, including through considerable logistical support for a number of regional herpetological societies in Australia.

WELLINGTONDELLA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:0DEB71F2-77D2-436C-937A-3349B280A208

Type species: *Crinia rosea* Harrison, 1927.

Diagnosis: Until now, most authors including Anstis (2013) and Cogger (2014) have treated the genus *Geocrinia* Blake, 1973, type species *Pterophrynus laevis* Günther, 1864 as including species from south-east and south-west Australia, largely being within two more-or-less separate lineages.

Wells and Wellington (1985) transferred all Western Australian species to their newly erected genus *Hesperocrinia* Wells and Wellington, 1985, with a type species of *Crinia leai* Fletcher, 1898.

However molecular studies (e.g. Read *et al.* 2001) have shown *Crinia leai* Fletcher, 1898 to be more closely related to the east Australian species than the

others from Western Australia, meaning that the best placement for that taxon is within *Geocrinia* and the remaining quite divergent West Australian species should in turn be placed in a new genus, herein named *Wellingtondella* gen. nov.

Morphological and biological evidence as summed up in Anstis (2013) confirms the preceding contention.

Based on the preceding *Hesperocrinia* is herein retained as a subgenus, within *Geocrinia*.

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* gen. nov. are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

Frogs in the subgenus *Hesperocrinia* Wells and Wellington, 1985, herein treated as a complex of three species, two of which are formally named in this paper for the first time, are separated from other species in the nominate subgenus of *Geocrinia* and the genus *Wellingtondella* gen. nov. by having toes with slight terminal expansions and with distinct subarticular tubercles; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe and a belly that is brown, yellow-brown or green-grey in colour.

Frogs in the genus *Geocrinia* are separated from the species within *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

Geocrinia (both subgenera) are separated from *Wellingtondella* gen. nov. by having diphasic calls and terrestrial egg deposition with aquatic tadpoles.

Wellingtondella gen. nov. in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *Geocrinia (Hesperocrinia) brianbarnetti* sp. nov. all from south-west Australia.

The genus *Wellingtondella* gen. nov. includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

Distribution: *Wellingtondella* gen. nov. is confined to wetter parts of far south-west Western Australia.

Etymology: *Wellingtondella* gen. nov. is named in honour of Cliff Ross Wellington of Ramornie, New South Wales, Australia, (about 485 km north of Sydney), previously of Woy Woy, New South Wales, Australia in recognition of his immense services to herpetology in Australia. While best known for his co-authorship of landmark publications Wells and Wellington (1984 and 1985) his contributions to herpetology go well beyond these papers both before and since the time they were published, including numerous other important published works and services to conservation.

They include his petitioning the ICZN to stamp out the nefarious and dishonest practice of taxonomic vandalism and numerous conservation programs for rare and threatened species in New South Wales, especially in relation to frogs.

Wellington was also the first herpetologist in the world to demonstrate the significance of toxic chemicals in waterways inhibiting the spread of Chytrid fungus and thereby inadvertently helping vulnerable species of frogs evade extinction caused by the same fungus. This included several species from the Sydney and Blue Mountains regions of New South Wales.

Content: *Wellingtondella rosea* (Harrison, 1927) (type species); *W. alba* (Wardell-Johnson and Roberts, 1989); *W. lutea* (Main, 1963); *W. vitellina* (Wardell-Johnson and Roberts, 1989).

GEOCRINIA (HESPEROCRINIA) BRETTBARNETTI SP. NOV.

LSIDurn: [lsid:zoobank.org:act:0693EF78-5757-4673-95A9-1886C703C687](https://zoobank.org/act:0693EF78-5757-4673-95A9-1886C703C687)

Holotype: A preserved male specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R166532

collected from the Shannon Area, Western Australia, Latitude -34.8194 S., Longitude 116.3025 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 R86438, R86439, R86440 and R29145 all collected from near Broke Inlet, Western Australia Latitude -34.8667 S., Longitude 116.35 E.

Diagnosis: Until now, both *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *G. brianbarnetti* sp. nov. have been treated as two distinct south-eastern populations of the putative species *G. leai* (Fletcher, 1898). However Edwards (2007), found species-level divergences between the three allopatric populations. As they are also morphologically divergent and evolving as separate species, it is appropriate that all three are formally identified and named as done in this paper. This means two species are formally named for the first time.

The three species constitute the entirety of the subgenus *Hesperocrinia* Wells and Wellington, 1985 as defined in this paper, the genus (or subgenus) concept being new and different from that of the original authors, Wells and Wellington (1985).

The type locality of *Crinia leai* Fletcher, 1898 (now placed in *Geocrinia* Blake, 1973, with a type species of *Pterophrynus laevis* Günther, 1864) is Bridgetown and Pipe Clay Creek (near Jarrahdale), Western Australia, Australia and hence this taxon represents the western population of the subgenus *Hesperocrinia*.

The putative species *Crinia michaelsoni* Werner, 1914 was synonymised with *G. leai* (Fletcher, 1898) by Cogger *et al.* (1983) and that taxon had a type locality of Donnybrook, Western Australia, which along with the type of *G. leai* is of the western population of the subgenus *Hesperocrinia*.

In other words the newer name is not available for the two populations herein referred to as *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *G. brianbarnetti* sp. nov..

The distribution of each of the three species is laid out in Fig. 5.2 of Edwards (2007) at top of page 125. The three species as identified by Edwards (2007) in Fig 5.2 from west to east, using the taxonomy and nomenclature of this paper are *G. laevis* (AKA Western lineage), occurring north and west of Warren and Donnelly, Western Australia, *G. brettbarnetti* sp. nov. being restricted to the Shannon-Gardner River catchment (AKA Shannon-Gardner lineage) and *G. brianbarnetti* sp. nov. from Walpole eastwards along the southern coast and nearby hinterland east to Two People's Bay of Western Australia, Australia (AKA south-east coastal lineage). Edwards (2007) at bottom of page 125 gave sequence divergences for each of the three species

indicating 2-3 million years divergence from one another.

They are separated from one another as follows:

G. leai is a generally yellowish to yellowish-brown coloured frog (adults) characterised by a semi-distinct dorsal pattern consisting of a dark greyish-brown or brown mid-dorsal stripe running down the mid back being as wide as the distance between the eyes. The boundary between this and the lighter upper flanks is not distinct. The mid dorsal area is also punctuated by small, raised irregular dark tubercular spots, slightly more prevalent near the mid outer edges. The flanks, while unicolour have a small number of semidistinct dark brown spots of small size on the lower flanks. Upper surfaces of the fore and hind limbs have limited dark flecks or markings, themselves only semidistinct, tending to form broken indistinct crossbands on the upper surfaces of the hind limbs. Iris is orange to red in colour. Crown across and between the eyes is yellow to orange brown.

G. brettbarnetti sp. nov. is a mainly grey frog both dorsally and on the sides, with strong russet flushes on the upper sides of the dorsum and on the upper surfaces of the upper arm (essentially brown) and to a lesser extent on the upper surfaces of the hind limbs (where it is a flush over grey and darker crossbands on the upper surfaces of the hind leg. Iris is chocolate brown. The upper surfaces of the back legs are grey and darker spots forming crossbands are also obvious. Crown across and between the eyes is light grey brown to chocolate brown.

G. brianbarnetti sp. nov. is a well-marked frog with a well-defined yellow or orange crown across and between the eyes, a dark, usually unicolour mid-dorsal stripe expanded to the width of between the eyes, which in some specimens is broken by a lighter mid-dorsal line down the mid section of most of the back. The wide mid dorsal stripe is bounded on the outer edge by a light (often near white boundary) at the leading edge of yellowish (brown or orange) upper flank in turn bounded by a fairly well-demarcated lower flank, which is dark brown in colour. Iris is yellow to brownish-yellow.

In both *G. leai* and *G. brettbarnetti sp. nov.* the metamorphosing tadpole is generally greyish in colour, without obvious dorsal markings or colouration. By contrast these tadpoles in *G. brianbarnetti sp. nov.* are well marked dorsally with bright orange-red on a beige background. The orange-red is particularly prominent on the upper limbs and the mid-dorsal line.

Anstis (2013) outlines various other differences between the tadpoles of both *G. leai* and *G. brianbarnetti sp. nov.* which she identifies as "southern" form of *G. leai*.

Photos of *G. leai* can be found in Storr, Smith and Johnstone (1994), plate 2, image 2, Cogger (2014)

on page 89 bottom and Anstis (2013) page 600 at top right.

G. brianbarnetti sp. nov. is depicted in Anstis (2013) page 600 at top left, middle right and middle bottom. Colour images of all three species *G. leai*, *G. brettbarnetti sp. nov.* and *G. brianbarnetti sp. nov.* in life can be found online at: <http://www.flickr.com> by typing in the search string "Geocrinia leai".

Frogs in the subgenus *Hesperocrinia* Wells and Wellington, 1985, herein treated as a complex of three species, two of which are formally named in this paper for the first time, are separated from other species in the nominate subgenus of *Geocrinia* and *Wellingtondella gen. nov.* by having toes with slight terminal expansions and with distinct subarticular tubercles; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe and a belly that is brown, yellow-brown or green-grey in colour.

Frogs in the genus *Geocrinia* are separated from the species within *Wellingtondella gen. nov.* by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella gen. nov.* are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

Geocrinia (both subgenera) are separated from *Wellingtondella gen. nov.* by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella gen. nov.* in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti sp. nov.* and *Geocrinia (Hesperocrinia) brianbarnetti sp. nov.* all from south-west Australia.

The genus *Wellingtondella gen. nov.* includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea*

(Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* *gen. nov.* are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden;

outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

Distribution: *G. brettbarnetti* *sp. nov.* is restricted to the Shannon-Gardner River catchment (AKA Shannon-Gardner lineage of Edwards 2007) and due to the very restricted distribution, must be regarded as a vulnerable or threatened species, meaning habitat where it occurs should be both protected and proactively managed.

Etymology: The species *G. brettbarnetti* *sp. nov.* is named in honour of Brett Barnett of Sunshine, Victoria, Australia, who like (and often with) his father Brian Barnett has devoted his life to furthering herpetology in Australia, including through active management of the Victorian Herpetological Society in many administrative and logistical roles over many decades, including managing security and many large, successful and at times difficult to manage, reptile breeder expos at the Melbourne Showgrounds.

GEOCRINIA (HESPEROCRINIA) BRIANBARNETTI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:DD12BE1C-20DA-4E09-9B52-5DEFEC217F42

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R120057 collected from 6 KM west of Albany, Western Australia, Australia, Latitude -35.0333 S., Longitude 117.8167 E. This government-owned facility allows access to its holdings.

Paratypes: Seven preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R116137-R116143 all collected from 8 KM west of Albany, Western Australia, Australia, Latitude -35.0167 S., Longitude 117.7916 E.

Diagnosis: Until now, both *Geocrinia (Hesperocrinia) brettbarnetti* *sp. nov.* and *G. brianbarnetti* *sp. nov.* have been treated as two distinct south-eastern populations of the putative species *G. leai* (Fletcher,

1898). However Edwards (2007), found species-level divergences between the three allopatric populations. As they are also morphologically divergent and evolving as separate species, it is appropriate that all three are formally identified and named as done in this paper. This means two species are formally named for the first time.

The three species constitute the entirety of the subgenus *Hesperocrinia* Wells and Wellington, 1985 as defined in this paper, the genus (or subgenus) concept being new and different from that of the original authors, Wells and Wellington (1985).

The type locality of *Crinia leai* Fletcher, 1898 (now placed in *Geocrinia* Blake, 1973, with a type species of *Pterophrynus laevis* Günther, 1864) is Bridgetown and Pipe Clay Creek (near Jarrahdale), Western Australia, Australia and hence this taxon represents the western population of the subgenus *Hesperocrinia*.

The putative species *Crinia michaelsoni* Werner, 1914 was synonymised with with *G. leai* (Fletcher, 1898) by Cogger *et al.* (1983) and that taxon had a type locality of Donnybrook, Western Australia, which along with the type of *G. leai* is of the western population of the subgenus *Hesperocrinia*.

In other words the newer name is not available for the two populations herein referred to as *Geocrinia (Hesperocrinia) brettbarnetti* *sp. nov.* and *G. brianbarnetti* *sp. nov.*.

The distribution of each of the three species is laid out in Fig. 5.2 of Edwards (2007) at top of page 125. The three species as identified by Edwards (2007) in Fig 5.2 from west to east, using the taxonomy and nomenclature of this paper are *G. laevis* (AKA Western lineage), occurring north and west of Warren and Donnelly, Western Australia, *G. brettbarnetti* *sp. nov.* being restricted to the Shannon-Gardner River catchment (AKA Shannon-Gardner lineage) and *G. brianbarnetti* *sp. nov.* from Walpole eastwards along the southern coast and nearby hinterland east to Two People's Bay of Western Australia, Australia (AKA south-east coastal lineage). Edwards (2007) at bottom of page 125 gave sequence divergences for each of the three species indicating 2-3 million years divergence from one another.

They are separated from one another as follows: *G. leai* is a generally yellowish to yellowish-brown coloured frog (adults) characterised by a semi-distinct dorsal pattern consisting of a dark greyish-brown or brown mid-dorsal stripe running down the mid back being as wide as the distance between the eyes. The boundary between this and the lighter upper flanks is not distinct. The mid dorsal area is also punctuated by small, raised irregular dark tubercular spots, slightly more prevalent near the mid outer edges. The flanks, while unicolour have a small number of semidistinct dark brown spots of

small size on the lower flanks. Upper surfaces of the fore and hind limbs have limited dark flecks or markings, themselves only semidistinct, tending to form broken indistinct crossbands on the upper surfaces of the hind limbs. Iris is orange to red in colour. Crown across and between the eyes is yellow to orange brown.

G. brettbarnetti sp. nov. is a mainly grey frog both dorsally and on the sides, with strong russet flushes on the upper sides of the dorsum and on the upper surfaces of the upper arm (essentially brown) and to a lesser extent on the upper surfaces of the hind limbs (where it is a flush over grey and darker crossbands on the upper surfaces of the hind leg. Iris is chocolate brown. The upper surfaces of the back legs are grey and darker spots forming crossbands are also obvious. Crown across and between the eyes is light grey brown to chocolate brown.

G. brianbarnetti sp. nov. is a well-marked frog with a well-defined yellow or orange crown across and between the eyes, a dark, usually unicolour mid-dorsal stripe expanded to the width of between the eyes, which in some specimens is broken by a lighter mid-dorsal line down the mid section of most of the back. The wide mid dorsal stripe is bounded on the outer edge by a light (often near white boundary) at the leading edge of yellowish (brown or orange) upper flank in turn bounded by a fairly well-demarcated lower flank, which is dark brown in colour. Iris is yellow to brownish-yellow.

In both *G. leai* and *G. brettbarnetti* sp. nov. the metamorphosing tadpole is generally greyish in colour, without obvious dorsal markings or colouration. By contrast these tadpoles in *G. brianbarnetti* sp. nov. are well marked dorsally with bright orange-red on a beige background. The orange-red is particularly prominent on the upper limbs and the mid-dorsal line.

Anstis (2013) outlines various other differences between the tadpoles of both *G. leai* and *G. brianbarnetti* sp. nov. which she identifies as "southern" form of *G. leai*.

Photos of *G. leai* can be found in Storr, Smith and Johnstone (1994), plate 2, image 2, Cogger (2014) on page 89 bottom and Anstis (2013) page 600 at top right.

G. brianbarnetti sp. nov. is depicted in Anstis (2013) page 600 at top left, middle right and middle bottom.

Colour images of all three species *G. leai*, *G. brettbarnetti* sp. nov. and *G. brianbarnetti* sp. nov. in life can be found online at: <http://www.flickr.com> by typing in the search string "Geocrinia leai".

Frogs in the subgenus *Hesperocrinia* Wells and Wellington, 1985, herein treated as a complex of three species, two of which are formally named in this paper for the first time, are separated from other species in the nominate subgenus of *Geocrinia* and *Wellingtondella* gen. nov. by having toes with slight

terminal expansions and with distinct subarticular tubercles; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe and a belly that is brown, yellow-brown or green-grey in colour.

Frogs in the genus *Geocrinia* are separated from the species within *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

Geocrinia (both subgenera) are separated from *Wellingtondella* gen. nov. by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella* gen. nov. in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *Geocrinia (Hesperocrinia) brianbarnetti* sp. nov. all from south-west Australia.

The genus *Wellingtondella* gen. nov. includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* gen. nov. are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood

pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phalanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

Distribution: *G. brianbarnetti* sp. nov. is restricted to the region from Walpole eastwards along the southern coast and nearby hinterland, east to Two People's Bay of Western Australia, Australia (AKA south-east coastal lineage according to Edwards 2007).

Etymology: The species *G. brianbarnetti* sp. nov. is named in honour of Brian Barnett of Sunshine, Victoria, Australia, who like (and often with) his son Brett Barnett has devoted his life to furthering herpetology in Australia, including through active management of the Victorian Herpetological Society in many roles over many decades.

Two other family members, Lani (former wife of Brian Barnett) and Tye (AKA Taipan), younger son of Brian Barnett are also formally recognized herein for their major contributions to herpetology and have previously had species formally named in their honour.

GEOCRINIA LAEVIS GRAMPIANSENSIS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:FEF2295D-DD04-4A1E-A354-4D4F3D8FF3DB

Holotype: A preserved male specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D23575 collected from Forest Lodge, Grampians, Victoria, Australia, Latitude -37.17 S., Longitude 142.35 E. This government-owned facility allows access to its holdings.

