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Hoser, R. T. 2020. For the first time ever! An overdue review and reclassification of Australasian Tree Frogs (Amphibia: Anura: Pelodryadidae), including formal descriptions of 12 tribes, 11 subtribes, 34 genera, 26 subgenera, 62 species and 12 subspecies new to science. *Australasian Journal of Herpetology* 44-46:1-192.

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M. brettbarnetti sp. nov. have more widely placed nostrils, mean EN/IN 0.99 +/- 0.01 versus 1.06 +/- 0.01 in *M. bicolor*.. A combination of two metrics, i.e. HB and HL/HB, provides better, but not absolute, separation (paraphrased here). *M. maxinehoserae sp. nov.* is by far the most distinctive Australian species in the genus *Maxinehoserranae gen. nov.*. It is readily separated from both other species as follows:

M. maxinehoserae sp. nov. has a distinctive, bright lime green dorsum with thin well-defined chocolate brown line running from tip of snout to eye, after which the line continues as a broad stripe, over-writing the entire tympanum and going along the mid flank to the groin. On the flank of the body, the line is distinctive and well defined. It is bordered on top by the lime green dorsum and below by a thick white band, bordered below with brown, that then fades to the white underside.

The chocolate coloured line from snout, through nostril to eye is bordered on top by a thin gold line in turn bordered by the lime green on top of the head and body.

This thin gold line upper border is not seen in the other two species. The limbs of *Maxinehoserranae gen. nov.* have scattered brown spots and the dorsum of this species is moderately granular.

M. brettbarnetti sp. nov. also has a moderately granular dorsum, whereas *M. bicolor* has a smooth dorsum.

Specimens of *M. brettbarnetti sp. nov*. that have a brownish coloured line running from the ear to the groin do not have either the rich dark chocolate colour seen in *M. maxinehoserae sp. nov*. or the sharp well defined upper edge on the dorsum as seen in *M. maxinehoserae sp. nov*..

The upper dorsum of *M. maxinehoserae sp. nov*. does not have the somewhat faded two tone colouration seen in both *M. brettbarnetti sp. nov.* and *M. bicolor*.

Images of *M. maxinehoserae sp. nov*. in life can be seen in Tyler, Smith and Johnstone (1994) on plate 27 at bottom and online at:
https://www.flickr.com/photos/euprepiosaur/22190269488/in/photolist-885upC-zNSW2f-z9rhah
and:
https://www.flickr.com/photos/euprepiosaur/21755237474/in/photolist-885upC-zNSW2f-z9rhah/
and:
https://www.flickr.com/photos/liquidghoul/4674588858/in/photolist-885upC-zNSW2f-z9rhah/

Images of *M. brettbarnetti sp. nov*. in life can be seen in Anstis (2013) on page 150 at bottom and page 151 at top left and page 153 top, in Vanderduys (2012) on page 26 in all images and Tyler and Davies (1986) in plate 20.

An image of *M. bicolor* in life can be seen in Anstis (2013) on page 150 at top.

Distribution: *M. brettbarnetti sp. nov*. is restricted to Cape York in Queensland. *M. bicolor* is restricted to the area spanning the environs of Darwin, across the top of the Northern Territory, including offshore islands and the western side of the Gulf of Carpentaria.

Etymology: Named in honour of Brett Barnett of Ardeer, Victoria, Australia in recognition of his significant contributions to herpetology over many decades.

MAXINEHOSERRANAE* (*MAXINEHOSERRANAE*) *MAXINEHOSERAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:C3873D43-BDD9-4F22-A5EB-0D5A72AAC722

Holotype: A preserved specimen at the Western Australian Museum, Australia, specimen number R47475, collected at Lake Gilbert, Beverley Springs Station, near Charnley River, Prince Regent District, Kimberley Division of Western Australia, Australia, Latitude -16.5667 S., Longitude 125.2667 E.

This government-owned facility allows access to its holdings.

Paratypes: Nine preserved specimens at the Western Australian Museum, specimen numbers R47476, R47477, R47478, R47479, R47480, R47481, R47482, R47483 and R47484 all collected at Lake Gilbert, Beverley Springs Station, near Charnley River, Prince Regent District, Kimberley Division of Western Australia, Australia, Latitude -16.5667 S., Longitude 125.2667 E.

Diagnosis: Until now, the putative species originally described as *Hyla bicolor* Oken, 1816, with a type locality of Port Essington, Northern Territory, has been treated as occurring across the northern wet tropics of Australia, including the Kimberley Division of Western Australia, the top end of the Northern Territory and Cape york in Queensland, as well as most parts of New Guinea and islands to the north, east and west of New Guinea.

Various species have been “split off” with Menzies, Richards and Tyler (2008) formally restricting *Maxinehoserranae bicolor* (Oken, 1816) (as *Litoria bicolor*) to Northern Australia, with a view that the Cape York population was closest to their New Guinea species, but not conspecific with them.

They did not put a name to that taxon and as of 2019, this taxon remained unnamed.

While restricting *M. bicolor* to the top end of the Northern Territory and Western Australia, Menzies, Richards and Tyler (2008) and no one since appears to have ever countenanced the possibility that there may be more than one species in north-west Australia, save for material to this effect in a thesis by James (1998).

However over more than 3 decades of active fieldwork in the relevant region, it was always apparent that those specimens from the West Kimberley were radically different to those from near Darwin and were therefore a separate species.

As that one was also unnamed as of 2019, it too is described herein.

All three species, namely *L. bicolor* from the Northern Territory, *M. maxinehoserae sp. nov*. from the Kimberley District of Western Australia and *M. brettbarnetti sp. nov*. from Cape York in Queensland would key out as *M. bicolor* in either Cogger (2014) or Anstis (2013).

The three Australian species are readily separated from those in the genus outside Australia (New Guinea and nearby offshore islands) by their call, which in the Australian species is a very distinctive short rolling sound, or rasp, which accelerates slightly at the end of the sequence as well as an absence of vomerine teeth,

or very tiny ones, versus presence in New Guinea species.

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

Adult male *M. brettbarnetti sp. nov*. and *M. bicolor* both have a well-defined broad band running from the back of the eye along the side of the back towards the groin. This is either green, or yellow with a stong greenish tinge in *M. brettbarnetti sp. nov.*, versus yellow in *M. bicolor.* Below this line, the border is brown in *M. brettbarnetti sp. nov*. versus brown, purple or grey in *M. bicolor.*

The forelimbs of both sexes of adult *M. brettbarnetti sp. nov*. are always heavily peppered with dark brown pigment, versus not so in *M. bicolor* which have light forelimbs.

The flanks of both sexes of adult *M. brettbarnetti sp. nov*. has a moderate amount of scattered black peppering, versus none or very little in *M. bicolour.*

In terms of further separation of the two species Menzies, Richards and Tyler (2008) stated *M. bicolor* are larger than Queensland *M. brettbarnetti sp. nov.*, with mean snout-vent 25.0 mm +/-0.98 versus 23.1 mm +/-1.58 mm in *M. brettbarnetti sp. nov.*, Queensland *M. brettbarnetti sp. nov.*, have larger heads, mean HL/HB 0.34 +/- 0.017 versus 0.33 +/- 0.014 in *M. bicolor*, but there are no differences in head proportions. *M. brettbarnetti sp. nov*. have more widely placed nostrils, mean EN/IN 0.99 +/- 0.01 versus 1.06 +/- 0.01 in *M. bicolor*, but none of these characters will provide

absolute separation as all measurements and ratios show extensive overlap and so are of little practical value. A combination of two metrics, i.e. HB and HL/HB, provides better, but not absolute, separation (paraphrased here).

M. maxinehoserae sp. nov. is by far the most distinctive Australian species in the genus *Maxinehoserranae gen. nov..* It is readily separated from both other species as follows:

M. maxinehoserae sp. nov. has a distinctive, bright lime green dorsum with thin well-defined chocolate brown line running from tip of snout to eye, after which the line continues as a broad stripe, over-writing the entire tympanum and going along the mid flank to the groin. On the flank of the body, the line is distinctive and well defined. It is bordered on top by the lime green dorsum and below by a thick white band, bordered below with brown, that then fades to the white underside.

The chocolate coloured line from snout, through nostril to eye is bordered on top by a thin gold line in turn bordered by the lime green on top of the head and body.

This thin gold line upper border is not seen in the other two species.

The limbs of *Maxinehoserranae gen. nov.* have scattered brown spots and the dorsum of this species is moderately granular.

M. brettbarnetti sp. nov. also has a moderately granular dorsum, whereas *M. bicolor* has a smooth dorsum.

Specimens of *M. brettbarnetti sp. nov*. that have a brownish coloured line running from the ear to the groin do not have either the rich dark chocolate colour seen in *M. maxinehoserae sp. nov*. or the sharp well defined upper edge on the dorsum as seen in *M. maxinehoserae sp. nov*..

The upper dorsum of *M. maxinehoserae sp. nov*. does not have the somewhat faded two tone colouration seen in both *M. brettbarnetti sp. nov.* and *M. bicolor*.

Images of *M. maxinehoserae sp. nov*. in life can be seen in Tyler, Smith and Johnstone (1994) on plate 27 at bottom and online at:
https://www.flickr.com/photos/euprepiosaur/22190269488/in/photolist-885upC-zNSW2f-z9rhah
and:
https://www.flickr.com/photos/euprepiosaur/21755237474/in/photolist-885upC-zNSW2f-z9rhah/
and:
https://www.flickr.com/photos/liquidghoul/4674588858/in/photolist-885upC-zNSW2f-z9rhah/

Images of *M. brettbarnetti sp. nov*. in life can be seen in Anstis (2013) on page 150 at bottom and page 151 at top left and page 153 top, in Vanderduys (2012) on page 26 in all images and Tyler and Davies (1986) in plate 20.

An image of *M. bicolor* in life can be seen in Anstis (2013) on page 150 at top.

Distribution: *M. maxinehoserae sp. nov*. is found throughout the Kimberley Division of Western Australia and into nearby parts of far north-west Western Australia, in the region generally south of the Daly River (inclusive). *M. bicolor* is restricted to the area spanning the environs of Darwin, across the top of the Northern Territory, including offshore islands and the western side of the Gulf of Carpentaria.

Etymology: the new species is named in honour of Maxine Hoser of Margate a loyal subject (minion) the United Kingdom of England, Scotland, Wales, Northern Island, Gibralta, the Falkland Islands and formerly including Hong Kong and other colonies, in recognition of her services to the author in herpetology.

MAXINEHOSERRANAE* (*MAXINEHOSERRANAE*) *PIERSONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:10C131B1-4741-4046-9702-4A782CFEC91F

Holotype: A preserved specimen in the University of Papua New Guinea, Port Moresby, Papua New Guinea, specimen number UP5276, collected from Yala River, Seram, Indonesia, Latitude 3.28 S., Longitude 128.99 E. This facility allows access to its holdings.

Paratypes: Four preserved specimens in the University of Papua New Guinea, Port Moresby, Papua New Guinea, specimen numbers UP5271-74, collected from Yala River, Seram, Indonesia, Latitude 3.28 S., Longitude 128.99 E.

Diagnosis: *Maxinehoserranae piersoni sp. nov.* from the island of Seram has until now been variously treated as *M. bicolor* (Gray, 1842) (in most texts placed in the genus *Litoria* Tschudi, 1838) and herein restricted to the top end of the Northern Territory, Australia, or more recently as a western population of the species formally named *Litoria eurynastes* Menzies *et al.* (2008) with a type locality of Madang, in the north of Papua New Guinea.

However this taxon (*M. piersoni sp. nov.*) is neither and herein formally described as a new species.

While it would be diagnosed as *Maxinehoserranae eurynastes* (Menzies *et al.*, 2008) using the diagnostic information within Menzies *et al.* (2018) the two species

are readily separated on the basis of the colouration of the concealed surfaces of the thighs. In *M. piersoni sp. nov.* these surfaces are vaguely mottled brown and not distinct, versus concealed surfaces of thighs with sparse to moderate sprinkling of blue-black.

M. piersoni sp. nov. is further separated by having a generally variable but dull olive green coloured dorsum, versus immaculate yellow green to bright green in *M. eurynastes.*

M. piersoni sp. nov. is further diagnosed by a pale yellow band running from the upper lip to the mid-body and vague dark dorsolateral stripe (versus bronze in *M. eurynastes*); and males with a pale yellow venter; throat deep yellow and gold iris.

Both *M. piersoni sp. nov.* and *M. eurynastes* are separated from all other species within *Maxinehoserranae gen. nov.* by the following quite of characters: A larger species of *Maxinehoserranae gen. nov.* with adult snout-vent 25.7-31.5 mm, HBF 27.3-33.0 mm; snout rounded and projecting in profile, somewhat angular from above; lores slightly sloping, flat; canthus rostralis rounded, straight; nostrils lateral, slightly visible from above; eyes large, tympanum large, distinct, except extreme upper margin; shallow postorbital fold fades before axilla; outer fingers about half webbed, others webbed only at base; simple, pale brown nuptial pad; all fingers with discs, larger than on the toes; toes fully webbed, except fourth with terminal phalanx free, all with discs; dorsal skin finely granular; ventral surface more coarsely; throat wrinkled; vomerine teeth in two small patches between the choanae and otherwise as for the genus.

Menzies *et al.* (2008) placed the Seram population described herein as *M. piersoni sp. nov.* within their species *M. eurynastes* on the basis of biogeographic proximity to New Guinea and the associated fact that other New Guinea frogs occur there, namely the identified (by them) species of "*Litoria amboinensis*, *L. infrafrenata*, *Platymantis papuensis*".

In doing so, they chose to ignore the morphological divergence between their type form of *M. eurynastes* from Alexishafen, Madang Province Papua New Guinea and this new species from Seram, which is highlighted here to separate the two taxa.

It should also be noted that biogeographically, Seram associates with southern New Guinea fauna and not that of the north, of which their species *M. eurynastes* is. Based on biogeography, the closest match to the Seram population (identified herein as *M. piersoni sp. nov.*) would logically be their southern New Guinea species, *M. viranula* (Menzies *et al.*, 2008), with a type locality of Wegamu Camp, Bensbach River, Western Province, Papua New Guinea.

However Menzies *et al.*, 2008 identify a raft of morphological differences separating those two forms and hence the only logical conclusion is that *M. piersoni sp. nov.* must therefore be a separate species.

The population of frogs from Yamur Lake and Siewa River in the neck of the Bird's Head of New Guinea, (south running drainages) are morphologically similar to *M. piersoni sp. nov.* and are tentatively included within this species. The quoted mean snout-vent for *M. piersoni sp. nov.* is 28 mm, versus 29 mm for the Yamur Lake and Siewa River forms, being of no significant difference.

For the record *M. viranula* is separated from *M. piersoni sp. nov.* by being a significantly smaller species maximum snout-vent of 23.5 mm and HBF 26.4 mm.

M. viranula is further separated from *M. piersoni sp. nov.* by having a green dorsum with mid-dorsal bronze band; narrow dark canthal stripe continuing through eye and tympanum, but becoming

indistinct between green dorsum and white ventrum; upper lip white, colour continuing below eye and tympanum before merging with ventral colour; male throat pale yellow, ventrum elsewhere white; groin and concealed surfaces of thigh dark brown (versus an indistinct mottled brown in *M. piersoni sp. nov.*).

M. viranula was illustrated in life by Menzies (2006) in plate 44 as "*Litoria bicolor*".

M. piersoni sp. nov. was illustrated by Menzies (2006) in plate 46 as "*Litoria cf. bicolor*, Yala River, Seram".

Based on the original description of *Hyla albolabris* Wandolleck, 1911 and relevant account in Tyler and Davies (1978), this taxon appears to fall within the genus *Maxinehoserranae gen. nov.,* but that placement is of course tentative.

Tyler and Davies (1978) placed the taxon in its own species group, but provided no evidence or justification for this quite drastic action. In key characters, *M. albolabris* clearly matches species within *Maxinehoserranae gen. nov.* (AKA "the *bicolor* group") including finger and toe webbing, adult size and colour, both dorsal and ventral. On this basis, it is highly likely that this taxon is in fact conspecific with *M. viranula*, or alternatively related to *M. contrastens* (Tyler, 1968) and possibly conspecific that that. If either situation is ultimately found to be correct, then *M. albolabris* will be the senior name and the other taxon name will move into its synonymy in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Distribution: Known definitively only from the southern parts of the island of Seram, Indonesia, however this taxon presumably occurs in all suitable lowland parts of the island, and nearby islands. Specimens from Yamur Lake and Siewa River in the neck of the Bird's Head of New Guinea, (south running drainages) are morphologically similar to *M. piersoni sp. nov.* and are tentatively included within this species.

Etymology: Named in honour of Charles Pierson of Moss Vale, New South Wales, Australia, publisher of numerous books on Australian wildlife, including Hoser (1989, 1991 and 1993) in recognition of his major contributions to wildlife conservation in Australia and assisting.

His efforts were also critical in forcing the Australian government to revoke draconian and anti-conservation wildlife laws that were enforced at gunpoint in Australia for two decades from the 1970's to the 1990's as detailed in Hoser (1993 and 1996). Those laws which, Person's efforts finally had revoked did in that 20 year period cause the extinctions of several species including frogs and at least one dragon species (*Tympanocryptis pinguicolla* Mitchell, 1948) (Hoser 2019a, 2019b).

ANGULARANTA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:5BEECB54-ABB0-444B-B17E-36C69FBF7105

Type species: *Hyla* (*Litoria*) *arfakiana* Peters and Doria, 1878.

Diagnosis: The genus *Angularanta gen. nov.* includes most of the better-known small, medium or large sized mountain stream dwelling tree frogs of New Guinea as well as a number of larger but morphologically similar lowland species.

The described species in the genus *Angularanta gen. nov.* are most easily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by separation of each of the relevant subgenera.

Frogs in the nominate subgenus *Angularanta subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by one of the two following suites of characters:

1/ Small to medium sized, stream-breeding species with unwebbed or slightly webbed, long fingers, large finger discs and fully webbed toes. Intercalary structures are broad or elongate and ossified. Straight canthus rostralis. The hyoid plate lacks alary processes. The eggs are large and unpigmented, or alternatively:

2/ Medium to large species wlth long and variously webbed fingers, long hindlimbs, pigmented or unpigmented bones and very highly variable dorsal coloration. The intercalary structures are small and cartilaginous. The hyoid plate bears pedunculate alary processes. The ova are small and pigmented.

Frogs in the subgenus *Alliuma subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are medium-sized montane tree frogs with spiniform tubercles on the hindlimbs, but no spiniform tubercles on the body, a green and brown blotched dorsum, and yellow colouration on the hidden surfaces of the thighs.The ventral surface is variegated with dark pigments. Moderate to extensive finger webbing. Vocal slits present in males; strongly curved canthus rostralis.

Frogs in the subgenus *Naveosrana subgen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: A small (under 50 mm snout-vent in both sexes) grey or brown species of frog with broad half-webbed fingers bearing large discs, and having a strongly curved canthus rostralis. The intercalary structures are elongate and cartilaginous. The hyoid plate lacks alary processes. Ova are small and unpigmented. Further diagnostic characters of this subgenus are as follows: The dorsum varies from grey to dark brown with pale markings including light pigment over the site of the cutaneous blood vessels. The snout is gently rounded and the canthus rostralis sharply curved. The fingers have broad discs and are approximately half webbed. The toes are webbed to the base of the discs. Tubercles occur commonly on the upper eyelids, below the anus, on the back of the thighs and on the heels.

The cranial elements are reduced. The nasals are small and very widely separated medially. They do not articulate with the sphenethmoid, which appears to be lobulated anteriorly in retaining a double condition and does not extend between the nasals. The frontoparietal fontanelle is large and ovoid. The squamosal has a short zygomatic ramus and slightly longer otic ramus. The quadratojugal is not developed. The pars facialis is shallow and the short posterior process does not articulate with the maxillary process of the nasal. The alary processes of the premaxillaries are well developed, bifurcated at their extremities, widely separated medially and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are reduced. The sacral diapophyses are broadly expanded and the ilia extend one third along their length. No flange is present on the third metacarpal and the intercalary structures are long and cartilaginous. Alary processes of the hyoid plate are lacking. The adductor mandibulae externus superficialis is absent.

Frogs within the subgenus *Scelerisqueanura subgen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small (adult males 25.8-30.3 mm) frogs. Dorsum is chocolate brown, with or without paler patches. Short, narrow fringed, half-webbed fingers and webbed toes. The finger lengths are as follows 3>4>2>1. The webbing between the third and fourth fingers extends to a point slightly below the paired subarticular tubercles at the base of the penultimate phalanx on the fourth toe. Broadly spaced nares (E-N/IN 0.657-0.758). No vomerine teeth. The head is slightly longer than broad (HL/HW 1.031), its length equivalent to more than one-third of the snout to vent length (HL/S-V 0.356). The snout is not prominent; abrupt and truncate when viewed from above and very slightly rounded in profile. The nostrils are lateral, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.694). The canthus rostralis is well defined and very slightly curved. The eye is large and conspicuous, its diameter greater than the eye to naris distance.

The tympanum is covered with skin and very small, its diameter equivalent to one-third of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue is broadly cordiform with weakly indented posterior border.

The terminal discs are prominent. Long and slender hindlimbs with a TL/S-V ratio of 0.584.

Toe lengths 4>5=3>2>1. The webbing of all toes except for the fourth reaches the base of the discs, while on the fourth toes the webbing reaches the subarticular tubercle at the base of the penultimate phalanx and continues to the disc via a narrow fringe. The dorsal and lateral surfaces of the body are finely pitted and striated. There is an inconspicuous supratympanic fold. The throat and chest are smooth. Abdomen and nearby halves of the ventral surface of the thighs are coarsely granular. There is a small pigmented nuptial pad at the base of the first finger. Vocal sac openings are exceptionally long, extending from the base of the tongue to the angles of the jaw.

Ventrally the frogs are a pale creamish colour, stippled with dark brown on the throat.

Frogs within the subgenus *Longuscrusanura subgen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small size with male maximum length 23 mm, female 28 mm. Fingers are slightly fringed and slightly less than half webbed and of moderate length. The toes are fully webbed and the hindlimbs are particularly long, with a ratio of tibia length to snout-vent length of 0.59-0.68.

The dorsum is greyish (in preservative) and marked with pale, cryptic markings resembling lichens.

The snout is short and very slightly pointed.

Ovarian eggs are unpigmented. Vomerine teeth are present in some individuals and absent in others.

The snout is prominent, slightly projecting and obtusely pointed when viewed from above and slightly projecting in profile. The nostrils are more lateral than superior, their distance from the end of the snout approximately two thirds that from the eye. The distance from the eye and the naris is less than the internarial span. The canthus rostralis is well defined and strongly rounded. The eyes are large and prominent the eye diameter being greater than the eye to naris distance.

The tympanum is covered with skin, only the inferior half of the annulus is visible. The tympanum diameter approximates the equivalent of two fifths of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue shape is somewhat distorted and roughly cordiform in shape with a very slightly indented posterior margin.

The two species *Angularanta impura* and *A. oxyeei sp. nov.* constitute the entirety of the subgenus *Raucus subgen. nov*. and are separated from all other species within *Angularanta gen. nov.* and all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: unpigmented bones; single subarticular tubercle on fourth finger; reduced toe webbing; reduced hand webbing (versus moderate to extensive in one or both in all species of *Angularanta gen. nov.*), narrow lateral fringes on fingers; dark brown to blackish chin in males; dark brown to reddish brown dorsum; dark brown canthal stripe; upper-lip may be white, with a very thin white line bordered by black or brown; concealed surfaces of thighs are brown with yellow spots; yellow to orange iris, sometimes with a green upper margin; ventrum white; slightly pointed snout when viewed from above, side on or below; a raucous call; IN/SV 0.072-0.08, TY/SV 0.067-0.075, HW/SV 0.34-0.3, HL/SV 0.34-0.3, EN/IN 1.1-1.2.

According to Duellman *et al*. (2016), the genus *Angularanta gen. nov.* diverged from its nearest living relatives in the divergent genus *Bellarana gen. nov*. 12.7 MYA, in turn diverged as a pair from their next nearest living relatives in the two genera *Hopviridi gen. nov.* and *Ornatanura gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Frogs in this genus are found in all parts of New Guinea, nearby offshore Islands, including those to the north (New Britain, New Ireland), with some species also occurring as far afield as most major islands within the Solomon Islands.

Etymology: The new genus name *Angularanta* comes from the Latin words meaning sharp snout, or sharp front, in reference to the generally pointed snouts of most of these species.

Content: *Angularanta arfakiana* (Peters and Doria, 1878) (type species); *L. mukherjii sp. nov.*; *A. becki* (Loveridge, 1943); *A. brongersmai* (Loveridge, 1945); *A. bulmeri* (Tyler, 1968); *A. chydaeus sp. nov.*; *A. communia sp. nov.*; *A. dorsivena* (Tyler, 1968); *A. extentacrus sp. nov.*; *A. flavescens* (Kraus and Allison, 2004); *A. fuscula* (Oliver and Richards, 2007); *A. impura* (Peters and Doria, 1878); *A. longicrus* (Boulenger, 1911); *L. louisiadensis* (Tyler, 1968); *A. lutea* (Boulenger, 1887); *A. macki* (Richards, 2001); *A. milneana* (Loveridge, 1945); *A. napaea* (Tyler, 1968); *A. oenicolen* (Menzies and Zweifel, 1974); *A. oxyeei sp. nov.*; *A. pratti* (Boulenger, 1911); *A. quaeinfernas sp. nov.*; *A. solomonis* (Vogt, 1912); *A. spartacus* (Richards and Oliver, 2006); *A. spinifera* (Tyler, 1968); *A. thesaurensis* (Peters, 1877); *A. vulgarans sp. nov.*; *A. wollastoni* (Boulenger, 1914).

ALLIUMA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:C23E103A-0397-4910-A0FB-30A3216FC26F

Type species: *Litoria spartacus* Richards and Oliver, 2006.

Diagnosis: Frogs in the subgenus *Alliuma subgen. nov.* (being a subgenus within the genus *Angularanta subgen. nov.*) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are medium-sized montane tree frogs with spiniform tubercles on the hindlimbs, but no spiniform tubercles on the body, a green and brown blotched dorsum and yellow colouration on the hidden surfaces of the thighs.The ventral surface is variegated with dark pigments. Moderate to extensive finger webbing. Vocal slits present in males; strongly curved canthus rostralis.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

According to Duellman *et al.* (2016), the subgenus *Alliuma subgen. nov.* diverged from the nominate subgenus *Angularanta subgen. nov.* 10.8 MYA.

According to Duellman *et al.* (2016), the genus *Angularanta gen. nov.* diverged from its nearest living relatives in the divergent genus *Bellarana gen. nov*. 12.7 MYA, in turn diverged as a pair from their next nearest living relatives in the two genera *Hopviridi gen. nov.* and *Ornatanura gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Known only from a few scattered locations around watercourses at 800-1500 metres in altitude in the central highlands region of central New Guinea, only in association with the main central cordillera.

Etymology: *Alliuma* is derived from the Latin word “alium” meaning different, reflecting the flanges on the frog, giving it a different appearance to a lot of other frogs. The name spelling of this genus with the addition of the letter “a” is deliberate as it avoids the genus being a homonym with the plant genus *Allium* Linnaeus, 1753

and the extra "l" is added for similar reasons.

Content: *Angularanta* (*Alliuma*) *spartacus* (Richards and Oliver, 2006) (type species); *A.* (*Alliuma*) *macki* (Richards, 2001); *A.* (*Alliuma*) *spinifera* (Tyler, 1968).

LONGUSCRUSANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:83CEADF8-E6D4-421E-B5E9-7AA0124924B6

Type species: *Hyla napaea* Tyler, 1968.

Diagnosis: Frogs within the subgenus *Longuscrusanura subgen. nov*. (being a subgenus within the genus *Angularanta subgen. nov.*) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small size with male maximum length 23 mm, female 28 mm. Fingers are slightly fringed and slightly less than half webbed and of moderate length.