Paratypes: Fourteen preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D23576, D23577, D23578, D23579, D23580, D23581, D24314, D68570, D68571, D68572, D72234, D72235, D72236, D72237 all collected from The Grampians, Victoria, Australia.

Diagnosis: Until now, the *G. laevis grampiansensis* subsp. nov. from the Grampians region of Victoria has been treated as nominate *G. laevis* Günther, 1864, with a type locality of Tasmania.

However both forms are morphologically divergent and geographically separated (allopatric) and therefore warrant taxonomic separation.

While they are probably separate species, the newly named form is herein conservatively named as a subspecies in the absence of a molecular basis to separate the forms (as in no comparative molecular study has been done).

G. laevis grampiansensis subsp. nov. is separated from *G. laevis* by having a dorsum covered with numerous (usually orange-tipped) tubercles, those on the sides of the back and upper flanks being largest

and most prominent. While there is often a russet sheen or semidistinct ill-defined russet or brown markings on the dorsum, there are no obvious and well-defined orange blotches or spots on smooth skin on the sides of the back and/or upper flanks (as seen in *G. laevis laevis*). The iris is yellow or yellowish. The dorsum has an obvious greyish wash throughout.

G. laevis laevis by contrast has a smooth dorsum, or sometimes has very few and widely scattered tiny tubercles at the rear of the dorsum. There are obvious and well-defined medium to large orange blotches or spots on smooth skin on the sides of the back and/or upper flanks (not seen in *G. laevis grampiansensis* subsp. nov.). The iris is brown or brownish. The dorsum is not covered with numerous usually orange-tipped tubercles, those on the sides of the back and upper flanks being largest and most prominent as seen in *G. laevis grampiansensis* subsp. nov.. There is no obvious greyish wash throughout the upper surface of the dorsum as seen in *G. laevis grampiansensis* subsp. nov..

The underside of the chin in *G. laevis laevis* is mainly white, versus heavily peppered greyish in *G. laevis grampiansensis* subsp. nov.. The belly of *G. laevis grampiansensis* subsp. nov. is also heavily peppered throughout versus boldly marked with black and white in *G. laevis laevis*.

Photos of *G. laevis grampiansensis* subsp. nov. in life can be seen online at:

<https://www.flickr.com/photos/88708273@N03/8743396751/>

and

<https://www.flickr.com/photos/88708273@N03/8743399897/>

and

<https://www.flickr.com/photos/14807473@N08/3445319297/>

and

<https://www.flickr.com/photos/88708273@N03/8744513418/>

A photo of the venter of this species can be seen online at:

<https://www.flickr.com/photos/whawha88/13162642714/>

Photos of *G. laevis laevis* in life can be seen in Anstis (2013) on page 595 at top

and online at:

<https://www.flickr.com/photos/126002448@N02/33642728361/>

and

<https://www.flickr.com/photos/126002448@N02/33772084545/>

G. laevis laevis dorsal and ventral views can be seen in Cogger (2014) on page 88 in the bottom two images.

G. laevis (both subspecies) are separated from the

morphologically similar species *G. victoriana* (Boulenger, 1888) (all three subspecies as defined in this paper), by having a mating call that is a cra-a-a-a-a-ack, cra-a-ack, cra-a-ack, cra-a-ack, etc, sound, versus cr-r-rack, cr-r-rack, cr-r-raxk, pip, pip, pip, pip-pip-pip-pip-pip-pip-pip.

G. laevis and *G. victoriana* constitute the entirety of the (nominative) subgenus *Geocrinia*, within the genus *Geocrinia* Blake, 1973.

Frogs in the genus *Geocrinia* are separated from the species within the morphologically similar genus *Wellingtondella* *gen. nov.* by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx. The nominative subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* (the only other subgenus within *Geocrinia*) by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* *gen. nov.* are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

Geocrinia (both subgenera) are separated from *Wellingtondella* *gen. nov.* by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella* *gen. nov.* in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti* *sp. nov.* and *Geocrinia (Hesperocrinia) brianbarnetti* *sp. nov.* all from south-west Australia.

The genus *Wellingtondella* *gen. nov.* includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* *gen. nov.* are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth

are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phalanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

Distribution: *G. laevis grampiansensis* *subsp. nov.* is presently only known from the Grampians in western Victoria. Populations assigned to putative *G. laevis* from southern Victoria appear to be morphologically divergent from both the Grampians and Tasmanian animals, but more similar to the Grampians taxon and may ultimately be referred to it. Images of these frogs can be found in Anstis (2013) on page 595 at bottom and page 596 (all four images).

It is likely that true *G. laevis laevis* is in fact confined to Tasmania and immediately offshore islands.

Etymology: *G. laevis grampiansensis* *subsp. nov.* is named with reference to the location it is known to occur, being the Grampians, a mountainous region, which is mainly a National Park, in south-western Victoria, away from the southern coast.

GEOCRINIA VICTORIANA OTWAYSSENSIS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:712D150E-DFEA-4655-9AD8-900A5251B87D

Holotype: A preserved female specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D47155 collected from Old Wonga Road, Otway Ranges, Victoria, Australia, Latitude -38.45 S., Longitude 143.53 E. This government-owned facility allows access to its holdings.

Paratype: A preserved female specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D43397 collected from 10.5 km south-east of Irrewillipe, Victoria, Australia, Latitude -38.48 S., Longitude 143.5 E.

Diagnosis: Until now, *Geocrinia victoriana otwaysensis* *subsp. nov.* from the Otway Ranges area of Victoria, has been treated as a divergent population of *Geocrinia victoriana* (Boulenger, 1888) with a type locality of Warragul, south-east of Melbourne, Victoria, Australia. Putative *G. victoriana* occurs across wetter parts of southern and eastern Victoria, excluding alpine regions, with the distribution becoming fragmented as one moves west of Melbourne, being generally confined to higher and wetter areas. In East Gippsland, east of Bairnsdale, Victoria, the subspecies *G. victoriana logani* *subsp. nov.* occurs in coastal and near coastal areas to the New South Wales border and north along the coast to at least Eden, New South Wales.

The population from the Otway Ranges is well-known to be morphologically divergent from others in Victoria, including those in the Ballarat region, which by distance is proximal to the Otways region, but separated from it by a relatively flat region. While it is most likely that full species-level recognition is appropriate for this population, no comparative molecular studies on populations of *G. victoriana* across Victoria have been published and so in this paper I have conservatively named the Otways population and similarly divergent East Gippsland population as new subspecies.

The name *Crinia froggatti* Fletcher, 1891 applies to specimens from Buninyong and Gong Gong, near Ballarat in Victoria and so cannot be used for the Otways population or that from east Gippsland. With no available names, the Otways population is formally named *Geocrinia victoriana otwaysensis* subsp. nov. and the east Gippsland population is named *G. victoriana logani* subsp. nov..

Geocrinia victoriana otwaysensis subsp. nov. is readily separated from all other *Geocrinia victoriana* (herein identified as *Geocrinia victoriana victoriana* or *G. victoriana logani* subsp. nov.) by having numerous expanded spots across the dorsum and flanks. The condition of expanded spots is sometimes seen in nominate *Geocrinia victoriana victoriana* (but not *G. victoriana logani* subsp. nov.) but when this is the case, the expanded spots are either small (instead of medium or large), or if large, there is only one or two present, as opposed to many.

From the dorsal view, pre-metamorphosing tadpoles of *G. victoriana victoriana* and *G. victoriana logani* subsp. nov. are a dark greyish-black in colour, versus a strongly peppered light brown in *G. victoriana otwaysensis* subsp. nov..

G. victoriana logani subsp. nov. is similar in most respects to *G. victoriana victoriana* as defined above, but is separated from that subspecies by the following characters: no enlarged spots on the dorsum; possession of a well defined dorsal pattern consisting of two, sometimes broken, dark brown stripes, sometimes formed by blotches and at other times as a continuous line, running from behind each eye, down the back to the posterior. The central region between is a lighter brown. Upper flanks are light brown and lower flanks darker, but the demarcation of each zone is not always well defined. Venter is light. On the upper surfaces of both hind and fore-limbs, dark markings on a lighter background are well-defined, which is not the case in *G. victoriana victoriana*. The upper labial region and front of snout has numerous small darker markings on a lighter background, versus only a few large dark markings over a light background in *G. victoriana victoriana*.

G. victoriana otwaysensis subsp. nov. in life is depicted in Anstis (2013) on page 610 (all photos)

and online at:

<https://www.flickr.com/photos/126002448@N02/33489508005/>

Geocrinia victoriana victoriana in life from east of Melbourne, Victoria, Australia is depicted online at: <https://www.flickr.com/photos/jono-dashper/44487345251/>

and

<https://www.flickr.com/photos/88708273@N03/41643684182/>

and

<https://www.flickr.com/photos/23031163@N03/26275046344/>

G. victoriana logani subsp. nov. is depicted in life online at:

<https://www.flickr.com/photos/68921296@N06/13709439403/>

and

<https://www.flickr.com/photos/58349528@N02/25483347914/>

and

<https://www.flickr.com/photos/akashsherping/13795350524/>

and

<https://www.flickr.com/photos/14807473@N08/5717539060/>

G. laevis (both subspecies) are separated from the morphologically similar species *G. victoriana* (Boulenger, 1888) (all three subspecies as defined in this paper), by having a mating call that is a cra-a-a-a-ack, cra-a-ack, cra-a-ack, cra-a-ack, etc, sound, versus cr-r-rack, cr-r-rack, cr-r-raxk, pip, pip, pip-pip-pip-pip-pip-pip in *G. victoriana*.

G. laevis and *G. victoriana* constitute the entirety of the (nominate) subgenus *Geocrinia*, within the genus *Geocrinia* Blake, 1973.

Frogs in the genus *Geocrinia* are separated from the species within the morphologically similar genus *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* (the only other subgenus within *Geocrinia*) by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

Geocrinia (both subgenera) are separated from

Wellingtondella gen. nov. by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella gen. nov.* in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti sp. nov.* and *Geocrinia (Hesperocrinia) brianbarnetti sp. nov.* all from south-west Australia.

The genus *Wellingtondella gen. nov.* includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella gen. nov.* are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden;

outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

Distribution: *Geocrinia victoriana otwaysensis subsp. nov.* appears to be a disjunct population restricted to the Otway Ranges area in coastal south-west Victoria, Australia. Populations found east of Ararat, across the north of Melbourne and including most of eastern Victoria and far south-east New South Wales are of the nominate subspecies *Geocrinia victoriana victoriana*.

Etymology: The subspecies *Geocrinia victoriana otwaysensis subsp. nov.* is named in recognition of where the population is found.

GEOCRINIA VICTORIANA LOGANI SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:9BC9EF8B-74F0-48A7-AF74-FD5980763FED

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D24265 collected from Cann River, Victoria, Australia, Latitude -37.57 S., Longitude

149.15 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D2196, D24201, D24245 and D24266 all from within 10 km of the type locality (Cann River, Victoria).

Diagnosis: Until now, *G. victoriana logani subsp. nov.* from East Gippsland, Victoria (east of Bairnsdale) and also found in nearby New South Wales on the far south coast, at least as far north as Eden in New South Wales, has been treated as a divergent and disjunct population of *Geocrinia victoriana* (Boulenger, 1888) with a type locality of Warragul, south-east of Melbourne, Victoria, Australia.

The population from the Otway Ranges is well-known to be morphologically divergent from others in Victoria, including those in the Ballarat region, which by distance is proximal to the Otways region, but separated from it by a relatively flat region. While it is most likely that full species-level recognition is appropriate for this population, no comparative molecular studies on populations of *G. victoriana* across Victoria have been published and so in this paper I have conservatively named the Otways population and similarly divergent East Gippsland population as new subspecies.

The name *Crinia froggatti* Fletcher, 1891 applies to specimens from Buninyong and Gong Gong, near Ballarat in Victoria and so cannot be used for the Otways population or that from east Gippsland. With no available names, the Otways population is formally named *Geocrinia victoriana otwaysensis subsp. nov.* and the east Gippsland population is named *G. victoriana logani subsp. nov.*

Geocrinia victoriana otwaysensis subsp. nov. is readily separated from all other *Geocrinia victoriana* (herein identified as *Geocrinia victoriana victoriana* or *G. victoriana logani subsp. nov.*) by having numerous expanded spots across the dorsum and flanks. The condition of expanded spots is sometimes seen in nominate *Geocrinia victoriana victoriana* (but not *G. victoriana logani subsp. nov.*) but when this is the case, the expanded spots are either small (instead of medium or large), or if large, there is only one or two present, as opposed to many.

From the dorsal view, pre-metamorphosing tadpoles of *G. victoriana victoriana* and *G. victoriana logani subsp. nov.* are a dark greyish-black in colour, versus a strongly peppered light brown in *G. victoriana otwaysensis subsp. nov.*

G. victoriana logani subsp. nov. is similar in most respects to *G. victoriana victoriana* as defined above, but is separated from that subspecies (and in turn *G. victoriana otwaysensis subsp. nov.*) by the following characters: no enlarged spots on the dorsum; possession of a well defined dorsal pattern consisting

of two, sometimes broken, dark brown stripes, sometimes formed by blotches and at other times as a continuous line, running from behind each eye, down the back to the posterior. The central region between is a lighter brown. Upper flanks are light brown and lower flanks darker, but the demarcation of each zone is not always well defined. Venter is light. On the upper surfaces of both hind and forelimbs, dark markings on a lighter background are well-defined, which is not the case in *G. victoriana victoriana*. The upper labial region and front of snout has numerous small darker markings on a lighter background, versus only a few large dark markings over a light background in *G. victoriana victoriana*.

G. victoriana otwaysensis subsp. nov. in life is depicted in Anstis (2013) on page 610 (all photos) and online at:

<https://www.flickr.com/photos/126002448@N02/33489508005/>

Geocrinia victoriana victoriana in life from east of Melbourne, Victoria, Australia is depicted online at: <https://www.flickr.com/photos/jono-dashper/44487345251/>

and

<https://www.flickr.com/photos/88708273@N03/41643684182/>

and

<https://www.flickr.com/photos/23031163@N03/26275046344/>

G. victoriana logani subsp. nov. is depicted in life online at:

<https://www.flickr.com/photos/68921296@N06/13709439403/>

and

<https://www.flickr.com/photos/58349528@N02/25483347914/>

and

<https://www.flickr.com/photos/akashsherping/13795350524/>

and

<https://www.flickr.com/photos/14807473@N08/5717539060/>

G. laevis (both subspecies) are separated from the morphologically similar species *G. victoriana* (Boulenger, 1888) (all three subspecies as defined in this paper), by having a mating call that is a cra-a-a-a-ack, cra-a-ack, cra-a-ack, cra-a-ack, etc, sound, versus cr-r-rack, cr-r-rack, cr-r-raxk, pip, pip, pip, pip-pip-pip-pip-pip-pip in *G. victoriana*.

G. laevis and *G. victoriana* constitute the entirety of the (n nominate) subgenus *Geocrinia*, within the genus *Geocrinia* Blake, 1973.

Frogs in the genus *Geocrinia* are separated from the species within the morphologically similar genus *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the

inner finger with at most a single very short phalanx. The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* (the only other subgenus within *Geocrinia*) by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

Geocrinia (both subgenera) are separated from *Wellingtondella* gen. nov. by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella* gen. nov. in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *Geocrinia (Hesperocrinia) brianbarnetti* sp. nov. all from south-west Australia.

The genus *Wellingtondella* gen. nov. includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* gen. nov. are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden;

outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

Distribution: *G. victoriana logani* subsp. nov. is found in East Gippsland, Victoria commencing east of Bairnsdale and also found in nearby New South Wales on the far south coast, at least as far north as

Eden in New South Wales.

Etymology: The subspecies *G. victoriana logani* *subsp. nov.* is named in honour of Clinton Logan of Genoa, Victoria, in recognition of his services to herpetology over many years (with grateful thanks to his wife, Debbie), including assisting with relevant fieldwork and studies on this subspecies and other frogs in the same region over many years, both by myself and other respected Victorian (Australia) herpetologists, including in particular Rob Valentic.

PARACRINIA LENHOSERI SP. NOV.

LSIDurn:lsid:zoobank.org:act:641431A9-EE8A-45E5-B458-BD50C01489FE

Holotype: A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D22285, collected 1.6 km North-east of Bittern, Victoria, Australia, Latitude -38.3 S., Longitude 145.18 E. This government-owned facility allows access to its holdings.

Paratypes: Nine preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D22286- D22293, D44333-D44334 all collected 1.6 km North-east of Bittern, Victoria, Australia, Latitude -38.3 S., Longitude 145.18 E.

Diagnosis: Until now, both *Paracrinia lenhoseri* *sp. nov.* and *P. funki* *sp. nov.* have been treated as populations of *P. haswelli* (Fletcher, 1894), with a type locality of Jervis Bay in New South Wales, Australia. Numerous field surveys by myself across the entire known range of putative *P. haswelli* from south-east of Melbourne, along the southern Victorian coastline, into southern New South Wales and along the coast to the mid north coast of New South Wales, including inspection of many hundreds of live specimens of all sex and age as well as tadpoles at various stages of development has confirmed that apparently allopatric populations are divergent and in need of species-level recognition.

The type form appears to be found from about Ourimbah on the New South Wales Central coast, Latitude 33.2154 S., Longitude 151.225 E., being about 78 km north of the Sydney Central Business District, south along the NSW coast to the Corunna State Forest on the New South Wales South Coast, Latitude -36.2799 S., Longitude 150.1261 E.

P. lenhoseri *sp. nov.* is found from about Kiah in the Bega Valley of far southern New South Wales, Latitude -37.15 S., Longitude 149.85 E., across southern Victoria to the lower Mornington Peninsula, Latitude -38.3 S., Longitude 145.18 E., south-east of Melbourne, Australia.

P. funki *sp. nov.* occurs north of Newcastle New South Wales (NSW), along the NSW North coast at least as far north as Napiac, New South Wales, Latitude -32.1235 S., Longitude 152.3987 E., with further unconfirmed reports and isolated specimens found further north on the New South Wales north

coast, the most northern museum voucher specimen being 20 km north of Coffs Harbour Latitude -30.083 S., Longitude 153.200 E.

Where each species occurs they are usually abundant and easily found by collectors, either during or after rain.

Paracrinia lenhoseri *sp. nov.*, *P. funki* *sp. nov.* and *P. haswelli* are readily separated from one another as follows:

P. lenhoseri *sp. nov.* is the only species of the trio to have numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black.

P. lenhoseri *sp. nov.* is further separated from the other two species by well defined and prominent large salmon coloured blotches or markings on the upper surfaces of the hind limbs.

Both *P. lenhoseri* *sp. nov.* and *P. haswelli* have well defined black marks of some form on the back, versus ill defined in *P. funki* *sp. nov.*

P. funki *sp. nov.* is separated from both *P. lenhoseri* *sp. nov.* and *P. haswelli* by having a premetamorphosing tadpole that lacks prominent black blotches on the muscle of the tail as seen in the other two species.

P. funki *sp. nov.* has a dark snout tip, versus light in both *P. lenhoseri* *sp. nov.* and *P. haswelli*.

In case it was missed in the above, *P. haswelli* is separated from the other two species by the unique combination of not having numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black; a light snout tip; a premetamorphosing tadpole that has prominent black blotches on the muscle of the tail.

P. haswelli in life is depicted in Anstis (2013) on page 626 in all images, Cogger 2014 on page 100 at bottom, and online at:

<https://www.flickr.com/photos/shaneblackfnq/18226091658/>

and

<https://www.flickr.com/photos/shaneblackfnq/16391846764/>

and

<https://www.flickr.com/photos/14807473@N08/3557615613/>

and

<https://www.flickr.com/photos/126237772@N07/19747508771/>

and

<https://www.flickr.com/photos/shaneblackfnq/17014263685/>

P. lenhoseri *sp. nov.* is seen in life in images online at:

<https://www.flickr.com/photos/126002448@N02/24670657915/>

and

<https://www.flickr.com/photos/127392361@N04/31472328583/>

and

<https://www.flickr.com/photos/88708273@N03/13708519635/>

P. funki sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/3914787034/>

and

<https://www.flickr.com/photos/88708273@N03/996826943/>

The three preceding species, forming the entirety of the genus *Paracrinia* Heyer and Liem, 1976 are readily separated from all other Myobatrachidae frogs by the following unique suite of characters:

Average adult size 35 mm in length. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are present, although stated as absent in the original genus description of *Paracrinia*. They are in two short rows behind the level of the choanae. Iris golden brown. Head as long as broad and slightly depressed; snout somewhat pointed. Tongue is small, narrow, oval and free at the rear. Pupil horizontal. Indistinct tympanum. Toes fringed and without webbing. Phlanges simple, tips of fingers not or only slightly dilated. Terminal phlanges are pointed and not T-shaped. No dermal brood pouches. Paratoid glands and flank glands either absent or not visible externally. Belly slightly granular. Dorsal skin smooth or with tubercles, the amount and size of tubercles varying depending on species, locality and individual frog.

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Tadpoles of both *P. haswelli* and *P. funki sp. nov.* are depicted on pages 627 and 628 of Anstis (2013).

Distribution: *P. lenhoseri sp. nov.* is found from about Kiah in the Bega Valley of far southern New South Wales, Latitude -37.15 S., Longitude 149.85 E., across southern Victoria to the lower Mornington Peninsula, Latitude -38.3 S., Longitude 145.18 E., south-east of Melbourne, Australia, generally south or east of the summit of the Great Dividing Range.

Etymology: *P. lenhoseri sp. nov.* is named in honour of my late father, Leonard (Len) Donald Hoser, born in the UK, who spent over 30 years in Australia

before retiring back to the United Kingdom in his final years, in recognition of his countless contributions to herpetology over a period spanning more than 3 decades.

PARACRINIA FUNKI SP. NOV.

LSIDurn:lsid:zoobank.org:act:2ECE1824-846D-46DF-B941-530B746E24FE

Holotype: A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.184425 collected 3.5 km along the Old Aerodrome Road, Nabiac, New South Wales, Australia, Latitude -32.1235 S., Longitude 152.3987 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ Four preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.184426, R.184427, R.184428 and R.184438 all collected 3.5 km along the Old Aerodrome Road, Nabiac, New South Wales, Australia, Latitude -32.1235 S., Longitude 152.3987 E. 2/ Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.158044, R.158057 and R.158061 all collected 1 km north north-west of Big Gibber Headland, Myall Lakes National Park, New South Wales, Australia, Latitude -32.4814 S., Longitude 152.4055 E.

Diagnosis: Until now, both *Paracrinia funki sp. nov.* and *P. lenhoseri sp. nov.* have been treated as populations of *P. haswelli* (Fletcher, 1894), with a type locality of Jervis Bay in New South Wales, Australia. Numerous field surveys by myself across the entire known range of putative *P. haswelli* from south-east of Melbourne, along the southern Victorian coastline, into southern New South Wales and along the coast to the mid north coast of New South Wales, including inspection of many hundreds of live specimens of all sex and age as well as tadpoles at various stages of development has confirmed that apparently allopatric populations are divergent and in need of species-level recognition.

The type form appears to be found from about Ourimbah on the New South Wales Central coast, Latitude 33.2154 S., Longitude 151.225 E., being about 78 km north of the Sydney Central Business District, south along the NSW coast to the Corunna State Forest on the New South Wales South Coast, Latitude -36.2799 S., Longitude 150.1261 E.

P. lenhoseri sp. nov. is found from about Kiah in the Bega Valley of far southern New South Wales, Latitude -37.15 S., Longitude 149.85 E., across southern Victoria to the lower Mornington Peninsula, Latitude -38.3 S., Longitude 145.18 E., south-east of Melbourne, Australia.

P. funki sp. nov. occurs north of Newcastle New South Wales, along the NSW North coast at least as far north as Nabiac, New South Wales, Latitude -32.1235 S., Longitude 152.3987 E., with further

unconfirmed reports and isolated specimens found further north on the New South Wales north coast, the most northern Australian museum voucher specimen being 20 km north of Coffs Harbour Latitude -30.083 S., Longitude 153.200 E.

Where each species occurs they are usually abundant and easily found by collectors.

Paracrinia lenhoseri sp. nov., *P. funki* sp. nov. and *P. haswelli* are readily separated from one another as follows:

P. lenhoseri sp. nov. is the only species of the trio to have numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black.

P. lenhoseri sp. nov. is further separated from the other two species by well defined and prominent large salmon coloured blotches or markings on the upper surfaces of the hind limbs.

Both *P. lenhoseri* sp. nov. and *P. haswelli* have well defined black marks of some form on the back, versus ill defined in *P. funki* sp. nov..

P. funki sp. nov. is separated from both *P. lenhoseri* sp. nov. and *P. haswelli* by having a premetamorphosing tadpole that lacks prominent black blotches on the muscle of the tail as seen in the other two species.

P. funki sp. nov. has a dark snout tip, versus light in both *P. lenhoseri* sp. nov. and *P. haswelli*.

In case it was missed in the above, *P. haswelli* is separated from the other two species by the unique combination of not having numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black; a light snout tip; a premetamorphosing tadpole that has prominent black blotches on the muscle of the tail.

P. haswelli in life is depicted in Anstis (2013) on page 626 in all images, Cogger 2014 on page 100 at bottom, and online at:

<https://www.flickr.com/photos/shaneblackfnq/18226091658/>

and

<https://www.flickr.com/photos/shaneblackfnq/16391846764/>

and

<https://www.flickr.com/photos/14807473@N08/3557615613/>

and

<https://www.flickr.com/photos/126237772@N07/19747508771/>

and

<https://www.flickr.com/photos/shaneblackfnq/17014263685/>

P. lenhoseri sp. nov. is seen in life in images online at:

<https://www.flickr.com/photos/126002448@N02/>

[24670657915/](https://www.flickr.com/photos/127392361@N04/31472328583/)

and

<https://www.flickr.com/photos/127392361@N04/31472328583/>

and

<https://www.flickr.com/photos/88708273@N03/13708519635/>

P. funki sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/3914787034/>

and

<https://www.flickr.com/photos/88708273@N03/9966826943/>

The three preceding species, forming the entirety of the genus *Paracrinia* Heyer and Liem, 1976 are readily separated from all other Myobatrachidae frogs by the following unique suite of characters:

Average adult size 35 mm in length. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are present, although stated as absent in the original genus description of *Paracrinia*. They are in two short rows behind the level of the choanae. Iris golden brown. Head as long as broad and slightly depressed; snout somewhat pointed. Tongue is small, narrow, oval and free at the rear. Pupil horizontal. Indistinct tympanum. Toes fringed and without webbing. Phlanges simple, tips of fingers not or only slightly dilated. Terminal phlanges are pointed and not T-shaped. No dermal brood pouches. Paratoid glands and flank glands either absent or not visible externally. Belly slightly granular. Dorsal skin smooth or with tubercles, the amount and size of tubercles varying depending on species, locality and individual frog.

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Tadpoles of both *P. haswelli* and *P. funki* sp. nov. are depicted on pages 627 and 628 of Anstis (2013).

Distribution: *P. funki* sp. nov. occurs north of Newcastle New South Wales (NSW), along the NSW North coast at least as far north as Nabiac, New South Wales, Latitude -32.1235 S., Longitude 152.3987 E., with further unconfirmed reports and isolated specimens found further north on the New South Wales north coast, the most northern Australian museum voucher specimen being 20 km north of Coffs Harbour Latitude -30.083 S., Longitude

153.200 E.

Etymology: *P. funki* sp. nov. is named in honour of Dr. Richard Funk of Mesa, Arizona, USA, previously of Florida, USA, in recognition of a lifetime's services and contributions to herpetology and wildlife conservation in general, in particular with regard to veterinary medicine and procedures.

METACRINIA BETTYSWILEAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:CC305EAA-911A-4A20-AF1B-CEA50A62B3B4

Holotype: A preserved 18 mm (snout-vent length / body length) adult specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R123330 collected from Mount Shadforth, Western Australia, Australia, Latitude -34.9678 S., Longitude 117.2797 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 R123331 collected from Mount Shadforth, Western Australia, Australia, Latitude -34.9678 S., Longitude 117.2797 E.

Diagnosis: The until now monotypic genus *Metacrinia* Parker, 1940, with the type species *Pseudophryne nichollsi* Harrison, 1927 known only from south-west Western Australia, is split into three species, each being morphologically and genetically divergent.

Three genetically divergent populations in south-west Australia were identified by Edwards (2007).

Only the western, population, identified by her as the main population, has an available name, being type form for the species *Metacrinia nichollsi* (Harrison, 1927), with a type locality of Pemberton, Western Australia. See Fig. 4.2 on page 101 of Edwards (2007), for exact distributions of each species as identified herein.

A second population from the south coast from Walpole in the west to Albany in the east in southern Western Australia, identified by Edwards (2007) as the "Southcoastal Lineage" is formally named as a new species, *M. bettyswileae* sp. nov. as is another outlier population confined to the Stirling Range National Park north-east of this area, identified by Edwards (2007) as the "Stirling Range Lineage", formally named herein as *M. wilhelminahughesae* sp. nov..

Edwards (2007) gave various time date estimates for the divergences of each population, but at page 108 estimated the populations of the three clades (named herein as species) diverged from one another 2.6 to 3.4 million years before present. While recognizing each as distinct lineages, she did not formally name any.

Morphological and genetic divergence of each lineage, made species level recognition the only

logical step to take when I was reviewing the taxonomy of the group and hence this formal description.

The three species are readily separated as follows:

Metacrinia nichollsi is readily separated from both other species by the presence of numerous closely-spaced large blunt, irregularly shaped tubercles on the middle and lower flanks. By contrast both other two species have relatively smooth skin on the mid and lower flanks with widely spaced small pointed tubercles that are mainly light tipped and encircled by dark in *M. bettyswileae* sp. nov. and mainly not light tipped and encircled by dark in *M. wilhelminahughesae* sp. nov..

While all three species have a dorsum covered with large blunt tubercles, bumps and welts, those which form folds in a linear arrangement are either absent or very limited in *M. nichollsi* and *M. wilhelminahughesae* sp. nov. but prominent in *M. bettyswileae* sp. nov..

The dorsum of both *M. nichollsi* and *M. bettyswileae* sp. nov. is generally dark grey or brown, often heavily overlain with red, brown or orange, whereas the dorsum of *M. wilhelminahughesae* sp. nov. is usually distinctly lighter in colour, being mainly beige, light brown or a light brownish grey.

M. nichollsi commonly has an obvious small to medium tympanum, usually of irregular diamond shape, although specimens without an obvious tympanum are also common. In both *M. bettyswileae* sp. nov. and *M. wilhelminahughesae* sp. nov. absence of a (visible) tympanum appears to be the usual state.

Metacrinia nichollsi in life is depicted in Anstis (2013) on page 617 at top right and middle right and online at:

<https://www.flickr.com/photos/fins72/38930714251/>

and

<https://www.flickr.com/photos/fins72/27153941029/>

M. bettyswileae sp. nov. is depicted in life in Anstis (2013) on page 617 at top left and online at:

<https://www.flickr.com/photos/euprepiosaur/30766600206/>

and

<https://www.flickr.com/photos/wacrakey/27485527484/>

and

<https://www.flickr.com/photos/23031163@N03/29903436420/>

and

<https://www.flickr.com/photos/23031163@N03/29934015530/>

and

<https://www.flickr.com/photos/wacrakey/30573912057/>

and

<https://www.flickr.com/photos/wacrakey/28099931805/>

and

<https://www.flickr.com/photos/wacrakey/43698034250/>

and

<https://www.inaturalist.org/observations/53473984>

and

<https://www.inaturalist.org/observations/41152903>

and

<https://www.inaturalist.org/observations/43023607>

The three preceding species within the genus *Metacrinia* Parker, 1940, constituting the entirety of the genus are readily separated from all other Australasian Myobatrachidae frogs by the following unique suite of characters: A small stubby toad-like froglet whose hindlimb when adpressed reaches well beyond the tympanum. A large frontoparietal foramen in adults. Pupil horizontal. Tympanum may be present or absent. Tongue small and narrowly oval; prevomer much reduced or absent; tongue does not adhere to the floor of the mouth at the rear; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No maxillary teeth; no terminal discs on fingers or toes; belly granular. A fold of skin extends back from each eyelid. There is a bright orange, yellow or red granular spot at the base of each forelimb. Similar spotting is in front of the thighs and the hind limbs. Males often have darker throats (adapted from Cogger 2014).

Distribution: *M. bettyswileae* sp. nov. is confined to the south coast of south-western Australia from Walpole in the west to Albany in the east in Western Australia, Australia.

Etymology: *M. bettyswileae* sp. nov. is named in honour of Betty Swile of Sunnyside, Athlone, Cape Town, South Africa for services to primate welfare.

METACRINIA WILHELMINAHUGHESAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:FB6FD8A6-6AA1-49F5-97CE-9910AE10F8DD

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R141980, collected from Bluff Knoll, Stirling Range National Park, Western Australia, Australia, Latitude -34.3747 S., Longitude 118.2381 E. This government-owned facility allows access to its holdings.

Paratypes: Ten preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R141981, R141982, R141983, R141984, R141985, R141986, R36436, R38696, R47774, R47775 all collected from the Stirling Range National Park, Western Australia, Australia.

Diagnosis: The until now monotypic genus *Metacrinia* Parker, 1940, with the type species *Pseudophryne nichollsi* Harrison, 1927 known only

from south-west Western Australia, is split into three species, each being morphologically and genetically divergent.

Three genetically divergent populations in south-west Australia were identified by Edwards (2007).

Only the western, population, identified by her as the main population, has an available name, being type form for the species *Metacrinia nichollsi* (Harrison, 1927), with a type locality of Pemberton, Western Australia. See Fig. 4.2 on page 101 of Edwards (2007), for exact distributions of each species as identified herein.

A second population from the south coast from Walpole in the west to Albany in the east in southern Western Australia, identified by Edwards (2007) as the "Southcoastal Lineage" is formally named as a new species, *M. bettyswileae* sp. nov. as is another outlier population confined to the Stirling Range National Park north-east of this area, identified by Edwards (2007) as the "Stirling Range Lineage", formally named herein as *M. wilhelminahughesae* sp. nov..

Edwards (2007) gave various time date estimates for the divergences of each population, but at page 108 estimated the populations of the three clades (named herein as species) diverged from one another 2.6 to 3.4 million years before present. While recognizing each as distinct lineages, she did not formally name any.

Morphological and genetic divergence of each lineage, made species level recognition the only logical step to take when I was reviewing the taxonomy of the group and hence this formal description.

The three species are readily separated as follows: *Metacrinia nichollsi* is readily separated from both other species by the presence of numerous closely-spaced large blunt, irregularly shaped tubercles on the middle and lower flanks. By contrast both other two species have relatively smooth skin on the mid and lower flanks with widely spaced small pointed tubercles that are mainly light tipped and encircled by dark in *M. bettyswileae* sp. nov. and mainly not light tipped and encircled by dark in *M. wilhelminahughesae* sp. nov..