The toes are fully webbed and the hindlimbs are particularly long, with a ratio of tibia length to snout-vent length of 0.59-0.68.

The dorsum is greyish (in preservative) and marked with pale, cryptic markings resembling lichens.

The snout is short and very slightly pointed.

Ovarian eggs are unpigmented.

Vomerine teeth are present in some individuals and absent in others.

The snout is prominent, slightly projecting and obtusely pointed when viewed from above and slightly projecting in profile. The nostrils are more lateral than superior, their distance from the end of the snout approximately two thirds that from the eye. The distance from the eye and the naris is less than the internarial span. The canthus rostralis is well defined and strongly rounded. The eyes are large and prominent, the eye diameter being greater than the eye to naris distance.

The tympanum is covered with skin, only the inferior half of the annulus is visible. The tympanum diameter approximates the equivalent of two fifths of the eye diameter, separated from the eye by a distance greater than its own diameter.

The tongue shape is somewhat distorted and roughly cordiform in shape with a very slightly indented posterior margin.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: Known only from the type locality in the Snow Mountains and from the Wapoga River catchments 300 km to the west, New Guinea, Papua, Indonesia.

Etymology: The new subgenus name is taken from Latin and literally means long legged frog, in direct reflection of the sole species in the subgenus.

Content: *Angularanta* (*Longuscrusanura*) *napaea* (Tyler, 1968) (monotypic).

NAVEOSRANA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:89B00246-658A-4EAF-AA19-7E09E4284B1C

Type species: *Hyla dorsivena* Tyler, 1968.

Diagnosis: Frogs in the subgenus *Naveosrana subgen. nov*. (being a subgenus within the genus *Angularanta subgen. nov.*) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: A small (under 50 mm snout-vent in both sexes) grey or brown species of frog with broad half-webbed fingers bearing large discs and having a strongly curved canthus rostralis. The intercalary structures are elongate and cartilaginous. The hyoid plate lacks alary processes. Ova are small and unpigmented. Further diagnostic characters of this subgenus are as follows: The dorsum varies from grey to dark brown with pale markings including light pigment over the site of the cutaneous blood vessels. The snout is gently rounded and the canthus rostralis sharply curved. The fingers have broad discs and are approximately half webbed. The toes are webbed to the base of the discs. Tubercles occur commonly on the upper eyelids, below the anus, on the back of the thighs and on the heels.

The cranial elements are reduced. The nasals are small and very widely separated medially. They do not articulate with the sphenethmoid, which appears to be lobulated anteriorly in retaining a double condition, and does not extend between the nasals. The frontoparietal fontanelle is large and ovoid. The squamosal has a short zygomatic ramus and slightly longer otic ramus. The quadratojugal is not developed. The pars facialis is shallow and the short posterior process does not articulate with the maxillary process of the nasal. The alary processes of the premaxillaries are well developed, bifurcated at their extremities, widely separated medially and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are reduced. The sacral diapophyses are broadly expanded and the ilia extend one third along their length. No flange is present on the third metacarpal and the intercalary structures are long and cartilaginous. Alary processes of the hyoid plate are lacking. The adductor mandibulae externus superficialis is absent.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: Known only from locations around watercourses in the central highlands region of central New Guinea, only in association with the main central cordillera mainly in the vicinity of the upper Fly and Sepik Rivers and slightly west of there in the Star Mountains as well as the Darewa River headwaters in West Papua, although there are specimens from the Ramu River, Eastern Highlands as well.

Reports of (putative) species in this genus from the Arfak Mountains further east are not confirmed, but if true, are probably of a different species.

Etymology: Taken from Latin, the words "naveos" means flecked and "rana" means frog and so the new genus name "*Naveosrana*" literally means flecked frog, which is the usual colouration of relevant species.

Content: *Angularanta* (*Naveosrana*) *dorsivena* (Tyler, 1968) (type species); *A.* (*Naveosrana*) *fuscula* (Oliver and Richards, 2007).

RAUCUS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:1DEED3E3-61E6-49B4-B560-8BB44C0F6D64

Type species: *Hyla* (*Litoria*) *impura* Peters and Doria, 1878.

Diagnosis: The two species *Angularanta impura* and *A. oxyeei sp. nov.* constitute the entirety of the subgenus *Raucus subgen. nov.* and are separated from all other species within *Angularanta gen. nov.* and all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: unpigmented bones; single subarticular tubercle on fourth finger; reduced toe webbing; reduced hand webbing (versus moderate to extensive in one or both in all other species of *Angularanta gen. nov.*), narrow lateral fringes on fingers; dark brown to blackish chin in males; dark brown to reddish brown dorsum; dark brown canthal stripe; upper-lip may be white, with a very thin white line bordered by black or brown; concealed surfaces of thighs are brown with yellow spots; yellow to orange iris, sometimes with a green upper margin; ventrum white; slightly pointed snout when viewed from above, side-on or below; a raucous call; IN/SV 0.072-0.08, TY/SV 0.067-0.075, HW/SV 0.34-0.3, HL/SV 0.34-0.3, EN/IN 1.1-1.2.

Until now *Angularanta oxyeei sp. nov.*. has been treated as the far south-eastern population of *A. impura* (Peters and Doria, 1878) with a type locality of Yule Island, north-west of Port Moresby, in Central Province, Papua New Guinea, being the form of the genus from that area.

Angularanta oxyeei sp. nov. is the similar and closely related species from the far east of the Milne Bay region in Papua New Guinea.

Angularanta oxyeei sp. nov. is readily separated from *A. impura* by the following suite of characters: Dorsum smooth and flanks either smooth or only very slightly granular; a chocolate brown dorsum with a significant amount of distinctive and well-defined blackish markings and mottling, including on the upper surfaces of the limbs as well as the posterior part of the upper surface of the head. Anterior to the eyes, the upper surface of the snout is immaculate or near immaculate chocolate brown, but the sides of the snout below the eye and anterior to them is wholly blackish brown in colour, there being a well defined border at the upper margin where the colours meet to form a line from tip of snout to top of eye along a well-defined ridge. The lower margin at the jawline is in turn bordered by a thin and well defined white line running the entire length of the mouth.

The upper surfaces of the front legs are well marked with chocolate brown and blackish blotches tending to form cross bands. Markings on the upper surfaces of the back legs are well defined but do not form any obvious pattern. By contrast, *A. impura* is separated from *A. oxyeei sp. nov.* by the following suite of characters: slightly granular dorsum, becoming more granular on the flanks; a medium brownish dorsum with minimal markings, being indistinct grey mottling or peppering mainly between the eyes and on the lower back. The upper lip and below the eye is also mainly brown with indistinct blackish markings on the upper surfaces of the limbs. The iris is light orangeish in colour. There is no obvious thin white line demarcating the upper lip.

A. impura in life is depicted on plate 51 of Menzies (2006).

A. oxyeei sp. nov. is depicted in life on plate 50 of Menzies (2006).

Distribution: The two species within *Raucus subgen. nov.* are only definitvely known from the south east of New Guinea in the Central and Milne Bay Provinces of Papua New Guinea.

Etymology: The new subgenus name *Raucus* is taken directly from the Latin word meaning raucous in English, meaning “making or constituting a disturbingly harsh and loud noise”, which reflects the nature of the mating call of males in both species.

Content: *Angularanta* (*Raucus*) *impura* (Peters and Doria, 1878) (type species); *A.* (*Raucus*) *oxyeei sp. nov.*.

SCLERISQUEANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:C1D3835F-B3D2-4A6A-857F-DF8C3F9C3A2F

Type species: *Hyla louisiadensis* Tyler, 1968.

Diagnosis: Frogs within the subgenus *Scelerisqueanura subgen. nov.* (being a subgenus within the genus *Angularanta subgen. nov.*) are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small (adult males 25.8-30.3 mm) frogs. Dorsum is chocolate brown, with or without paler patches. Short, narrow fringed, half-webbed fingers and webbed toes. The finger lengths are as follows 3>4>2>1. The webbing between the third and fourth fingers extends to a point slightly below the paired subarticular tubercles at the base of the penultimate phalanx on the fourth toe. Broadly spaced nares (E-N/IN 0.657-0.758). No vomerine teeth. The head is slightly longer than broad (HL/HW 1.031), its length equivalent to more than one-third of the snout to vent length (HL/S-V 0.356). The snout is not prominent; abrupt and truncate when viewed from above and very slightly rounded in profile. The nostrils are lateral, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.694).

The canthus rostralis is well defined and very slightly curved. The eye is large and conspicuous, its diameter greater than the eye to naris distance. The tympanum is covered with skin and very small, its diameter equivalent to one-third of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue is broadly cordiform with weakly indented posterior border.

The terminal discs are prominent. Long and slender hindlimbs with a TL/S-V ratio of 0.584.

Toe lengths 4>5=3>2>1. The webbing of all toes except for the fourth reaches the base of the discs, while on the fourth toes the webbing reaches the subarticular tubercle at the base of the penultimate phalanx and continues to the disc via a narrow fringe. The dorsal and lateral surfaces of the body are finely pitted and striated. There is an inconspicuous supratympanic fold. The throat and chest are smooth. Abdomen and nearby halves of the ventral surface of the thighs are coarsely granular.

There is a small pigmented nuptial pad at the base of the first finger. Vocal sac openings are exceptionally long,

extending from the base of the tongue to the angles of the jaw.

Ventrally the frogs are a pale creamish colour, stippled with dark brown on the throat.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: Known only from Sudest (Tagula) and Rossell Islands in the Louisiade Islands, in the Milne Bay Province, south-east of the main landmass of New Guinea, Papua New Guinea.

Etymology: The new subgenus name taken from Latin literally means chocolate (brown) coloured frog in reflection of the usual colour of the dorsum.

Content: *Angularanta* (*Scelerisqueanura*) *louisiadensis* (Tyler, 1968), including one subspecies.

ANGULARANTA* (*ANGULARANTA*) *CHYDAEUS SP. NOV.

LSIDurn:lsid:zoobank.org:act:6B3CE863-7862-41D8-9093-ADE406B22687

Holotype: A preserved specimen in the National Museum of Natural History; Smithsonian Institution; Washington, DC, USA, specimen number Amphibians and Reptiles 195538 collected from north of Brown River Road, between Laloki River and Brown River, Central Province, Papua New Guinea, Latitude -9.2916 S., Longitude 147.227 E.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ Herp A-90396 collected at 2 km west of Sogeri, 3 km north of Bisianumu, Central Province, Papua New Guinea, Latitude -9.3968 S., Longitude 147.4016 E.

Diagnosis: The three species *A. chydaeus sp. nov.* from the Central Province of Papua New Guinea, in the Port Moresby region, *A. quaeinfernas sp. nov.* from the West Sepik region of Papua New Guinea including the Bewani Mountains and *Angularanta vulgarans sp. nov.* from Guadalcanal, Solomon Islands, have all until now been treated as populations of the widespread species *A. thesaurensis* (Peters, 1877), originally described as "*Hyla thesaurensis* Peters, 1877" with a type locality of Treasury Island, Solomon Islands.

The four species are separated from one another as follows:

Both *A. vulgarans sp. nov.* and *A. chydaeus sp. nov.* are separated from *A. quaeinfernas sp. nov.* and *A. thesaurensis* by their shorter legs with a TL/S-V of less than 0.55, versus greater than this in the latter two species.

A. vulgarans sp. nov. is separated from the other three species by the chin having a distinctive mottlling with brown, which in effect also separates *A. chydaeus sp. nov.* from the other three species in that it, *A. chydaeus sp. nov.*, lacks distinctive brown mottling on the chin and also has shorter legs than both *A. quaeinfernas sp. nov.* and *A. thesaurensis.*

Kraus and Allison (2014a) noted that *A. chydaeus sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. quaeinfernas sp. nov. is separated from the other three species in that the yellow colouration of the undersurfaces extends onto the tympanum (versus not so in the other three species) and the posterior part of the middle iris is orange in colour.

Kraus and Allison (2014a) also noted that *A. quaeinfernas sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. thesaurensis is separated from the other three species by its larger adult size with a maximum snout vent of 67 mm in females and 50 mm in males, versus 59 mm in females and 45 mm in males in the other three species, an orange iris and a narrow well-defined ring of greenish-yellow around the eye.

A. vulgarans sp. nov. is separated from *A. chydaeus sp. nov.* by having an orange iris, versus yellow with red peppering or obvious red venation in *A. chydaeus sp. nov.*.

The flanks of *A. vulgarans sp. nov.* and *A. thesaurensis* are yellowish in colour, with no markings other than some indistinct darker, greyish marbling. In *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* the flanks are also yellow in colour but punctuated by well defined dark brown spots, flecks or peppering. The hind legs of both *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* have well defined black spots, blotches or marks on them, versus either none or indistinct at best in both *A. vulgarans sp. nov.* and *A. thesaurensis.*

A. vulgarans sp. nov. and *A. thesaurensis* have smooth skin above the eyelid, versus a few tiny tubercles above the eyelid in *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.*.

A photo of *A. chydaeus sp. nov.* in life can be found on plate 53 in Menzies (2006).

The four species *A. chydaeus sp. nov.*, *A. quaeinfernas sp. nov.*, *A. vulgarans sp. nov.* and *A. thesaurensis* until now treated as the single putative taxon *A. thesaurensis* can all be separated from other species within the genus *Angularanta gen. nov.* by the following suite of characters: Reduced webbing of the fingers and green bones. Adult maximum snout vent of 67 mm in females and 50 mm in males (smaller in all of the three species formally named herein).

The head is flattened and longer than broad (HL/HW 1.023-1.200), its length greater than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is prominent, when viewed from above and in profile it is slightly rounded.

The nostrils are more lateral than superior, their distance from the end of the snout approximately half that from the eye. The distance between the eye and the naris is very much greater than the internarial span (E-N/IN 1.257-1.485).

The canthus rostralis is curved and slightly defined. The eye is large and prominent, its diameter less than, equal to, or greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter. The vomerine teeth are in two large, oblique series between the upper margins of the choanae. The tongue is broadly

oval with a slightly indented posterior border.

The fingers are long and slender with large terminal discs and very narrow lateral fringes, in decreasing order of length 3>4>2>1. The webbing between the fingers is scant, just reaching the sub-articular tubercle at the base of the penultimate phalanx of the fourth.

The length of the hind limbs is highly variable, differing markedly between species and within species. The range of TL/S-V is from 0.528-0.629. Toes in decreasing order of length 4>5 =3>2>1. The webbing reaches the base of the disc on the fifth toe and the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface is smooth. In some specimens the upper eyelids are slightly granular. A row of tubercles on the posterior surface of the forearm vary from well developed to being scarcely detectable.

There is a very weak supra-tympanic fold extending from the posterior corner of the eye to a point above the insertion of the forearm. A very small portion of the superior margin of the tympanic annulus is usually hidden beneath the supra-tympanic fold. There are a few flattened tubercles on the throat. The chest is smooth and the abdomen and lower surfaces of the thighs coarsely granular.

The male possesses a sub-gular vocal sac and an exceptionally elongate nuptial pad on the first finger.

The ground colouration of the dorsal surfaces is usually pale grey, buff, brown or cream with or without lighter or darker markings.

The lighter markings sometimes consist of three pale yellow longitudinal stripes situated mid-dorsally and dorso-laterally. The darker markings are commonly in the form of irregularly shaped brown or black spots. A white (in *A. chydaeus sp. nov.*) or yellow (in *A. vulgarans sp. nov.*, *A. thesaurensis*, and *A. quaeinfernas sp. nov.*) bar is present above the upper lip directly beneath the eye of most specimens. The backs of the thighs are brown with or without numerous, very small, circular white or cream spots. The white spots on the backs of the thighs being most common in the two Solomon Islands species. The bones are green. Pigmentation is not confined to the periosteum but is present throughout the bone and persists in specimens preserved in formalin for at least thirty years (according to Tyler, 1978).

In the two Solomon Islands species the three pale to bright yellow longitudinal stripes, found on most if not all specimens, are united by a narrow trans-ocular bar.

See the detailed description for the genus *Angularanta gen. nov.* in this paper for details of the separation of the subgenus *Angularanta subgen. nov.* and other subgenera within *Angularanta gen. nov.* from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta chydaeus sp. nov.* is belived to be restricted to the region generally around the Central Province of Papua New Guinea including the outskirts of the PNG capital Port Moresby.

Etymology: The new species name "*chydaeus*" is taken from the same Latin word meaning common or ordinary, as this species is both common where found and ordinary in general appearance. As a frog species there is nothing particularly unusual about its appearance.

ANGULARANTA* (*ANGULARANTA*) *COMMUNIA SP. NOV.

LSIDurn:lsid:zoobank.org:act:830EEE3B-4E23-4A5E-A2C1-7D0F8B769684

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.137991 collected at Param Village, Milne Bay Province, Papua New Guinea, Latitude -9.966 S., Longitude 149.483 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.137945 collected at the Munimum Village, Agaun area, Milne Bay Province, Papua New Guinea, Latitude -9.883 S., Longitude 149.383 E.

Diagnosis: *Angularanta communia sp. nov*. has until now been treated as a far south-eastern population of *Angularanta arfakiana* (Peters and Doria, 1878) (type species for the genus *Angularanta gen. nov.*).

They are however readily separated on the basis of colouration.

Adult *A. arfakiana* have an olive grey or olive brown dorsum, vaguely mottled with or without an hour-glass mak. Concealed parts of thighs are yellowish-purplish spotted yellow. The dorsum merges into a plain whitish ventrum and the iris is speckled fawn in colour. Scattered tubercles on upper hind leg are small. Tubercles above the eye are tiny.

By contrast Adult *A. communia sp. nov*. are light brown with an hour-glass mark. Snout is lighter or with a pale bar between the eyelids. Lores are dark, the colour extending to include the tympanum. Flanks are speckled dark and light brown and green. Concealed surfaces of the thighs are dark brown, speckled white. Ventrum is white and spotted with grey-brown. Scattered tubercles on upper hind leg are medium to large. Tubercles above eye obvious.

Both *A. communia sp. nov.* and *A. arfakiana* are readily separated from all other species in the genus *Angularanta gen. nov.* by the following suite of characters: A prominent pointed snout with a sharp canthus rostralis, and a conspicuous, straight supra-tympanic fold. Large sub-anal tubercles are exhibited by all specimens and conical heel tubercles are usually present, ranging in size from tiny to large, depending on species. The S-V length of adult males varies from approximately 35 mm to 45 mm and from 45 mm to 65 mm in females.

The head is flattened, being longer than broad (HL/HW 1.077-1.152), its length slightly more than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is projecting; when viewed from above its shape may be acutely pointed (males) or obtusely pointed (most large females); in profile the snout is acutely pointed in both sexes. The nostrils are lateral, their distance from the tip of the snout slightly less than that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.600-0.760). The canthus rostralis is very slightly curved and extremely sharply defined. The loreal region is concave and oblique. The eye is large, its diameter greater than the distance

separating it from the nostril. The tympanum is visible, its diameter equivalent to one-third to one-half of the eye diameter. The vomerine teeth are in two, short oblique series situated between the rounded choanae. The tongue is cordiform with a slightly indented posterior border. The fingers are long and slender and lack lateral fringes; in decreasing order of length 3>4>2>1; unwebbed or with a trace of webbing at the base of the third and fourth fingers. The terminal discs are extremely prominent. The hind limbs are slender and there is considerable variation in the TL/S-V ratio (range 0.554-0.712, mean 0.645). The extreme individuals in most samples differ by approximately 10 percent. Toes in decreasing order of length 4>5>3>2>1. The webbing between the outer and fourth toes extends to the sub-articular tubercle at the base of the penultimate phalanx or to approximately half way up the penultimate phalanx on the fifth, whilst the penultimate phalanx of the fourth may be free or webbed to slightly above the sub-articular tubercle. The skin on the dorsal surfaces is roughened. Conical tubercles are distributed as follows: on the upper eyelid (usually confined to the posterior half), where they may be tiny to large, depending on species and individual, and on the heel and beneath the vent. Throat lightly granular, abdomen and lower femur coarsely granular. There is a conspicuous, straight supra-tympanic fold extending from the eye to the shoulder, an irregular, slightly raised tubercular ridge above the vent and rows of small tubercles on the posterior surface of the forearm and the tarsus. The canthus rostralis and the skin fold behind the eye are usually darker than the surrounding areas and may be surrounded by a narrow white line. The pre-anal fold is white and the backs of the thighs are red or dull brown. Males possess a sub-gular vocal sac.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *A. communia sp. nov*. is currently known only from the vicinity of the type locality and the Owen Stanley Ranges in south-east New Guinea. *A. arfakiana* as a species complex, including those species resurrected from synonymy in this paper are found in most other parts of New Guinea from the Central Highlands and west to include the Bird's Head region of Irian Jaya, Indonesia.

Etymology: The new species name "*communia*" comes from the Latin word *communia* which means common, general, ordinary, universal, public, usual, in reflection of the fact that these frogs are common and "ordinary" to people where they naturally occur.

ANGULARANTA* (*ANGULARANTA*) *EXTENTACRUS SP. NOV.

LSIDurn:lsid:zoobank.org:act:6102BFFE-7AAA-4114-A300-A848EC162992

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R6482 collected at Kawolabib in the Star Mountains, Papua New Guinea.

This government owned facility allows access to its holdings.

Paratypes: Two preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R9154 and R9429, collected from "Camp 2" at Pio River, Gulf Province, Papua New Guinea.

Diagnosis: Until now *Angularanta extentacrus sp. nov.* from the central highlands of New Guinea has been treated as an eastern population of *A. longicrus* (Boulenger, 1911) with syntypes type localities of Fakfak and Wendessi, both on the Vogelkop Peninsula (Bird's Head), Indonesian New Guinea.

A. extentacrus sp. nov. is however readily separated from *A. longicrus* by having pigment on the dorsal surface of the thigh (versus unpigmented) and in lacking the white bar below the eye (versus a short white bar below the eye extending posteriorly to the angle of the jaws in *A. longicrus*).

Both *A. extentacrus sp. nov.* and *A. longicrus* are readily separated from all other species in the genus *Angularanta gen. nov.* by the following unique suite of characters: Exceptionally long hind limbs (TL/S-V 0.623-0.628), widely spaced nares (E-N/IN 0.579-0.616) and uniform dorsal colouration. In more detail, adult snout to vent lengths are approximately 31.8 mm (female), 27.4 mm (male). The head is flattened and as long as broad, its length equivalent to slightly less than or more than one-third of the snout to vent length (HL/S-V 0.321-0.358). The snout is not prominent; rounded when viewed from above and in profile. The nostrils are more lateral than superior, their distance from the end of the snout about one-half that from the eye. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.579-0.616). The canthus rostralis is slightly defined and gently curved. The eye is large and conspicuous, its diameter equivalent to one and one-half the eye to naris distance. The tympanum is visible, its diameter equivalent to slightly less than one-half the eye diameter. The vomerine teeth are in two very small, circular series on a line directly between the choanae. The tongue is oval with a weakly indented posterior margin. The fingers are short and equipped with narrow lateral fringes; in decreasing order of length 3>4>2>1. The webbing between the third and fourth fingers reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The hind limbs are extremely long with a TL/S-V ratio of 0.623-0.628. Toes in decreasing order of length 4>5>3>2>1. The webbng of all toes except the fourth reaches the base of the discs. On the fourth toe the webbing reaches the sub-articular tubercle at the base of the penultimate phalanx. The dorsal and lateral surfaces of the body are smooth. There is an inconspicuous, flattened supra-tympanic fold. The throat and chest are smooth, and the abdomen and lower surface of the thighs are granular.

In life, the dorsal surface is green and unmarked. In preservative the dorsal surface of the body is dull blue and unmarked. The limbs with the exception of the thighs, are a similar colour. The thighs are unpigmented. In *A. longicrus* there is a short white bar below the eye

extending posteriorly to the angle of the jaws, but this is absent in *A. extentacrus sp. nov.*. The ventral surfaces of the body and limbs are white to cream.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta extentacrus sp. nov.* occurs in the central highlands of New Guinea. *A. longicrus* (Boulenger, 1911) is apparently confined to the Vogelkop Peninsula (Bird's Head), Indonesian New Guinea.

Etymology: The new species name is taken from the Latin words "extent" meaning stretched and "crus" meaning leg, thereby meaning stretched leg, in reflection of the relative length of the leg in this species.

ANGULARANTA* (*ANGULARANTA*) *MUKHERJII SP. NOV.

LSIDurn:lsid:zoobank.org:act:C669E69D-8BC3-4145-861E-57CD08DE4CA7

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R70092 collected from Townsville Drill Station at the headwaters of the Ok Tedi River, Western Province, Papua New Guinea, Latitude -5.15972 S., Longitude 141.1666 E.

This government-owned facility allows access to its holdings.

Diagnosis: Until now *Angularanta mukherjii sp. nov.* from the Fly River basin has been regarded as a southern population of *Angularanta bulmeri* (Tyler, 1968), with a type locality of upper Aunjung Valley, Schrader Mountains, Eastern Mountains, Madang Province, Papua New Guinea.

A. mukherjii sp. nov. is separated from *A. bulmeri* by a lack of a well-defined black lateral stripe extending from the naris to a point at least midway along the body, instead the stripe becoming indistinct on the body in *A. bulmeri* as well as numerous small tubercles on the upper surface of the hind legs, versus relatively few in *A. bulmeri*.

A. mukherjii sp. nov. and *A. bulmeri* are readily separated from all other species in the subgenus *Angularanta subgen. nov.* by the following suite of characters: small size (males 29-34 mm), broadly spaced nares (E-N/IN 0.605-0.641) and distinctive colouration. The dorsal surface is a dark greenish grey, being somewhat mottled and with white spots or flecks (often on tubercles). There is a broad, black lateral stripe extending from the naris through the tympanum and posterior to this to a point at least midway along the body in *A. bulmeri* or merging with the body colour past the ear in *A. mukherjii sp. nov.*. The head is high and the head is consistently longer than broad with a range 1.030-1.160, and the head length less than or greater than one-third of the snout to vent length, its length equivalent to slightly more than one-third of the snout to vent length (HL/S-V 0.366). The snout is abrupt, broadly rounded when viewed from above, projecting and almost pointed in profile. The nostrils are more lateral than superior, their distance from the end of the snout less than one-half that from the eye. The distance between the eye and the naris is very much less than the internarial span (E-N/IN 0.605-0.641). The canthus rostralis is slightly defined and gently rounded. The eye is not prominent, its diameter is considerably greater than the eye to naris distance. The tympanum is covered with skin and the annulus only slightly defined. The tympanum diameter is equivalent to one-third of the eye diameter; separated from the eye by a distance equivalent to half its own diameter. Vomerine teeth may or may not be present, depending on the individual frog. When present they are small and round and situated near the upper margin of the choana. The choanae are very widely spaced. The tongue is small and broadly cordiform with a slightly indented posterior border. The fingers are very long and slender with narrow lateral fringes, in decreasing order of length 3>4>2>1. There is no webbing between the fingers. The terminal discs are prominent. The hind limbs are long and slender (TL/S-V 0.590-0.665). Toes in decreasing order of length 4>5=3>2>1. The webbing between the toes reaches the base of the disc on the fifth toe and slightly below the sub-articular tubercle at the base of the penultimate phalanx on the fourth toe. There is a small depressed inner metatarsal tubercle. The dorsal surface of the head and body is smooth. There is a very weak supra-tympanic fold extending from the posterior corner of the eye to above the insertion of the forearm. Above and at the sides of the anus is a row of tubercles. The throat and chest are smooth, and the abdomen and lower surface of the thighs coarsely granular.

There is a nuptial pad on the first finger.

There is a short black, horizontal line beneath the eye and a smaller marking beneath it on the margin of the upper jaw. The anterior and posterior surfaces of the thigh are pale yellow and the anal region pale brown. The throat is white, finely stippled with palegreen or otherwise simply pale green or grey. The chest and lower surfaces of the thighs are dull yellow or green and the abdomen cream. On the abdomen and lower surfaces of the thighs are small indistinct spots of pale brown. The plantar surface is a very dark brown and there is a very fine white line at the margin of the plantar surface and the lateral greenish grey colouration. The proximal half of the posterior surface of the thigh is usually dull greyish-greenish-brown.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: The species *A. mukherjii sp. nov.* is only known from the type locality. *A. bulmeri* is found in uplands of headwaters draining north of the main cordillera.

Etymology: The new species name "*mukherjii*" is named in honour of Melbourne, Victoria, Australia barrister Gautam Mukherji, in recognition for his services to wildlife conservation, defending Raymond Hoser against unlawful attacks by trademark infringing thieves and others working to attack the wildlife conservation cause for their own financial self-gratification.

ANGULARANTA* (*ANGULARANTA*) *QUAEINFERNAS SP. NOV.

LSIDurn:lsid:zoobank.org:act:474462DF-1FA2-4723-ABDC-AB4FC2D3CD5F

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.135574 collected at Imonda Village, West Sepik Province, Papua New Guinea, Latitude 3.20 S., Longitude 141.10 E.

This government-owned facility allows access to its holdings.

Diagnosis: The three species *A. quaeinfernas sp. nov.* from the West Sepik region of Papua New Guinea including the Bewani Mountains, *Angularanta vulgarans sp. nov.* from Guadalcanal, Solomon Islands and *A. chydaeus sp. nov.* from the Central Province of Papua New Guinea, in the Port Moresby region, have all until now been treated as populations of the widespread species *A. thesaurensis* (Peters, 1877), originally described as "*Hyla thesaurensis* Peters, 1877" with a type locality of Treasury Island, Solomon Islands.

The four species are separated from one another as follows:

Both *A. vulgarans sp. nov.* and *A. chydaeus sp. nov.* are separated from *A. quaeinfernas sp. nov.* and *A. thesaurensis* by their shorter legs with a TL/S-V of less than 0.55, versus greater than this in the latter two species.

A. vulgarans sp. nov. is separated from the other three species by the chin having a distinctive mottlling with brown, which in effect also separates *A. chydaeus sp. nov.* from the other three species in that it, *A. chydaeus sp. nov.*, lacks distinctive brown mottling on the chin and also has shorter legs than both *A. quaeinfernas sp. nov.* and *A. thesaurensis.*

Kraus and Allison (2014a) noted that *A. chydaeus sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. quaeinfernas sp. nov. is separated from the other three species in that the yellow colouration of the undersurfaces extends onto the tympanum (versus not so in the other three species) and the posterior part of the middle iris is orange in colour.

Kraus and Allison (2014a) also noted that *A. quaeinfernas sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. thesaurensis is separated from the other three species by its larger adult size with a maximum snout vent of 67 mm in females and 50 mm in males, versus 59 mm in females and 45 mm in males in the other three species, an orange iris and a narrow well-defined ring of greenish-yellow around the eye.

A. vulgarans sp. nov. is separated from *A. chydaeus sp. nov.* by having an orange iris, versus yellow with red peppering or obvious red venation in *A. chydaeus sp. nov..*

The flanks of *A. vulgarans sp. nov.* and *A. thesaurensis* are yellowish in colour, with no markings other than some indistinct darker, greyish marbling. In *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* the flanks are also yellow in colour but punctuated by well defined dark brown spots, flecks or peppering. The hind legs of both *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* have well defined black spots, blotches or marks on them, versus either none or indistinct at best in both *A. vulgarans sp. nov.* and *A. thesaurensis.*

A. vulgarans sp. nov. and *A. thesaurensis* have smooth skin above the eyelid, versus a few tiny tubercles above the eyelid in *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.*.

The four species *A. chydaeus sp. nov.*, *A. quaeinfernas sp. nov.*, *A. vulgarans sp. nov.* and *A. thesaurensis* until now treated as the single putative taxon *A. thesaurensis* can all be separated from other species within the genus *Angularanta gen. nov.* by the following suite of characters: Reduced webbing of the fingers and green bones. Adult maximum snout vent of 67 mm in females and 50 mm in males (smaller in all of the three species formally named herein). The head is flattened and longer than broad (HL/HW 1.023-1.200), its length greater than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is prominent, when viewed from above and in profile it is slightly rounded. The nostrils are more lateral than superior, their distance from the end of the snout approximately half that from the eye. The distance between the eye and the naris is very much greater than the internarial span (E-N/IN 1.257-1.485). The canthus rostralis is curved and slightly defined. The eye is large and prominent, its diameter less than, equal to, or greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter. The vomerine teeth are in two large, oblique series between the upper margins of the choanae. The tongue is broadly oval with a slightly indented posterior border.

The fingers are long and slender with large terminal discs and very narrow lateral fringes. In decreasing order of length 3>4>2>1. The webbing between the fingers is scant, just reaching the sub-articular tubercle at the base of the penultimate phalanx of the fourth.

The length of the hind limbs is highly variable, differing markedly between species and within species. The range of TL/S-V is from 0.528-0.629. Toes in decreasing order of length 4>5 =3>2>1. The webbing reaches the base of the disc on the fifth toe and the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface is smooth. In some specimens the upper eyelids are slightly granular. A row of tubercles on the posterior surface of the forearm vary from well developed to being scarcely detectable.

There is a very weak supra-tympanic fold extending from the posterior corner of the eye to a point above the insertion of the forearm. A very small portion of the superior margin of the tympanic annulus is usually hidden beneath the supra-tympanic fold. There are a few flattened tubercles on the throat. The chest is smooth and the abdomen and lower surfaces of the thighs coarsely granular.

The male possesses a sub-gular vocal sac and an exceptionally elongate nuptial pad on the first finger.

The ground colouration of the dorsal surfaces is usually pale grey, buff, brown or cream with or without lighter or

darker markings.

The lighter markings sometimes consist of three pale yellow longitudinal stripes situated mid-dorsally and dorso-laterally. The darker markings are commonly in the form of irregularly shaped brown or black spots. A white (in *A. chydaeus sp. nov.*) or yellow (in *A. vulgarans sp. nov.*, *A. thesaurensis*, and *A. quaeinfernas sp. nov.*) bar is present above the upper lip directly beneath the eye of most specimens. The backs of the thighs are brown with or without numerous, very small, circular white or cream spots. The white spots on the backs of the thighs being most common in the two Solomon Islands species. The bones are green. Pigmentation is not confined to the periosteum but is present throughout the bone and persists in specimens preserved in formalin for at least thirty years (according to Tyler, 1978).

In the two Solomon Islands species the three pale to bright yellow longitudinal stripes, found on most if not all specimens, are united by a narrow trans-ocular bar.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta quaeinfernas sp. nov.* is belived to be restricted to northern Papua New Guinea and nearby Irian Jaya, including the Bewani Mountains, in areas generally proximate to the type locality in the West Sepik Province and west of the Huon Peninsula.

Etymology: The new species name "*quaeinfernas*" is taken from the Latin words meaning lowland dwelling, which is apt, as this species, while being found in some hilly locations is not found in the higher altitude regions.

ANGULARANTA* (*ANGULARANTA*) *VULGARANS SP. NOV.

LSIDurn:lsid:zoobank.org:act:9C4268DD-45F0-4B3D-A251-CD423D9088F3

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.90277 collected at Mount Austin, Guadalcanal, Solomon Islands, Latitude -9.29 S., Longitude 160.00 E. This government owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.136387 collected from Mount Austen, Guadalcanal, Solomon Islands, Latitude -9.29 S., Longitude 159.58 E.

2/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.137027.001 collected from Makarakomburu (South Slope), Guadalcanal, Solomon Islands, Latitude -9.45 S., Longitude 160.00 E.

3/ Five preserved specimens at the American Museum of Natural History, Manhattan, New York City, USA, specimen numbers AMNH 52173 and 52176-79 collected from Guadalcanal, Solomon Islands.

4/ Two preserved specimens at the California Academy of Sciences, San Francisco, California, USA, specimen numbers CAS. 49952-3 collected from Guadalcanal, Solomon Islands.

Diagnosis: The three species *Angularanta vulgarans sp. nov.* from Guadalcanal, Solomon Islands, *A. quaeinfernas sp. nov.* from the West Sepik region of Papua New Guinea including the Bewani Mountains and *A. chydaeus sp. nov.* from the Central Province of Papua New Guinea, in the Port Moresby region, have all until now been treated as populations of the widespread species *A. thesaurensis* (Peters, 1877), originally described as "*Hyla thesaurensis* Peters, 1877" with a type locality of Treasury Island, Solomon Islands.

The four species are separated from one another as follows:

Both *A. vulgarans sp. nov.* and *A. chydaeus sp. nov.* are separated from *A. quaeinfernas sp. nov.* and *A. thesaurensis* by their shorter legs with a TL/S-V of less than 0.55, versus greater than this in the latter two species.

A. vulgarans sp. nov. is separated from the other three species by the chin having a distinctive mottlling with brown, which in effect also separates *A. chydaeus sp. nov.* from the other three species in that it, *A. chydaeus sp. nov.*, lacks distinctive brown mottling on the chin and also has shorter legs than both *A. quaeinfernas sp. nov.* and *A. thesaurensis.*

Kraus and Allison (2014a) noted that *A. chydaeus sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. quaeinfernas sp. nov. is separated from the other three species in that the yellow colouration of the undersurfaces extends onto the tympanum (versus not so in the other three species) and the posterior part of the middle iris is orange in colour.

Kraus and Allison (2014a) also noted that *A. quaeinfernas sp. nov.* (identified by them as a potential new species) has a different call than the type form of *A. thesaurensis.*

A. thesaurensis is separated from the other three species by its larger adult size with a maximum snout vent of 67 mm in females and 50 mm in males, versus 59 mm in females and 45 mm in males in the other three species, an orange iris and a narrow well-defined ring of greenish-yellow around the eye.

A. vulgarans sp. nov. is separated from *A. chydaeus sp. nov.* by having an orange iris, versus yellow with red peppering or obvious red venation in *A. chydaeus sp. nov..*

The flanks of *A. vulgarans sp. nov.* and *A. thesaurensis* are yellowish in colour, with no markings other than some indistinct darker, greyish marbling. In *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* the flanks are also yellow in colour but punctuated by well defined dark brown spots, flecks or peppering.

The hind legs of both *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.* have well defined black spots, blotches or marks on them, versus either none or indistinct at best in both *A. vulgarans sp. nov.* and *A. thesaurensis.*

A. vulgarans sp. nov. and *A. thesaurensis* have smooth skin above the eyelid, versus a few tiny tubercles above the eyelid in *A. chydaeus sp. nov.* and *A. quaeinfernas sp. nov.*.

The four species *A. chydaeus sp. nov.*, *A. quaeinfernas sp. nov.*, *A. vulgarans sp. nov.* and *A. thesaurensis* until now treated as the single putative taxon *A. thesaurensis* can all be separated from other species within the genus *Angularanta gen. nov.* by the following suite of characters: Reduced webbing of the fingers and green bones. Adult maximum snout vent of 67 mm in females and 50 mm in males (smaller in all of the three species formally named herein). The head is flattened and longer than broad (HL/HW 1.023-1.200), its length greater than one-third of the snout to vent length (HL/S-V 0.340-0.373). The snout is prominent, when viewed from above and in profile it is slightly rounded. The nostrils are more lateral than superior, their distance from the end of the snout approximately half that from the eye. The distance between the eye and the naris is very much greater than the internarial span (E-N/IN 1.257-1.485). The canthus rostralis is curved and slightly defined. The eye is large and prominent, its diameter less than, equal to, or greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter. The vomerine teeth are in two large, oblique series between the upper margins of the choanae. The tongue is broadly oval with a slightly indented posterior border.

The fingers are long and slender with large terminal discs and very narrow lateral fringes. In decreasing order of length 3>4>2>1. The webbing between the fingers is scant, just reaching the sub-articular tubercle at the base of the penultimate phalanx of the fourth.

The length of the hind limbs is highly variable, differing markedly between species and within species. The range of TL/S-V is from 0.528-0.629. Toes in decreasing order of length 4>5 =3>2>1. The webbing reaches the base of the disc on the fifth toe and the sub-articular tubercle at the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface is smooth. In some specimens the upper eyelids are slightly granular. A row of tubercles on the posterior surface of the forearm vary from well developed to being scarcely detectable.

There is a very weak supra-tympanic fold extending from the posterior corner of the eye to a point above the insertion of the forearm. A very small portion of the superior margin of the tympanic annulus is usually hidden beneath the supra-tympanic fold. There are a few flattened tubercles on the throat. The chest is smooth and the abdomen and lower surfaces of the thighs coarsely granular.

The male possesses a sub-gular vocal sac and an exceptionally elongate nuptial pad on the first finger.

The ground colouration of the dorsal surfaces is usually pale grey, buff, brown or cream with or without lighter or darker markings.

The lighter markings sometimes consist of three pale yellow longitudinal stripes situated mid-dorsally and dorso-laterally. The darker markings are commonly in the form of irregularly shaped brown or black spots. A white (in *A. chydaeus sp. nov.*) or yellow (in *A. vulgarans sp. nov.*, *A. thesaurensis*, and *A. quaeinfernas sp. nov.*) bar is present above the upper lip directly beneath the eye of most specimens. The backs of the thighs are brown with or without numerous, very small, circular white or cream spots. The white spots on the backs of the thighs being most common in the two Solomon Islands species. The bones are green. Pigmentation is not confined to the periosteum but is present throughout the bone and persists in specimens preserved in formalin for at least thirty years (according to Tyler, 1978).

In the two Solomon Islands species the three pale to bright yellow longitudinal stripes, found on most if not all specimens, are united by a narrow trans-ocular bar.

See the detailed description for the genus *Angularanta gen. nov.* in this paper for details of the separation of the subgenus *Angularanta subgen. nov.* and other subgenera within *Angularanta gen. nov.* from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *Angularanta vulgarans sp. nov.* occurs on Guadalcanal, Solomon Islands. It is assumed that the morphologically similar species *A. thesaurensis* is found on the other main islands to the north and west, at least as far as Bougainville.

Etymology: The new species name *vulgarans* is taken from the Latin word “vulgarins” meaning common, or ordinary, which is a fair account of this species of frog among local people where these frogs occur. The name “*vulgarans*” is a deliberate misspelling and should not be amended as the spelling is chosen to avoid a potential homonym with another species.

ANGULARANTA* (*ANGULARANTA*) *LUTEA LEUCOPUNCTATA SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:79031E4B-473C-4C65-BC6E-02238BAC1C59

Holotype: A preserved specimen at the Naturhistorisches Museum, Basle, Switzerland, specimen number NMB 4274 collected from New Georgia, Solomon Islands.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Naturhistorisches Museum, Basle, Switzerland, specimen number NMB 4275 collected from New Georgia, Solomon Islands, and:

2/ A preserved specimen at the Field Museum of Natural History, Chicago, Illinois, USA, specimen number FMNH Amphibians and Reptiles 190313 collected from New Georgia, Solomon Islands.

Diagnosis: The subspecies *A. lutea leucopunctata subsp. nov.* is separated from the nominate form of *A. lutea lutea* (Boulenger, 1887) by having a slightly granular dorsal surface (versus smooth), few if any white spots on the head between the eyes or anterior to them (versus many) and an obvious orangeish upper iris, versus not so in *A. lutea lutea.*

The taxon *A. lutea leucopunctata subsp. nov.* has been conservatively formally named as a subspecies in the absence of molecular evidence. However in light of the biogeograpical barrier separating the New Georgia group of islands from the other populations of *A. lutea* in the form of a deep sea barrier present even in the height of the most recent glacial maxima, it is likely that the New Georgia frogs may in fact be divergent at the species level.

The species *A. lutea* has been treated by some past authors as a synonym of *A. thesaurensis* (Peters, 1877).

However it is readily separated from that species by having a very flattened head; disc of third finger generally larger than the tympanum and discs of fingers not or scarcely broader than the subtending digit which is bordered by a wide flange of skin. By contrast *A. thesaurensis* has a head that is only slightly flattened; disc of third finger generally smaller than the tympanum and discs of fingers (except the inner one) much broader than the subtending digit which is not bordered by a wide flange of skin.

A. lutea are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Head slightly less broad to as broad as long, its breadth about 1/3 the length from snout to vent; snout round-pointed; eye moderate, its diameter about 1/3 the breadth of the head; tympanum round, its diameter 1/2 or slightly more than that of the eye; loreal region strongly oblique, concave; canthus rostralis rounded, rather indistinct; interorbital space broader than upper eyelid; vomerine teeth in two transverse patches between the choanae and almost in contact medially; tongue broadly oval and but feebly indented at the mid-point of the posterior margin.

Forelimb well developed; finger tips strongly depressed with large discs; discs broader than long (except for the inner finger), but scarcely broader than the subtending digits as measured to include the flanges of skin on the lateral margins; fingers more extensively webbed than in the sympatric species *A. thesaurensis* (Peters, 1877), which has minimal hand webbing, the third finger in *A. lutea* being webbed to the subdistal tubercle on the outside and to a point between this and the basal tubercle on the inside, the second almost to the distal tubercle on the outside; subarticular tubercles small, low, transversely elongate; metacarpal tubercles indistinct; hindlimb long, length of tibia about 3/5 the length from snout to vent; discs of toes smaller than those of the fingers.

Subarticular tubercles small, more strongly protrudent than those of the hands; inner metatarsal tubercle narrow and elliptical, its length less than its distance from the basal tubercle of the inner toe; outer absent; toes webbed almost to the discs except for the fourth; skin smooth or granular dorsally except for the flat granules of the lower surfaces of the thighs and abdomen.

Two penultimate subarticular tubercles on finger four (versus one in *A. thesaurensis* and all other species most similar to it, including the three formally named in this paper, formerly treated as populations of *A. thesaurensis*).

Colour of the dorsum is uniformly green save for numerous scattered white (usually, or rarely yellow) tiny spots on the dorsum. Whiteish or yellow ventrally. Concealed areas of limbs yellow.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the subgenus *Angularanta subgen. nov*. and other subgenera within *Angularanta gen. nov*. from all other Australasian (Australian / New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *A. lutea leucopunctata subsp. nov.* is restricted to the New Georgia group of islands within the Solomon Islands.

Etymology: The new subspecies name "*leucopunctata*" is taken from the Latin words meaning "white spots" or "white points", in reflection of the tiny white dots scattered on the dorsum of the species.

ANGULARANTA* (*RAUCUS*) *OXYEEI SP. NOV.

LSIDurn:lsid:zoobank.org:act:9105FBA3-99CE-4072-8A81-906E48D8A696

Holotype: A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number: BPBM 4101 collected from Alotau, Milne Bay Province, Papua New Guinea (PNG), Latitude -10.3157 S., Longitude 150.4588 E.

This facility allows access to its holdings.

Paratypes: Five preserved specimens at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, being BPBM 4102-04 collected from Alotau, Milne Bay Province, Papua New Guinea, Latitude -10.3157 S., Longitude 150.4588 E. and BPBM 15194-95 collected from Pini Range at 300 metres elevation, Milne Bay Province, Papua New Guinea, Latitude -10.25 S., Longitude 150.18 E.

Diagnosis: Until now *Angularanta oxyeei sp. nov.*. has been treated as the far south-eastern population of *A. impura* (Peters and Doria, 1878) with a type locality of Yule Island, north-west of Port Moresby, in Central Province, Papua New Guinea, being the form of the genus from that area.

Angularanta oxyeei sp. nov. is the similar and closely related species from the far east of the Milne Bay region in Papua New Guinea.

Angularanta oxyeei sp. nov. is readily separated from *A. impura* by the following suite of characters: Dorsum smooth and flanks either smooth or only very slightly granular; a chocolate brown dorsum with a significant amount of distinctive and well-defined blackish markings and mottling, including on the upper surfaces of the limbs as well as the posterior part of the upper surface of the head. Anterior to the eyes, the upper surface of the snout is immaculate or near immaculate chocolate brown, but the sides of the snout below the eye and anterior to them is wholly blackish brown in colour, there being a well defined border at the upper margin where the colours meet to form a line from tip of snout to top of eye along a well-defined ridge.

The lower margin at the jawline is in turn bordered by a thin and well defined white line running the entire length of the mouth.

The upper surfaces of the front legs are well marked with chocolate brown and blackish blotches tending to form cross bands. Markings on the upper surfaces of the back legs are well defined but do not form any obvious pattern. By contrast, *A. impura* is separated from *A. oxyeei sp. nov.* by the following suite of characters: slightly granular dorsum, becoming more granular on the flanks; a medium brownish dorsum with minimal markings, being indistinct grey mottling or peppering mainly between the eyes and on the lower back. The upper lip and below the eye is also mainly brown with indistinct blackish markings on the upper surfaces of the limbs. The iris is light orangeish in colour. There is no obvious thin white line demarcating the upper lip. *A. impura* in life is depicted on plate 51 of Menzies (2006).

A. oxyeei sp. nov. is depicted in life on plate 50 of Menzies (2006).

The two preceding species are separated from all other species within *Angularanta gen. nov.* and all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: unpigmented bones; single subarticular tubercle on fourth finger; reduced toe webbing; reduced hand webbing (versus moderate to extensive in one or both in all species of *Angularanta gen. nov.*), narrow lateral fringes on fingers; dark brown to blackish chin in males; dark brown to reddish brown dorsum; dark brown canthal stripe; upper-lip may be white, with a very thin white line bordered by black or brown; concealed surfaces of thighs are brown with yellow spots; yellow to orange iris, sometimes with a green upper margin; ventrum white; slightly pointed snout when viewed from above, side on or below; a raucous call; IN/SV 0.072-0.08, TY/SV 0.067-0.075, HW/SV 0.34-0.3, HL/SV 0.34-0.3, EN/IN 1.1-1.2.

Distribution: *Angularanta oxyeei sp. nov.* is known only from the far east of the Milne Bay region in Papua New Guinea.

Etymology: The new species is named in honour of "Oxy", being the abbreviated name of a now deceased Great Dane dog that protected this author's scientific research facility for 8 years. It is appropriate that a species is formally named in his honour. His full name was "Oxyuranus", being the genus name for a group of large venomous Australian elapid snakes. The spelling of the species name with the extra two letter "e's" is deliberate and should not be changed.

ANGULARANTA* (*SCELERISQUEANURA*) *LOUSIADENSIS BRUNETUS SUBSP. NOV.

LSIDurn:lsid:zoobank.org:act:2ECB4A36-4D24-4EF0-B7A8-CABAE66B511D

Holotype: A preserved specimen in the American Museum of Natural History, Manhattan, New York City, USA, specimen number 60069 collected at Mount Riu, Sudest Island, Louisiadae Archipelago, Milne Bay Province, Papua New Guinea.

This facility allows access to its holdings.

Paratypes: Nine preserved specimens in the American Museum of Natural History, Manhattan, New York City, USA, specimen numbers 60070-60078 collected at Mount Riu, Sudest Island, Louisiadae Archipelago, Milne Bay Province, Papua New Guinea.

Diagnosis: The subspecies *Angularanta* (*Scelerisqueanura*) *louisiadensis brunetus subsp. nov.* from Sudest Island (AKA Tagula Island) has until now been treated as wholly conspecific with *A. louisiadensis* (Tyler, 1968) from nearby Rossell Island, with the type material here for *A. brunetus subsp. nov.* treated as paratypes of *A. louisiadensis* by Tyler (1968).

However both populations are consistently morphologically divergent, are clearly evolving separately and can be reasonably expected to have diverged most recently at the end of the Pleistocene (11.7 K years ago).

A check of sea level depths (to the 120 m level), shows a likely narrow connection between Sudest Island and Rossell Island, or alternatively a gap of less than 1 km. The ambiguity in determination relates to positions of fringing reefs, sediment accumulation or removal, tectonic movements of land and sea beds and factors that cannot be determined with precision.

Significantly, Weijola *et al.* (2020) found late Pleistocene divergence between populations of putative Mangrove Monitors *Euprepiosaurus indicus* (Daudin, 1802) from Rossell Island and Sudest Island.

I note that an estuarine dwelling species, *E. indicus* would be far more able to breach any gap between the two nearby islands than a salt water vulnerable species like a tree frog.

Those same authors named a species "*Varanus bennetti* Weijola *et al.*, 2020" based on a similar late Pleistocene divergence between their new putative species and populations of the previously described "*Varanus tsukamotoi* Kishida, 1929".

Fred Kraus a man well known for science grant rorting and for engaging in taxonomic vandalism, this being the recklessly renaming of species previously properly described and named by others, did in Kraus (2009) name *Toxicocalamus mintoni* from Sudest Island as a distinct species from the near identical *Toxicocalamus holopelturus* McDowell, 1969 from the adjacent Rossel Island based on a single scalation difference on the head of the single specimen he had on hand.

This was the frontal fused with the supraoculars, which may well have been an unusual trait for the specimen as opposed to a species specific diagnostic character.

In light of the two recent preceding cases of species-level recognition of similarly divergent populations, I view late Pleistocene divergence being a depth of divergence more appropriate for subspecies-level differentiation at the taxonomic level and hence describe *A. louisiadensis brunetus subsp. nov.* as a new subspecies accordingly.

A. louisiadensis brunetus subsp. nov. is readily separated from nominate *A. louisiadensis louisiadensis* by having relatively shorter hindlimbs. Comparative measurements are TL/S-V range of 0.511-0.575, versus 0.584 in *A. louisiadensis louisiadensis*.

A. louisiadensis brunetus subsp. nov. has a dark chocolate brown dorsum, lateral surfaces and limbs versus one that is dark, but with obscure, faint irregular patches in *A. louisiadensis louisiadensis*.

Both subspecies of *A. louisiadensis*, comprising the entirety of the subgenus *Scelerisqueanura subgen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small (adult males 25.8-30.3 mm) frogs. Dorsum is chocolate brown, with or without paler patches. Short, narrow fringed, half-webbed fingers and webbed toes. The finger lengths are as follows 3>4>2>1. The webbing between the third and fourth fingers extends to a point slightly below the paired subarticular tubercles at the base of the penultimate phalanx on the fourth toe. Broadly spaced nares (E-N/IN 0.657-0.758). No vomerine teeth.

The head is slightly longer than broad (HL/HW 1.031), its length equivalent to more than one-third of the snout to vent length (HL/S-V 0.356). The snout is not prominent; it is abrupt and truncate when viewed from above and very slightly rounded in profile. The nostrils are lateral, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris

is less than the internarial span (E-N/IN 0.694). The canthus rostralis is well defined and very slightly curved. The eye is large and conspicuous, its diameter greater than the eye to naris distance. The tympanum is covered with skin and very small, its diameter equivalent to one-third of the eye diameter, separated from the eye by a distance greater than its own diameter. The tongue is broadly cordiform with weakly indented posterior border.

The terminal discs are prominent. Long and slender hindlimbs with a TL/S-V ratio of 0.584.

Toe lengths 4>5=3>2>1. The webbing of all toes except for the fourth reaches the base of the discs, while on the fourth toes the webbing reaches the subarticular tubercle at the base of the penultimate phalanx and continues to the disc via a narrow fringe. The dorsal and lateral surfaces of the body are finely pitted and striated. There is an inconspicuous supratympanic fold. The throat and chest are smooth. Abdomen and nearby halves of the ventral surface of the thighs are coarsely granular. There is a small pigmented nuptial pad at the base of the first finger. Vocal sac openings are exceptionally long, extending from the base of the tongue to the angles of the jaw.

Ventrally the frogs are a pale creamish colour, stippled with dark brown on the throat.

See the detailed description for the genus *Angularanta gen. nov*. in this paper for details of the separation of the other subgenera within *Angularanta subgen. nov*. from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae).