While all three species have a dorsum covered with large blunt tubercles, bumps and welts, those which form folds in a linear arrangement are either absent or very limited in *M. nichollsi* and *M. wilhelminahughesae* sp. nov. but prominent in *M. bettyswileae* sp. nov..

The dorsum of both *M. nichollsi* and *M. bettyswileae* sp. nov. is generally dark grey or brown, often heavily overlain with red, brown or orange, whereas the dorsum of *M. wilhelminahughesae* sp. nov. is usually distinctly lighter in colour, being mainly beige, light brown or a light brownish grey.

M. nichollsi commonly has an obvious small to

medium tympanum, usually of irregular diamond shape, although specimens without an obvious tympanum are also common. In both *M. bettyswileae* sp. nov. and *M. wilhelminahughesae* sp. nov. absence of a (visible) tympanum appears to be the usual state.

Metacrinia nichollsi in life is depicted in Anstis (2013) on page 617 at top right and middle right and online at:

<https://www.flickr.com/photos/fins72/38930714251/>
and

<https://www.flickr.com/photos/fins72/27153941029/>
M. bettyswileae sp. nov. is depicted in life in Anstis (2013) on page 617 at top left and online at:

<https://www.flickr.com/photos/euprepiosaur/30766600206/>
and

<https://www.flickr.com/photos/wacrakey/27485527484/>
and

<https://www.flickr.com/photos/23031163@N03/29903436420/>
and

<https://www.flickr.com/photos/23031163@N03/29934015530/>
and

<https://www.flickr.com/photos/wacrakey/30573912057/>
and

<https://www.flickr.com/photos/wacrakey/28099931805/>
and

<https://www.flickr.com/photos/wacrakey/43698034250/>
and

<https://www.inaturalist.org/observations/53473984>
and

<https://www.inaturalist.org/observations/41152903>
and

<https://www.inaturalist.org/observations/43023607>
The three preceding species within the genus *Metacrinia* Parker, 1940, constituting the entirety of the genus are readily separated from all other Australasian Myobatrachidae frogs by the following unique suite of characters: A small stubby toad-like froglet whose hindlimb when adpressed reaches well beyond the tympanum. A large frontoparietal foramen in adults. Pupil horizontal. Tympanum may be present or absent. Tongue small and narrowly oval; prevomer much reduced or absent; tongue does not adhere to the floor of the mouth at the rear; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No maxillary teeth; no terminal discs on fingers or toes; belly granular. A fold of skin extends back from each eyelid. There is a bright orange, yellow or red granular spot at the base

of each forelimb. Similar spotting is in front of the thighs and the hind limbs. Males often have darker throats (adapted from Cogger 2014).

Distribution: *M. wilhelminahughesae* sp. nov. is confined to the Stirling Range National Park of southern Western Australia, Australia, away from the south coastal strip.

Etymology: *M. wilhelminahughesae* sp. nov. is named in honour of Wilhelmina Hughes (AKA Winnie) of Silverton, Cape Town, South Africa for services to primate welfare.

A NEW SUBGENUS WITHIN *UPEROLEIA* GRAY, 1841.

***QUASIUPEROLEIA* SUBGEN. NOV.**

LSIDurn:lsid:zoobank.org:act:323B9966-627C-452C-9147-48BC020DADEA

Type species: *Pseudophryne mjobergii* Andersson, 1913.

Diagnosis: The genus *Uperoleia* Gray, 1841, as defined by Cogger (2014), has been an established genus-level concept for decades as seen by an essentially identical concept by Cogger *et al.* (1983). Since 1983, only Wells and Wellington (1985) have provided a dissenting position, breaking up the genus as accepted, three ways, splitting off two of the more morphologically divergent groups.

A molecular phylogeny for the genus as recognized by Cogger *et al.* (1983) and all other authors since, excluding Wells and Wellington was produced by Catullo and Keogh (2014). It showed the species within the putative genus *Hosmeria* Wells and Wellington, 1985, type species *Uperoleia marmorata laevigata* Keferstein, 1867, to have diverged from other species within putative *Uperoleia* about 17 MYA (see Fig. 5 on page 114). On this basis, the eastern Australian clade is herein recognized as a genus separate from *Uperoleia*, comprising the species *H. laevigata* (Keferstein, 1867), *H. fusca* (Davies, McDonald and Corben, 1986), *H. martini* (Davies and Littlejohn, 1986), *H. shuddafakup* sp. nov. and *H. tyleri* (Davies and Littlejohn, 1986).

The genus name *Prohartia* Wells and Wellington, 1985, type species: *Pseudophryne fimbriatus* Parker, 1926 is herein accepted as a valid subgenus within *Uperoleia* on the basis of the molecular results of Catullo and Keogh (2014). This showed a divergence of just under 10 MYA from the nominate group of species within the genus, *Uperoleia* Gray, 1841, type species *U. marmorata* Gray, 1841 by monotypy.

The genus name *Glauertia* Loveridge, 1933, type species *Glauertia russelli* Loveridge 1933 by monotypy is closely related to *U. marmorata* and is therefore treated as a synonym of *Uperoleia*.

Catullo and Keogh (2014) found a divergence between relevant species being less than 8 MYA.

Two species within putative *Uperoleia* were shown by Catullo and Keogh (2014), to be closely related to

one another and yet 11 MYA divergent from all other species in the genus *Uperoleia*. *Pseudophryne mjobergii* Andersson, 1913 and the closely related *U. micromeles* Tyler, Davies and Martin, 1981 form the entirety of the subgenus *Quasiuperoleia subgen. nov.* These two species are readily separated from all other species in the genus *Uperoleia* Gray, 1841, including subgenus *Prohartia* Wells and Wellington, 1985, as well as species in the genus *Hosmeria* Wells and Wellington, 1985, by the following suite of characters: Adults about 25 mm, body length; toes fringed with basal webbing; internarial distance greater than eye-naris distance; skin moderately to very warty above; very prominent parotoid glands and one or other of: 1/ A few maxillary teeth present (*U. micromeles*), or 2/ Maxillary teeth present in a series and the presence of a distinctive tubercle or flap on the heel (*U. mjobergii*).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters:

Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phalanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *Uperoleia* Gray, 1841 is found in most parts of continental Australia, with one species known to extend to southern New Guinea near Cape York, Queensland.

Quasiuperoleia subgen. nov. is found in the Pilbara region of Western Australia, to the southern edge of the Kimberley bioregion, extending across the northern Arid zone into the mid-central region of the Northern Territory, Australia.

Both described species are closely related.

Catullo and Keogh (2014) estimated a divergence of 1.22 MYA between both species, based on samples from across the ranges of both taxa.

Etymology: Quasi- means, “apparently but not really”, “seemingly”, or “being partly or almost”, with reference to the fact that the said species are almost *Uperoleia*.

Content: *Uperoleia (Quasiuperoleia) mjobergii* (Andersson, 1913) (type species); *U. (Quasiuperoleia) micromeles* Tyler, Davies and Martin, 1981.

HOSMERIA SHUDDAFAKUP SP. NOV.

LSIDurn:lsid:zoobank.org:act:4C51C2B3-1C94-47D6-9A52-1EA06A8A0087

Holotype: A preserved male specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J86589 collected from Thanes Creek, Durikai State Forest, west of Warwick, Queensland, Australia, Latitude -28.2881 S., Longitude 151.6964 E. This government-owned facility allows access to its holdings.

Paratype: A preserved female specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J86606 collected from Thanes Creek, Durikai State Forest, west of Warwick, Queensland, Australia, Latitude -28.2881 S., Longitude 151.6964 E.

Diagnosis: Until now, *Hosmeria shuddafakup sp. nov.* has been treated as a Queensland, or northern population of *H. laevigata* (Keferstein, 1867), with a type locality of Randwick (Sydney), New South Wales.

The genetic study of Clulow *et al.* (2016) indicated that the northern population of putative “*Uperoleia laevigata*” had species-level divergence from the type population from further south. Morphological evidence confirms this contention and so that taxon is named as a new species herein.

The two species are separated from one another as follows:

H. laevigata has a dorsum covered with numerous tightly spaced, small, but prominent orange tipped tubercles that are pointed, but of somewhat irregular shape and in prominent rows on the upper surfaces of the hind legs. The background colour of the upper flanks are of a similar greyish brown to the dorsum. The oversized parotoid glands on the back of the head are more-or-less diamond-shaped but with rounded edges.

H. shuddafakup sp. nov. has tubercles on the dorsum, but these are moderately, as opposed to tightly-spaced and whereas most if not all are orange-tipped in *H. laevigata*, this is not the case for *H. shuddafakup sp. nov.*, where some, but not most are orange-tipped. The orange tipped tubercles do not strongly contrast with the greyish or brown dorsum in *H. shuddafakup sp. nov.*, which is the case for *H. laevigata*. There is a fairly obvious demarcation between the darker dorsum and the lighter surface of the upper flank in *H. shuddafakup sp. nov.* again in contrast to the state in *H. laevigata*.

The oversized parotoid glands on the back of the head are more-or-less oval-shaped.

Adult male *H. laevigata* has a generally blackish under throat region, versus whitish, but heavily peppered or marbled with black in *H. shuddafakup sp. nov.*

Images of *H. shuddafakup sp. nov.* in life can be found in Vanderduys (2012) on page 172 at bottom and online at:

<https://www.flickr.com/photos/smacdonald/3201846955/>

and

<https://www.flickr.com/photos/rocknvole/6256767734/>

Images of *H. laevigata* in life can be found on page 87 of Tyler (1992), on page 125 of Cogger (2014), bottom left, Anstis (2013) on page 724 (all images) and online at:

<https://www.flickr.com/photos/shaneblackfnq/15152188723/i>

and

<https://www.flickr.com/photos/126002448@N02/15121247017/>

and

<https://www.flickr.com/photos/12742129@N07/49103585128/>

and

https://www.flickr.com/photos/jono_hooper/27874378436/

Both *H. shuddafakup sp. nov.* and *H. laevigata* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum is grey, olive or brown, with blackish spots, bars or reticulations, usually of irregular form; including a light triangular patch on the head between the eyes and towards the snout (sometimes darker edged); and obscure blotches or bands on the limbs, in particular the hindlimbs. Maxillary teeth present in a well-developed series; two moderate metatarsal tubercles, that are not strongly compressed; no tubercle or flap on the heel; toes fringed and without a trace of webbing; chest and abdomen are pale with a strong purplish tinge, especially at the distal parts, with at most sparse peppering of darker pigment on the otherwise whitish ventral surface; the entire ventral surfaces are smooth, not granular; adult body length of 25 mm or more and the presence of large well-developed oversized parotoid glands.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomerine is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *H. shuddafakup sp. nov.* occurs in south-east Queensland, north of the ranges on the NSW, Queensland border, extending at least as far north as the Blackdown Tableland National Park.

The distributional limits of *H. laevigata* is not known, but believed to include most of New South Wales east of the flat regions to the west of that state, extending into far north-east Victoria.

Etymology: In mid 2019, I was camping in Paul Woolf's borrowed car (see etymology for *Bufo* *woolfi sp. nov.*) by a swamp with a Gidjhal elder of the local Aboriginal tribe from Warwick in south-east Queensland, when a frog next to our parked car made a penetrating nasal buzz lasting just under half a second and being repeated every 2-3 seconds. He yelled out "shuddafakup". The froglet I then caught making this noise is of this taxon and hence the name.

HOSMERIA SHIRENSBOGENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:D2010B70-2F80-4AD7-9382-EA518001075C

Holotype: A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.184120 collected at Heaton Rd Dam, Wattagan State Forest, New South Wales, Australia, Latitude -32.9934 S., Longitude 151.4455 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.138913, R.138914 and R.138915 all collected at the corner of Mount Faulk and Heaton Rds, Awaba State Forest, New South Wales, Australia, Latitude -32.9944 S., Longitude 151.4455 E.

Diagnosis: Until now, *H. shirensbogensis sp. nov.* of New South Wales and South-east Queensland has been treated as conspecific with *H. fusca* (Davies, McDonald and Corben, 1986), with a type locality of Eungella, Queensland and restricted to that general part of Australia, (mid-eastern Queensland).

Their ranges abut at the Conondale Range in south-east Queensland (north of Brisbane), with *H. shirensbogensis sp. nov.* being distributed fairly continuously south of there to the Sydney region in New South Wales in coastal and near coastal areas, and *H. fusca* north of there, being patchily distributed as far north as the type locality in wetter hilly areas and immediate environs.

Adult *H. shirensbogensis sp. nov.* are readily separated from *H. fusca* by the presence of a yellow colour inside the thigh (see for example the image in Cogger 2014 at page123), versus reddish orange in colour in *H. fusca*. Enlarged tubercles on the dorsum of *H. shirensbogensis sp. nov.* are mainly tipped orange, versus mainly tipped brown in *H. fusca*.

H. shirensbogensis sp. nov. in life is depicted in

Anstis (2013) on page 715 (all images), Cogger (2014) on page 123, top right and online at: <https://www.flickr.com/photos/58349528@N02/29280611284/>

and

<https://www.flickr.com/photos/23031163@N03/16992321511/>

and

<https://www.flickr.com/photos/ianbool/10393353633/>

and

<https://www.flickr.com/photos/ianbool/10876665173/>
An image of *H. fusca* in life can be found online at: <https://www.flickr.com/photos/reptileshots/24091161397/>

Both *H. shirensbogensis* sp. nov. and *H. fusca* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Maxillary teeth are present in a well developed series; there is no tubercle or flap on the heel; the chest and abdomen are strongly pigmented; parotoid glands are moderate and they are not or scarcely raised above the surface of the head and neck; there is an absence of two rows of distinctive whitish-yellow tubercles along the upper surface of the forearms and the tubercles on the dorsum are not yellow-tipped (as seen in the morphologically similar *Uperoleia (Prohartia) altissima* Davies, Watson, McDonald, Trenerry and Werren, 1993).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *H. shirensbogensis* sp. nov. occurs from New South Wales, north of the Sydney metropolitan area, along the coast and nearby ranges to South-east Queensland at the Conondale Range north of Brisbane. From there, *H. fusca* (Davies, McDonald and Corben, 1986) is patchily distributed as far north as the type locality (Eungella, near Mackay, Queensland) in wetter hilly areas and immediate environs. The two species may be sympatric where their ranges abut.

Molecular evidence published by Catulla and Scott Keogh (2014) at Fig. 3. indicates species level divergence between the two species as identified herein.

Etymology: In mid 2019, I was doing fieldwork on the New South Wales north coast just before visiting a pair of well-known herpetologists, Richard Wells and Cliff Ross Wellington at a venue somewhere between Brisbane and Sydney.

My wife Shireen Hoser was able to relieve herself at a public toilet and because it predated the Covid-19 pandemic, there was still toilet paper available for her to wipe her bottom. While she was relieving her bowels of Paul Woolf's cooking from the previous few nights (see etymology for *Bufo* *woolfi* sp. nov.), I jumped a fence and located several specimens of this frog species. They were hiding under some rubbish next to a flooded swamp. In Australia a swamp is commonly also referred to as a "bog". Because the place became known as "Shireen's Bog" because she also did a "bog" there, it is appropriate that the species be known as *H. shirensbogensis* sp. nov..

UPEROLEIA (UPEROLEIA) JADEHARRISAE SP. NOV.

LSIDDurn:lsid:zoobank.org:act:6DC0091A-03A7-426D-B647-4F6F9BC8B627

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R23834 collected from 5.8 km east of Victoria River, on the Victoria Highway, Northern Territory, Australia, Latitude -15.60 S., Longitude 131.15 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R23835 collected from 12.9 km east of Victoria River, on the Victoria Highway, Northern Territory, Australia, Latitude -15.60 S., Longitude 131.23 E.

Diagnosis: *Uperoleia jadeharrisae* sp. nov., *U. keilleri* sp. nov. and *U. lowryi* sp. nov. have until now all been treated as putative *U. borealis* Tyler, Davies and Martin, 1981, with a type locality of Lake Argyle Tourist Village, East Kimberley District, Western Australia, Australia. However these taxa are all morphologically distinct from *U. borealis* of the type form and the evidence of Catullo and Scott Keogh (2014) indicates species-level genetic divergences of each as well. The four populations also conform with other similarly constrained taxa in the Kimberley/Victoria River regions of north-west Australia in terms of distributions shaped by historical placement of escarpments and drainage basins, including those during of ice-age maxima.

U. borealis Tyler, Davies and Martin, 1981 is effectively confined to the Ord River drainage system of far north-east Western Australia.

U. jadeharrisae sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region. It appears to

be more similar to *U. borealis* than the following two species.

U. keilleri sp. nov. is effectively restricted to the Fitzroy River basin in the south-west Kimberley District and some smaller systems to the north along the coast, as far north as the Prince Regent River, north-west, Western Australia.

U. lowryi sp. nov. is similar in most respects to *U. keilleri sp. nov.* and appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia.

The three preceding newly named species are separated from *U. borealis* as follows:

U. jadeharrisae sp. nov. and *U. borealis* are of similar colouration. Both have a generally reddish-brown dorsum, with underlying indistinct darker markings. The parotoid glands are light brown to orange in colour and of different colour to the surrounding pigment. The dorsum is generally granular, with a small number of larger and blunt tubercles most common in an irregular line down each side of the back, which are not at all distinct due to being the same colour as surrounding skin.

U. jadeharrisae sp. nov. has fingers that are not fringed, versus fringed slightly in *U. borealis*.

U. jadeharrisae sp. nov. has parotoid glands that rise abruptly from the surrounding skin, versus not so in *U. borealis*. *U. jadeharrisae sp. nov.* has virtually no webbing on the toes, versus slight webbing in *U. borealis*.

U. jadeharrisae sp. nov. is also notably different to *U. borealis* in that the dorsum has bold blackspots or markings encircling brown tipped tubercles, and bold black or purplish-black markings on the upper surfaces of the legs, which are not seen in *U. borealis*.

Contrary to reports in the literature (e.g. Davies 1987), both *U. borealis* and *U. jadeharrisae sp. nov.* do have a mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), being of moderate thickness, but it is of similar colour to the dorsum and very indistinct.

U. keilleri sp. nov. is readily separated from both *U. borealis* and *U. jadeharrisae sp. nov.* by being a generally charcoal blackish coloured frog. A very thin red mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), is present, which against the charcoal black background colour of the dorsum, readily separates this species from *U. borealis* and *U. jadeharrisae sp. nov.* as well as *U. lowryi sp. nov.*

In turn *U. lowryi sp. nov.* is separated from *U. keilleri sp. nov.* by having a very thin white or yellow mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), and a dorsum which is mottled and marbled beige and charcoal in colour, giving the frog a somewhat whitish or marble

colour type of appearance, even though the back is also predominately covered with blackish pigment. The extremely large parotoid glands of *U. lowryi sp. nov.* are not with blackish pigment, but instead beige with about four irregular shaped orangeish blotches with blackish peppering at the outer edges. By contrast the parotoid glands of *U. keilleri sp. nov.* are somewhat smaller and of the same blackish colour as the rest of the dorsum.

U. lowryi sp. nov. is further separated from *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* by having well defined blotches or cross-bands on the upper surfaces of fore and hind limbs, superimposed on otherwise beige or yellowish surfaces. *U. lowryi sp. nov.* is unlike *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* in that the lower flanks have small scattered darker spots or blotches on an otherwise lighter background. In *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* the flanks grade from the darker dorsal colour to lighter, near white at the lower edge and without spots, blotches, or other obvious markings.

All of *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* have tiny pink markings between the eye and the upper axilla of the forearm, which are distinct in *U. keilleri sp. nov.* and indistinct in the other two species. These markings are absent in *U. lowryi sp. nov.*

U. borealis in life is depicted in Anstis (2013) on page 705 in all images and Eipper and Rowland (2018) page 93 at bottom, and online at:

<https://www.flickr.com/photos/88708273@N03/16359750469/>

and

<https://www.flickr.com/photos/23031163@N03/8507485347/>

and

<https://www.flickr.com/photos/88708273@N03/16600750347/>

and

<https://www.flickr.com/photos/126002448@N02/15307440612/>

U. keilleri in life is depicted online at:

<https://www.flickr.com/photos/angusmcnab/5977205014/>

and

<https://www.flickr.com/photos/78180980@N02/7650841344/>

A specimen morphologically similar to *U. lowryi* in life from Home Valley Station, Kimberleys, Western Australia is depicted online at:

<https://www.flickr.com/photos/robertwhyte/14176359167/>

All of *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.* are separated from all other species within the genera *Uperoleia* Gray, 1841

and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum with numerous tubercles, venter smooth; venter whitish, with grey stippling on the throat. Flanks not obviously speckled with brown and white. Thigh, groin and behind knee markings are orange or reddish. Fourth finger is equal to second. Minimal webbing on toes, being less than half webbed, and toes with broad fringes. Maxillary teeth absent; metatarsal tubercles are small but prominent.

I note that previously published keys for the species *U. borealis*, *U. jadeharrisae* sp. nov., *U. keilleri* sp. nov. and *U. lowryi* sp. nov., all defined by the relevant authors as "*U. borealis*" are erroneous and will not separate the relevant species from others in the genus *Uperoleia* as defined by them (e.g. Cogger 2014, who erroneously states on page 119 "no indication of pale vertebral stripe" for *U. borealis*, even though his depicted specimen on page 121 does in fact have one).

Mentioning of one or more errors in Cogger (2014), should not in any way detract from the overall quality and utility of this magnificent work (and predecessors) by Cogger and one should realise that a work of this magnitude, will by definition have numerous errors for a variety of reasons and regardless of the best possible intentions by the author.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. jadeharrisae* sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region.

Etymology: *U. jadeharrisae* sp. nov. is named in honour of Jade Leigh Harris of remote Rocklands, in the general area of Mitchell's Plain in southern Africa in recognition of services to welfare of elderly Africans in remote places and assisting this author in locating a large number of Cape Cobras *Naja nivea* Linnaeus, 1758 and other species of fauna in the informal local rubbish tip situated at the west side of the road at the corner of Jakes Gerwel Drive and Cape Flats Road.

UPEROLEIA (UPEROLEIA) KEILLERI SP. NOV.
 LSIIDurn:lsid:zoobank.org:act:AA772094-AA2E-4D88-8FCA-3BD27EF3BF6B

Holotype: A preserved adult female specimen (29 mm long and 2.2. grams) at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R171529 collected from the Harding Range, West Kimberley District, Western Australia, Australia, Latitude -16.3231 S., Longitude 124.7589 E. This government-owned facility allows access to its holdings.

Paratypes: Nine preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R171516-R171522, R171528 and R171529 all collected from the type locality of the Harding Range, West Kimberley District, Western Australia, Australia, Latitude -16.3231 S., Longitude 124.7589 E.

Diagnosis: *Uperoleia keilleri* sp. nov., *U. jadeharrisae* sp. nov. and *U. lowryi* sp. nov. have until now all been treated as putative *U. borealis* Tyler, Davies and Martin, 1981, with a type locality of Lake Argyle Tourist Village, East Kimberley District, Western Australia, Australia. However these taxa are all morphologically distinct from *U. borealis* of the type form and the evidence of Catullo and Scott Keogh (2014) indicates species-level genetic divergences of each as well. The four populations also conform with other similarly constrained taxa in the Kimberley/Victoria River regions of north-west Australia in terms of distributions shaped by historical placement of escarpments and drainage basins, including those during of ice-age maxima.

U. borealis Tyler, Davies and Martin, 1981 is effectively confined to the Ord River drainage system of far north-east Western Australia.

U. jadeharrisae sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region. It appears to be more similar to *U. borealis* than the following two species.

U. keilleri sp. nov. is effectively restricted to the Fitzroy River basin in the south-west Kimberley District and some smaller systems to the north along the coast, as far north as the Prince Regent River, north-west, Western Australia.

U. lowryi sp. nov. is similar in most respects to *U. keilleri* sp. nov. and appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia.

The three preceding newly named species are separated from *U. borealis* as follows:

U. jadeharrisae sp. nov. and *U. borealis* are of similar colouration. Both have a generally reddish-brown dorsum, with underlying indistinct darker markings.

The parotoid glands are light brown to orange in colour and of different colour to the surrounding pigment. The dorsum is generally granular, with a small number of larger and blunt tubercles most common in an irregular line down each side of the back, which are not at all distinct due to being the same colour as surrounding skin.

U. jadeharrisae sp. nov. has fingers that are not fringed, versus fringed slightly in *U. borealis*.

U. jadeharrisae sp. nov. has parotoid glands that rise abruptly from the surrounding skin, versus not so in *U. borealis*. *U. jadeharrisae sp. nov.* has virtually no webbing on the toes, versus slight webbing in *U. borealis*.

U. jadeharrisae sp. nov. is also notably different to *U. borealis* in that the dorsum has bold blackspots or markings encircling brown tipped tubercles, and bold black or purplish-black markings on the upper surfaces of the legs, which are not seen in *U. borealis*.

Contrary to reports in the literature (e.g. Davies 1987), both *U. borealis* and *U. jadeharrisae sp. nov.* do have a mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), being of moderate thickness, but it is of similar colour to the dorsum and very indistinct.

U. keilleri sp. nov. is readily separated from both *U. borealis* and *U. jadeharrisae sp. nov.* by being a generally charcoal blackish coloured frog. A very thin red mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), is present, which against the charcoal black background colour of the dorsum, readily separates this species from *U. borealis* and *U. jadeharrisae sp. nov.* as well as *U. lowryi sp. nov.*

In turn *U. lowryi sp. nov.* is separated from *U. keilleri sp. nov.* by having a very thin white or yellow mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), and a dorsum which is mottled and marbled beige and charcoal in colour, giving the frog a somewhat whitish or marble colour type of appearance, even though the back is also predominately covered with blackish pigment. The extremely large parotoid glands of *U. lowryi sp. nov.* are not with blackish pigment, but instead beige with about four irregular shaped orangeish blotches with blackish peppering at the outer edges,

By contrast the parotoid glands of *U. keilleri sp. nov.* are somewhat smaller and of the same blackish colour as the rest of the dorsum.

U. lowryi sp. nov. is further separated from *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* by having well defined blotches or cross-bands on the upper surfaces of fore and hind limbs, superimposed on otherwise beige or yellowish surfaces. *U. lowryi sp. nov.* is unlike *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* in that the lower flanks have small scattered darker spots or blotches on an

otherwise lighter background. In *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* the flanks grade from the darker dorsal colour to lighter, near white at the lower edge and without spots, blotches, or other obvious markings.

All of *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* have tiny pink markings between the eye and the upper axilla of the forearm, which are distinct in *U. keilleri sp. nov.* and indistinct in the other two species. These markings are absent in *U. lowryi sp. nov.*

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<https://www.flickr.com/photos/88708273@N03/16359750469/>

and

<https://www.flickr.com/photos/23031163@N03/8507485347/>

and

<https://www.flickr.com/photos/88708273@N03/16600750347/>

and

<https://www.flickr.com/photos/126002448@N02/15307440612/>

U. keilleri in life is depicted online at:

<https://www.flickr.com/photos/angusmcnab/5977205014/>

and

<https://www.flickr.com/photos/78180980@N02/7650841344/>

A specimen morphologically similar to *U. lowryi* in life from Home Valley Station, Kimberleys, Western Australia is depicted online at:

<https://www.flickr.com/photos/robertwhyte/14176359167/>

All of *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum with numerous tubercles, venter smooth; venter whitish, with grey stippling on the throat. Flanks not obviously speckled with brown and white. Thigh, groin and behind knee markings are orange or reddish. Fourth finger is equal to second. Minimal webbing on toes, being less than half webbed, and toes with broad fringes. Maxillary teeth absent; metatarsal tubercles are small but prominent.

I note that previously published keys for the species *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.*, all defined by the relevant authors as "*U. borealis*" are erroneous and will not separate the relevant species from others in the genus *Uperoleia* as defined by them (e.g. Cogger 2014, who erroneously states on page 119 "no indication of pale vertebral stripe" for *U. borealis*,

even though his depicted specimen on page 121 does in fact have one).

Mentioning of one or more errors in Cogger (2014) in this or any other paper by myself (or differences of opinion on taxonomy), should not in any way detract from the overall quality and utility of this magnificent work (and predecessors) by Cogger and one should realise that a work of this magnitude, will by definition have numerous errors for a variety of reasons and regardless of the best possible intentions by the author.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. keilleri* sp. nov. is effectively restricted to the Fitzroy River basin in the south-west Kimberley District and some smaller systems to the north along the coast, as far north as the Prince Regent River, north-west, Western Australia. This includes inland parts of the Fitzroy River basin and tributaries.

Etymology: *U. keilleri* sp. nov. is named in honour of Darren Keiller, a well known snake controller based in Geelong, Victoria, Australia, for services to wildlife conservation and public safety spanning many years.

UPEROLEIA (UPEROLEIA) LOWRYI SP. NOV.

LSIDurn:lsid:zoobank.org:act:B2E7BD53-74C4-48E4-BBC2-555EB388B352

Holotype: A preserved 14 mm long specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R165840 collected from Bigge Island, West Kimberley District, Western Australia, Australia, Latitude -14.4833 S., Longitude 125.1667 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R165841 and R165842 collected from Bigge Island, West Kimberley District, Western Australia, Australia, Latitude -14.4833 S., Longitude 125.1667 E.

Diagnosis: *Uperoleia lowryi* sp. nov., *U. keilleri* sp. nov. and *U. jadeharrisae* sp. nov. have until now all been treated as putative *U. borealis* Tyler, Davies and Martin, 1981, with a type locality of Lake Argyle Tourist Village, East Kimberley District, Western

Australia, Australia. However these taxa are all morphologically distinct from *U. borealis* of the type form and the evidence of Catullo and Scott Keogh (2014) indicates species-level genetic divergences of each as well. The four populations also conform with other similarly constrained taxa in the Kimberley/ Victoria River regions of north-west Australia in terms of distributions shaped by historical placement of escarpments and drainage basins, including those during of ice-age maxima.

U. borealis Tyler, Davies and Martin, 1981 is effectively confined to the Ord River drainage system of far north-east Western Australia.

U. jadeharrisae sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region. It appears to be more similar to *U. borealis* than the following two species.

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U. lowryi sp. nov. is similar in most respects to *U. keilleri* sp. nov. and appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia.

The three preceding newly named species are separated from *U. borealis* as follows:

U. jadeharrisae sp. nov. and *U. borealis* are of similar colouration. Both have a generally reddish-brown dorsum, with underlying indistinct darker markings. The parotoid glands are light brown to orange in colour and of different colour to the surrounding pigment. The dorsum is generally granular, with a small number of larger and blunt tubercles most common in an irregular line down each side of the back, which are not at all distinct due to being the same colour as surrounding skin.

U. jadeharrisae sp. nov. has fingers that are not fringed, versus fringed slightly in *U. borealis*.

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snout and running backwards down the dorsum), being of moderate thickness, but it is of similar colour to the dorsum and very indistinct.

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U. lowryi sp. nov. is further separated from *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* by having well defined blotches or cross-bands on the upper surfaces of fore and hind limbs, superimposed on otherwise beige or yellowish surfaces. *U. lowryi sp. nov.* is unlike *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* in that the lower flanks have small scattered darker spots or blotches on an otherwise lighter background. In *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* the flanks grade from the darker dorsal colour to lighter, near white at the lower edge and without spots, blotches, or other obvious markings.

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U. keilleri in life is depicted online at:

<https://www.flickr.com/photos/angusmcnab/5977205014/>

and

<https://www.flickr.com/photos/78180980@N02/7650841344/>

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All of *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum with numerous tubercles, venter smooth; venter whitish, with grey stippling on the throat. Flanks not obviously speckled with brown and white. Thigh, groin and behind knee markings are orange or reddish. Fourth finger is equal to second. Minimal webbing on toes, being less than half webbed, and toes with broad fringes. Maxillary teeth absent; metatarsal tubercles are small but prominent.

I note that previously published keys for the species *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.*, all defined by the relevant authors as "*U. borealis*" are erroneous and will not separate the relevant species from others in the genus *Uperoleia* as defined by them (e.g. Cogger 2014, who erroneously states on page 119 "no indication of pale vertebral stripe" for *U. borealis*, even though his depicted specimen on page 121 does in fact have one).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. lowryi sp. nov.* appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia in a region approximately bound by Kalumburu in the

north and Augustus Island in the south and drainage basins flowing westwards from the adjoining mainland.

Etymology: *U. lowryi* sp. nov. is named in honour of Andrew Lowry of Cheltenham, Victoria, Australia, for services to wildlife conservation and herpetology spanning several decades.

UPEROLEIA (UPEROLEIA) SHANESCARFFI SP. NOV.

LSIDurn:lsid:zoobank.org:act:5566E830-1D4B-4556-A5FF-9BFCE4A0C395

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184324 collected from Mornington station, Kimberley District, Western Australia, Latitude -17.5108 S., Longitude 126.1068 E. This government-owned facility allows access to its holdings.

Paratypes: Three preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184325-7 collected from Mornington station, Kimberley District, Western Australia, Latitude -17.5108 S., Longitude 126.1068 E.

Diagnosis: Until now, *U. shanescarffi* sp. nov. has been treated as a population of *U. crassa* Tyler, Davies and Martin, 1981 with a type locality of Mitchell Plateau, north-west Kimberley division of Western Australia. However it is sufficiently distinctive and biogeographically divergent to be recognized as a separate species.

U. shanescarffi sp. nov. appears to be confined to a region broadly corresponding to the Fitzroy River system in the south and south-west Kimberley division of Western Australia. *U. crassa* as herein recognized appears to be confined to a region north-west of here with drainages flowing west and not meeting the Fitzroy River system, even in times of glacial maxima and lowest sea levels. It appears that the relevant region was sufficiently arid in recent geological time frames to keep the populations apart. The two species *U. shanescarffi* sp. nov. and *U. crassa* are separated as follows: In *U. crassa* the dorsum is a pale beige colour and well marked with prominent dark brown blotches and prominent orange-tipped tubercles on dorsal and upper lateral surfaces. The upper surface of the upper arm is cream or light yellow. The oversized paratoid gland is cream to beige, and often with a strong orange flush. Upper lip area is mainly cream.

U. shanescarffi sp. nov. is a very different looking frog. The colouration of the dorsum is generally dull and with no well defined markings. There is no strong contrast between dark and light markings on the back. The dark pigment is reduced in darkness and intensity and the light is similarly darkened, making the frog a generally dull greyish brown colour. Dark pigment is also reduced in area to only include the

warty bumps on the back, as opposed to including surrounding skin in *U. crassa*. As already noted, the contrast between these darker spots (in this species) and the lighter areas is minimal, versus strong contrast between larger dark blotches (as opposed to just spots) and pale interspace in *U. crassa*.