Distribution: *A. louisiadensis brunetus subsp. nov.* is confined to Sudest Island in the Louisiade Archipelago, Milne Bay Province of Papua New Guinea.

Conservation: As an evolutionary divergent taxon within a confined geographical range, *A. louisiadensis brunetus subsp. nov.* is always at high risk of extinction by way of human activities or their consequences. The highest risks are probably from introduced species of vertebrate or pathogen of some form not previously encountered by the species and for which it may have no reasonable defence.

Etymology: *A. louisiadensis brunetus subsp. nov.* is named in reflection of its generally brown dorsum (from the Latin word brunneis).

BELLARANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:AF9FC11C-932C-48AB-95CB-9F5C3308917D

Type species: *Hyla angiana* Boulenger, 1915.

Diagnosis: The five described species in the genus *Bellarana gen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: The head is high and usually broader than long (average HL/HW 0.878-1.012), its length usually less than one-third of the snout to vent length (average HL/S-V 0.300-0.347). The snout is not prominent; when viewed from above it is evenly rounded or obtusely angular; in profile it is rounded or acutely angular. The nostrils are more lateral than superior, their distance from the end of the snout less than that from the eye.

The distance between the eye and the naris is either more or less than the internarial span (average E-N/IN 0.509-0.884). The canthus rostralis may be curved, slightly defined or straight. The eye is moderate to large, its diameter greater than the distance separating it from the nostril. The tympanum is visible, its diameter equivalent to one-third to one-quarter of the eye diameter. The vomerine teeth are in two short oblique series situated between the choanae. The tongue is cordiform wih a slightly indented posterior border.

The fingers are moderately long and are equipped with narrow lateral fringes; in decreasing order of length 3>4>2>1; the webbing is not extensive, not reaching the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are moderate.

The hind limbs are long with a moderate to high TL/S-V ratio (0.524-0.689). Toes in decreasing order of length 4>3>or= 5>2>1. The toes are webbed to the discs with the exception of the fourth which is webbed to the sub-articular tubercle at the base of the penultimate phalanx.

The skin on the dorsal surfaces is smooth or at most slightly tubercular with very small and widely scattered tubercles distributed evenly across the upper body and upper surfaces of the limbs. The throat is smooth and the chest, abdomen and lower femora granular. There is a prominent, curved supra-tympanic fold extending from the posterior corner of the eye to the shoulder. On the posterior surface of the forearm are tubercles which are widely separated from one another, in juxtaposition in a distinct row, or replaced by a continuous fold. There is a poorly defined dermal ridge on the posterior surface of the heel and tarsus.

The colouration is very highly variable, including at times, strong sexual dimorphism in many locations.

Two species synonymised with *Bellarana angiana* (Boulenger, 1915), namely, *B. mintima* (Tyler, 1963), based on an exceptionally dark variant from south of the central cordillera (Mintima, Chimbu Region, at 6,000 feet, Central Highlands, Papua New Guinea. Latitude -5.57 S., Longitude 144.54 E.), and *B. angularis* (Loveridge, 1945) from, Mount Wilhelm, 5000-8000 feet, Bismarck Range, Madang Division, Papua New Guinea, are herein resurrected.

This is done on the basis that all three described taxa are from different parts of New Guinea to the type locality of *B. angiana* (Arfak Mountains, Vogelkop Peninsula, West Papua, Indonesia), separated by wide zones of unsuitable habitat and/or well-known biogeographical barriers, combined with the known divergence of the *B. angiana* lineage being about 9.5 MYA from nearest living relatives indicating presence of more than one species. At this stage however, all these species cannot be properly separated on the basis of morphology or colour, or at least this has not yet been done.

Within most populations of putative *B. angiana*, *B. mintima* and *B. angularis* it is possible to separate the majority of specimens in collections into at least four main colour groups, with the remainder representing so-called intergrades beween the main colour variants.

The characteristic features of each of the most common variant (a term of convenience coined by Tyler 1978) and the names applied to them are as follows:

1/ Type Variant (as figured by Boulenger, 1915) and depicted on plate 66 of Menzies (2006). The dorsal surface is pale green with or without a few indistinct black spots or marbling. There is a dark (usually black) patch at the end of the snout, dividing on a level with the nares and continuing as a broad stripe along the canthus rostralis to the eye and continuing behind the eye as a short stripe to the insertion of the forearm. There are brilliant, white longitudinal stripes on the posterior surface of the forearm, heel and tarsus, and a broad, curved, white supra-anal bar. The lateral surfaces of the body are dull crimson marked with large, irregular white spots. The ventral surfaces of the body are a paler crimson with white spots which are particularly dense on the throat.

2/ Brown Variant as depicted in plate 67 of Menzies (2006). A uniform brown dorsally and laterally. The only markings are a triangular, pale blue patch behind the eye and a white supra-anal bar. The ventral surfaces vary from white to a very pale brown.

3/ So-called Mintima variant. The dorsal and lateral surfaces are uniformly a very deep slate and lack markings of any kind. The ventral surfaces are pale slate.

4/ Dull variant. Basically similar to the type variant but with extensive black markings on the dorsal and lateral surfaces. The white limb and supra-anal markings are absent or replaced by poorly defined pale grey patches. The ventral surfaces are dull grey.

5/ So-called Intergrades. Many specimens exhibit large white spots on the dorsal surfaces and some the hour-glass shaped marking on the posterior portion of the head and anterior portion of the body (a marking common to other New Guinea tree frog species). These markings are not seen in any of the other variants described above.

B. micromembrana (Tyler, 1963) with a distribution also centered on the central cordillera of New Guinea is readily separated from *B. angiana* (and those species recently synonymised with it) by having a larger eye, the eye is larger than the internarial span and the canthus rostralis is strongly curved (particularly in females), versus not curved in *B. angiana*.

In turn the species *B. megalops* (Richards and Iskandar, 2006) is separated from *B. micromembrana* by its smaller size (average male SVL: 24.6-27.5 mm versus 31.7-35.5 mm in *B. micromembrana*), exceptionally large and prominent eyes and conical tubercles on the dorsum.

According to Duellman *et al*. (2016), the genus *Bellarana gen. nov*. diverged from its nearest living relatives in the divergent genus *Angularanta gen. nov.* 12.7 MYA, in turn diverged as a pair from their next nearest living relatives in the two genera *Hopviridi gen. nov.* and *Ornatanura gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: The genus *Bellarana gen. nov*. is found along the main cordillera of New Guinea, from west to East and including outlier mountain ranges such as the Foja Mountains.

Etymology: Bella in Latin means “cute” and Rana means “frog” and these are “cute frogs”, hence the new genus name *Bellarana*.

Content: *Bellarana angiana* (Boulenger, 1915) (type species); *B. angularis* (Loveridge, 1945); *B. megalops* (Richards and Iskandar, 2006); *B. micromembrana* (Tyler, 1963); *B. mintima* (Tyler, 1963).

FLUVIRANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:4F7D63C9-585D-4862-BE99-7E1146CBD195

Type species: *Litoria rara* Günther and Richards, 2005.

Diagnosis: *Fluvirana gen. nov.* are a genus of stream-dwelling frogs only known from the north-west of New Guinea (Indonesia) separated from all other similar species in New Guinea (including those sympatric in northern New Guinea) by having a stout build, only slightly pointed snout from above or below, also being slightly truncate; distinctive finger webbing on otherwise short, thick fingers, an absence of distinctive markings on the dorsum; brownish or grey dorsum; limited markings on upper limbs and usually in the form of scattered flecks or indistinct bars or spots; white to whitish underparts; dorsal skin that is either smooth or only moderately granular or tuberculate; short thick limbs which are greyish in colour and spotted with white; relatively dull concealed areas of limbs and a moderate tympanic fold that covers the top section of the otherwise exposed tympanum.

Distribution: As far as is known, the three species in this genus are confined to north-west New Guinea (Indonesia), being known only from Nabire and Waponga River, Irian Jaya, Indonesia.

Etymology: The new genus name *Fluvirana* is taken from the Latin words “*Fluvi*” for stream and “*rana*” for frog, as these are stream dwelling species.

Content: *Fluvirana rara* (Günther and Richards, 2005) (type species); *F. rivicola* (Günther and Richards, 2005); *F. scabra* (Günther and Richards, 2005).

HOPVIRIDI GEN. NOV.

LSIDurn:lsid:zoobank.org:act:FA913E50-A9B1-4667-9B6A-88E99AD95623

Type species: *Hyla leucova* Tyler, 1968.

Diagnosis: The species in the genus *Hopviridi gen. nov*. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Small, montane species. They are uniformly green, sometimes lacking flash markings on the undersides of limbs or alternatively pink with yellow spots in *H. leucova* (Tyler, 1968) or otherwise bright orange in *H. chloronota* (Boulenger, 1911). Short, slightly fringed, half-webbed fingers, fully webbed toes and eggs unpigmented, 2 mm in diameter ova. Maximum size of females is 30 mm snout-vent. The snout is short with a low internarial span. Vomerine teeth are absent.

According to Duellman *et al.* (2016), the genus *Hopviridi gen. nov*. diverged from its nearest living relatives in the divergent genus *Ornatanura gen. nov.* 12.1 MYA.

These in turn diverged as a pair from their next nearest living relatives in the genera *Bellarana gen. nov*. and *Angularanta gen. nov.* 13.5 MYA.

All these genera diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Known only from the upper Sepik River system in Papua New Guinea (*H. leucova*) and the Arfak Mountains in Irian Jaya (*H. chloronota*). Alleged records from other areas to date (e.g. Upper Fly River, in PNG) have invariably turned out to be other, not particularly similar species.

Etymology: These animals "hop" because they are frogs and they are green in colour (viridi in Latin) and so the new genus name *Hopviridi* is a direct combination of these.

Content: *Hopviridi leucova* (Tyler, 1968) (type species); *H. chloronota* (Boulenger, 1911).

INCERTANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:26D001AA-6F36-4E1D-AB1B-BC898078DE6A

Type species: *Incertanura fakfakensis sp. nov.*

Diagnosis: The genus *Incertanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

A long (up to at least 2.8 mm) erectile rostral spike in males that is circular in cross section; relatively small size (SVL up to 30.5 mm); slender build (HW/SVL 0.22-0.26); tibia approximately half length of the body (TL/SVL 0.049-0.053); moderately large eyes (EYE/SVL 0.10-0.12); moderately small tympanum (TYM/SVL 0.42-0.53); small, rounded and often green tubercles extending across the mid-dorsum in life; brown to yellowish-brown dorsal colouration with, or without, distinct green transverse bands; and orange colouration in concealed areas of the thighs and axilla.

The five species within *Incertanura gen. nov*. are further defined as follows: Body very slender and elongate, tibia approximately half length of body; head wider than body in dorsal profile, clearly distinct from neck. Snout rounded in dorsal view and truncate in lateral view. Rostral spike in males extending from tip of upper jaw; mean spike length varies among populations and species from different localities. Canthus rostralis moderately well defined, slightly curved; loreal region concave. Nares closer to tip of snout (excluding spike) than to eye, oriented laterally. Eyes moderately large, protruding in both dorsal and lateral views; pupil horizontal. Upper jaw protruding marginally beyond lower jaw. Tympanum small with distinct to indistinct annulus, bordered dorsally by a fleshy supratympanic fold extending to the superior edge of the insertion of the upper arm. Choanae small and circular, situated close to anterior and lateral edge of palate; no vomerine teeth visible; tongue fleshy and ovoid and usually with a slightly indented posterior edge. Vocal slits present in males. Dorsal skin tuberculate; ventral skin finely to coarsely granular on throat, abdomen and tibia; remaining ventral surfaces of limbs smooth; additional tubercles also present in clusters around the vent and to a variable extent on sides of ankles and upper forearms.

Fingers with relative lengths 3>4>2>1; fleshy, whitish to translucent webbing between all digits, forming a narrow basal strip between 1 and 2, extending to disc on distal edge of 2 and proximal edge of 4 and to penultimate phalanx on both sides on 3. Terminal finger discs expanded or narrower (depending on species) and usually wider than toe discs and with distinct circum-marginal grooves. Nuptial pads dark brown, roughly tear-shaped with point of tear oriented in posteroventral direction. Indistinct unpigmented bifid subarticular tubercles usually visible at the base of penultimate phalanx on all fingers, further indistinct unpigmented subarticular tubercles in series on finger four, indistinct proximal metacarpal tubercles at base of finger one, and small distal metacarpal tubercles at base of three and four.

Toes moderately long, relative lengths 4>3>5>2>1. All digits with extensive fleshy, opaque webbing, basal between 1 and 2, extending to anterior end of penultimate phalanx on distal edge of 2 and 3 and proximal edge of five, to halfway along penultimate phalanx on proximal edge of three and four, and base of penultimate tubercle on distal edge of four. Terminal discs slightly expanded to not really expanded and otherwise, narrower than finger discs and with distinct circum-marginal grooves. Indistinct unpigmented subarticular tubercles on penultimate phalanx of all toes, single on 1-3, bifid on 4 and 5. No other tubercles clearly apparent. Small, indistinct unpigmented metatarsal tubercle at base of 1.

In preservative, ground colour of all dorsal surfaces is medium brown, with extensive blueish green and darker brown flecking, maculations, vermiculations and/or blotches across all dorsal surfaces, blueish pattern elements sometimes coalesce into three indistinct transverse blotches, overall darker pigmentation elements tend to be densest on body and less concentrated and more finely reticulated towards distal extremities of limbs.

Rostral spike is usually light brown, with extensive darker brown flecking at base, tending towards unpatterned at tip. White or yellow patches often, but not always, present on either side of head, extending from posterolateral edge of eye, below tympanum and around axilla. Venter predominantly buff, internal organs sometimes visible, throat sometimes offwhite, and/or with two clusters of dark brown maculations laterally, tubercles around vent and sometimes those along outer edge of limbs, off-white.

Appearance in life is as follows: Dorsal base colouration is light to dark brown, with variable amounts of green and darker brown spotting, mottling or banding on the body, limbs and head. Dorsal and lateral tubercles on torso and limbs often, but not always, green and contrasting against the brown base colouration. Head brown, often with extensive green pigmentation, usually including a ring around the eyes and more variably a green transverse band between the eyes. Dense clusters of dark-brown to almost black maculations extend to a variable degree across the limbs, lateral portions of torso and in patches across the back. Off-white patches sometimes present below tympanum and on exposed surfaces of lower hindlimbs. Iris pattern complex; base colouration is usually light brownish, with extensive darker brown vermiculations; rim of pupil orange. Hidden regions of axilla and groin orange (adapted from Oliver *et al.* 2019a).

Frogs treated by Oliver *et al.* (2019a) as outlier populations of *Incertanura pronimia* (Menzies, 1993),

which they placed in the genus *Litoria* Tschudi, 1838 from the Fakfak Mountains and near Timika, both being in Irian Jaya are within this paper formally named as new species, namely *I. fakfakensis sp. nov.*and *I. cuspis sp. nov.* based on geographical an morphological divergence of these forms with one another and all other known species in the genus.

According to Duellman *et al.* (2016), *Incertanura gen. nov*. diverged from their nearest living relatives 14.6 MYA, being other newly named genera (within this paper) and at least 21.5 MYA diverged from nearest living relatives in previously named genera.

Distribution: Known only from mid-montane regions in New Guinea, including at least one satellite Mountain Range to the north of the main cordillera (Foja Mountains) and another to the west (Fakfak)

Etymology: In Latin “Incertis” means variable and “anura” means frog and hence the effective name “variable frog”, which is a fair description of the variability of dorsal colour patterning in these frogs, even within a given population of a given species and of the same sex.

Content: *Incertanura pronimia* (Menzies, 1993) (type species); *I. cuspis sp. nov.*; *I. fakfakensis sp. nov.*; *I. pinocchio* (Oliver, Günther and Richards, 2019); *I. vivissimia* (Oliver, Richards and Donnellan, 2019).

INCERTANURA CUSPIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:A586FF1C-BB98-4C47-B83E-AEDFCA6EDAEA

Holotype: A preserved adult specimen at the Museum Zoologie Bogor, Indonesia, specimen numbers, MZB amphibians 13775 collected from the Timika area, Papua Province, Indonesia, Latitude -4.371 S., Longitude 136.270 E.

This facility allows access to its holdings.

Paratypes: Five preserved adult specimens at the Museum Zoologie Bogor, Indonesia, specimen numbers, MZB amphibians 13776-13380 collected from the Timika area, Papua Province, Indonesia, Latitude -4.371 S., Longitude 136.270 E.

Diagnosis: All species within *Incertanura gen. nov.* are morphologically similar. All can be separated from all other Tree Frogs (Pelodryadidae) by the following suite of characters: A long (up to at least 2.8 mm) erectile rostral spike in males that is circular in cross section; relatively small size (SVL up to 30.5 mm); slender build (HW/SVL 0.22-0.26); tibia approximately half length of the body (TL/SVL 0.049-0.053); moderately large eyes (EYE/SVL 0.10-0.12); moderately small tympanum (TYM/SVL 0.42-0.53); small, rounded and often green tubercles extending across the mid-dorsum in life; brown to yellowish-brown dorsal colouration with, or without, distinct green transverse bands; and orange colouration in concealed areas of the thighs and axilla.

The three previously described species within the genus, are *Incertanura pronimia* (Menzies, 1993), with a type locality of near Ok Ma, Western Province of Papua New Guinea, *I. pinocchio* (Oliver, Günther and Richards, 2019) with a type locality of Foja Mountains, Papua Province, Indonesia and *I. vivissimia* (Oliver, Richards and Donnellan, 2019), with type locality of Hides Ridge, Hela Province, Papua New Guinea. The latter two were defined and diagnosed with direct reference to their morphological differences to the earlier described taxon *I. pronimia.*

With this in mind, it is important that this description of *I. cuspis sp. nov.* and the other newly named species, *I. fakfakensis sp. nov.* set out what separates all five named species within the genus from one another.

Each of the five relevant species are separated from one another by the following unique suites of meristic and other characters:

I. pronimia can be readily separated from the other four species by the following unique suite of (average) meristic characters: rostral spike length/snout-vent length from vent to tip of snout minus the spike if present (RL/SVL) of 0.067 (a figure much higher than for *I. fakfakensis sp. nov.*and *I. cuspis sp. nov.* and also much lower than for *I. pinocchio*), head width measured as transverse distance between tympana/snout-vent length from vent to tip of snout minus the spike if present (HW/SVL) of 0.24, horizontal eye diameter/snout-vent length from vent to tip of snout minus the spike if present (EYE/SVL) 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.51, horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.047, transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present (4TD/SVL) 0.045 and transverse diameter of finger 3 disc/ snout-vent length from vent to tip of snout minus the spike if present (3FD/SVL) 0.048.

I. cuspis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL (rostral spike length/snout-vent length from vent to tip of snout minus the spike if present) 0.034 (a figure much smaller than for all other species), HW/SVL 0.25, EYE/SVL 0.12, TL/SVL 0.51, TYM/SVL 0.047, 4TD/SVL (transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present) 0.034 and 3FD/SVL (transverse diameter of finger 3 disc/ snout-vent length from vent to tip of snout minus the spike if present) 0.042, meaning this species has much smaller hand and toe pads than all other species, beingn indistinct versus distinct I the other species.

I. fakfakensis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.052, HW/SVL 0.25, EYE/SVL 0.11, TL/SVL (tibia length/snout-vent length from vent to tip of snout minus the spike if present) 0.52 (a figure that is higher than for all other species), TYM/SVL (horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present) 0.043 (a figure lower than for all other species), 4TD/SVL 0.045, 3FD/SVL 0.049.

I. pinocchio can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.086, HW/SVL 0.26, EYE/SVL 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.48 (a number lower than for all other species), horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.055 (a number higher than for all other species), 4TD/SVL 0.045, 3FD/

SVL .051.

I. vivissimia can be readily separated from the other (preceding) four species by the following unique suite of characters: TL/SVL 0.52, TYM/SVL 0.049, extensive olive-green tubercles across the dorsum and white crenulations; tubercles along the outer edge of the ankle (vs absent). dorsal and ventral edges of the lateral flanges on the shanks with extensive white flecking and tubercles and rugose skin on the ventral surface of the thigh extending more than half the distance from the cloaca to the knee (vs extending less than half way in the other species). *I. vivissimia* also has prominent and larger blue (green in life) blotches on the dorsal surface of upper arms, forearms, thighs and shanks (vs mottled light and dark), more extensive white flecking on the dorsal and ventral edges of lateral flanges on the shank, and only sparse dark-brown maculations on the digits and ankles (versus dense in the other species) (modified from Oliver *et al.* 2019a).

Adult male *I. cuspis sp. nov.*, *I. pinocchio* and *I. fakfakensis sp. nov.* also have noticeably thicker forearms than the other two species in the genus.

A photo of the type form of *I. pronimia* in life can be found in Oliver *et al*. (2019a) on page 337 (two top images).

A photo of *I. cuspis sp. nov.* in life can be found in Oliver *et al*. (2019a) on page 337 middle right.

A photo of *I. pinocchio* in life can be found in Oliver *et al*. (2019a) on page 434, five photos on page.

A photo of *I. vivissimia* in life can be found in Oliver *et al*. (2019b) on page 447 in the top image.

All five species are known from relatively few collected specimens in relatively undisturbed locations, which are increasingly under threat as deforestation and agriculture take hold in most parts of New Guinea, as a direct consequence of exploding human populations in New Guinea and globally.

Distribution: *I. cuspis sp. nov.* is only known from the general area that the six type specimens were collected, being the Timika area, Papua Province, Indonesia.

Etymology: The name *cuspis* in Latin, means “point” or “cone” with reference to the frontal appendage of males of this species.

INCERTANURA FAKFAKENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:2F7210FA-0ED5-499A-9660-4AAEC291BE7E

Holotype: A preserved adult specimen at the Museum für Naturkunde, Berlin, Germany, specimen number ZMB 85620 collected from Fakfak Mountains, Bomberai Peninsula, Papua Barat Province, Indonesia Latitude -2.780 S., Longitude 132.270 E.

This facility allows access to its holdings.

Paratype: A preserved adult specimen at the Museum für Naturkunde, Berlin, Germany, specimen number ZMB 85621 collected from Fakfak Mountains, Bomberai Peninsula, Papua Barat Province, Indonesia Latitude -2.780 S., Longitude 132.270 E.

Diagnosis: All species within *Incertanura gen. nov.* are morphologically similar.

All can be separated from all other Tree Frogs (Pelodryadidae) by the following suite of characters: A long (up to at least 2.8 mm) erectile rostral spike in males that is circular in cross section; relatively small size (SVL up to 30.5 mm); slender build (HW/SVL 0.22-0.26); tibia approximately half length of the body (TL/SVL 0.049-0.053); moderately large eyes (EYE/SVL 0.10-0.12); moderately small tympanum (TYM/SVL 0.42-0.53); small, rounded and often green tubercles extending across the mid-dorsum in life; brown to yellowish-brown dorsal colouration with, or without, distinct green transverse bands; and orange colouration in concealed areas of the thighs and axilla.

The three previously described species within the genus, are *Incertanura pronimia* (Menzies, 1993), with a type locality of near Ok Ma, Western Province of Papua New Guinea, *I. pinocchio* (Oliver, Günther and Richards, 2019) with a type locality of Foja Mountains, Papua Province, Indonesia and *I. vivissimia* (Oliver, Richards and Donnellan, 2019), with type locality of Hides Ridge, Hela Province, Papua New Guinea. The latter two were defined and diagnosed with direct reference to their morphological differences to the earlier described taxon *I. pronimia.*

With this in mind, it is important that this description of *I. fakfakensis sp. nov.* and the other newly named species, *I. cuspis sp. nov.* set out what separates all five named species within the genus from one another.

Each of the five relevant species are separated from one another by the following unique suites of meristic and other characters:

I. pronimia can be readily separated from the other four species by the following unique suite of (average) meristic characters: rostral spike length/snout-vent length from vent to tip of snout minus the spike if present (RL/SVL) of 0.067 (a figure much higher than for *I. fakfakensis sp. nov.*and *I. cuspis sp. nov.* and also much lower than for *I. pinocchio*), head width measured as transverse distance between tympana/snout-vent length from vent to tip of snout minus the spike if present (HW/SVL) of 0.24, horizontal eye diameter/snout-vent length from vent to tip of snout minus the spike if present (EYE/SVL) 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.51, horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.047, transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present (4TD/SVL) 0.045 and transverse diameter of finger 3 disc/ snout-vent length from vent to tip of snout minus the spike if present (3FD/SVL) 0.048.

I. cuspis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL (rostral spike length/snout-vent length from vent to tip of snout minus the spike if present) 0.034 (a figure much smaller than for all other species), HW/SVL 0.25, EYE/SVL 0.12, TL/SVL 0.51, TYM/SVL 0.047, 4TD/SVL (transverse diameter of toe 4 disc/snout-vent length from vent to tip of snout minus the spike if present) 0.034 and 3FD/SVL (transverse diameter of finger 3 disc/snout-vent length from vent to tip of snout minus the spike if present) 0.042, meaning this species has much smaller hand and toe pads than all other species, beingn indistinct versus distinct in the other species.

I. fakfakensis sp. nov. can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.052, HW/SVL 0.25, EYE/SVL 0.11, TL/SVL (tibia length/snout-vent length from vent to tip of snout minus the spike if present) 0.52 (a figure that is higher than for all other species), TYM/SVL (horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present) 0.043 (a figure lower than for all other species), 4TD/SVL 0.045, 3FD/SVL 0.049.

I. pinocchio can be readily separated from the other four species by the following unique suite of (average) meristic characters: RL/SVL 0.086, HW/SVL 0.26, EYE/SVL 0.12, tibia length/snout-vent length from vent to tip of snout minus the spike if present (TL/SVL) 0.48 (a number lower than for all other species), horizontal tympanum diameter/snout-vent length from vent to tip of snout minus the spike if present (TYM/SVL) 0.055 (a number higher than for all other species), 4TD/SVL 0.045, 3FD/SVL .051.

I. vivissimia can be readily separated from the other (preceding) four species by the following unique suite of characters: TL/SVL 0.52, TYM/SVL 0.049, extensive olive-green tubercles across the dorsum and white crenulations; tubercles along the outer edge of the ankle (vs absent). dorsal and ventral edges of the lateral flanges on the shanks with extensive white flecking and tubercles and rugose skin on the ventral surface of the thigh extending more than half the distance from the cloaca to the knee (vs extending less than half way in the other species). *I. vivissimia* also has prominent and larger blue (green in life) blotches on the dorsal surface of upper arms, forearms, thighs and shanks (vs mottled light and dark), more extensive white flecking on the dorsal and ventral edges of lateral flanges on the shank, and only sparse dark-brown maculations on the digits and ankles (versus dense in the other species) (modified from Oliver *et al.* 2019a).

Adult male *I. cuspis sp. nov.*, *I. pinocchio* and *I. fakfakensis sp. nov.* also have noticeably thicker forearms than the other two species in the genus.

A photo of the type form of *I. pronimia* in life can be found in Oliver *et al*. (2019a) on page 337 (two top images).

A photo of *I. cuspis sp. nov.* in life can be found in Oliver *et al*. (2019a) on page 337 middle right.

A photo of *I. pinocchio* in life can be found in Oliver *et al*. (2019a) on page 434, five photos on page.

A photo of *I. vivissimia* in life can be found in Oliver *et al*. (2019b) on page 447 in the top image.

All five species are known from relatively few collected specimens in relatively undisturbed locations, which are increasingly under threat as deforestation and agriculture take hold in New Guinea, as a direct consequence of exploding human populations in New Guinea and globally.

Distribution: *I. fakfakensis sp. nov.* is only known from the type locality in the Fakfak Mountains of Bomberai Peninsula, Papua Barat Province, Indonesia and is probably confined to this range due to the absence of suitable habitat in nearby areas (being flat lands).

Etymology: The name *fakfakensis* is taken from where this species is known to occur.

INLUSTANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:006C107D-4BEC-41A5-BD7B-D02627566E13

Type species: *Hyla multiplica* Tyler, 1964.

Diagnosis: Frogs of the genus *Inlustanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

The known species are characterised by fully webbed outer fingers, a large rounded head with inconspicuous to large eyes (depending on the species), and distinctive well developed dermal folds on the posterior surface of the forearm, anus, tibia, tarsus and fifth toe. However, in at least one species the development of the fold on the tarsus may be reduced. These frogs have a distinctive dorsal colouration of green intersperced with yellow spots in life (in preservative a distinctive colouration in which blue and violet are the predominant pigments), with yellow spots absent in at least some specimens of one species. These frogs are moderately sized species. Females attain a maximum snout to vent length of 35-48 mm and males 39-42 mm.

According to Duellman *et al.* (2016), the species within *Inlustanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Variabilanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

Distribution: Known from scattered locations in the ranges areas of New Guinea both north and south of the main cordillera and in both the Papua New Guinea (PNG) and Indonesian sides.

Etymology: The Latin word *inluster* means “bright coloured” and by adding “*anura*” for frog, the full genus name means “bright coloured frog”.

Content: *Inlustanura multiplica* (Tyler, 1964) (type species); *I. gasconi* (Richards, Oliver, Krey and Tjaturadi, 2009); *I. inluster sp. nov*.

INLUSTANURA INLUSTER SP. NOV.

LSIDurn:lsid:zoobank.org:act:D1535947-0F68-4274-BD76-65FDD2CB230C

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R34360, collected from Magidobo, Southern Highlands Province, Papua New Guinea, Latitude -6.11 S., Longitude 142.46 E.

This government-owned facility allows access to its holdings.

Diagnosis: The species *Inlustanura inluster sp. nov*. from the Southern Highlands Province, Papua New Guinea, conforms to the genus diagnosis for the genus *Inlustanura gen. nov.* (this paper). It is morphologically most similar to the species *I. multiplica* (Tyler, 1964), originally described as *Hyla multiplica* Tyler, 1964. However *I. inluster sp. nov.* is separated from that species by lacking any obvious sign of dorsal yellow spots (in life), has a distinctive white marking along the posterior-ventral edge of the eye (not seen in *I. multiplica*), and has reduced development of a dermal flange on the tarsus, versus well-developed in both *I. multiplica* and the morphologically similar *I. gasconi* (Richards, Oliver, Krey and Tjaturadi, 2009).

I. gasconi is from the Foja Mountains, Irian Jaya, are separated from both *I. inluster sp. nov.* and *I. multiplica* by in lacking extensive bright blue, or orange mixed with bright blue markings on the groin, venter and lateral surfaces, and instead having bright orange groin, thigh and axillary colouration as well as having noticeably larger eyes (average EYE/SVL 0.13 versus 0.10).

All three preceding species, consisting the entirety of the genus *Inlustanura gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: The known species are characterised by fully webbed outer fingers, a large rounded head with inconspicuous to large eyes (depending on the species), and distinctive well developed dermal folds on the posterior surface of the forearm, anus, tibia, tarsus and fifth toe. Although in at least one species the development of the fold on the tarsus may be reduced. These frogs have a distinctive dorsal colouration of green intersperced with yellow spots in life (in preservative a distinctive colouration in which blue and violet are the predominant pigments), with dorsal yellow spots absent in at least some specimens of one species. These frogs are moderately sized species. Females attain a maximum snout to vent length of 35-48 mm and males 39-42 mm.

According to Duellman *et al.* (2016), the species within *Inlustanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Variabilanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

Distribution: The species *Inlustanura inluster sp. nov.* is only known from the type locality in the Southern Highlands Province of Papua New Guinea.

Etymology: The Latin word *inluster* means “bright coloured” and is an accurate diagnosis of the colour in life of this species, noting however that it is well camoflagued in its natural habitat.

MOECHAENURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:BFE0BAB6-ABE1-411D-B244-7A3A54067C3F

Type species: *Hyperolius nigropunctatus* Meyer, 1874.

Diagnosis: Species within *Moechaeanura gen. nov.* are morphologically similar to those species in the genus *Variabilanura gen. nov.*, with some differences between the two detailed in this description.

Moechaeanura gen. nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small to medium species (male maximum snout-vent length 34 mm, female maximum snout-vent length 38 mm with short, three webbed fingers and almost fully webbed toes.

The webbing of the fourth toe extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx, (versus reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger in the genus *Variabilanura gen. nov.*). The skin on the dorsal surfaces of the head, body and limbs is minutely roughened.

The throat and chest are smooth except for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Predominantly green in life and may be marked with gold and black. The intercalary structures are elongate and ossified. The hyoid plate lacks alary processes. The ova are small and pigmented (see below).

The dorsum is green, stippled with black and occasionally marked quite extensively with gold. The fingers are short and slender, with about one third webbing; the toes are almost fully webbed. The snout is slightly rounded in profile.

The cranial elements are poorly developed. The nasals are widely separated medially and do not articulate with the sphenethmoid. The sphenethmoid remains double in the adult. The frontoparietal foramen is large and ovoid. The squamosals have short zygomatic rami and very much longer otic rami. The pars facialis of the maxillary is shallow and the posterior process does not make contact with the maxillary process of the nasal. The alary processes of the premaxillary are broad, widely separated medially, and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are very much reduced.

A phlange is present on the distal surface of the third metacarpal. The sacral diapophyses are broadly dilated and the intercalary structures are elongate and ossified. There are no alary processes on the hyoid plate. The adductor mandibulae externus superficialis is absent.

The ova are small and pigmented (brown animal pole) and laid in stagnant marshes. The mean ovidiameters are 1.2-1.7 mm. Tadpoles have moderately developed fins and the labial teeth comprise 2 upper and 3 lower rows (Tyler 1963; Menzies 1972). The chromosome number is 26.

Moechaeanura gen. nov. is further separated from a number of morphologically similar New Guinea species within the genus *Variabilanura gen. nov.* by its very different reproductive mode. *Moechaeanura gen. nov.* species have small brown pigmented eggs (average ova size of 1.2-1.7 mm) that are deposited in water, while species in the genus *Variabilanura gen. nov.* attach a mass of large green eggs with an average ova size of 2.5 mm to vegetation overhanging slow moving streams.

In *Variabilanura gen. nov.* the ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements (Tyler 1978).

Frogs within the subgenus *Aspercutis subgen. nov.* (within *Moechaeanura gen. nov.*) conform to the above diagnosis for the genus *Moechaeanura gen. nov.*, except for their more extensive finger webbing, highly tuberculate dorsum (versus smooth to slightly tuberculate

in the nominate subgenus), distinctively crenulated ridges following the outer surfaces of the lower limbs, silvery-gold and heavily veined iris and fully truncate snout (versus normal to slightly truncate in the nominate subgenus) which as a full diagnosis separates them from all other New Guinea frogs.

Frogs within the subgenus *Telaater subgen. nov*. are separated from all other New Guinea tree frogs by having full black webbing on hands and feet, the venter with extensive areas of black, white and yellow and a transparent periphery on the tympanic membrane combined with a small adult size of less than 30 mm. the placement of these species within a subgenus within a greater *Moechaeanura gen. nov.* is tentative and elevation to full genus may be required as further evidence is obtained.

According to Duellman *et al.* (2016), the genus *Moechaeanura gen. nov.* diverged from its nearest living relatives, the morphologically distinctive *Nasuscuspis gen. nov.* 13.4 MYA, and the morphologically similar genera *Incertanura gen. nov*., *Inlustanura subgen. nov*. and *Variabilanura gen. nov*. 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

Distribution: New Guinea including offshore islands to the east and west at least as far as Halmahera.

Etymology: In Latin "*Moechaeanura*" means drab frog, which is true in the context of the colouration of a number of species in this genus.

Content: *Moechaeanura nigropunctatus* (Meyer, 1874) (type species); *M. albatermacula sp. nov.*; *M. biakensis* (Günther, 2006); *M. christianbergmanni* (Günther, 2008); *M. richardsi* (Dennis and Cunningham, 2006); *M. rubrops* (Kraus and Allison, 2004); *M. singadanae* (Richards, 2005); *M. spica sp. nov.*; *M. tritong sp. nov.*; *M. umarensis* (Günther, 2008); *M. verae* (Günther, 2004); *M. vocivincens* (Menzies, 1972); *M. wapogaensis* (Richards and Iskandar, 2001).

ASPERCUTIS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:57D4B7F9-DD7E-4E98-8496-50B075E95CD4

Type species: *Litoria verae* Günther, 2004.

Diagnosis: Species within *Moechaeanura gen. nov*. are morphologically similar to those species in the genus *Variabilanura gen. nov.*, with some differences between the two detailed in this description.

Moechaeanura gen. nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

They are small to medium species (male maximum snout-vent length 34 mm, female maximum snout-vent length 38 mm with short, three webbed fingers and almost fully webbed toes.

The webbing of the fourth toe extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx, (versus reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger in the genus *Variabilanura gen. nov.*). The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth except for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Predominantly green in life and may be marked with gold and black. The intercalary structures are elongate and ossified. The hyoid plate lacks alary processes. The ova are small and pigmented (see below).

The dorsum is green, stippled with black and occasionally marked quite extensively with gold. The fingers are short and slender, with about one third webbing; the toes are almost fully webbed. The snout is slightly rounded in profile.

The cranial elements are poorly developed. The nasals are widely separated medially and do not articulate with the sphenethmoid. The sphenethmoid remains double in the adult. The frontoparietal foramen is large and ovoid. The squamosals have short zygomatic rami and very much longer otic rami. The pars facialis of the maxillary is shallow and the posterior process does not make contact with the maxillary process of the nasal. The alary processes of the premaxillary are broad, widely separated medially, and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are very much reduced.

A phlange is present on the distal surface of the third metacarpal. The sacral diapophyses are broadly dilated, and the intercalary structures are elongate and ossified. There are no alary processes on the hyoid plate. The adductor mandibulae externus superficialis is absent.

The ova are small and pigmented (brown animal pole) and laid in stagnant marshes. The mean ovidiameters are 1.2-1.7 mm. Tadpoles have moderately developed fins and the labial teeth comprise 2 upper and 3 lower rows (Tyler 1963; Menzies 1972). The chromosome number is 26.

Moechaeanura gen. nov. is further separated from a number of morphologically similar New Guinea species within the genus *Variabilanura gen. nov.* by its very different reproductive mode. *Moechaeanura gen. nov*. species have small brown pigmented eggs (average ova size of 1.2-1.7 mm) that are deposited in water, while species in the genus *Variabilanura gen. nov.* attach a mass of large green eggs with an average ova size of 2.5 mm to vegetation overhanging slow moving streams.

In *Variabilanura gen. nov.* the ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water. The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements (Tyler 1978).

Frogs within the subgenus *Aspercutis subgen. nov.* (within *Moechaeanura gen. nov.*) conform to the above diagnosis for the genus *Moechaeanura gen. nov.*, except for their more extensive finger webbing, highly tuberculate dorsum (versus smooth to slightly tuberculate

in the nominate subgenus), distinctively crenulated ridges following the outer surfaces of the lower limbs, silvery-gold and heavily veined iris and fully truncate snout (versus normal to slightly truncate in the nominate subgenus) which as a full diagnosis separates them from all other New Guinea frogs.

Frogs within the subgenus *Telaater subgen. nov*. are separated from all other New Guinea tree frogs by having full black webbing on hands and feet, the venter with extensive areas of black, white and yellow and a transparent periphery on the tympanic membrane combined with a small adult size of less than 30 mm. the placement of these species within a subgenus within a greater *Moechaeanura gen. nov.* is tentative and elevation to full genus may be required as further evidence is obtained.

According to Duellman *et al.* (2016), the genus *Moechaeanura gen. nov.* diverged from its nearest living relatives, the morphologically distinctive *Nasuscuspis gen. nov.* 13.4 MYA, and the morphologically similar genera *Incertanura gen. nov*., *Inlustanura subgen. nov*. and *Variabilanura gen. nov*. 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

Distribution: The two species in this subgenus are only known from their type localities being, Wandamen Peninsula, near the Birds Head of Irian Jaya, Indonesia and Huon Peninsula, northeastern Papua New Guinea.

Etymology: The subgenus name "*Aspercutis*"comes from the Latin words meaning rough skinned. The "a" at the end of "Aspera" has been removed from this genus name to prevent potential risk of creating a homonym and so the spelling is deliberate.

Content: *Moechaeanura* (*Aspercutis*) *verae* (Günther, 2004) (type species); *M.* (*Aspercutis*) *singadanae* (Richards, 2005).

TELAATER SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:028D0D83-90D3-4BDB-8BC4-12AE2518DA32

Type species: *Litoria richardsi* Dennis and Cunningham, 2006.

Diagnosis: Species within *Moechaeanura gen. nov*. are morphologically similar to those species in the genus *Variabilanura gen. nov.*, with some differences between the two detailed in this description.

Moechaeanura gen. nov. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small to medium species (male maximum snout-vent length 34 mm, female maximum snout-vent length 38 mm with short, three webbed fingers and almost fully webbed toes.

The webbing of the fourth toe extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx, (versus reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger in the genus *Variabilanura gen. nov.*).

The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth except for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Predominantly green in life and may be marked with gold and black. The intercalary structures are elongate and ossified. The hyoid plate lacks alary processes. The ova are small and pigmented (see below).

The dorsum is green, stippled with black and occasionally marked quite extensively with gold. The fingers are short and slender, with about one third webbing; the toes are almost fully webbed. The snout is slightly rounded in profile.

The cranial elements are poorly developed. The nasals are widely separated medially and do not articulate with the sphenethmoid. The sphenethmoid remains double in the adult. The frontoparietal foramen is large and ovoid. The squamosals have short zygomatic rami and very much longer otic rami. The pars facialis of the maxillary is shallow and the posterior process does not make contact with the maxillary process of the nasal. The alary processes of the premaxillary are broad, widely separated medially, and perpendicular to the pars dentalis. The palatine processes are well developed and do not articulate with each other medially. The prevomers are very much reduced.

A phlange is present on the distal surface of the third metacarpal. The sacral diapophyses are broadly dilated, and the intercalary structures are elongate and ossified. There are no alary processes on the hyoid plate. The adductor mandibulae externus superficialis is absent.

The ova are small and pigmented (brown animal pole) and laid in stagnant marshes. The mean ovidiameters are 1.2-1.7 mm. Tadpoles have moderately developed fins and the labial teeth comprise 2 upper and 3 lower rows (Tyler 1963; Menzies 1972). The chromosome number is 26.

Moechaeanura gen. nov. is further separated from a number of morphologically similar New Guinea species within the genus *Variabilanura gen. nov.* by its very different reproductive mode. *Moechaeanura gen. nov*. species have small brown pigmented eggs (average ova size of 1.2-1.7 mm) that are deposited in water, while species in the genus *Variabilanura gen. nov.* attach a mass of large green eggs with an average ova size of 2.5 mm to vegetation overhanging slow moving streams.

In *Variabilanura gen. nov.* the ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements (Tyler 1978).

Frogs within the subgenus *Aspercutis subgen. nov.* (within *Moechaeanura gen. nov.*) conform to the above diagnosis for the genus *Moechaeanura gen. nov.*, except for their more extensive finger webbing, highly

tuberculate dorsum (versus smooth to slightly tuberculate in the nominate subgenus), distinctively crenulated ridges following the outer surfaces of the lower limbs, silvery-gold and heavily veined iris and fully truncate snout (versus normal to slightly truncate in the nominate subgenus) which as a full diagnosis separates them from all other New Guinea frogs.

Frogs within the subgenus *Telaater subgen. nov*. are separated from all other New Guinea tree frogs by having full black webbing on hands and feet, the venter with extensive areas of black, white and yellow and a transparent periphery on the tympanic membrane combined with a small adult size of less than 30 mm. the placement of these species within a subgenus within a greater *Moechaeanura gen. nov.* is tentative and elevation to full genus may be required as further evidence is obtained.

According to Duellman *et al.* (2016), the genus *Moechaeanura gen. nov.* diverged from its nearest living relatives, the morphologically distinctive *Nasuscuspis gen. nov.* 13.4 MYA, and the morphologically similar genera *Incertanura gen. nov*., *Inlustanura subgen. nov*. and *Variabilanura gen. nov*. 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

Distribution: Known only from the type localities of the type specimens of each species, being the upper reaches of the Mamberano Drainage, Irian Jaya, Indonesia and the Upper Fly River drainage in Western Province, Papua New Guinea.

Etymology: The subgenus name "*Telaater*" comes from the Latin words "web" and "black" in reference to the distinctive black webbing on the feet of both species.

Content: *Moechaeanura (Telaater) richardsi* (Dennis and Cunningham, 2006); *M. (Telaater) spica sp. nov.*.

MOECHAEANURA* (*MOECHAEANURA*) *TRITONG SP. NOV.

LSIDurn:lsid:zoobank.org:act:1D81F542-71BB-4ECE-941D-5D68113AF63B

Holotype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R65036, collected from the Western Province, Papua New Guinea, Latitude -5.7292 S., Longitude 142.2633 E. This government-owned facility allows access to its holdings.

Diagnosis: *Moechaeanura* (*Moechaeanura*) *tritong sp. nov.* and *M. albatermacula sp. nov*. have until now been treated as a Papua New Guinea populations of *M. nigropunctatus* (Meyer, 1874), with a type locality of Japen Island, West Papua, Indonesia, better known to most people as *Litoria nigropunctatus* (Meyer, 1874).

M. tritong sp. nov. and *M. albatermacula sp. nov*. would key out as *M. nigropunctatus* in Tyler (1968) in terms of separation from all other New Guinea species of Tree Frogs. However *M. tritong sp. nov.* from Western Province, Papua New Guinea and *M. albatermacula sp. nov*. from the northern foothills of the Owen Stanley Range, Papua New Guinea are readily separated from *M. nigropunctatus* as follows:

M. tritong sp. nov. has a grey-green dorsum without marks, except for a yellow patch above the axilla. Ventral surface is white except for the intense yellow below the limbs and concealed surfaces of the limbs. The dark patch at the jaw angles.

M. albatermacula sp. nov. has a dorsum that is a lichenous grey-brown with ill-defined black spots; lower limbs are white with dark black cross bars; concealed surfaces of the thighs and posterior of the belly are a brilliant golden yellow.

M. nigropunctatus is readily separated from the other two species by being grey-green to grey-brown dorsally with well-defined green or brown spotting or marks, especially on the limbs, hands and feet; concealed surfaces of the thighs, groins and axillae are brilliant orange; ventral surface white; lateral sides of throat lightly or heavily spotted black; iris is gold and with heavy black veins.

M. nigropunctatus, *M. tritong sp. nov.* and *M. albatermacula sp. nov*. are readily separated from all other Tree Frogs in New Guinea by the following suite of characters: The head is moderately flattened and longer than broad (HL/HW 1.033-1.077), its length slightly or considerably more than one third of the snout to vent length (HL/S-V 0.334-0.366). The snout is not prominent; when viewed from above and in profile it is gently rounded.

The nostrils are lateral, their distance from the tip of the snout less than that from the eye. The canthus rostralis is curved and only slightly defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-quarter to one-half of the eye diameter. The vomerine teeth are reduced to a single or pair of teeth near each choana and are not elevated. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with fairly prominent lateral fringes and paired sub-articular tubercles; in decreasing order of length 3>4>2>1. The webbing reaches midway up the terminal phalanx on the fourth finger. The terminal discs are prominent.

The hind limbs are moderate with a TL/S-V ratio of 0.526-0.566. Toes in decreasing order of length 4>5 >3>2>1. The webbing reaches the base of the disc of all toes, except the fourth where it extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx.

The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth but for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Distribution: *M. tritong sp. nov.* is known only definitively from the type locality, south of the main central cordillera in the Western Province of Papua New Guinea.

Etymology: In Latin, *Trito* means unmarked and so the letters NG, which are an abbreviation for New Guinea are added to the name to to make the word *tritong* to mean "unmarked from New Guinea", in reflection to the most common dorsal colour state for the species and where it comes from.

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

MOECHAEANURA* (*MOECHAEANURA*) *ALBATERMACULA SP. NOV.

LSIDurn:lsid:zoobank.org:act:D65F2F2C-3972-4363-8E2A-0BC145B18795

Holotype: A preserved specimen at the National Museum of Natural History, Smithsonian Institution (USNM), Washington, DC, United States of America, Amphibians and Reptiles collection specimen number 121216 collected from Dobadura, Northern Province, Papua New Guinea, Latitude -8.7708 S., Longitude 148.375 E.

This facility allows access to its holdings.

Paratype: A preserved specimen at the National Museum of Natural History, Smithsonian Institution (USNM), Washington, DC, United States of America, Amphibians and Reptiles collection specimen number 269421, collected from 7 miles north of Kokoda, Northern Province, Papua New Guinea, Latitude -8.7785 S., Longitude 147.741.

Diagnosis: *Moechaeanura* (*Moechaeanura*) *albatermacula sp. nov.* and *M. tritong sp. nov*. have until now been treated as a Papua New Guinea populations of *M. nigropunctatus* (Meyer, 1874), with a type locality of Japen Island, West Papua, Indonesia, better known to most people as *Litoria nigropunctatus* (Meyer, 1874).

M. tritong sp. nov. and *M. albatermacula sp. nov*. would key out as *M. nigropunctatus* in Tyler (1968) in terms of separation from all other New Guinea species of Tree Frogs. However *M. tritong sp. nov.* from Western Province, Papua New Guinea and *M. albatermacula sp. nov*. from the northern foothills of the Owen Stanley Range, Papua New Guinea are readily separated from *M. nigropunctatus* as follows:

M. tritong sp. nov. has a grey-green dorsum without marks, except for a yellow patch above the axilla. Ventral surface is white except for the intense yellow below the limbs and concealed surfaces of the limbs. The dark patch at the jaw angles.

M. albatermacula sp. nov. has a dorsum that is a lichenous grey-brown with ill-defined black spots; lower limbs are white with dark black cross bars; concealed surfaces of the thighs and posterior of the belly are a brilliant golden yellow.

M. nigropunctatus is readily separated from the other two species by being grey-green to grey-brown dorsally with well-defined green or brown spotting or marks, especially on the limbs, hands and feet; concealed surfaces of the thighs, groins and axillae are brilliant orange; ventral surface white; lateral sides of throat lightly or heavily spotted black; iris is gold and with heavy black veins.

M. nigropunctatus, *M. tritong sp. nov.* and *M. albatermacula sp. nov*. are readily separated from all other Tree Frogs in New Guinea by the following suite of characters: The head is moderately flattened and longer than broad (HL/HW 1.033-1.077), its length slightly or considerably more than one third of the snout to vent length (HL/S-V 0.334-0.366). The snout is not prominent; when viewed from above and in profile it is gently rounded.

The nostrils are lateral, their distance from the tip of the snout less than that from the eye. The canthus rostralis is curved and only slightly defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-quarter to one-half of the eye diameter. The vomerine teeth are reduced to a single or pair of teeth near each choana and are not elevated. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with fairly prominent lateral fringes and paired sub-articular tubercles; in decreasing order of length 3>4>2>1. The webbing reaches midway up the terminal phalanx on the fourth finger.

The terminal discs are prominent.

The hind limbs are moderate with a TL/S-V ratio of 0.526-0.566. Toes in decreasing order of length 4>5 >3>2>1. The webbing reaches the base of the disc of all toes, except the fourth where it extends to a point midway between the disc and the sub-articular tubercle at the base of the penultimate phalanx.

The skin on the dorsal surfaces of the head, body and limbs is minutely roughened. The throat and chest are smooth but for a few flattened tubercles. The abdomen and lower femora are coarsely granular. There is a short row of tubercles on the outer surface of the fourth finger. A more conspicuous dermal ridge extends along the outer surface of the tarsus and fifth toe. There are numerous tubercles below the anus and two extremely prominent femoral tubercles. The supra-tympanic fold is inconspicuous.

Distribution: *M. albatermacula sp. nov*. is only definitively known from the Northern Province of Papua New Guinea near where the holotype and paratype were caught.

Etymology: In Latin "*alba ater macula*" literally means pale black spots and so the name *albatermacula* literally means that same thing and refers to the dorsal colouration of the species.

MOECHAEANURA* (*TELEATER*) *SPICA SP. NOV.

LSIDurn:lsid:zoobank.org:act:B5929C08-060F-44E5-BA4A-84AFF569BEFD

Holotype: A preserved adult male specimen at the Museum Zoologie Bogor, Indonesia, specimen number MZB Amphibians 11823 caught in forest adjacent to Tin River, Mamberamo Drainage, Papua, Indonesia, Latitude -3.1730 S., Longitude 134.3453 E.

This facility allows access to its holdings.

Diagnosis: The holotype of this species *Moechaeanura spica sp. nov.* was the paratype for the similar species originally described as *Litoria richardsi* Dennis and Cunningham, 2006, but now placed in the genus *Moechaeanura gen. nov.*. Their holotype was an adult female collected at 5.5 km west of Tabubil township, Western Province, Papua New Guinea, Latitude -5.1730 S., Longitude 141.1155 E.

Dennis and Cunningham (2006) concluded that they were of opposite sexes of the same species, but this is not the contention here.

Both specimens were morphologically distinct from one another and the noting that closely related species do not show significant sexual dimporphism to anywhere near the extent seen between the two relevant specimens, one is forced to conclude that they are in fact separate

species. Furthermore, the two specimens come from different bio-regions, with one being from north of the central New Guinea cordillera and the other from the south. This also leads to a reasonable inference that the two frogs would be of different species, even in the absence of strong morphological divergence. In combination these two elements are compelling evidence for two species being involved and not just one.

Moechaeanura spica sp. nov. is readily separated from *M. richardsi* (Dennis and Cunningham, 2006) by having little if any webbing between the first and second fingers, versus webbing that goes to the first finger disc and nearly the second finger disc in *M. richardsi.*

The dorsum of *M. spica sp. nov.* is a light grey colour overlain with scattered yellowish brown irregular markings, with a limited number of chocolate brown spots and blotches, mainly on the flanks. There are areas of bright yellow in the groin. Forearms have few if any dark brown or black markings. The cross-bands on the upper hind legs are thick, brown in colour and mainly complete. The white tipped tubercles on the sides of body and to a lesser extent elsewhere are of moderate size. The tympanum is mainly brown. The iris is pink and brown.

By contrast *M. richardsi* has a relatively dark blue-grey dorsum, with irregular black markings forming cross bands across the body and also and huge areas of bright yellow in the groin. Forearms have numerous black markings. The cross-bands on the upper hind legs are thin, black in colour, mainly broken and mainly incomplete. The white tipped tubercles on the sides of body and to a lesser extent elsewhere are large and prominent. The tympanum is mainly blue. The iris is yellow and grey.

Both *M. spica sp. nov.* and *M. richardsi* constituting the entirety of the subgenus *Telaater subgen. nov.* are separated from all other Tree Frogs in New Guinea and Australia by a combination of black webbing on the feet, venter with large areas of black, white and yellow, a small size being less than 30 mm snout vent length in both sexes and a transparent periphery on the tympanic membrane.

Areas where both *M. spica sp. nov.* and *M. richardsi* are known to occur in are regions of severe habitat degradation and explosive human population growth and further research on these species should be conducted as a matter of urgency.

Colour photos of both *M. spica sp. nov.* and *M. richardsi* in life are depicted in Dennis and Cunningham (2006) on page 66 (*M. spica sp. nov.* in photo “B”).

Distribution: *M. spica sp. nov.* is known only from the type locality at Tin River, Mamberamo Drainage, Papua, Indonesia.

Etymology: The name **“***spica*” means “spikey” in Latin in reference to the tubercles on the upper flanks and other parts of the frog’s body.

ORNATANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:C857380D-A567-4F6E-A3C5-298B91B032A8

Type species: *Hyla modica* Tyler, 1968.