The mainly dull coloured parotoid glands are smaller in size than in *U. crassa* being mainly greyish in colour and the lighter top section, while marked beige with an orange flush, is barely distinct from the surrounding skin. The upper surface of the upper arm has a well defined orange patch on it (usually larger and more prominent in females). The upper lip area is mainly grey.

Orange spotting at the tips of tubercles scattered across the dorsum and upper flanks in *U. crassa* is prominent. These spots are either absent, heavily reduced or indistinct in *U. shanescarffi* sp. nov.. *U. shanescarffi* sp. nov. from the type locality is depicted in life in Anstis (2013) on page 709 (top right), with *U. crassa* from the type locality of that species depicted in Anstis (2013) on page 709 in the three other photos.

U. crassa in life is also depicted in Cogger (2014) on page 134 bottom right, Eipper and Rowland (2018) on page 94 (top) and online at:

<https://www.flickr.com/photos/ianbool/50209194586/> and

<https://www.flickr.com/photos/chrisjolly1989/24600138628/>

Both *U. shanescarffi* sp. nov. and *U. crassa* are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Diamond-shaped iris. No obvious mid vertebral stripe, save for some scattered raised orange-tipped tubercles more-or-less along the mid dorsal line running though an area of beige or cream without intruding darker blotches seen elsewhere on the dorsum, in *U. crassa* (but not in any way in *U. shanescarffi* sp. nov.); no maxillary teeth. Ventral surface slightly granular, whitish and without darker markings. Inner leg red (*U. crassa*) or dark orange (*U. shanescarffi* sp. nov.).

Toes slightly fringed and less than half webbed; Thigh and groin markings red; fourth finger longer than second.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil

rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. shanescarffi* sp. nov. appears to be confined to a region broadly corresponding to the Fitzroy River system in the south and south-west Kimberley division of Western Australia. *U. crassa* as herein recognized appears to be confined to a region north-west of here with drainages flowing west and not meeting the Fitzroy River system, even in times of glacial maxima and lowest sea levels. It appears that the relevant region was sufficiently arid in recent geological time frames to keep the populations apart.

Etymology: *U. shanescarffi* sp. nov. is named in honour of Shane Scarff of Heckenberg, a suburb in south-western Sydney, in the state of New South Wales, Australia, known for his snake breeding enterprise called Shane's Aussie Pythons, for services to wildlife conservation in Australia.

UPEROLEIA (UPEROLEIA) MICRA DIVERGANS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:82066330-A9B4-4618-810A-AD5832232705

Holotype: A preserved adult male specimen at the Western Australian Museum, Perth, Western Australia, specimen number R164897 collected from Katers Island, Western Australia, Australia, Latitude 14.2656 S., Longitude; 125.3122 E.

Paratype: A preserved adult male specimen at the Western Australian Museum, Perth, Western Australia, specimen number R164898 collected from Katers Island, Western Australia, Australia, Latitude 14.2656 S., Longitude; 125.3122 E.

Diagnosis: The subspecies *Uperoleia micra divergans* subsp. nov. is similar in most respects to the nominate form of *Uperoleia micra* Doughty and Roberts, 2008, but is readily separated from that subspecies by having slightly lighter dorsal colouration, being generally medium brown, rather than dark brown to charcoal in colour and by the presence of inguinal glands that are an intense orange-red colouration.

Both *U. micra divergans* subsp. nov. and *Uperoleia micra micra* (the nominate form) are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: A small body size, presence of maxillary teeth, broadly exposed frontoparietal fontanelle, slightly tubercular skin on dorsum and upper limbs, moderately conspicuous parotoid and inguinal glands and less developed coccygeal glands, toes basally webbed, elongate inner metatarsal tubercle perpendicular to foot, light to dark brown or charcoal coloured dorsal surfaces with small darker spots, loreal and lateral zone stippled with bluish-white dots, pale orange-red femoral patches, sometimes intense

(darker) in colour, speckled and slightly granular ventral surface and high-pitched rasp as an advertisement call (modified from Doughty and Roberts, 2008).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomerine is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: At the present time *U. micra divergans* subsp. nov. is only known from Katers Island, Western Australia, Australia, Latitude 14.2656 S., Longitude; 125.3122 E in the north-east Kimberley division of Western Australia. However it almost certainly also occurs on the adjoining mainland of the same region in association with the relevant drainage systems and presumably constrained by drier intermediate zones.

Etymology: The subspecies name "divergans" refers to this taxon being morphologically divergent from the nominate form. The spelling is deliberate and intentional, is chosen to avoid creating any potential homonyms and should not be changed.

UPEROLEIA (PROHARTIA) MARGWEEKSAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:F8C9E380-10D3-457C-9AC1-108DAAF0F846

Holotype: A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen number R35075 collected at McMillans Road, Berrimah, Northern Territory, Australia, Latitude -12.438 S., Longitude 130.9533 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen numbers R20706 and R20705 collected from Stage 3, Kakadu National Park, Northern Territory, Australia, Latitude -13.083 S., Longitude 132.15 E.

Diagnosis: Until now, both *Uperoleia margweeksa* sp. nov. and *U. grantturneri* sp. nov. have been treated as populations of the widely distributed taxon *U. lithomoda* Tyler, Davies and Martin, 1981 with a type locality of Spillway Bridge, 11.5 km north-east of Lake Argyle Tourist Village, Western Australia, Australia.

Specimens consistent with this putative species are

found in a band from the East Kimberley district in Western Australia, across the Northern Territory and to the western edge of the Gulf of Carpentaria.

Morphologically divergent specimens from the top end of the Northern Territory in the region of Darwin and Arnhemland are herein treated as the new species *U. margweeksae sp. nov.*

The morphologically divergent, geographically disjunct whitish coloured specimens from the eastern edge of the Gulf of Carpentaria and the drier western parts of Cape York Peninsula, Queensland are herein formally named *U. grantturneri sp. nov.*

The three species are readily separated from one another as follows: *U. lithomoda* is characterised by having a dorsum covered with close spaced large blunt tubercles, sometimes lighter at the highest point. The flanks are brown with numerous tiny, yellow-white tubercles. In males there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, commencing on the upper parotoid gland and extending to near the rear leg. The pigment on either side of this fold is chocolate brown, with the raised blunt tubercles being reddish brown, but not particularly well defined in terms of colour.

A thin, well-defined white or yellow vertebral line runs from the tip of the snout to about level with the front limbs, at which point it terminates. Anterior of snout is mainly grey.

U. margweeksae sp. nov. is readily separated from *U. lithomoda* by having a dorsum that is more-or-less smooth but with scattered and relatively pointed tubercles across the dorsum, these becoming tiny on the upper flanks. Where in male *U. lithomoda* there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, this is reduced so as to be barely discernable. The reduction is both in the fold itself (no longer as an obvious fold) and in colouration in that there is a slight lightening of the zone to yellowish (rather than a well defined colour change), but not in any way as a distinctive white and broken line at the top of the flank as seen in *U. lithomoda*. Some of the scattered tubercles on the dorsum of *U. margweeksae sp. nov.* are brightly and distinctly orange-tipped, which is not seen in *U. lithomoda*.

The subspecies *U. margweeksae maximus subsp. nov.* occurring only on Groote Eylandt, is readily separated from *U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.* by being the only taxon in the complex which has significant amounts of dark peppering and pigment on the ventral surfaces.

The average snout-vent length (body length) of male *U. margweeksae maximus subsp. nov.* is relatively huge, being 24.6 mm (N=10), versus a range of 19.0-21.9 mm for all other species and subspecies in the complex (*U. margweeksae sp. nov.*, *U. lithomoda* and

U. grantturneri sp. nov.) (N=92) (Davies 1987), making this a distinctively large taxon in the complex. Females are also relatively larger in *U. margweeksae maximus subsp. nov.* as compared to in the other species (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*).

U. grantturneri sp. nov. comes across as a distinctively whiteish coloured frog.

The base colour of the dorsum is whitish, yellow, creamy or beige overlaid with a fairly distinctive randomised pattern of dark orange-brown blotches and spots. In addition to this there are scattered orange tipped tubercles mainly on the dorsum and with other tiny ones on the upper flanks.

Like in *U. lithomoda*, there is a thick, sometimes broken fold of skin along the upper flank, but because it is surrounded by similarly coloured yellow, cream or beige skin, it is not seen as an obvious fold line as in *U. lithomoda*, where the whitish line is sharply demarcated from the adjoining chocolate-brown skin. The dorsum of *U. grantturneri sp. nov.* is heavily covered with blunt warts, being not as densely packed as seen in *U. lithomoda*, but more so than seen in *U. margweeksae sp. nov.*

U. margweeksae sp. nov. has a bluish-grey iris, versus reddish brown in the other two species.

U. lithomoda has mainly reddish-brown flanks.

U. margweeksae sp. nov. has mainly greyish flanks.

U. grantturneri sp. nov. has mainly whitish flanks.

Premetamorphosing tadpoles of *U. lithomoda* when viewed from above are a dull greyish background colour, with indistinct darker grey mottling on the body and a slight darkening at the end of the tail. The muscle tissue of the tail is lightly peppered black top and bottom consistently along the length.

At the same stage and view *U. margweeksae sp. nov.* tadpoles are yellowish in colour with well-defined areas of black pigment. The tip of the snout has a distinctive short yellow/white bar extending to between the nostrils, the same bar being barely distinct in *U. lithomoda* at the same life stage. The tail tip is heavily pigmented black. The muscle tissue of the tail is heavily peppered black top and bottom consistently along the length.

At the same stage and view *U. grantturneri sp. nov.* tadpoles are generally a light grey colour when viewed from above and with only limited, but distinct, dark blackish flecks or markings, although like in *U. margweeksae sp. nov.* the darker markings or flecks are strongly contrasting. The tip of the tail is heavily pigmented black in similar manner to *U.*

margweeksae sp. nov., however in contrast to both *U. lithomoda* and *U. margweeksae sp. nov.* the muscle tissue of the tail is characterised with scattered large black spots, as opposed to a consistent and continuous blackening of the upper surface.

U. lithomoda in life is depicted in Anstis (2013) on

page 727 at top left, top right and middle right, Tyler, Smith and Johnstone (1994) on plate 20, at top, and online at:

<https://www.flickr.com/photos/23031163@N03/8486378849/>

U. margweeksae sp. nov. is depicted in life in Anstis (2013) on pages 727 bottom right and 728 top left, Cogger (2014) on page 125, bottom right and online at:

<https://www.flickr.com/photos/ryanfrancis/32451097512/>

and

<https://www.flickr.com/photos/58349528@N02/49485781717/>

U. grantturneri sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/32481012315/>

and

<https://www.flickr.com/photos/euprepiosaur/6835095601/>

U. lithomoda, *U. margweeksae* sp. nov., and *U. grantturneri* sp. nov. are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Large parotoid glands usually tending to be creamish or cream on the upper surfaces; venter is cream, except for a blackish rim below the lower jaw; ventral surface is slightly to coarsely granular; belly and abdomen pale with at most some sparsely scattered stippling of darker pigment; inner thigh is orange (*U. lithomoda* and *U. grantturneri* sp. nov.) or pinkish (*U. margweeksae* sp. nov.). Toes without fringes and without or at most a trace of basal webbing; Maxillary teeth absent. Internarial distance is less than eye-naris distance. Outer metatarsal tubercle is larger than the inner, with both being small but conspicuous;

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. margweeksae* sp. nov. appears to be confined to the tropical north of the Northern Territory in the region of Darwin and Arnhemland and presumably extends further east to Groote Eylandt (see description of subspecies from Groote Eylandt below).

Etymology: *U. margweeksae* sp. nov. is named in honour of Marg Weeks of Croydon Hills (North Croydon), Victoria, Australia, sometimes known as the “Gorilla Doctor” in recognition of her many years of service to the female waxing and hair removal industry, including her specialty of removing hair from people’s feet.

UPEROLEIA (PROHARTIA) MARGWEEKSAE MAXIMUS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:822D768C-1321-486F-B47C-A94F08C67B4D

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, specimen number R25467 collected from 2.7 km east of Angurugu Airport, Groote Eylandt, Northern Territory, Australia, Latitude -13.97 S., Longitude 136.47 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the South Australian Museum, Adelaide, South Australia, specimen numbers R25468- R25471 collected from 2.7 km east of Angurugu Airport, Groote Eylandt, Northern Territory, Australia, Latitude -13.97 S., Longitude 136.47 E.

Diagnosis: Until now, both *Uperoleia margweeksae* sp. nov. and *U. grantturneri* sp. nov. have been treated as populations of the widely distributed taxon *U. lithomoda* Tyler, Davies and Martin, 1981 with a type locality of Spillway Bridge, 11.5 km north-east of Lake Argyle Tourist Village, Western Australia, Australia.

Specimens consistent with this putative species are found in a band from the East Kimberley district in Western Australia, across the Northern Territory and to the western edge of the Gulf of Carpentaria. Morphologically divergent specimens from the top end of the Northern Territory in the region of Darwin and Arnhemland are herein treated as the new species *U. margweeksae* sp. nov..

The morphologically divergent, geographically disjunct whitish coloured specimens from the eastern edge of the Gulf of Carpentaria and the drier western parts of Cape York Peninsula, Queensland are herein formally named *U. grantturneri* sp. nov..

The three species are readily separated from one another as follows: *U. lithomoda* is characterised by having a dorsum covered with close spaced large blunt tubercles, sometimes lighter at the highest point. The flanks are brown with numerous tiny, yellow-white tubercles. In males there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, commencing on the upper parotoid gland and extending to near the rear leg. The pigment on either side of this fold is chocolate brown, with the raised blunt tubercles being reddish brown, but not particularly well defined in terms of colour.

A thin, well-defined white or yellow vertebral line runs

from the tip of the snout to about level with the front limbs, at which point it terminates. Anterior of snout is mainly grey.

U. margweeksae sp. nov. is readily separated from *U. lithomoda* by having a dorsum that is more-or-less smooth but with scattered and relatively pointed tubercles across the dorsum, these becoming tiny on the upper flanks. Where in male *U. lithomoda* there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, this is reduced so as to be barely discernable. The reduction is both in the fold itself (no longer as an obvious fold) and in colouration in that there is a slight lightening of the zone to yellowish (rather than a well defined colour change), but not in any way as a distinctive white and broken line at the top of the flank as seen in *U. lithomoda*. Some of the scattered tubercles on the dorsum of *U. margweeksae sp. nov.* are brightly and distinctly orange-tipped, which is not seen in *U. lithomoda*.

The subspecies *U. margweeksae maximus subsp. nov.* occurring only on Groote Eylandt, is readily separated from *U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.* by being the only taxon in the complex which has significant amounts of dark peppering and pigment on the ventral surfaces.

The average snout-vent length (body length) of male *U. margweeksae maximus subsp. nov.* is relatively huge, being 24.6 mm (N=10), versus a range of 19.0-21.9 mm for all other species and subspecies in the complex (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*) (N=92) (Davies 1987), making this a distinctively large taxon in the complex. Females are also relatively larger in *U. margweeksae maximus subsp. nov.* as compared to in the other species (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*).

U. grantturneri sp. nov. comes across as a distinctively whiteish coloured frog.

The base colour of the dorsum is whitish, yellow, creamy or beige overlaid with a fairly distinctive randomised pattern of dark orange-brown blotches and spots. In addition to this there are scattered orange tipped tubercles mainly on the dorsum and with other tiny ones on the upper flanks.

Like in *U. lithomoda*, there is a thick, sometimes broken fold of skin along the upper flank, but because it is surrounded by similarly coloured yellow, cream or beige skin, it is not seen as an obvious fold line as in *U. lithomoda*, where the whitish line is sharply demarcated from the adjoining chocolate-brown skin. The dorsum of *U. grantturneri sp. nov.* is heavily covered with blunt warts, being not as densely packed as seen in *U. lithomoda*, but more so than seen in *U. margweeksae sp. nov.*

U. margweeksae sp. nov. has a bluish-grey iris, versus reddish brown in the other two species.

U. lithomoda has mainly reddish-brown flanks.

U. margweeksae sp. nov. has mainly greyish flanks.

U. grantturneri sp. nov. has mainly whitish flanks.

Premetamorphosing tadpoles of *U. lithomoda* when viewed from above are a dull greyish background colour, with indistinct darker grey mottling on the body and a slight darkening at the end of the tail. The muscle tissue of the tail is lightly peppered black top and bottom consistently along the length.

At the same stage and view *U. margweeksae sp. nov.* tadpoles are yellowish in colour with well-defined areas of black pigment. The tip of the snout has a distinctive short yellow/white bar extending to between the nostrils, the same bar being barely distinct in *U. lithomoda* at the stage. The tail tip is heavily pigmented black. The muscle tissue of the tail is heavily peppered black top and bottom consistently along the length.

At the same stage and view *U. grantturneri sp. nov.* tadpoles are generally a light grey colour when viewed from above and with only limited, but distinct, dark blackish flecks or markings, although like in *U. margweeksae sp. nov.* the darker markings or flecks are strongly contrasting. The tip of the tail is heavily pigmented black in similar manner to *U. margweeksae sp. nov.*, however in contrast to both *U. lithomoda* and *U. margweeksae sp. nov.* the muscle tissue of the tail is characterised with scattered large black spots, as opposed to a consistent and continuous blackening of the upper surface.