Diagnosis: The species in the genus *Ornatanura gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suites of characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818).

The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling.

The anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being, 1/ Liberally spotted with white, 2/

Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

According to Duellman *et al*. (2016), the genus *Ornatanura gen. nov.* diverged from its nearest living relatives in the divergent genus *Hopviridi gen. nov*. 12.1 MYA, in turn diverged as a pair from their next nearest living relatives in the genera *Bellarana gen. nov*. and *Angularanta gen. nov.* 13.5 MYA and all diverged 21.5 MYA from the most closely related living species in previously named genera.

Distribution: Species of *Ornatanura gen. nov.* are abundant in lower montane forests in geologically more ancient ranges and uplands of New Guinea from the far south-east to far north-west.

Etymology: The etymology of the new genus *Ornatanura* is simply a reference in Latin to the fact that the species in this genus are ornate frogs.

Content: *Ornatanura modica* (Tyler, 1968) (type speces); *O. parsviridis sp. nov.*; *O. parscinereo sp. nov.*; *O. leucopicturas sp. nov.*

ORNATANURA LEUCOPICTURAS SP. NOV.

LSIDurn:lsid:zoobank.org:act:CE695639-BD80-4EF6-B1A1-B34D57C22B6D

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.23566 collected from Wharton Range, Central Province, Papua New Guinea, Latitude -8.33 S., Longitude 147.15 E.

This government-owned facility allows access to their holdings.

Diagnosis: The three species *O. leucopicturas sp. nov.*, *O. parscinereo sp. nov.* and *O. parsviridis sp. nov.* are all similar in most respects to *O. modica* (Tyler, 1968) and like *O. modica* conform to the genus diagnosis for *Ornatanura gen. nov.*.

The four preceding species are separated from one another as follows.

The species *Ornatanura parsviridis sp. nov.* from Madang is similar in most respects to *O. modica* (Tyler, 1968), but is readily separated from that taxon as well as *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov*. by the following suite of colouration character and morphology traits: Flanks are light greenish in colour overlain with about 6 large black spots or blotches (sometimes merged), in turn edged with thick white lines, dorsal surface of the hindlimbs are medium brown with indistinct dark brown to black crossbands. Upper forearms are barred with white on a dark background. Small blunt tubercles scattered across all parts of the dorsum and limbs, and only a small percentage are white tipped. The tympanum is less than a third of the diameter of the eye.

By contrast *O. modica* from the higher elevation areas in the region bound by the Star Mountain, West Papua and the Eastern Highlands Province in Papua New Guinea, mainly from upper reaches of south flowing drainages, has flanks that are greenish in colour and liberally spotted with white. Markings on the upper forearms are indistinct and blotches on the upper surfaces of the hind limbs do not form indistinct or obvious bands. The skin on the dorsal surface of the head, body and limbs is smooth but for a few small and only slightly developed tubercles on the scapular region. The tympanum is slightly more than a third of the diameter of the eye.

The species *O. parscinereo sp. nov.* from Utikini Village, At Waa River in the Tembagapura Area, West Papua is separated from *O. parsviridis sp. nov.*, *O. modica* and *O. leucopicturas* by having a dorsum with numerous scattered and large tubercles that are the same colour as the skin surrounding them. There are no distinctive markings on upper surfaces of limbs, green on the dorsum is restricted to the upper surface of the head anterior to the eyes, which also has some dark peppering on it and similarly peppered green on the upper surfaces of the arms, save for scattered green spots elsewhere. The tympanum is less than a third of the diameter of the eye.

The species *O. leucopicturas* from central Province, Papua New Guinea is readily separated from

O. parsviridis sp. nov., *O. parscinereo sp. nov.*, *O. modica* and *O. leucopicturas* by having a brownish grey dosum with numerous scattered black spots, as well as numerous areas of green, generally arranged in one or more irregular blotches forming a sort of longitudinal stripe, rich immaculate green on the upper snout anterior to the eyes; large black spots and blotches from the dorsum spread to the flanks, where their size generally increases but number decreases. There are scattered small tubercles all over the body, with a noticeable general absence on the head, save for an exceptionally large series of tubercles above each eye. Most are white or light tipped.

O. parsviridis sp. nov. in life is depicted in Menzies (2006) on plate 75.

The four preceding species, being the entirety of the genus *Hopviridi gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of

characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818). The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling. The

anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws, and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being, 1/ Liberally spotted with white, 2/ Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

Distribution: *O. leucopicturas sp. nov.* is known only from hilly areas in the Central Province of New Guinea, associated with the headwaters of south-flowing drainages.

Etymology: The new species name is taken directly from the Latin words "*leuco picturas*" which means "white markings" which accurately describes the dorsal colouration of the labial region and flanks of this species.

ORNATANURA PARSCINEREO SP. NOV.

LSIDurn:lsid:zoobank.org:act:F8ACAFF8-E95B-483B-8EBC-A266B291CD88

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.144550 collected from Utikini Village, At Waa River, Tembagapura Area, West Papua, Indonesia, Latitude -4.24 S., Longitude 137.08 E.

This government-owned facility allows access to their holdings.

Diagnosis: The three species *O. parscinereo sp. nov.*, *O. parsviridis sp. nov.* and *O. leucopicturas sp. nov.* are all similar in most respects to *O. modica* (Tyler, 1968) and like *O. modica* conform to the genus diagnosis for *Ornatanura gen. nov.*.

The four preceding species are separated from one another as follows.

The species *Ornatanura parsviridis sp. nov.* from Madang is similar in most respects to *O. modica* (Tyler, 1968), but is readily separated from that taxon as well as *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov.* by the following suite of colouration character and morphology traits: Flanks are light greenish in colour overlain with about 6 large black spots or blotches (sometimes merged), in turn edged with thick white lines, dorsal surface of the hindlimbs are medium brown with indistinct dark brown to black crossbands. Upper forearms are

barred with white on a dark background. Small blunt tubercles scattered across all parts of the dorsum and limbs, and only a small percentage are white tipped. The tympanum is less than a third of the diameter of the eye.

By contrast *O. modica* from the higher elevation areas in the region bound by the Star Mountain, West Papua and the Eastern Highlands Province in Papua New Guinea, mainly from upper reaches of south flowing drainages, has flanks that are greenish in colour and liberally spotted with white. Markings on the upper forearms are indistinct and blotches on the upper surfaces of the hind limbs do not form indistinct or obvious bands. The skin on the dorsal surface of the head, body and limbs is smooth but for a few small and only slightly developed tubercles on the scapular region. The tympanum is slightly more than a third of the diameter of the eye.

The species *O. parscinereo sp. nov.* from Utikini Village, At Waa River in the Tembagapura Area, West Papua is separated from *O. parsviridis sp. nov.*, *O. modica* and *O. leucopicturas* by having a dorsum with numerous scattered and large tubercles that are the same colour as the skin surrounding them. There are no distinctive markings on upper surfaces of limbs, green on the dorsum is restricted to the upper surface of the head anterior to the eyes, which also has some dark peppering on it and similarly peppered green on the upper surfaces of the arms, save for scattered green spots elsewhere. The tympanum is less than a third of the diameter of the eye.

The species *O. leucopicturas* from central Province, Papua New Guinea is readily separated from *O. parsviridis sp. nov.*, *O. parscinereo sp. nov.*, *O. modica* and *O. leucopicturas* by having a brownish grey dosum with numerous scattered black spots, as well as numerous areas of green, generally arranged in one or more irregular blotches forming a sort of longitudinal stripe, rich immaculate green on the upper snout anterior to the eyes; large black spots and blotches from the dorsum spread to the flanks, where their size generally increases but number decreases. There are scattered small tubercles all over the body, with a noticeable general absence on the head, save for an exceptionally large series of tubercles above each eye. Most are white or light tipped.

O. parsviridis sp. nov. in life is depicted in Menzies (2006) on plate 75.

The four preceding species, being the entirety of the genus *Hopviridi gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818). The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling. The anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws, and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being 1/ Liberally spotted with white, 2/ Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently

longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

Distribution: *O. parscinereo sp. nov.* is known only from hilly areas west of the headwaters of the Lorentz River in West Papua, Indonesia.

Etymology: The new species name is taken directly from the Latin words "*pars cinereo*" which means "partly grey" which accurately describes the dorsal colouration of this species.

ORNATANURA PARSVIRIDUS SP. NOV.

LSIDurn:lsid:zoobank.org:act:D0BEEEDF-C48E-4A81-BC95-DDB678CC7DE7

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.31051 collected from Wau, on the Eddie Creek Road, Morobe Province, Papua New Guinea, Latitude -7.24 S., Longitude 146.40 E.

This government-owned facility allows access to their holdings.

Diagnosis: The three species *O. parsviridis sp. nov.*, *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov*. are all similar in most respects to *O. modica* (Tyler, 1968) and like *O. modica* conform to the genus diagnosis for *Ornatanura gen. nov.*.

The four preceding species are separated from one another as follows.

The species *Ornatanura parsviridis sp. nov.* from Madang is similar in most respects to *O. modica* (Tyler, 1968), but is readily separated from that taxon as well as *O. parscinereo sp. nov.* and *O. leucopicturas sp. nov*. by the following suite of colouration character and morphology traits: Flanks are light greenish in colour overlain with about 6 large black spots or blotches (sometimes merged), in turn edged with thick white lines, dorsal surface of the hindlimbs are medium brown with indistinct dark brown to black crossbands. Upper forearms are barred with white on a dark background. Small blunt tubercles scattered across all parts of the dorsum and limbs, and only a small percentage are white tipped. The tympanum is less than a third of the diameter of the eye.

By contrast *O. modica* from the higher elevation areas in the region bound by the Star Mountain, West Papua and the Eastern Highlands Province in Papua New Guinea, mainly from upper reaches of south flowing drainages, has flanks that are greenish in colour and liberally spotted with white. Markings on the upper forearms are indistinct and blotches on the upper surfaces of the hind limbs do not form indistinct or obvious bands. The skin on the dorsal surface of the head, body and limbs is smooth but for a few small and only slightly developed tubercles on the scapular region. The tympanum is slightly more than a third of the diameter of the eye.

The species *O. parscinereo sp. nov.* from Utikini Village, At Waa River in the Tembagapura Area, West Papua is separated from *O. parsviridis sp. nov.*, *O. modica* and *O. leucopicturas* by having a dorsum with numerous scattered and large tubercles that are the same colour as the skin surrounding them. There are no distinctive markings on upper surfaces of limbs, green on the dorsum is restricted to the upper surface of the head anterior to the eyes, which also has some dark peppering on it and similarly peppered green on the upper surfaces of the arms, save for scattered green spots elsewhere. The tympanum is less than a third of the diameter of the eye.

The species *O. leucopicturas* from central Province, Papua New Guinea is readily separated from

O. parsviridis sp. nov., *O. parscinereo sp. nov.*, *O. modica* and *O. leucopicturas* by having a brownish grey dosum with numerous scattered black spots, as well as numerous areas of green, generally arranged in one or more irregular blotches forming a sort of longitudinal stripe, rich immaculate green on the upper snout anterior to the eyes; large black spots and blotches from the dorsum spread to the flanks, where their size generally increases but number decreases. There are scattered small tubercles all over the body, with a noticeable general absence on the head, save for an exceptionally large series of tubercles above each eye. Most are white or light tipped.

O. parsviridis sp. nov. in life is depicted in Menzies (2006) on plate 75.

The four preceding species, being the entirety of the genus *Hopviridi gen. nov.* are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: These species are characterised by their small size (males 23.4-30.0 mm, females 27.4-35.4 mm), moderate to relatively long limbs (average TL/S-V 0.522-0.604) and broadly spaced nares (average E-N/IN 0.611-0.818). The colouration is highly variable.

The dorsal surface of the head, body and limbs may range from light sandy grey, or brown to dark grey and is darkened by the presence of very dense, minute, dark brown to black stippling. The anterior portion of the head bordered laterally by the canthus rostralis, and posteriorly to a line between the anterior portions of the upper eyelids is an immaculate pale green, although in some species this may be reduced to be brown or grey with some lime green spots or markings.

The head is longer than broad (average HL/HW 1.132), its length equivalent to more than one-third of the snout to vent length (average HL/S-V 0.350). The snout is evenly rounded when viewed from above and projects slightly in profile. The nostrils are more lateral than superior, their distance from the tip of the snout less than that from the eye.

The distance between the eye and the naris is less than the internarial span (average E-N/IN 0.727). The canthus rostralis is well defined and distinctly curved.

The eye is prominent and bulges above the head, its

diameter greater than the eye to naris distance and less than the internarial span. The superior one-quarter to one-third of the tympanum is hidden beneath the supra-tympanic fold. The diameter of the tympanum is equivalent to less than one third of the eye diameter to slightly more than one-third of the eye diameter. The vomerine teeth are in two small oblique series between the choanae. The tongue is almost circular and lacks a posterior indentation.

The fingers are long and lack lateral fringes; in decreasing order of length 3>4>2>1. There is a small vestige of webbing between the third and fourth fingers. The terminal discs are not prominent, with the degree of expansion varying slightly between species.

The hind limbs are relatively long with an average TL/S-V ratio of 0.558. Toes in decreasing order of length 4>5=3>2>1. On the fifth toe, the webbing extends two-thirds up the penultimate phalanx of the fifth and to the base of the penultimate phalanx on the fourth.

The skin on the dorsal surface of the head, body and limbs is either smooth with numerous small, spaced apart, scattered tubercles all over, ranging down to smooth all over but for a few small and only slightly developed tubercles on the scapular region.

The throat, abdomen and lower surface of the thighs are very weakly granular. There is a row of small tubercles extending posteriorly from the angle of the jaws, and a patch of similar sized tubercles beneath the anus.

Of the tubercles at the angles of the jaws those anterior to the tympanum are green, grey or white, whilst those posterior to it are usually white.

The scapular tubercles are usually green, and the lateral surfaces of the body between the axilla and the groin are one or other of being 1/ Liberally spotted with white, 2/ Grey marks or spots on a cream background, 3/ Back marks in the form of large spots or blotches, circled by white and on an otherwise light lime green background.

The ventral surfaces are creamish with less dense stippling than appears on the dorsum and although dense stippling occurs in some specimens.

The greatest density of groups of chromatophores on the ventral surface appear on the throat and particularly towards the labial margins, with more on the upper than lower margin and greatest intensity between eye and ear, although the exact configuration varies between specimens and species.

Males vary in size from 23.4 mm to 30.0 mm and females from 27.4-35.4mm. The head length is consistently longer than broad (average HL/HW 1.028-1.155) and the head length varies from one-third to considerably more than one-third of the snout to vent length, the complete HL/S-V range

being 0.333-0.404. The E-N/IN range is 0.611-0.818 and the eye diameter is consistently smaller than the internarial span. The average TL/S-V range is 0.522-0.604.

The diploid chromosome number is 26.

The morphologically similar species *Bellarana micromembrana* (Tyler, 1963) from Madang, is most readily separated from the species within *Ornatanura gen. nov.* by its distinctive orange upper iris, versus yellowish in *Ornatanura gen. nov.* species.

Distribution: *O. parsviridis sp. nov.* is presently only known from Madang, Papua New Guinea.

Etymology: The new species name is taken directly from the Latin words “pars” meaning some, or partly and the word “viridis” which means green. This reflects the reality that most specimens of these frogs have some green in their colour, but they are never wholly green.

NASUSCUSPIS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:ABB692F7-77D0-47C0-86BE-9EC2A41BEC8A

Type species: *Hyla prora* Menzies, 1969.

Diagnosis: Species within the genus *Nasuscuspis gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are montane species, growing to a maximum of 50 mm snout vent length in females and males to 45 mm. The dorsum is a mixture of greys, greenish greys and ochres. The fingers and toes are extensively webbed. There are highly developed dermal appendages including crenulated ridges on the posterior surfaces of the radius and tarsus, prominent dermal folds above the vent; a row of very large tubercles on the undersurface of the mandible and an elongate rostral, dermal spike always in males and females although in some reduced form in females of some species.

Duellman *et al*. (2016) found that species in the genus *Nasuscuspis gen. nov.* diverged from nearest living relatives 13.4 MYA, being members of the genus *Moechaeanura gen. nov.*. In turn both these genera as a pair diverged from the morphologically similar genera *Incertanura gen. nov*., *Inlustanura subgen. nov*. and *Variabilanura gen. nov*. 17.8 MYA and with each of the latter three genera diverging from one another at least 13.4 MYA.

The species name “*Litoria rostandi* Kraus, 2007” is an illegally coined junior synonym of “*Litoria hilli* Hiaso and Richards, 2006 improperly created by the serial taxonomic vandal Fred Kraus, best known for scamming millions of dollars in US Government research grants that he uses for personal self-gratification and then justifies via the repeated stealing of work from other others in is acts of taxonomic vandalism.

While US Government authorites are aware of his highly illegal activities, he continues (in 2020) to operate with corrupt protection from within the US government, giving him immunity from prosecution in the same way that police officers in the USA can kill unarmed black people without risk of being charged and convicted fo such crimes.

Distribution: *Nasuscuspis gen. nov.* species are known from scattered highland locations in various parts of Papua New Guinea and Irian Jaya, Indonesia.

Etymology: In Latin, the genus name “*Nasuscuspis*” means “nose pointed” as fits the case for adult males and many adult females in the genus.

Content: *Nasuscuspis prora* (Menzies, 1969) (type species); *N. chrisdahli* (Richards, 2007); *N. humboldtorum* (Günther, 2006); *N. hilli* (Hiaso and Richards, 2006).

ROTUNDAURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:264E5827-AA91-421E-91D2-F56901121E9E

Type species: *Hyla jeudii* Werner, 1901.

Diagnosis: Known only from the type specimen collected in the north of New Guinea, this species (and genus) do not conform to any other in New Guinea or Australia and is therefore placed in a monotypic genus *Rotundaura gen. nov.*.

Rotundaura gen. nov. is separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

A very high E-N/IN ratio (1.435), short limbs with a low TL/S-V ratio (0.482), wholly unwebbed fingers and incompletely webbed toes characterise this species. The head is long and flattened and longer than broad (HL/HW 1.073), its length more than one-third of the snout to vent length (HL/S-V 0.355). The snout is rather prominent, gently rounded when viewed from above and strongly rounded in profile. The nostrils are more superior than lateral, their distance from the end of the snout about one-half that from the eye and separated from each other by a distance which is equivalent to approximately two-thirds of the eye to naris distance (E-N/IN 1.435). The canthus rostralis is straight and inconspicuous and the loreal region oblique. The eye is small, its diameter less than the eye to naris distance. The tympanum is visible, its diameter equivalent to two-thirds of the eye diameter and separated from the eye by a distance equivalent to approximately one-half its own diameter. The vomerine teeth are in two obliquely oval series in juxtaposition on the midline between the small, obliquely oval choanae. The tongue is small, triangular and very feebly indented on its posterior border. The fingers are long, slender and unwebbed. The terminal discs are large and the sub-articular tubercles prominent. The fingers in decreasing order of length 3>4>2>1. The hind limbs are short with a TL/S-V ratio of 0.482. The toes are incompletely webbed, the webbing reaching the base of the penultimate phalanx on the fourth toe and half-way up the penultimate phalanx of the fifth. Toes in decreasing order of length 4>5=3>2>1. The skin on the dorsal surfaces of the head and body is smooth but for a few flattened tubercles on the back. The throat is smooth and the chest, abdomen and back of the thighs are coarsely granular. There is an inconspicuous supratympanic fold barely obscuring any of the tympanum and a pronounced skin fold across the chest. There is neither a tarsal ridge nor a dermal appendage on the heel. Dimensions: Of gravid female holotype are snout-vent 33.2 mm; tibia length 15.8 mm; head length 11.8 mm; head width 11.0 mm; eye to naris distance 3.3 mm; internarial span 2.3 mm; eye diameter 3.1 mm; tympanum diameter 2.0 mm. The dorsal surfaces of the head and body and limbs are a very pale brown with indistinct darker and lighter marbling. Marbling is present and most conspicuous on the dorsal surface of the thigh and tibia.

The ventral surfaces of the body and limbs are dull cream with an irregular brown patch on the throat (modified from Tyler 1978).

Specimens of the morphologically similar *Llewellynura* Wells and Wellington, 1985 are readily separated by their much smaller adult size of less than 25 mm adult body length.

Species of *Rotundaura gen. nov*. are separated from the genus *Summaviridis gen. nov.* by the tympanum being fully exposed and round, versus the upper surface being cut at the rear by a well-defined and prominent skin fold forming a straight line and a significantly blunter snout in *Rotundaura gen. nov*. versus pointed, when both are viewed in profile side-on.

Distribution: The holotype and sole known representative of this genus is believed to be from northern New Guinea somewhere in the vicinity of Madang (Tyler, 1978).

Etymology: The name *Rotundaura* is derived from Latin and refers to the visible round ear (tympanum) in the sole species in the genus.

Content: *Rotundaura jeudii* (Werner, 1901).

VARIABILANURA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:573588FF-F254-4979-AD95-1D9F134A7B34

Type species: *Hyla iris* Tyler, 1962.

Diagnosis: The genus *Variabilanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small montane species (males 24.3-34.1 mm; females 30.1-43 mm in SV). In life they are green, usually with yellow spots or markings (in preservative the dorsal surface is blue, usually with darker and occasionally lighter markings). There is usually a deep violet, orange, yellow or red patch in the groin and similarly coloured markings occur on the axilla, posterior surface of the thighs, tibia and tarsus.

The head is as broad as long or longer than broad (HL/HW 0.910-1.192), its length less than or greater than one-third of the snout to vent length (HL/S-V 0.328-0.384). The shape of the snout is highly variable, being from prominent to inconspicuous and strongly or only slightly rounded when viewed from above and in profile. The nostrils are lateral in specimens with prominent snouts and more lateral than superior in specimens with inconspicuous snouts. The nares are very much nearer the eye than the tip of the snout in the latter individuals and almost equidistant in the former. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.667-0.965). The canthus rostralis is curved and slightly or well defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-third to slightly less than one-half the eye diameter. Vomerine teeth are present in the majority of specimens and confined to small circular series on slight elevations between the choanae. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with very slight lateral fringes; in decreasing order of length 3>4>2>1. The webbing reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are prominent. The hind limbs are variable with a TL/S-V ratio of 0.485-0.587. Toes in decreasing order of length 4>5>3>2>1. The webbing between the toes reaches the base of the disc of all toes, except the fourth

where it reaches the tubercle at the base of the penultimate phalanx. The skin on the dorsal surface of the head, body and limbs is minutely roughened. The throat and chest are slightly granular. There are a row of tubercles on the posterior surface of the forearm, and conspicuous tubercles below the anus. Femoral tubercles are usually present. The supra-tympanic fold is inconspicuous. In preservative and in life, dull orange patches may extend on to the dorsum in the axillary region.

The lateral surfaces of the body are frequently heavily pigmented with black or deep yellow (in life, being violet in preservative), marked with large white patches. There is invariably a yellow, orange, red or violet patch in the groin (in life) and the same colouration may be present in the axilla and on the posterior surface of the tibia and tarsus. There is a white patch beneath the eye extending to the angle of the jaws or on the lateral surfaces of the body. The ventral surface of the body is cream to white (white in subgenus *Sudesanura subgen. nov.*), with or without sparse blue stippling on the throat near the angle of the jaws. The lower surface of the hind limbs is creamish yellow or dull yellow. These species are often beautifully pigmented in life being marked with cream, orange, yellow, green, violet and black (Tyler, 1962).

The ovum is pale green in colour and has a diameter of approximately 2.5 mm. The ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements. The mouth is anterior in position, and surrounded by a band of papillae on the inferior and lateral borders. There are two upper and three lower rows of labial teeth.

Species in the subgenus *Sudesanura subgen. nov.* (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

Species within *Sudesanura subgen. nov.* are further defined as follows: Small (SV max. 30.05 mm); head narrow (average HL/HW 1.08); Head always longer than wide (average HL/HW>1.0) except in females, which lack the rostral spike, where HL=HW; canthus rounded, concave, lores oblique, nostrils more or less lateral, widely placed (average EN/IN 0.63 in males and EN/IN 0.54 in females); snout with a prominent pointed rostral spike; vomerine teeth absent; eye large (EY/SV 0.11); tympanum visible, upper margin covered by skin fold. Fore limb with indistinct row of raised tubercles down outer side; hind limb without heel lappets or other dermal appendages; fingers half-webbed, toes fully webbed; subarticular tubercles poorly developed. Legs always long (average TL/SV>0.54). Dorsum usually immaculate, bright pale green, yellow or fawn brown reduced to a very narrow band on the thighs and ceasing at ankle and wrist, leaving hands and feet virtually colourless; concealed thighs and axillae bright cherry-red; white band on upper lip, snout to axilla; raised tubercles on fore limb white; ventral surfaces pure white.

According to Duellman *et al.* (2016), the species within *Variabilanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Inlustanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

According to Duellman *et al.* (2016), the subgenus *Sudesanura subgen. nov.* diverged from the nominate genus 12 MYA.

The type species for *Sudesanura subgen. nov.*, being "*Litoria havina* Menzies, 1993" as currently understood by most authors, is in fact a number of morphologically similar and closely related species.

Distribution: New Guinea mainly in the mountainous areas and adjacent foothills.

Etymology: Species within this genus can be quite variable in colouration, including depending on time of day and with variation in body temperature and they are frogs, so therefore the genus name *Variabilanura* reflects both.

Content: *Variabilanura iris* (Tyler, 1962) (type species); *V. tomcottoni sp. nov.*; *V. havina* (Menzies, 1993); *V. majikthise* (Johnston and Richards, 1994); *L. mucro* (Menzies, 1993); *L. mareku* (Günther 2008); *L. ollauro* (Menzies, 1993).

SUDESANURA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:4A1CB6B5-C8FF-47EC-B94D-D22439DB3242

Type species: *Litoria havina* Menzies, 1993.

Diagnosis: Species in the subgenus *Sudesanura subgen. nov.* (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus (*Variabilanura subgen. nov.*) by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

The genus *Variabilanura gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small montane species (males 24.3-34.1 mm; females 30.1-43 mm). In life they are green, usually with yellow spots or markings (in preservative the dorsal surface is blue, usually with darker and occasionally lighter markings). There is usually a deep violet, orange, yellow or red patch in the groin and similarly coloured markings occur on the axilla, posterior surface of the thighs, tibia and tarsus. The head is as broad as long or longer than broad (HL/HW 0.910-1.192), its length less than or greater than one-third of the snout to vent length (HL/S-V 0.328-0.384). The shape of the snout is highly variable, being from prominent to inconspicuous and strongly or only slightly rounded when viewed from above and in profile. The nostrils are lateral in specimens with prominent snouts and more lateral than superior in specimens with inconspicuous snouts. The nares are very much nearer the eye than the tip of the snout in the latter individuals and almost equidistant in the former.

The distance between the eye and the naris is less than the internarial span (E-N/IN 0.667-0.965). The canthus

rostralis is curved and slightly or well defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-third to slightly less than one-half the eye diameter. Vomerine teeth are present in the majority of specimens, and confined to small circular series on slight elevations between the choanae. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with very slight lateral fringes; in decreasing order of length 3>4>2>1. The webbing reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are prominent. The hind limbs are variable with a TL/S-V ratio of 0.485-0.587. Toes in decreasing order of length 4>5>3>2>1. The webbing between the toes reaches the base of the disc of all toes, except the fourth where it reaches the tubercle at the base of the penultimate phalanx. The skin on the dorsal surface of the head, body and limbs is minutely roughened. The throat and chest are slightly granular. There are a row of tubercles on the posterior surface of the forearm, and conspicuous tubercles below the anus. Femoral tubercles are usually present. The supra-tympanic fold is inconspicuous. In preservative and in life, dull orange patches may extend on to the dorsum in the axillary region.