U. lithomoda in life is depicted in Anstis (2013) on page 727 at top left, top right and middle right, Tyler, Smith and Johnstone (1994) on plate 20, at top, and online at:

<https://www.flickr.com/photos/23031163@N03/8486378849/>

U. margweeksae sp. nov. is depicted in life in Anstis (2013) on pages 727 bottom right and 728 top left, Cogger (2014) on page 125, bottom right and online at:

<https://www.flickr.com/photos/ryanfrancis/32451097512/>

and

<https://www.flickr.com/photos/58349528@N02/49485781717/>

U. grantturneri sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/32481012315/>

and

<https://www.flickr.com/photos/euprepiosaur/6835095601/>

U. lithomoda, *U. margweeksae sp. nov.* (nominate form and other subspecies from Groote Eylandt, namely *U. margweeksae maximus subsp. nov.*), and *U. grantturneri sp. nov.* are readily separated from all other species within the genera *Uperoleia* Gray, 1841

and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Large parotoid glands usually tending to be creamish or cream on the upper surfaces; venter is cream, except for a blackish rim below the lower jaw; ventral surface is slightly to coarsely granular; belly and abdomen pale with at most some sparsely scattered stippling of darker pigment; inner thigh is orange (*U. lithomoda* and *U. grantturneri* sp. nov.) or pinkish (*U. margweeksae* sp. nov.). Toes without fringes and without or at most a trace of basal webbing; Maxillary teeth absent. Internarial distance is less than eye-naris distance. Outer metatarsal tubercle is larger than the inner, with both being small but conspicuous;

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. margweeksae maximus* subsp. nov. is only known from Groote Eylandt, Northern Territory, Australia and is believed to be an insular subspecies.

Etymology: *U. margweeksae maximus* subsp. nov. is named in reflection of the greater size of the adults of this subspecies as compared to the nominate form and other closely related species.

UPEROLEIA (PROHARTIA) GRANTTURNERI SP. NOV.

LSIDurn:lsid:zoobank.org:act:A43BD3AA-2F5F-4F57-A19F-502B39217662

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J75722 collected from Forsayth-Georgetown Road, Queensland, Australia, Latitude -18.3656 S., Longitude 143.5228 E. This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J75729 collected from Forsayth-Georgetown Road, Queensland, Australia, Latitude -18.3656 S., Longitude 143.5228 E.

2/ A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J77533 collected from Kendall River, Queensland, Australia, Latitude -13.7422 S., Longitude 142.1267 E.

3/ A preserved specimen in the Queensland

Museum, Brisbane, Queensland, Australia, specimen number J85141 collected near Normanton, 40km E of Chillagoe turnoff, Queensland, Australia, Latitude -17.3157 S., Longitude 141.5153 E.

4/ Two preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J64934 and J64938 collected at Marsupial Ck, via Croydon, Queensland, Australia, Latitude -18.2 S., Longitude 142.3 E.

5/ Five preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J65967, J65968, J65969, J88211 and J88212 all collected from the Georgetown-Croydon Road, Queensland, Australia, Latitude -18.2436 S., Longitude 142.7164 E.

6/ Two preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J88811 and J88812 both collected at Lagoon Creek, Westmoreland Station, Latitude -17.5 S., Longitude 138.1 E.

Diagnosis: Until now, both *U. grantturneri* sp. nov. and *Uperoleia margweeksae* sp. nov. have been treated as populations of the widely distributed taxon *U. lithomoda* Tyler, Davies and Martin, 1981 with a type locality of Spillway Bridge, 11.5 km north-east of Lake Argyle Tourist Village, Western Australia, Australia.

Specimens consistent with this putative species are found in a band from the East Kimberley district in Western Australia, across the Northern Territory and to the western edge of the Gulf of Carpentaria.

Morphologically divergent specimens from the top end of the Northern Territory in the region of Darwin and Arnhemland are herein treated as the new species *U. margweeksae* sp. nov..

The morphologically divergent, geographically disjunct whitish coloured specimens from the eastern edge of the Gulf of Carpentaria and the drier western parts of Cape York Peninsula, Queensland are herein formally named *U. grantturneri* sp. nov..

The three species are readily separated from one another as follows: *U. lithomoda* is characterised by having a dorsum covered with close spaced large blunt tubercles, sometimes lighter at the highest point. The flanks are brown with numerous tiny, yellow-white tubercles. In males there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, commencing on the upper parotoid gland and extending to near the rear leg. The pigment on either side of this fold is chocolate brown, with the raised blunt tubercles being reddish brown, but not particularly well defined in terms of colour.

A thin, well-defined white or yellow vertebral line runs from the tip of the snout to about level with the front limbs, at which point it terminates. Anterior of snout is mainly grey.

U. margweeksae sp. nov. is readily separated from

U. lithomoda by having a dorsum that is more-or-less smooth but with scattered and relatively pointed tubercles across the dorsum, these becoming tiny on the upper flanks. Where in male *U. lithomoda* there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, this is reduced so as to be barely discernable. The reduction is both in the fold itself (no longer as an obvious fold) and in colouration in that there is a slight lightening of the zone to yellowish (rather than a well defined colour change), but not in any way as a distinctive white and broken line at the top of the flank as seen in *U. lithomoda*. Some of the scattered tubercles on the dorsum of *U. margweeksae sp. nov.* are brightly and distinctly orange-tipped, which is not seen in *U. lithomoda*.

The subspecies *U. margweeksae maximus subsp. nov.* occurring only on Groote Eylandt, is readily separated from *U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.* by being the only taxon in the complex which has significant amounts of dark peppering and pigment on the ventral surfaces.

The average snout-vent length (body length) of male *U. margweeksae maximus subsp. nov.* is relatively huge, being 24.6 mm (N=10), versus a range of 19.0-21.9 mm for all other species and subspecies in the complex (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*) (N=92) (Davies 1987), making this a distinctively large taxon in the complex. Females are also relatively larger in *U. margweeksae maximus subsp. nov.* as compared to in the other species (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*).

U. grantturneri sp. nov. comes across as a distinctively whiteish coloured frog.

The base colour of the dorsum is whitish, yellow, creamy or beige overlaid with a fairly distinctive randomised pattern of dark orange-brown blotches and spots. In addition to this there are scattered orange tipped tubercles mainly on the dorsum and with other tiny ones on the upper flanks.

Like in *U. lithomoda*, there is a thick, sometimes broken fold of skin along the upper flank, but because it is surrounded by similarly coloured yellow, cream or beige skin, it is not seen as an obvious fold line as in *U. lithomoda*, where the whitish line is sharply demarcated from the adjoining chocolate-brown skin. The dorsum of *U. grantturneri sp. nov.* is heavily covered with blunt warts, being not as densely packed as seen in *U. lithomoda*, but more so than seen in *U. margweeksae sp. nov.*

U. margweeksae sp. nov. has a bluish-grey iris, versus reddish brown in the other two species.

U. lithomoda has mainly reddish-brown flanks.

U. margweeksae sp. nov. has mainly greyish flanks.

U. grantturneri sp. nov. has mainly whitish flanks.

Premetamorphosing tadpoles of *U. lithomoda* when

viewed from above are a dull greyish background colour, with indistinct darker grey mottling on the body and a slight darkening at the end of the tail. The muscle tissue of the tail is lightly peppered black top and bottom consistently along the length.

At the same stage and view *U. margweeksae sp. nov.* tadpoles are yellowish in colour with well-defined areas of black pigment. The tip of the snout has a distinctive short yellow/white bar extending to between the nostrils, the same bar being barely distinct in *U. lithomoda* at the stage. The tail tip is heavily pigmented black. The muscle tissue of the tail is heavily peppered black top and bottom consistently along the length.

At the same stage and view *U. grantturneri sp. nov.* tadpoles are generally a light grey colour when viewed from above and with only limited, but distinct, dark blackish flecks or markings, although like in *U. margweeksae sp. nov.* the darker markings or flecks are strongly contrasting. The tip of the tail is heavily pigmented black in similar manner to *U. margweeksae sp. nov.*, however in contrast to both *U. lithomoda* and *U. margweeksae sp. nov.* the muscle tissue of the tail is characterised with scattered large black spots, as opposed to a consistent and continuous blackening of the upper surface.

U. lithomoda in life is depicted in Anstis (2013) on page 727 at top left, top right and middle right, Tyler, Smith and Johnstone (1994) on plate 20, at top, and online at:

<https://www.flickr.com/photos/23031163@N03/8486378849/>

U. margweeksae sp. nov. is depicted in life in Anstis (2013) on pages 727 bottom right and 728 top left, Cogger (2014) on page 125, bottom right and online at:

<https://www.flickr.com/photos/ryanfrancis/32451097512/>

and

<https://www.flickr.com/photos/58349528@N02/49485781717/>

U. grantturneri sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/32481012315/>

and

<https://www.flickr.com/photos/euprepiosaur/6835095601/>

U. lithomoda, *U. margweeksae sp. nov.* (including the single subspecies), and *U. grantturneri sp. nov.* are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Large parotoid glands usually tending to be creamish or cream on the upper surfaces; venter is cream, except for a blackish rim below the lower jaw; ventral surface is slightly to coarsely granular; belly and abdomen pale with at most some sparsely

scattered stippling of darker pigment; inner thigh is orange (*U. lithomoda* and *U. grantturneri* sp. nov.) or pinkish (*U. margweeksae* sp. nov.). Toes without fringes and without or at most a trace of basal webbing; Maxillary teeth absent. Internarial distance is less than eye-naris distance. Outer metatarsal tubercle is larger than the inner, with both being small but conspicuous;

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. grantturneri* sp. nov. appears to be confined to the eastern edge of the Gulf of Carpentaria and the drier, mainly western parts of Cape York Peninsula, Queensland.

Etymology: *U. grantturneri* sp. nov. is named in honour of Grant Turner of Innisfail, North Queensland, Australia, formerly of Bundoora, Victoria, Australia, in recognition of a lifetime of significant contributions to herpetology in Australia, through numerous major scientific works and also recognizing his invaluable (always unpaid and difficult for him) assistances to myself, Rob Valentic and other herpetologists in numerous extremely intensive and demanding fieldwork projects across Victoria in the late 1980's and 1990's.

UPEROLEIA (PROHARTIA) MINIMA DISPAR SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:FEA212C1-EE72-41ED-8CB0-4A27BAAAAB12

Holotype: A preserved male specimen (snout-vent 26 mm, weight 1.3 grams) at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R169936 collected from the Wunaamin Miliwundi Ranges, which prior to 2020 were known as the King Leopold Ranges, Western Australia, Australia, Latitude -17.4943 S., Longitude 125.7537 E. This government-owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R169934 and R169935 collected from the Wunaamin Miliwundi Ranges, which prior to 2020 were known as the King Leopold Ranges, Western Australia, Australia, Latitude 17.4943 S., Longitude 125.7537 E.

Diagnosis: *U. minima dispar* subsp. nov. is similar in most respects to nominate *U. minima* with a type locality of the Mitchell Plateau Region of the North-east Kimberley, Western Australia, but separated from that taxon by having a dorsum and upper flanks that are dark brown, heavily infused with a leaden grey colour and with closely scattered light brown tubercles of varying size, versus a similar colouration, but with minimal grey infusion and generally lighter all over the dorsum. Fingers of *U. minima dispar* subsp. nov. are mainly dark in colour on top versus mainly light (yellowish blotches or wash) in nominate *U. minima minima*.

Both forms of *U. minima* are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Internarial distance less than eye-naris distance. No maxillary teeth. Toes without fringing or web. Two large metatarsal tubercles. Dorsum is generally drab in colour with little evidence of formation of colour pattern save for numerous small, irregularly shaped and poorly defined darker blotches across the dorsum. The dorsum and upper flanks are covered in closely scattered light brown tubercles of varying size. Bright red patches in the groin and behind the knee. Venter whitish, but suffused with grey on the throat, chest and lower flanks. Skin is moderately granular on the belly. Moderate-sized parotoid glands. Average adult size is about 20-26 mm (snout-vent).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

Distribution: *U. minima dispar* subsp. nov. is known only from the area of the type locality being the Wunaamin Miliwundi Ranges, which prior to 2020 were known as the King Leopold Ranges, Western Australia, Australia, Latitude 17.4943 S., Longitude 125.7537 E.

Etymology: In Latin “*dispar*” means different, referring to the subtle differences between the two **UPEROLEIA (PROHARTIA) GEDYEI SP. NOV.**

LSIDurn:lsid:zoobank.org:act:3F6A45E8-C7F1-4EB6-849F-313BB8CC5690

Holotype: A preserved specimen (whole animal, cleaned and stained in ethanol) at the Museum of

Comparative Zoology at Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ Herp A-106605, collected from near Morehead, Western Province, Papua New Guinea, Latitude -8.7137 S., Longitude 141.6416 E. This facility allows access to its holdings.

Diagnosis: The species *Uperoleia gedyei* sp. nov. only presently known from southern Papua New Guinea near the Irian Jaya border is similar in most respects to *U. mimula* Davies, McDonald and Corben, 1986, type locality of Lakefield Ranger Station, far north Queensland, which it would otherwise be identified as and has been to date (e.g. Davies 1987, Cogger 2014).

It is readily distinguished from that species, *U. mimula* from the eastern side of Cape York in far north Queensland, being found from Torres Strait to at least as far south as the Paluma Range and potentially south as far as Mackay and the new species *U. rossignolii* sp. nov., previously treated as a population of *U. mimula*, currently only known from Townsville Town Common, Townsville, by the presence of extremely prominent and raised inguinal and femoral patches, which are not seen in either species or for that matter in the morphologically similar species *U. lithomoda* Tyler, Davies and Martin, 1981, *U. grantturneri* sp. nov. and *U. margweeksae* sp. nov. (including subspecies).

U. rossignolii sp. nov. is separated from each of *U. mimula* and *U. gedyei* sp. nov. by having coarsely granular ventral skin, versus only slightly granular in the other two species, as well as a unique crescentric indentation on the anterior edge of the nasals not seen in either of the other two species. The frontoparietal fontanelle is poorly exposed in *U. rossignolii* sp. nov. versus moderately to well exposed in both *U. mimula* and *U. gedyei* sp. nov..

U. rossignolii sp. nov. is depicted in life, showing diagnostic characters online at:

<https://www.flickr.com/photos/euprepiosaur/6955419823/>

and

<https://www.flickr.com/photos/euprepiosaur/8516088374/>

and:

<https://www.flickr.com/photos/euprepiosaur/8514973181/>

All of *U. mimula*, *U. gedyei* sp. nov. and *U. rossignolii* sp. nov. are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Outer metatarsal tubercle is large, raised and conspicuous and inner one also well developed. Internarial distance is less than the eye-naris distance. No maxillary teeth. Toes fringed and with a small amount of basal webbing. Dorsal body pattern usually not well developed, but generally drab and consisting of a light background

overlaid with scattered darker blotches or spots. Paler blotches or spots are on the parotoid glands, which are smaller in size than some other members of the genus. Dorsum is more-or-less smooth with numerous moderately spaced, moderately sized tubercles, with relatively indistinct, but lighter tips. Reddish-orange patches in the groin and behind each knee. Cream or dirty white below, in turn peppered with dark grey or brown. Venter, smooth or slightly granular, except in *U. rossignolii* sp. nov. where it is coarsely granular.

Distribution: *Uperoleia gedyei* sp. nov. is only known from the type locality and environs, being near Morehead, Western Province, Papua New Guinea, Latitude -8.7137 S., Longitude 141.6416 E.

Diagnosis: The species *Uperoleia gedyei* sp. nov. is named in honour of Andrew Gedye of Bentley Park, a suburb of Cairns, North Queensland, Australia, formerly of Cheltenham, Victoria, Australia, a well known breeder of rare and threatened species of snakes, in recognition of contributions to herpetology in Australia spanning some decades. He has also conducted herpetological fieldwork in Papua New Guinea in recent years.

UPEROLEIA (PROHARTIA) ROSSIGNOLII SP. NOV.

LSIDDurn:lsid:zoobank.org:act:FB296CE3-258B-4229-A60D-E0F31CBFA9A

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R29628 collected from Townsville Town Common, Townsville, Queensland, Australia. This government-owned facility allows access to its holdings.

Paratypes: 12 preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R29629-R29640 collected from Townsville Town Common, Townsville, Queensland, Australia.

Diagnosis: *Uperoleia rossignolii* sp. nov. and *U. gedyei* sp. nov. have both until now been treated as aberrant populations at the southern and northern extremities of the known range of the putative species *U. mimula* Davies, McDonald and Corben, 1986, type locality of Lakefield Ranger Station, far north Queensland.

The species *Uperoleia gedyei* sp. nov. only presently known from southern Papua New Guinea near the Irian Jaya border is similar in most respects to *U. mimula* which it would otherwise be identified as and has been to date (e.g. Davies 1987, Cogger 2014). It is readily distinguished from that species, *U. mimula* from the eastern side of Cape York in far north Queensland, being found from Torres Strait to at least as far south as the Paluma Range and potentially south as far as Mackay and the new species *U. rossignolii* sp. nov., previously treated as a population of *U. mimula*, currently only known from

Townsville Common, by the presence of extremely prominent and raised inguinal and femoral patches, which are not seen in either species or for that matter in the morphologically similar species *U. lithomoda* Tyler, Davies and Martin, 1981, *U. grantturneri* sp. nov. and *U. margweksae* sp. nov. (including subspecies).

U. rossignolii sp. nov. is separated from each of *U. mimula* and *U. gedyei* sp. nov. by having coarsely granular ventral skin, versus only slightly granular in the other two species, as well as a unique crescentric indentation on the anterior edge of the nasals not seen in either of the other two species. The frontoparietal fontanelle is poorly exposed in *U. rossignolii* sp. nov. versus moderately to well exposed in both *U. mimula* and *U. gedyei* sp. nov..