The lateral surfaces of the body are frequently heavily pigmented with black or deep yellow (in life, being violet in preservative), marked with large white patches. There is invariably a yellow, orange, red or violet patch in the groin (in life) and the same colouration may be present in the axilla and on the posterior surface of the tibia and tarsus. There is a white patch beneath the eye extending to the angle of the jaws or on the lateral surfaces of the body. The ventral surface of the body is cream to white (white in subgenus *Sudesanura subgen. nov.*), with or without sparse blue stippling on the throat near the angle of the jaws. The lower surface of the hind limbs is creamish yellow or dull yellow. These species are often beautifully pigmented in life being marked with cream, orange, yellow, green, violet and black (Tyler, 1962).

The ovum is pale green in colour and has a diameter of approximately 2.5 mm.

The ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water.

The ova are surrounded by a very large mass of clear albumen.

A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements. The mouth is anterior in position, and surrounded by a band of papillae on the inferior and lateral borders.

There are two upper and three lower rows of labial teeth.

As already mentioned, species in the subgenus *Sudesanura subgen. nov.* (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

Species within *Sudesanura subgen. nov.* are further defined as follows: Small (SV max. 30.05 mm); head narrow (average HL/HW 1.08); Head always longer than wide (average HL/HW>1.0) except in females, which lack the rostral spike, where HL=HW; canthus rounded, concave, lores oblique, nostrils more or less lateral, widely placed (average EN/IN 0.63 in males and EN/IN 0.54 in females); snout with a prominent pointed rostral spike; vomerine teeth absent; eye large (EY/SV 0.11); tympanum visible, upper margin covered by skin fold. Fore limb with indistinct row of raised tubercles down outer side; hind limb without heel lappets or other dermal appendages; fingers half-webbed, toes fully webbed; subarticular tubercles poorly developed. Legs always long (average TL/SV>0.54). Dorsum usually immaculate, bright pale green, yellow or fawn brown reduced to a very narrow band on the thighs and ceasing at ankle and wrist, leaving hands and feet virtually colourless; concealed thighs and axillae bright cherry-red; white band on upper lip, snout to axilla; raised tubercles on fore limb white; ventral surfaces pure white.

According to Duellman *et al.* (2016), the species within *Variabilanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Inlustanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

According to Duellman *et al.* (2016), the subgenus *Sudesanura subgen. nov.* diverged from the nominate genus 12 MYA.

The type species for *Sudesanura subgen. nov.*, being "*Litoria havina* Menzies, 1993" as currently understood by most authors, is in fact a number of morphologically similar and closely related species.

From photos of the various regional forms alone this contention is clearly supported.

Due to the extreme urgency in which species of frog need to be formally identified and named in the New Guinea region, as in before human population growth and associated issues cause their demise and extinction, I seriously considered naming two outlier forms of putative *V. havina* as new species herein on the basis of previously published photos.

Heeding the advice of Krell and Marshall (2017), I have refrained from doing so.

However I take this opportunity to urge those who do have access to specimens of these frogs, to immediately obtain specimens and lodge them with a State or National Museum and then formally describe them so that proper conservation management plans can be enacted.

Refer also to the statements in Hoser (2019a, 2019b).

Distribution: *Sudesanura subgen. nov.* species are found in New Guinea mainly in the mountainous areas and adjacent foothills.

Etymology: *Sudes* in Latin means "spike", while "anura" means frog and therefore the new genus name *Sudesanura* literally means spike frog, in reference to the rostral appendage in males.

Content: *Variabilanura* (*Sudesanura*) *havina* (Menzies, 1993) (type species) (treated herein as monotypic, but in fact a group of species).

VARIABILANURA* (*VARIABILANURA*) *TOMCOTTONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:BB6A8CEF-84A4-40CB-9679-626F97E9DCFD

Holotype: A preserved specimen at the Museum of Natural History, London, United Kingdom, specimen number 1980.630-634 collected at the banks of Lake Trist, Kuper Range, Morobe Province, Papua New Guinea.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Museum of Natural History, London, United Kingdom, specimen number 1980.635-637 collected at the banks of Lake Trist, Kuper Range, Morobe Province, Papua New Guinea.

Diagnosis: *Variabilanura tomcottoni sp. nov*. has until now been treated as an eastern population of *V. iris* (Tyler, 1962), but can be separated from that species by having generally unmarked and translucent toes in adults and a slightly larger tympanum, versus marked toes in adult *V. iris* and more reduced tympanum. Outside of these differences, there are general differences between the forms, including a greater preponderance of mainly brown and green coloured specimens in *V. tomcottoni sp. nov*. versus mainly with green and not necessarily brown in *V. iris*, but in both species the variation between specimens and various colour morphs within a single site is significant.

That both populations are also reproductively isolated across the Wau-Bulolo area and likely to have been so for an extended geological time, gives me no hesitation in describing *V. tomcottoni sp. nov*. as a new species being different to the type form of *V. iris* from the south-side of the main central cordillera.

Both *V. tomcottoni sp. nov*. and *V. iris* are readily separated from all other species in the genus *Variabilanura gen. nov.* by the following unique suite of characters: Small species (male average SV 24-36 mm, female average SV 34-43 mm); legs short to long (TL/SV 0.46-0.63); head about as broad as long (HL/HW 0.91-1.06); nostrils moderately widely spaced (EN/IN 0.77-0.97); snout truncate to slightly pointed in profile; eye large; tympanum usually visible but small.

Dorsum is green, green-and-brown or entirely brown and always mottled with black or darker green. Occasionally the body is with scattered white spots and a white lateral stripe commencing below the eye. In life it appears that no two examples are exactly alike but they can be divided into four main morphotypes: (a) dark green, with indistinct black reticulation; (b) pale green, with distinct fine or coarse black reticulation; (c) pale green, with distinct fine or coarse black reticulation, but also the green has patches of brown; and (d) mostly brown, with distinct fine or coarse black reticulation. The ventral surface is white, tending to creamy posteriorily and on the hind limbs. The concealed parts of the thighs are basically purple-blotched white, or white and red, or white and pale blue, these colours sometimes meeting below abdomen and thighs.

There is invariably a violet patch in the groin, and often in the axilla as well, and this may be interrupted with blue or white spots or the patch may extend along the side of the body between dorsal green and ventral white.

The genus *Variabilanura gen. nov*. are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: They are small montane species (males 24.3-34.1 mm; females 30.1-43 mm). In life they are green, usually with yellow spots or markings (in preservative the dorsal surface is blue, usually with darker and occasionally lighter markings). There is usually a deep violet, orange, yellow or red patch in the groin and similarly coloured markings occur on the axilla, posterior surface of the thighs, tibia and tarsus. The head is as broad as long or longer than broad (HL/HW 0.910-1.192), its length less than or greater than one-third of the snout to vent length (HL/S-V 0.328-0.384). The shape of the snout is highly variable, being from prominent to inconspicuous and strongly or only slightly rounded when viewed from above and in profile. The nostrils are lateral in specimens with prominent snouts and more lateral than superior in specimens with inconspicuous snouts. The nares are very much nearer the eye than the tip of the snout in the latter individuals and almost equidistant in the former. The distance between the eye and the naris is less than the internarial span (E-N/IN 0.667-0.965). The canthus rostralis is curved and slightly or well defined. The eye is large and prominent, its diameter greater than the distance separating it from the nostril. The tympanum is covered with skin, its diameter equivalent to from one-third to slightly less than one-half the eye diameter. Vomerine teeth are present in the majority of specimens and confined to small circular series on slight elevations between the choanae. The tongue is broadly cordiform with a slightly indented posterior margin. The fingers are short and equipped with very slight lateral fringes; in decreasing order of length 3>4>2>1. The webbing reaches the sub-articular tubercle at the base of the penultimate phalanx on the fourth finger. The terminal discs are prominent. The hind limbs are variable with a TL/S-V ratio of 0.485-0.587. Toes in decreasing order of length 4>5>3>2>1. The webbing between the toes reaches the base of the disc of all toes, except the fourth where it reaches the tubercle at the base of the penultimate phalanx. The skin on the dorsal surface of the head, body and limbs is minutely roughened. The throat and chest are slightly granular. There are a row of tubercles on the posterior surface of the forearm and conspicuous tubercles below the anus. Femoral tubercles are usually present. The supra-tympanic fold is inconspicuous. In preservative and in life, dull orange patches may extend on to the dorsum in the axillary region.

The lateral surfaces of the body are frequently heavily pigmented with black or deep yellow (in life, being violet in preservative), marked with large white patches. There is invariably a yellow, orange, red or violet patch in the groin (in life) and the same colouration may be present in the axilla and on the posterior surface of the tibia and tarsus. There is a white patch beneath the eye extending to the angle of the jaws or on the lateral surfaces of the body. The ventral surface of the body is cream to white (white in subgenus *Sudesanura subgen. nov.*), with or without sparse blue stippling on the throat near the angle of the jaws. The lower surface of the hind limbs is

creamish yellow or dull yellow. These species are often beautifully pigmented in life being marked with cream, orange, yellow, green, violet and black (Tyler, 1962).

The ovum is pale green in colour and has a diameter of approximately 2.5 mm. The ova are laid in groups of from 4 to 37 (mean 14) on the leaves of trees overhanging water, and around the stems of vegetation at the edge of the water. The ova are surrounded by a very large mass of clear albumen. A period of approximately fourteen days is spent within the spawn clump, and the tadpole emerges possessing internal gills and capable of coordinated movements. The mouth is anterior in position, and surrounded by a band of papillae on the inferior and lateral borders. There are two upper and three lower rows of labial teeth.

Species in the subgenus *Sudesanura subgen. nov*. (type species "*Litoria havina* Menzies, 1993") are separated from those in the nominate subgenus by having a red patch in the groin, versus a deep violet, orange or yellow patch in the groin in the nominate subgenus.

Species within *Sudesanura subgen. nov*. are further defined as follows: Small (SV max. 30.05 mm); head narrow (average HL/HW 1.08); Head always longer than wide (average HL/HW>1.0) except in females, which lack the rostral spike, where HL=HW; canthus rounded, concave, lores oblique, nostrils more or less lateral, widely placed (average EN/IN 0.63 in males and EN/IN 0.54 in females); snout with a prominent pointed rostral spike; vomerine teeth absent; eye large (EY/SV 0.11); tympanum visible, upper margin covered by skin fold. Fore limb with indistinct row of raised tubercles down outer side; hind limb without heel lappets or other dermal appendages; fingers half-webbed, toes fully webbed; subarticular tubercles poorly developed. Legs always long (average TL/SV>0.54). Dorsum usually immaculate, bright pale green, yellow or fawn brown reduced to a very narrow band on the thighs and ceasing at ankle and wrist, leaving hands and feet virtually colourless; concealed thighs and axillae bright cherry-red; white band on upper lip, snout to axilla; raised tubercles on fore limb white; ventral surfaces pure white.

According to Duellman *et al.* (2016), the species within *Variabilanura gen. nov.* diverged from their nearest living relatives 13.4 MYA, being the newly named (within this paper) genus *Inlustanura gen. nov.* and are at least 21.5 MYA diverged from nearest living relatives in previously named genera.

According to Duellman *et al.* (2016), the subgenus *Sudesanura subgen. nov*. diverged from the nominate genus 12 MYA.

The type species for *Sudesanura subgen. nov*., being "*Litoria havina* Menzies, 1993" as currently understood by most authors, is in fact a number of morphologically similar and closely related species.

Distribution: *V. tomcottoni sp. nov*. is known only from the type locality being the banks of Lake Trist, Kuper Range, Morobe Province, Papua New Guinea.

Etymology: The new species name "*tomcottoni*" is named in honour of Tom Cotton, formerly of Ringwood in Victoria in recognition of his many years work with the team at Snakebusters and Australia's best reptiles educating people with Australia's only hands on reptile shows that let people hold the animals and a significant amount of other critically important wildlife conservation work. Another species of tree frog named in honour of Tom Cotton has the nomen "*cottoni*".

DRYMONTANTINA SUBTRIBE NOV.

***DRYOMANTIS* PETERS, 1882**

Type species: *Drymomantis fallax* Peters, 1882.

Diagnosis: Frogs in the genus *Drymomantis* Peters, 1882 are all readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: These are small elongated and agile frogs averaging about 25 mm in body length with moderately pointed snouts, varying somewhat between species; brown head streak present or absent; dorsal surface is uniform green or fawn, sometimes with darker flecks and with at most a paler vertebral zone; there is not a broad vertebral band of bronze bordered on either side with green; skin is smooth above; finely granular on the throat and coarsely granular below; at least one strong pectoral fold, no dorsolateral fold and no tubercles above each eye; fingers webbed at the base and toes moderately webbed. A moderate oval inner and small rounded outer metatarsal tubercle; vomerine teeth absent, or if present, the hind edge of vomerine teeth are between the choanae; first finger is much smaller than the second when pressed together, the top of the first finger reaching no further than the base of the disc of the second finger.

According to Duellman *et al.* (2016), the members of this genus diverged from their nearest living relatives 21.5 MYA.

Distribution: East coast of Australia.

Content: *Drymomantis fallax* Peters, 1882 (type species); *D. ausviridis sp. nov.*; *D. celantur sp. nov.*; *D. cooloolensis* (Liem, 1974); *D. glauerti* (Copland, 1957); *D. northdtradbrokeensis sp. nov.*; *D. olongburensis* (Liem and Ingram, 1977).

DRYMOMANTIS AUSVIRIDIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:FC390EC9-13B7-4C17-AFBE-AA22A6DB27AE

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J54722 collected at Cairns, Queensland, Australia, Latitude 16.9186 S., Longitude 145.7781 E. This government-owned facility allows access to its holdings.

Paratypes: Four preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J54723, J54727, J54730 and J54733 all collected at Cairns, Queensland, Australia, Latitude 16.9186 S., Longitide 145.7781 E.

Diagnosis: The putative species defined as "*Litoria fallax* (Peters, 1882)" as defined and separated from other species by Cogger (2014) and Anstis (2013) is found along the coast and ranges from southern New South Wales along the east Australian coast to the northern edge of the wet tropics in far north Queensland. However as far back as 1985, Wells and Wellington (1985) correctly resurrected from synonymy the taxon *Drymomantis glauerti* (Copland, 1957) (in this form) from the synonymy of *Litoria fallax* (Peters, 1882).

At the same time, Wells and Wellington resurrected from

synonymy of *Litoria* Tschudi, 1838 the genus *Drymomantis* Peters, 1882, as proposed for the species "*fallax*".

To make it clear, *D. fallax* has a type locality of Bowen, Mackay and Rockhampton, while *D. glauerti* has a type locality of Colo, north-west of Sydney, New South Wales.

Wells and Wellington (1985) have been consistently lampooned and vilified by the Wolfgang Wüster gang of thieves ever since 1985 (see for example a recent hate post by Wolfgang Wüster on the ICZN internet list server dated 6 May 2020, posted at 7:44 AM, UK time). In that post, he yet again implores people to ignore the taxonomy and nomenclature of Wells and Wellington (1985) and all other publications by them and to ignore or steal from the works of all other people the Wüster gang declare as not being within their gang.

Wüster and his his cohort harass and threaten others who dare to use the Wells and Wellington taxonomy including so far as committing acts of violence against them and telephone death threats to kill. See for example the threat to kill phone call by police-protected criminal Crystal Kniese made on 10 Feb 2019. This call was made from a blocked phone number, which was tape recorded and has been posted online at: http://www.smuggled.com/Gatt-Girlfriend-11-2-19-11-43-17_AM.m4a

The Wüster gang have been involved in attacks on private property, including for example a failed attempt to burn down this author's research facility with an incendiary attack, instigation of illegal and violent police raids on properties and other criminal actions.

This activity, described by Lynn Raw of the ICZN list server in 2020 as "Mafia" style misconduct has been successful in that most herpetologists have in the past 35 years been bludgeoned into not using the Wells and Wellington taxonomy or nomenclature, even when it is clearly correct.

Hal Cogger, author of numerous major works on Australian herpetofauna has even openly stated he often uses the Wüster gang taxonomy and nomenclature, knowing it to be illegal, unscientific and just plain "wrong" so that "I don't get getting threatening phone calls from them at strange hours of the night", as stated by him in a recorded phone call in 2018 (author's phone automatically records and archives all phone calls).

These actions by Wüster and his gang are not science, but rather a form of anarachy instead.

In terms of the taxonomic actions of Wells and Wellington taken with regards to the putative species *Drymomantis fallax* Peters, 1882, the science is clearly on the side of Wells and Wellington. These two men made their taxonomic judgement on the basis of some decades of field experience with the putative taxon from most areas it was known to occur and with good reason thought the Queensland animals were different from those on the central coast of New South Wales, as explicitly stated by them on page 5 of their paper Wells and Wellington (1985).

Unlike the Wüster gang, who have never stepped foot into a swamp in Eastern Australia to search for or inspect the relevant taxa, I have and on many occasions across a 50 year time span, having caught thousands of the relevant frogs from north of Cairns along the coast to southern New South Wales must agree with the conclusions of Wells and Wellington (1985) with regards to the relevant frogs.

I note herein that according to Duellman *et al.* (2016) the relevant species in the genus *Drymomantis* Peters, 1882 being the lineage of *Drymomantis fallax* Peters, 1882 and close relatives, diverged from their nearest living relatives assigned to other genera by 21.5 MYA, confiming the correct genus-level assignment by Wells and Wellington (1985).

The name *Drymomantis* was a creation of Wilhelm Karl Hartwich (or Hartwig) Peters, a prominent German herpetologist from the 1800's, not of Wells and Wellington (1985), as they only resurrected the name from synonymy, but the Wüster gang were blissfully unaware of this minor detail and so forced everyone else on the planet not to use the name as part of their "mafia" style attack on Wells and Wellington.

I however will not be cowed or intimidated by these anti-scientists and therefore correctly assign the relevant frogs to the genus *Drymomantis.*

At the species level of classification, Wells and Wellington were also correct.

James and Moritz (2000), published a molecular phylogeny for the putative species from the entire known range and confirmed the Wells and Wellington classification.

They found two major genetic lineages for the putative taxon, including an estimated 6 MYA divergence between the coastal New South Wales and east Queensland frogs (11.1-12.5 per cent sequence divergence of mtDNA), thereby confirming species level division between the two populations.

Furthermore James and Moritz (2000) found that the population from north of the Burdekin Gap, north Queensland and Kroombit Tops south-west of Gladstone, Queensland, had populations with a 5 percent sequence divergence (= 2.5 MYA), also warranting species-level recognition.

Those two species are therefore formally recognized and named herein.

The four species, until now usually treated all as *Drymomantis fallax* Peters, 1882 are readily separated from their nearest relatives and congeners, *D. cooloolensis* (Liem, 1974); the similar *D. northstradbrokensis sp. nov.* and *D. olongburensis* (Liem and Ingram, 1977) by morphology. Same applies in terms of the morphologically similar species most widely known as "*Litoria bicolor* (Gray, 1842)" (e.g. Cogger, 2014), but herein placed in the new genus *Maxinehoserranae gen. nov..*

Duellman *et al.* (2016) found a divergence of the so-called *bicolor* species group of 21.5 MYA from the genus *Drymomantis* making separate genus-level recognition an obvious judgement.

The morphologically similar species *Drymomantis fallax* Peters, 1882 from coastal Queensland south of the Burdekin River, North Queensland, just into north-east New South Wales and excluding Kroombit Tops, *D. ausviridis sp. nov.* from the wet tropics of North Queensland, *D. celantur sp. nov.* from Kroombit Tops,

south-west of Gladstone, Queensland and *D. glauerti* (Copland, 1957) from New South Wales and just into south-east Queensland are all readily separated from the species *D. cooloolensis* (Liem, 1974), *D. northstradbrokensis sp. nov.*, *D. olongburensis* (Liem and Ingram, 1977) and *Maxinehoserranae bicolor* (Gray, 1842) including associated similar species formerly included within *M. bicolor* by the following unique combination of characters:

Dorsal colour uniformly green or brownish (not obviously bicoloured); web of first toe reaches base of disc; posterior of thighs orange; IN/EN and HW/HL ratio is less than 1.000; no dark brown spots or reticulations of any form and no purplish-brown femoral streak bordering the dorsal green colour of the thigh (this colour configuration as seen in *D. cooloolensis* (Liem, 1974) and *D. northstradbrokensis sp. nov.*); no extremely pointed snout with a distinct, slightly upturned rostrum, with upper jaw protruding rostrum (as seen in *D. oblongburensis*).

While all of *D. fallax*, *D. ausviridis sp. nov., D. celantur sp. nov.* and *D. glauerti* are morphologically similar and also variable in colouration within a single population, there are consistent differences in terms of character suites that separate all from one another.

The four species are separated from one another as follows:

D. fallax has a brown iris, with a slight reddish tinge, the dark brown line running from nostril to eye is bounded on both sides by a light brown border; scattered raised tubercles on the forelimbs are obvious.

D. glauerti has a brown iris, numerous indistinct tubercles on the forelimbs and the line running from nostril to eye is not bordered by a lighter brown border and is otherwise well defined and sharp edged.

D. ausviridis sp. nov. has a red iris and tiny white spots on the upper hind limbs. The line between the nostril and the eye has indistinct upper and lower boundaries.Tubercles on the forelimbs are so small as to be effectively invisible.

D. celantur sp. nov. has scattered tiny raised white tubercles on the front limbs, an ill-defined line from nostril to eye, a brown iris and often has indistinct blotches or flecks arranged longitudinally down the back. The white line commencing on the upper-lip below the eye, that runs across the forelimb and along the lower side of the flank is particularly well defined.

D. ausviridis sp. nov. in life is depicted in Vanderduys (2012) on page 40 at bottom left and Anstis (2013) on page 200 on the right (2 images).

D. fallax in life is depicted in Vanderduys (2012) on page 40 at bottom right.

D. glauerti in life is depicted in Cogger (2014) on page 164 bottom right and in Anstis (2013) on page 203 top left (2 images).

Photos of all of *D. ausviridis sp. nov.*, *D. fallax*, *D. glauerti* and *D. celantur sp. nov.* can be found at http://www.flickr.com

By doing a search for “Litoria fallax”.

Distribution: *D. ausviridis sp. nov.* occurs on Cape York in Queensland, generally north of the Burdekin River gap, a well defined biogeographical barrier separating this taxon from the species *D. fallax* Peters, 1882 found south of there along the Queensland coast to the NSW Queensland border south of which the similar species *D. glauerti* (Copland, 1957) occurs, further down the coast and adjacent ranges to southern New South Wales.

This means *D. ausviridis sp. nov.* is found along the Queensland coast and ranges from Townsville, north to include the wet tropics region, but not including drier parts of Cape York further north.

Etymology: Named in refection of where the frog is found (Australia) and the dorsal colour, usually being a bright emerald green (hence “aus” and “viridis” = “ausviridis”).

DRYMOMANTIS CELANTUR SP. NOV.

LSIDurn:lsid:zoobank.org:act:230275D2-ACA8-4803-AA4B-CE6B0CF65211

Holotype: A preserved adult male specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J86217 collected at Kroombit Creek at the crossing of Kroombit Forest Drive, Kroombit Tops National Park, south-west of Gladstone, Queensland, Australia, Latitude -24.3842 S., Longitude 151.0014 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J42175 collected at Kroombit Tops, south-west of Gladstone, Queensland, Australia, Latitude -24.3667 S., Longitude 151.0167 E.

Diagnosis: The putative species defined as “*Litoria fallax* (Peters, 1882)” as defined and separated from other species by Cogger (2014) and Anstis (2013) is found along the coast and ranges from southern New South Wales along the east Australian coast to the northern edge of the wet tropics in far north Queensland.

That putative taxon is treated herein as four morphologically similar species.

The four species, until now usually treated all as *Drymomantis fallax* Peters, 1882 are readily separated from their nearest relatives and congeners, *D. cooloolensis* (Liem, 1974); the similar *D. northstradbrokensis sp. nov.* and *D. olongburensis* (Liem and Ingram, 1977) by morphology. Same applies in terms of the morphologically similar species group most widely known as “*Litoria bicolor* (Gray, 1842)” (e.g. Cogger, 2014), but herein placed in the new genus *Maxinehoserranae gen. nov.*.

Duellman *et al.* (2016) found a divergence of the so-called *bicolor* species group of 21.5 MYA from the genus *Drymomantis* making separate genus-level recognition an obvious judgement.

The morphologically similar species *Drymomantis fallax* Peters, 1882 from coastal Queensland south of the Burdekin River, North Queensland, just into north-east New South Wales and excluding Kroombit Tops, *D. ausviridis sp. nov.* from the wet tropics of North Queensland, *D. celantur sp. nov.* from Kroombit Tops, south-west of Gladstone, Queensland and *D. glauerti* (Copland, 1957) from New South Wales and just into south-east Queensland are all readily separated from the species *D. cooloolensis* (Liem, 1974), *D.*

northstradbrokensis sp. nov., *D. olongburensis* (Liem and Ingram, 1977) and *Maxinehoserranae bicolor* (Gray, 1842) by the following unique combination of characters: Dorsal colour uniformly green or brownish (not obviously bicoloured); web of 1st toe reaches base of disc; posterior of thighs orange; internarial/eye-naris distance and head-width/head-length ratio is less than 1; no dark brown spots or reticulations of any form and no purplish-brown femoral streak bordering the dorsal green colour of the thigh (this colour configuration as seen in *D. cooloolensis* (Liem, 1974) and *D. northstradbrokensis sp. nov.*); no extremely pointed snout with a distinct, slightly upturned rostrum, with upper jaw protruding rostrum (as seen in *D. oblongburensis*).

While all of *D. fallax*, *D. ausviridis sp. nov., D. celantur sp. nov.* and *D. glauerti* are morphologically similar and also variable in colouration within a single population, there are consistent differences in terms of character suites that separate all from one another. The four species are separated from one another as follows:

D. fallax has a brown iris, with a slight reddish tinge, the dark brown line running from nostril to eye is bounded on both sides by a light brown border; scattered raised tubercles on the forelimbs are obvious.

D. glauerti has a brown iris, numerous indistinct tubercles on the forelimbs and the line running from nostril to eye is not bordered by a lighter brown border and is otherwise well defined and sharp edged.

D. ausviridis sp. nov. has a red iris and tiny white spots on the upper hind limbs. The line between the nostril and the eye has indistinct upper and lower boundaries. Tubercles on the forelimbs are so small as to be effectively invisible.

D. celantur sp. nov. has scattered tiny raised white tubercles on the front limbs, an ill-defined line from nostril to eye, a brown iris and often has indistinct blotches or flecks arranged longitudinally down the back. The white line commencing on the upper-lip below the eye, that runs across the forelimb and along the lower side of the flank is particularly well defined.

D. ausviridis sp. nov. in life is depicted in Vanderduys (2012) on page 40 at bottom left and Anstis (2013) on page 200 on the right (2 images).

D. fallax in life is depicted in Vanderduys (2012) on page 40 at bottom right.

D. glauerti in life is depicted in Cogger (2014) on page 164 bottom right and in Anstis (2013) on page 203 top left (2 images).

Photos of all of *D. ausviridis sp. nov.*, *D. fallax*, *D. glauerti* and *D. celantur sp. nov.* can be found at http://www.flickr.com

By doing a search for “Litoria fallax”.

Distribution: Currently *D. celantur sp. nov.* is only known from Kroombit Tops National Park in Queensland, Australia and based on an absence of Museum voucher specimens of these frogs from the periphery of this highland reserve, it is most probably restricted to this area. A similar situation exists at Kroombit Tops for other climatically confined taxa.

Etymology: Celantur in Latin means concealed and this species has been effectively concealed from science for longer than it should have been.

DRYMOMANTIS NORTHSTRADBROKENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:9DE222E5-C9E8-430E-AF71-3C6BD6C0F2CF

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27569 collected at Tortoise Lagoon, North Stradbroke Island, Queensland, Australia, Latitude -27.5183 S., Longitude 153.4728 E.