U. rossignolii sp. nov. is depicted in life, showing diagnostic characters online at:

<https://www.flickr.com/photos/euprepiosaur/6955419823/>

and

<https://www.flickr.com/photos/euprepiosaur/8516088374/>

and:

<https://www.flickr.com/photos/euprepiosaur/8514973181/>

All of *U. mimula*, *U. gedyei* sp. nov. and *U. rossignolii* sp. nov. are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Outer metatarsal tubercle is large, raised and conspicuous and inner one also well developed. Internarial distance is less than the eye-naris distance. No maxillary teeth. Toes fringed and with a small amount of basal webbing. Dorsal body pattern usually not well developed, but generally drab and consisting of a light background overlaid with scattered darker blotches or spots. Paler blotches or spots are on the parotoid glands, which are smaller in size than some other members of the genus. Dorsum is more-or-less smooth with numerous moderately spaced, moderately sized tubercles, with relatively indistinct, but lighter tips. Reddish-orange patches in the groin and behind each knee. Cream or dirty white below, in turn peppered with dark grey or brown. Venter, smooth or slightly granular, except in *U. rossignolii* sp. nov. where it is coarsely granular.

Distribution: *Uperoleia rossignolii* sp. nov. is only currently known from the type locality being the Townsville Town Common, Townsville, Queensland, Australia.

Etymology: *Uperoleia rossignolii* sp. nov. is named in honour of Federico Rossignoli of Hurtbridge, Victoria, Australia, previously of North Ringwood, Victoria, Australia, in recognition of his services to herpetology and wildlife conservation spanning some decades.

MIXOPHYES (QUASIMIXOPHYES) HOSERAE JACKYAE SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:0FFABA9C-5F7F-433A-A21F-EC900C65115C

Holotype: A preserved male specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D43725, collected from 46.7 km North of Cann River, East Gippsland, Victoria, Australia. Latitude -37.3 S., Longitude 149.18 S. This facility allows access to its holdings.

Paratypes: Five preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D43726, D43729, D43742, D43743 and D43744 all from roughly 47 km North of Cann River, East Gippsland, Victoria, Australia. Latitude -37.3 S., Longitude 149.18 S.

Diagnosis: Until 2020 *Mixophyes (Quasimixophyes) hoserae* Hoser, 2020 had been treated as a southern population of the well-known species *M. (Quasimixophyes) balbus* Straughan, 1968.

All three species in the subgenus *Quasimixophyes* Hoser, 2020 are separated from the nominate subgenus of *Mixophyes* Günther, 1864 by having a grey (not whitish) upper lip and areas of darker pigment being prominent on the upper lip, versus a pale creamy-white upper lip without obvious darker blotches in *Mixophyes*.

The subgenus *Feremixophyes* Hoser, 2020 is readily separated from the other two subgenera within *Mixophyes* Günther, 1864, namely *Mixophyes* and *Quasimixophyes* Hoser, 2020 by the following two characters: The length of the inner metatarsal tubercle is approximately half the length of the first toe versus nearly equal to the length in the other two subgenera and the webbing between the toes extends to the second most distal joint of the fourth toe. The web extends to the third most distal joint of the fourth toe in the other two subgenera and to the terminal disc of the fourth toe in *Oxyslop gen. nov.*

Feremixophyes Hoser, 2020 can be separated from *Paramixophyes* Hoser, 2016 by having a few or no scattered dark spots on the side versus a broad zone of numerous dark spots on the side.

Feremixophyes can also be distinguished from *Oxyslop* Hoser, 2020 by the absence of an uninterrupted narrow vertebral stripe extending from between the eyes to just above the vent.

Within *Quasimixophyes* Hoser, 2020 the species *M. (Quasimixophyes) fleayi* Corben and Ingram, 1987 is separated from the other two species *M.*

(Quasimixophyes) balbus Straughan, 1968 and *M. (Quasimixophyes) hoserae* Hoser, 2020 by having well-defined dark cross bands on the limbs, which also widen posteriorly to form dark triangles that are visible from below, as well as an evenly spaced series of conspicuous black spots or blotches on the side, versus ill-defined cross bands on the forelimbs and only moderately well-defined on the upper hind

limbs in the other two species and dark spots or blotches on the side being either infrequent and irregular (in *M. balbus* Straughan, 1968) or absent (in *M. hoserae* Hoser, 2020).

M. balbus is further separated from *M. hoserae* by having a broad, irregular, or broken band or patches forming a band, running down the middle of the back. This is not the case for *M. hoserae*.

The subspecies *M. hoserae jackyae subsp. nov.* is found south of Ulladulla, along the coast and nearby ranges of New South Wales, Australia to just south of the Victorian border in East Gippsland, whereas the allopatric nominate subspecies *M. hoserae hoserae* Hoser, 2020 is found north of the Kangaroo Valley.

M. hoserae jackyae subsp. nov. is separated from nominate *M. hoserae hoserae* by having a noticeably thickened black bar anterior to and posterior to the eye, running along the upper margin from behind the nostril, over the eye, the top of the ear and posterior to it. The same bar is noticeably thinner in both *M. hoserae hoserae* and *M. balbus*.

The darker banding on the upper surfaces of the forearms is wider than the lighter interspaces, in contrast to both *M. hoserae hoserae* and *M. balbus*, where the lighter interspaces are wider. This banding also extends all the way across the top of the forearm in *M. hoserae jackyae sp. nov.* as opposed to not doing so in both *M. hoserae hoserae* and *M. balbus*.

Adult *M. hoserae jackyae subsp. nov.* is a distinctively pinkish brown coloured frog on the dorsum, with underparts whitish with a slight pinkish tinge. The upper lip beneath the eye is heavily darkened, with dark blackish pigment, dark peppering or both.

Lower flanks of *M. hoserae jackyae subsp. nov.* are a whitish pink in colour, versus yellowish in both *M. hoserae hoserae* and *M. balbus*.

Both *M. fleayi* and *M. balbus* have a prominent silvery white to blue crescent on top of the iris, whereas this is either indistinct or absent in *M. hoserae sp. nov.* (both subspecies).

An image of living *M. hoserae* can be found on page 29 of Hoser (1989) in the top image or alternatively in Anstis (2013) on page 425 at top right in amplexus.

An image of living *M. balbus* can be seen in Anstis (2013) on page 425 in the top left image and bottom right image.

Images of living *M. fleayi* in life can be found in Anstis (2013) at page 440 (top three images).

An image of living *M. hoserae jackyae subsp. nov.* can be seen online at:

<https://canberra.naturemapr.org/Species/15417>

Distribution: The subspecies *M. hoserae jackyae subsp. nov.* is found south of Ulladulla, along the coast and nearby ranges of New South Wales, Australia to just south of the Victorian border in East Gippsland, whereas the allopatric nominate

subspecies *M. hoserae hoserae* Hoser, 2020 is found north of the Kangaroo Valley.

Etymology: Named in honour of my daughter, Jacky Indigo Hoser, who as of late 2020 was aged 19, in recognition of services to wildlife conservation in her first 19 years of life, including assisting in Scientific Research projects in various locations around the world, and educating the public via the Reptile Party and Snake Catcher (TM/R) businesses.

MYOBATRACHINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:86EEB328-06CB-4104-978A-A223B88356CE

Type genus: *Myobatrachus* Schlegel, 1850.

Diagnosis: Frogs within genera in the tribe Myobatrachini tribe nov. are separated from all other species within the family Myobatrachidae by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval. Maxillary teeth absent. Prevomer is much reduced or absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; no terminal discs on fingers or toes (Genera: *Myobatrachus* Schlegel, 1850; *Bufo* Girard, 1853; *Crottyphryne gen. nov.*; *Kankanophryne* Heyer and Liem, 1976; *Metacrinia* Parker, 1940; *Oxyphryne gen. nov.*; *Pseudophryne* Fitzinger, 1843; *Sloppophryne gen. nov.*), or: as for previous except for the following: Lacking vomerine teeth; maxillary teeth present; a massive pectoral girdle; reduced digits; colourless and translucent skin on the snout tip; no extensive areas of dark pigment on the ventral surface. The skin around the body forms a loose sac which extends to the elbow and knee (Genus: *Arenophryne* Tyler, 1976).

Distribution: Most parts of the southern half of mainland Australia and Tasmania, except extremely flat arid zones.

Content: *Myobatrachus* Schlegel, 1850 (type genus); *Arenophryne* Tyler, 1976; *Bufo* Girard, 1853; *Crottyphryne gen. nov.*; *Kankanophryne* Heyer and Liem, 1976; *Metacrinia* Parker, 1940; *Oxyphryne gen. nov.*; *Pseudophryne* Fitzinger, 1843; *Sloppophryne gen. nov.*

OXYPHRYNEINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:FB3734E1-8F71-4EAA-91EA-6992EF1039F3

Type genus: *Oxyphryne gen. nov.*

Diagnosis: Frogs in the subtribe Oxyphryneina subtribe nov. are readily separated from the nominate subtribe Myobatrachina subtribe nov. by having short limbs that are more-or less normal, the adpressed hindlimb reaching the tympanic region or beyond and a smooth ventral surface.

Frogs within genera in the tribe Myobatrachini tribe nov. are separated from all other species within the family Myobatrachidae by the following unique suite of characters: Tongue not adhering to the floor of the

mouth at the rear; tongue is small and/or narrowly oval. Maxillary teeth absent. Prevomer is much reduced or absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; no terminal discs on fingers or toes (Genera: *Myobatrachus* Schlegel, 1850; *Bufo* Girard, 1853; *Crottyphryne* gen. nov.; *Kankanophryne* Heyer and Liem, 1976; *Metacrinia* Parker, 1940; *Oxyphryne* gen. nov.; *Pseudophryne* Fitzinger, 1843; *Sloppophryne* gen. nov.), or: as for previous except for the following: Lacking vomerine teeth; maxillary teeth present; a massive pectoral girdle; reduced digits; colourless and translucent skin on the snout tip; no extensive areas of dark pigment on the ventral surface. The skin around the body forms a loose sac which extends to the elbow and knee (Genus: *Arenophryne* Tyler, 1976).

The nominate subtribe *Myobatrachina* subtribe nov. is also formally defined within this diagnosis.

Distribution: Most parts of the southern half of mainland Australia and Tasmania, except extremely flat arid zones.

Content: *Oxyphryne* gen. nov. (type genus); *Bufo* Girard, 1853; *Crottyphryne* gen. nov.; *Kankanophryne* Heyer and Liem, 1976; *Pseudophryne* Fitzinger, 1843; *Sloppophryne* gen. nov..

UPEROLEIAINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:1BEAA6AB-8585-4AD2-97F9-F75E293268D3

Type genus: *Uperoleia* Gray, 1841.

Diagnosis: Species within the genera within the tribe *Uperoleiaini* tribe nov. are readily separated from all other species within the family *Myobatrachidae* by the following unique suite of characters:

Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent, and one or other of the following unique suites of characters: 1/ Inner and outer metatarsal tubercles more or less equally developed (subtribe *Uperoleiaina* subtribe nov.), or: 2/ Dermal brood pouches absent. Parotoid glands present and evident externally; no prevomer or vomerine teeth; terminal phlanges pointed, not T-shaped. Tips of fingers and toes lack distinct discs. First finger is normal, or if vestigial, there is no dorsolateral skin fold. No outer metatarsal tubercle. Maxillary teeth present. No loose sac of skin around the body; very dark brown or black above; throat, chest and feet bright orange; belly and undersides of limbs are bright blue, overlain with a blackish reticulum (subtribe *Spicospinaina* subtribe nov.),

Distribution: Most parts of mainland Australia.

Content: *Uperoleia* Gray, 1841 (type genus); *Hosmeria* Wells and Wellington, 1985; *Spicospina* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997.

SPICOSPINAINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:13FF82AF-7BB7-4E5C-9D84-B98C351006B8

Type genus: *Spicospina* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997.

Frogs in the subtribe *Spicospinaina* subtribe nov. are readily separated from species within the nominate subtribe *Uperoleiaina* subtribe nov., the only other tribe within *Uperoleiaini* tribe nov. and all other *Myobatrachidae* species by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. Dermal brood pouches absent. Parotoid present and evident externally; no prevomer or vomerine teeth; terminal phlanges pointed, not T-shaped. Tips of fingers and toes lack distinct discs. First finger is normal, or if vestigial, there is no dorsolateral skin fold. No outer metatarsal tubercle. Maxillary teeth present. No loose sac of skin around the body; very dark brown or black above; throat, chest and feet bright orange; belly and undersides of limbs are bright blue, overlain with a blackish reticulum

Species within the subtribe *Uperoleiaina* subtribe nov. are in turn separated from all species within *Uperoleiaini* tribe nov. (only the monotypic species, *Spicospina flammocaerulea* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997) and all other *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. Inner and outer metatarsal tubercles more or less equally developed.

The nominate subtribe *Uperoleiaina* subtribe nov. is also formally defined within this diagnosis.

Content: *Spicospina* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997 (monotypic).

WELLINGTONDELLAINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:171D5B31-A64A-4E37-8DD0-9B6600ABBE98

Type genus: *Wellingtondella* gen. nov.

Diagnosis: Species within the tribe *Wellingtondellaini* tribe nov. are readily separated from all other species within the family *Myobatrachidae* by the following unique suite of characters:

Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped, and one or other of the following three suites of characters: 1/ Dermal inguinal brood pouches present in males; first finger vestigial; a faint to conspicuous dermal skin fold that extends back from the supratympanic region, often sharply demarcating

the contrasting dorsal and lateral colours (Genus *Assa* Tyler, 1972), or 2/ No dermal brood pouches present; first finger normal, or if vestigial, there is no dorsolateral skin fold. Vomerine teeth, small but present. Belly smooth (Genera *Wellingtondella* gen. nov., *Geocrinia* Blake, 1973), or 3/ Vomerine teeth present and conspicuous, behind the level of the choanae; Granular belly. Parotoid glands and flank glands are absent or not evident externally. Toes broadly fringed (Genus *Paracrinia* Heyer and Liem, 1976 forming the subtribe *Paracrinia* subtribe nov.).

Distribution: Wetter parts of south-east and south-west Australia, extending as far north as south-east Queensland in the east.

Content: *Wellingtondella* gen. nov. (type genus); *Geocrinia* Blake, 1973; *Paracrinia* Heyer and Liem, 1976.

PARACRINIAINA SUBTRIBE NOV.

LSIDurn:lsid:zoobank.org:act:DAF69A89-4A03-4247-96B1-3EF4C01EB6D4

Type genus: *Paracrinia* Heyer and Liem, 1976.

Diagnosis: Species within the subtribe *Paracrinia* subtribe nov. are separated from all other species within tribe *Wellingtondellaini* tribe nov. and from all other species within the family *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped. Vomerine teeth present and conspicuous, behind the level of the choanae; Granular belly. Parotoid glands and flank glands are absent or not evident externally. Toes broadly fringed (Genus *Paracrinia* Heyer and Liem, 1976 forming the entirety of the subtribe *Paracrinia* subtribe nov.).

Species within the subtribe *Wellingtondellaini* subtribe nov. are separated from all other species within the only other subtribe in the tribe, being *Paracrinia* subtribe nov. and from all other species within the family *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped, and one or other of the following two suites of characters: 1/ Dermal inguinal brood pouches present in males; first finger vestigial; a faint to conspicuous dermal skin fold that extends back from the supratympanic region, often sharply demarcating the contrasting dorsal and lateral colours (Genus *Assa* Tyler, 1972), or 2/ No dermal brood pouches present; first finger normal, or if vestigial, there is no dorsolateral skin fold. Vomerine teeth, small but present. Belly smooth

(Genera *Wellingtondella* gen. nov., *Geocrinia* Blake, 1973).

The nominate subtribe *Wellingtondellaini* subtribe nov. is also formally defined within this diagnosis.

Distribution: Coastal areas of south-east Australia, extending from south-east of Melbourne, Victoria (The Mornington Peninsula), along the coast and nearby range areas to the lower north coast of New South Wales, north of Newcastle and south of the Queensland border.

Content: *Paracrinia* Heyer and Liem, 1976 (herein treated as including at least three species).

CRINIINI TRIBE NOV.

LSIDurn:lsid:zoobank.org:act:EA86A910-CAA8-4A34-BAEB-B1BC7B924176

Type genus: *Crinia* Tschudi, 1838.

Diagnosis: Species of frogs within the tribe *Criniini* tribe nov. are readily separated from from all other species within the family *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped. No vomerine teeth, although sometimes rarely present, but if so, then very inconspicuous and in the form of small clusters or short rows. Tympanum usually hidden or otherwise indistinct. Skin on belly is coarsely granular. Parotoid glands and flank glands are absent or not evident externally. A large frontoparietal foramen in adults. Toes without fringes, or if present only narrow.

The genus *Crinia* Tschudi, 1838 as defined herein includes six well-defined and divergent subgenera, as defined elsewhere in this paper, especially with respect of those newly named ones, that all may ultimately warrant being split into full genera.

Distribution: Most of mainland Australia, including Tasmania, except for the most arid regions. Known from southern New Guinea near the closest area to the Cape York Peninsula.

Content: *Crinia* Tschudi, 1838 (monotypic as identified herein, but including defined subgenera).

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CONFLICTS OF INTEREST
None.

Crinia signifera from Kooweerup, Victoria.



Hoser 2020 - Australasian Journal of Herpetology 50-51:1-128.

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Covers: Issue 50: *Crinia signifera* from Kooweerup, Victoria.
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Photos of frogs and habitat by Author, Raymond Hoser.

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