This government-owned facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27558 collected at Blue Lake, North Stradbroke Island, Queensland, Australia, Latitude -27.5303 S., Longitude 153.4764 E. 2/ A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J81495, collected at Swallow Lagoon, North Stradbroke Island, Queensland, Australia, Latitude -27.4989 S., Longitude 153.4547 E.

Diagnosis: Until now, *Drymomantis northstradbrokensis sp. nov.* from North Stradbroke Island, east of Brisbane in Queensland, Australia, has been treated as a southern population of *D. cooloolensis* (Liem and Ingram, 1977), with a type locality of Cooloola, Queensland, Australia.

However the two species are morphologically divergent and this has been known for some time and hence it being formally named herein.

D. cooloolensis is restricted to Cooloola and nearby Fraser Island, Queensland (Cogger, 2014), while *D. northstradbrokensis sp. nov.* is known only from North Stradbroke Island, East of Brisbane, Queensland.

Both species are separated from all other species within the genera *Drymomantis* Peters, 1882 and

the morphologically similar *Maxinehoserranae gen. nov.* (known as the “*Litoria bicolor* group” to most herpetologists as of 2020) by the following unique suite of characters: The green dorsum has numerous brown spots and reticulations (versus none or very few in all morphologically similar Australian species); absence of a brown or grey head streak between nostril and eye (present in all morphologically similar Australian species); the tympanum is always green; there is a purplish-brown streak along the upper thigh (absent or obscure in all morphologically similar Australian species); internarial/eye-naris distance and head-width/head-length ratio is less than 1 (versus less than 1 in all morphologically similar Australian species).

Adult *D. northstradbrokensis sp. nov.* are readily separated from adult *D. cooloolensis* by having an orange iris (versus grey/brown in *D. cooloolensis*) and a dorsum where the spots or flecks are ill-defined and subdued, versus obvious and distinct in *D. cooloolensis.* In *D. northstradbrokensis sp. nov.* the white line from the back of the upper-lip over the forelimb to the lower flank is obvious and distinct, versus indistinct and often broken in *D. cooloolensis.*

Photos of both *D. northstradbrokensis sp. nov.* and *D. cooloolensis*, side-by-side in life can be found in Cogger (2014), page 158, with *D. northstradbrokensis sp. nov.* on right, Vanderduys (2012) on page 31 with *D. northstradbrokensis sp. nov.* on left and in Anstis (2013) on page 173, with *D. northstradbrokensis sp. nov.* on left.

NYCTIMYSTINI TRIBE NOV.

***NYCTIMYSTES* STEJNEGER, 1916.**

Type species: *Nyctimantis papua* Boulenger, 1897.

Diagnosis: The genus *Nyctimystes* Stejneger, 1916 has in the past 3 decades undergone significant revision and alteration by various authors.

Zweifel (1958) defined the genus as follows: "The genus *Nyctimystes* (family Hylidae) is defined as including those species that combine the following characteristics: pupil forming a vertical slit when closed, lower eyelid with pigmented venation, feet without elongate or opposable first digits."

Cogger (2014) had a similar diagnosis for the genus stating "Species of *Nyctimystes* are distinguished by their large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females."

With the preceding diagnosis in mind, Cogger (2014) removed the Australian species from *Nyctimystes* on the basis of recent phylogenetic studies and the fact that their pupils were in fact horizontally elliptical, in line with other Australian tree frogs.

With a divergence of 19.9 MYA from their nearest living relatives (according to Duellman *et al.* 2016), those species have been formally transferred to the newly erected genus *Gedyerana gen. nov.*.

However the preceding diagnosis applies to all of the six following genera, all relevant species of which until now, were included in the single genus *Nyctimystes.*

The other five newly erected genera are *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov..*

The diagnosis of all six genera, including of a narrower group of species now treated as the entirety of the genus *Nyctimystes* and the other five genera which are formally named within this paper for the first time is given below.

Duellman *et al.* (2016) expanded the genus *Nyctimystes* to include a clade of frogs with a divergence of 41 MYA from nearest living relatives, thereby including lineages of frogs previously included in the genus "*Litoria* Tschudi, 1838. However such deep divergence is more appropriate for tribe level in classification and not genus level. Hence the break up as indicated herein and/or throughout this paper in it's full state.

Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov.* are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov.* by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov.* are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Webpede subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with

relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc.

The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov.* as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov.* diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: New Guinea including nearby offshore islands on the continental shelf.

Content: *Nyctimystes papua* (Boulenger, 1897) (type species); *N. aspera sp. nov.*; *N. charlottae sp. nov.*; *N. doggettae sp. nov.*; *N. disruptus* Tyler, 1963; *N. georgefloydi sp. nov.*; *N. mondoensis sp. nov.*; *N. oktediensis* Richards and Johnston, 1993; *N. pulchra* (Wandolleck, 1910); *N. trachydermis* Zweifel, 1983; *N. tyleri* (Zweifel, 1983).

MAGNUMMANIBUS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:084E0A6D-0B8C-4521-8139-4E53BA85F70B

Type species: *Hyla pulchra* Wandolleck, 1910.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often

having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

For further detail see the diagnosis of the genus *Nyctimystes* above.

Frogs within *Magnummanibus subgen. nov*. are further diagnosed and separated from other morphologically similar species as follows: Moderately large 60 mm in snout-vent length frogs. Head very broad and flat; palpebral venation is a network of gold or dark brown lines with vertical-oblique orientation and frequent horizontal cross connections. Very long, prominent heel lappets. Dorsum varies in coliur and pattern, but is usually brownish. Venter is usually yellowish and mottled or speckled with darker pigment all over. Iris is dark to very dark brown.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov*. diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Distribution: Both north and south of the main cordillera in New Guinea.

Etymology: The name *Magnummanibus* is derived from the Latin meaning, which is “large hand” and is an obvious characteristic of the subgenus.

Content: *Nyctimystes* (*Magnummanibus*) *pulchra* (Wandolleck, 1910) (type species); *N.* (*Magnummanibus*) *charlottae sp. nov.*; *N.* (*Magnummanibus*) *doggettae sp. nov*.

ASPEROHYLA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:C7F57438-81FF-45EA-BB77-635BAACE1219

Type species: *Nyctimystes trachydermis* Zweifel, 1983.

Diagnosis: *Nyctimystes* Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

For further detail see the diagnosis of the genus *Nyctimystes* above.

Distribution: New Guinea from the Irian Jaya border, along the central ranges and nearby mountain ranges east to Milne Bay on both sides of the central cordillera.

Etymology: The subgenus name “Asperohyla” refers in Latin to the relevant species having a relative rough to touch skin on the dorsal surface and the fact that the said frogs are also tree frogs.

Content: *Nyctimystes* (*Asperohyla*) *trachydermis* Zweifel, 1983 (type species); *N.* (*Asperohyla*) *aspera sp. nov.*; *N.* (*Asperohyla*) *georgefloydi sp. nov.*.

NYCTIMYSTES* (*NYCTIMYSTES*) *MONDOENSIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:72AF2EBA-F8B9-46B2-844C-3B6F88E0400B

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A 21816 collected at Mondo, elevation 5000 feet (1524 m.) on the north slope of Mt. Tafa, Papua New Guinea, Latitude -8.6333 S., Longitude 147.1833 E.

This facility allows access to its holdings.

Paratypes: Three preserved specimens at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen numbers MCZ A 21817-21820 collected at Mondo, elevation 5000 feet (1524 m.) on the north slope of Mt. Tafa, Papua New Guinea, Latitude -8.6333 S., Longitude 147.1833 E.

Diagnosis: *Nyctimystes mondoensis sp. nov.* is similar in most respects to *N. papua* (Boulenger, 1897) and would key out as that species as seen in Zweifel (1958). Both species are separated from all other species in the genus *Nyctimystes* Stejneger, 1916 by having palpebral venation that is relatively weak and disconnected, sometimes virtually absent (versus distinct in all other species); outer fingers with only a basal web or not much greater and male without vocal-sac openings and adult size usually between 50-60 mm in snout-vent length.

Nyctimystes mondoensis sp. nov. is separated from *N. papua* by having a semi-distinct pigmentation, with diagonal lines, occasionally interconnected, over three-quarters of the palpebral area (versus almost absent in *N. papua*), moderate finger webbing (versus little in *N. papua* and a lot in the related species *N. disruptus* Tyler, 1963 and *N. oktediensis* Richards and Johnston, 1993) relatively shorter legged than *N. papua* and a greater EN distance (over 5.8 mm) than in *N. papua* (below 5.7 mm).

Distribution: *Nyctimystes mondoensis sp. nov.* is known only from the type locality, but probably occurs more widely on the northern side of the Owen Stanley Range in south-east New Guinea.

Etymology: Named in reflection of the type locality.

NYCTIMYSTES* (*MAGNUMMANIBUS*) *CHARLOTTAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:37FE756E-47A1-4ACC-9A10-21AFD84CCE49

Holotype: A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-110420, collected at Olsobip at an elevation of 1,500 feet, Western Province, Papua New Guinea, Latitude -5.3895 S., Longitude 141.5153 E.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-95510 collected at Imigabip, at an elevation of 4,200 feet, Western Province, Papua New Guinea, Latitude -5.2898 S., Longitude 141.5018 E.

2/ A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-110442, collected at Wangbin at an elevation of 4,800 feet, Western Province, Papua New Guinea, Latitude -5.2518 S., Longitude 141.2412 E.

3/ A preserved specimen at the Museum of Comparative Zoology, Harvard University in Cambridge, Massachusetts, USA, specimen number MCZ A-87137 collected at Kavorabip, elevation 5,000 feet, Western Province, Papua New Guinea, Latitude -5.1301 S., Longitude 141.1148 E.

Diagnosis: *Nyctimystes* (*Magnummanibus*) *charlottae sp. nov.* and *N. doggettae sp. nov.* have both until now been treated as populations of the species *N. pulchra* (Wandolleck, 1910).

All would until now have been identified as that species via the information given in Menzies (2006).

These three species, constituting all frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Males grow to 70 mm in body length and females to 80 mm. The body is slender and the head broad and flat with large foreward facing eyes. The venation on the eyelid forms a network of dark brown lines oriented in a vertical/ oblique direction.

The three species *N. charlottae sp. nov.* from south of the central cordillera in New Guinea, *N. doggettae sp. nov.* from the Milne Bay region of Papua New Guinea and *N. pulchra* from Madang and nearby parts of the north of New Guinea are all readily separated from one another on the basis of colour.

N. pulchra has a dorsum that is plain medium to dark brown with whitish or yellowish lichen-like spots or mottled tan to medium dark brown; flanks bluish mottled with darker or yellowish brown, speckled black; concealed surfaces of thighs bluish, mottled brown; ventral surface yellowish, mottled or speckled dark all over. Iris is dark brown.

N. charlottae sp. nov. is brown or olive brown above, with orange blotches; flanks mottled bluish or yellowish, speckled black; concealed surfaces of thighs greenish blue, with dark reticulum; entire ventral surface is yellowish, mottled or speckled dark all over. The iris is a very dark brown.

N. doggettae sp. nov. is chocolate brown above with irregular indistinct blotches of lighter brown breaking up the darker dorsum. At the rear of the back on the dorsum are areas of light yellowish-brown, more or less in the central region of the rear of the back. The thin dark and light bands on the upper surfaces of the upper and lower hind legs are very well defined (as opposed to being ill-defined or absent in the other two species). Prominent in this species are scattered white tipped tubercles on the back, which are either absent, or small and ill-defined in the other two species. Iris is a very dark brown.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera (*Magnummanibus subgen. nov.* and *Nyctimystes*) and by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Distribution: *N. charlottae sp. nov.* is found in high elevation regions south of the central cordillera in New Guinea, including in both Papua New Guinea and Indonesia.

Etymology: The species is named in honour of Charlotte Doggett of Ringwood East, Victoria, this species being named after her first name, in recognition of her services to wildlife conservation in assisting the team at Australia's best reptiles shows and Snakebusters.

NYCTIMYSTES* (*MAGNUMMANIBUS*) *DOGGETTAE SP. NOV.

LSIDurn:lsid:zoobank.org:act:57D5C8C1-66AB-423A-8CC2-834654F48FFB

Holotype: A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 11032, collected at Iana River, 3.8 km West of Agaun, Papua New Guinea, Latitude -9.876 S., Longitude 149.352 E.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 17045 collected at Uga River, Papua New Guinea, Latitude -10.0245 S., Longitude 149.59 E.

2/ A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 39561 collected at Binigua, Papua New Guinea, Latitude -9.7071. S., Longitude 149.25 E.

Diagnosis: *Nyctimystes* (*Magnummanibus*) *doggettae sp. nov.* and *N. charlottae sp. nov.* have both until now been treated as populations of the species *N. pulchra* (Wandolleck, 1910).

All would until now have been identified as that species via the information given in Menzies (2006).

These three species, constituting all frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Males grow to 70 mm in body length and females to 80 mm. The body is slender and the head broad and flat with large foreward facing eyes. The venation on the eyelid forms a network of dark brown lines oriented in a vertical/ oblique direction.

The three species *N. doggettae sp. nov.* from the Milne Bay region of Papua New Guinea, *N. charlottae sp. nov.* from south of the central cordillera in New Guinea and *N. pulchra* from Madang and nearby parts of the north of New Guinea are all readily separated from one another on the basis of colour.

N. pulchra has a dorsum that is plain medium to dark brown with whitish or yellowish lichen-like spots or mottled tan to medium dark brown; flanks bluish mottled with darker or yellowish brown, speckled black; concealed surfaces of thighs bluish, mottled brown; ventral surface yellowish, mottled or speckled dark all over. Iris is dark brown.

N. doggettae sp. nov. is chocolate brown above with irregular indistinct blotches of lighter brown breaking up the darker dorsum. At the rear of the back on the dorsum are areas of light yellowish-brown, more or less in the central region of the rear of the back. The thin dark and light bands on the upper surfaces of the upper and lower hind legs are very well defined (as opposed to being ill-defined or absent in the other two species). Prominent in this species are scattered white tipped tubercles on the back, which are either absent, or small and ill-defined in the other two species. Iris is a very dark brown.

N. charlottae sp. nov. is brown or olive brown above, with orange blotches; flanks mottled bluish or yellowish, speckled black; concealed surfaces of thighs greenish blue, with dark reticulum; entire ventral surface is yellowish, mottled or speckled dark all over. The iris is a very dark brown.

Nyctimystes Stejneger, 1916 are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera (*Magnummanibus subgen. nov.* and *Nyctimystes*) and by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Distribution: *N. doggettae sp. nov.* is found in the Milne Bay region of Papua New Guinea.

Etymology: The species is named in honour of Charlotte Doggett of Ringwood East, Victoria in recognition of her services to wildlife conservation in assisting the team at Australia's best reptiles shows and Snakebusters. In this case the species name is taken from her last name (*N. doggettae sp. nov.*) as opposed to the first, which was the case for the previous species (*N. charlottae sp. nov.*) also named in her honour.

NYCTIMYSTES* (*ASPEROHYLA*) *ASPERA SP. NOV.

LSIDurn:lsid:zoobank.org:act:E9912B48-3433-4D33-A6D8-D918AE430260

Holotype: A preserved specimen at the American Museum of Natural History, Manhattan, New York, USA, herpetology collection, specimen number 103184 collected at Nipa, Southern Highlands Province, Papua New Guinea, Latitude 6.1272 S., Longitude 143.4203 E. This facility allows access to its holdings.

Paratypes. Four preserved specimens at the American Museum of Natural History, Manhattan, New York, USA, herpetology collection, specimen number 103185-8 collected at Nipa, Southern Highlands Province, Papua New Guinea, Latitude 6.1272 S., Longitude 143.4203 E.

Diagnosis: Both species, *Nyctimystes* (*Asperohyla*) *aspera sp. nov.* and *N. georgefloydi sp. nov.* have until now been treated as populations of *N. trachydermis* Zweifel, 1983 and as a trio form the entirety of the subgenus *Asperohyla subgen. nov..*

The three species *N. trachydermis* Zweifel, 1983 from the Bowutu Mountains in Morobe Province, Papua New Guinea, *N. aspera sp. nov.* from the Southern Highlands Province of Papua New Guinea and *N. georgefloydi sp. nov.* from south-flowing watersheds in the Owen Stanley Range, Central Province of Papua New Guinea can all be separated as follows.

N. trachydermis has a dorsal ground color that is brown in life, with a pale tan area on the top of the snout, continuous along the outer edge of the eyelids with an elongate patch of the same color on the right side and slightly separated from a similar, shorter patch on the left. Smaller, irregularly shaped areas of the same light color are present on the hind limbs and lower back.

The upper lip is edged with yellowish tan, but with the upper edge of that color ill defined.

The dorsal patterning just described may be prominent or indistinct.

The iris is reddish brown, with the conspicuous vertical pupil narrowly edged in yellow. The supratympanic ridge is moderately well-defined. Tubercles are significantly enlarged on the lower flanks.

N. aspera sp. nov. is similar in most respects to *N. trachydermis* but differs in not having significantly enlarged tubercles on the lower flanks and prominent whitish markings on the upper toes.

N. georgefloydi sp. nov. is similar in most respects to *N. trachydermis* and *N. aspera sp. nov.* but differs in not having significantly enlarged tubercles on the lower flanks, no prominent whitish markings on the upper toes, a dorsum that is generally unmarked in any way and a distinctive dark brown colour with strong green peppering all over, giving it an obvious dark greenish hue; no markings on snout or upper lip and a very strongly developed supratympanic ridge.

In *N. trachydermis* and *N. aspera sp. nov.* the back of forearm tubercles are large, prominent and closely spaced, sometimes forming a fold or ridge, whereas in *N. georgefloydi sp. nov.* the tubercles are well spaced and smaller.

N. trachydermis in life is depicted in Zweifel (1983) at fig. 10.

N. georgefloydi sp. nov. in life is depicted in Menzies (2006) at plate 96.

Distribution: *N. aspera sp. nov.* is known from the Southern Highlands Province of Papua New Guinea.

Etymology: The species name “Aspera” in Latin refers to the species being rough to touch.

NYCTIMYSTES* (*ASPEROHYLA*) *GEORGEFLOYDI SP. NOV.

LSIDurn:lsid:zoobank.org:act:3711B439-F2E6-4FA8-B210-3E6556B9FAE1

Holotype: A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 19446 collected at Mount Obree, Central Province, Papua New Guinea, Latitude -9.46014 S., Longitude 148.03 S.

This facility allows access to its holdings.

Paratypes: 8 preserved specimens at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number BPBM Herp 18181, 19447, 19448, 19450, 19451, 19453, 19455 and 19457 all from Mount Obree, Central Province, Papua New Guinea, Latitude -9.46014 S., Longitude 148.03 S.

Diagnosis: Both species, *Nyctimystes* (*Asperohyla*) *georgefloydi sp. nov.* and *N. aspera sp. nov.* have until now been treated as populations of *N. trachydermis* Zweifel, 1983 and as a trio form the entirety of the subgenus *Asperohyla subgen. nov.*.

The three species *N. trachydermis* Zweifel, 1983 from the Bowutu Mountains in Morobe Province, Papua New Guinea, *N. aspera sp. nov.* from the Southern Highlands Province of Papua New Guinea and *N. georgefloydi sp. nov.* from south-flowing watersheds in the Owen Stanley Range, Central Province of Papua New Guinea can all be separated as follows.

N. trachydermis has a dorsal ground color that is brown in life, with a pale tan area on the top of the snout, continuous along the outer edge of the eyelids with an elongate patch of the same color on

the right side and slightly separated from a similar, shorter patch on the left. Smaller, irregularly shaped areas of the same light color are present on the hind limbs and lower back. The upper lip is edged with yellowish tan, but with the upper edge of that color ill defined.

The dorsal patterning just described may be prominent or indistinct.

The iris is reddish brown, with the conspicuous vertical pupil narrowly edged in yellow. The supratympanic ridge is moderately well-defined. Tubercles are significantly enlarged on the lower flanks.

N. aspera sp. nov. is similar in most respects to *N. trachydermis* but differs in not having significantly enlarged tubercles on the lower flanks, prominent whitish markings on the upper toes and a very strongly developed supratympanic ridge.

N. georgefloydi sp. nov. is similar in most respects to *N. trachydermis* and *N. aspera sp. nov.* but differs in not having significantly enlarged tubercles on the lower flanks, no prominent whitish markings on the upper toes, a dorsum that is generally unmarked in any way and a distinctive dark brown colour with strong green peppering all over, giving it an obvious dark greenish hue; no markings on snout or upper lip and a very strongly developed supratympanic ridge.

In *N. trachydermis* and *N. aspera sp. nov.* the back of forearm tubercles are large, prominent and closely spaced, sometimes forming a fold or ridge, whereas in *N. georgefloydi sp. nov.* the tubercles are well spaced and smaller.

N. trachydermis in life is depicted in Zweifel (1983) at fig. 10.

N. georgefloydi sp. nov. in life is depicted in Menzies (2006) at plate 96.

Distribution: *N. georgefloydi sp. nov.* is known from south-flowing watersheds in the Owen Stanley Range, Central Province of Papua New Guinea**.**

Etymology: The species is named in honour of the late George Floyd, a victim of an unprovoked attack by four thug police officers at Powderhorn, in downtown Minneapolis, USA, on 25 May 2020.

Floyd was bashed by four Police Officers, Derek Chauvin, Thomas Kane, Tou Thao and J. Alexander Jueng. The attack was apparently led by Derek Chauvin who in the final moments put his knee on top of Floyd’s neck and killed him by blocking his airways by maintaining the blockage for at least 8 minutes (Bungard *et al.* 2020).

The viciously subdued Floyd, was lying handcuffed, face-down on the bitumen of the city street.

There is no doubt Chauvin would have got away with the murder were it not for the fact that his vicious attack was filmed by members of the public from at least three different angles.

After the videos were posted on the internet, public

protests globally caused the Minneapolis Police department to stand the four officers down, but within days, the police were blaming the victim, alleging the death was caused by pre-existing medical conditions and not the police actions.

Floyd died after Derek Chauvin put his weight on top of Floyd's neck for more than eight minutes causing his death. Two other police were also on top of the handcuffed Floyd face-down with their body weight on his lower body causing further pain and suffering, while a third, heavily armed officer made sure that no members of the public intervened to stop the vicious attack.

During this time, Floyd repeatedly asked the thug police officer Chauvin to get off him and at least fifteen times Floyd said "I can't breath".

One bystander told officers they needed to let him breathe. Another yelled at them to check the man's pulse (Forliti and Baenen 2020). They were herded away from the scene by one of the police officers.

Chauvin only removed his body from on top of Floyd after it was clear Floyd was non-responsive and dead.

Prior to this part of the attack being filmed by bystanders from both sides of the car, as well as two CCTV cameras that also caught footage of the police bashing Floyd on the back seat of the police car, after which the attack was continued with Floyd being removed from the police car with his face slammed onto the hard road surface.

What a viewing of the video shows is that Chauvin was not just a single rogue cop.

The four officers were working as a well organised team, all knowing their well-defined roles and working together. Two were full body weight down holding handcuffed Floyd onto the bitumen, without which, Chauvin would not have been in a position to be able to put his foot on a fully restrained Floyd to suffocate and kill him. The fourth police officer as part of the team aggressively pushed, shoved and threatened concerned bystanders who wanted to assist the clearly severely injured and dying Floyd.

Derek Chauvin has also used his proceeds of crime to amass a huge property portfolio spanning the United States from California to Florida, which at this stage seems safe and not likely to be seized on behalf of his many victims.

State police were guarding his assets from demonstrators to ensure none were attacked.

Floyd is one of millions of victims of police violence and brutality and his death sparked massive demonstrations of solidarity across the United States in over 30 major cities and other parts of the world including London, Berlin, Sydney and Melbourne.

Police buildings in California, Minnesota and Washington were torched as were countless police cars.

The government-controlled media in the United States and Australia, including the Murdoch Press and CNN, tried to paint the protests as black people versus white people (see for example Bolt 2020), but this was never the case.

Most of the protestors were in fact white people!

The protest was against police corruption, police brutality, police lies and dishonesty and the destruction of innocent people's lives, with murder being the most serious crime committed against a fellow human being, but most certainly not the only crime being perpetrated by police and associated corrupt government employees.

The United States in law has a "death penalty" and there as never a better case in which to apply this penalty for a crime than arising from the murder of the unarmed and handcuffed George Floyd by Derek Chauvin.

Chauvin, had been subject of at least 18 previous complaints against him since 2001 and all were systematically whitewashed by the Minneapolis Police Department.

Had the law been properly applied in the first place, George Floyd would not have been murdered by Derek Chauvin.

In terms of the 4 corrupt police who killed Chauvin, the corruption did not stop there.

The response of the Minneapolis Police Department was also coordinated to minimize damage to their murderer cops from the outset.

Following a massive public uprising that caused over 30 police cars to be destroyed and a major Minneapolis Police Station torched and burnt to the ground, the Mineapolis Police charged Derek Chauvin with "third degree murder". The other three co-murderers were not charged!

In fact they were quietly shifted out of town with full police protection.

This degree of murder is a low-level of murder in US law. It borders on accidental murder, whereas first degree is a planned killing.

However in line with such matters there is also little doubt that the case will be sabotaged and Chauvin will walk free in the same way that police who got caught on video bashing Rodney King in Los Angeles 3 March 1991.

This will be treated as a green light for more like-minded law-enforcement people to conduct similar acts of brutality, lies, deception and murder in the future to destroy the lives of yet more innocent victims.

Indication of the final result came when the Minnesota Police department released their "official" autopsy report which claimed that Floyd had in fact died of "Coronavirus" and not the bashing, with his death at the time of the bashing being nothing more than an unfortunate coincidence.

So when you have 4 bad cops and a department with 10,000 other cops who do nothing to stop the corruption, lies and violence, you have an entire police department that is corrupt! That is 10,004 bad cops!

Meanwhile the USA President, Donald Trump got onto "Twitter" and tweeted to State Governors to get police to start shooting protesters, an instruction many actually followed, adding a few dozen more people to the USA death toll of people killed and maimed by their police, already pumped up with over 100,000 coronavirus deaths in the USA at the time Floyd was murdered.

In the USA victims of police violence and corruption now have the chants "I can't breathe" and "George Floyd, say his name!"

Australian victims of police violence and corruption say "lest we forget" which was a line borrowed from Nazi Holocaust survivors. See also the etymology for *Kumanjayiwalkerus kumanjayi sp. nov*. in this paper.

ALBOGIBBA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:CAA18748-21DC-4A71-859D-567F6548FB8D

Type species: *Hyla humeralis* Boulenger, 1912.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections.

A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique “reticulated” palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of

the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc. The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov*. diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov*. as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov*. diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: Distributed on the northern and southern flanks of the central mountain ranges of New Guinea, from approximately 138 deg E. to 147 deg E., New Guinea, usually at 600-1700 metres elevation.

Etymology: "*Albogibba*" in Latin means "white lumps", with the small raised white tipped tubercles or lumps on the lower flanks being characteristic of the type species.

Content: *Albogibba humeralis* (Boulenger, 1912) (type species); *A. granti* (Boulenger, 1914); *A. ingens sp. nov.*; *A. zweifeli* (Tyler, 1967).

RATIOBRUNNEIS SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:AFD879FD-2C28-4032-9975-342A10E36B55

Type species: *Nyctimystes zweifeli* Tyler, 1967.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present.

The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the

mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc. The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov.* as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov.* diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: The two species in the subgenus *Ratiobrunneis subgen. nov.* are known from West Sepik,

Chimbu, Southern Highlands and Western Provinces (Papua New Guinea) as well as on the Utakwa River, Eipomek (Papua, Indonesia).

Etymology: In Latin "*Ratiobrunneis*" means brown pattern, which is exactly the character state of the dorsal surface of these frogs.

Content: *Badiohyla* (*Ratiobrunneis*) *zweifeli* (Tyler, 1967) (type species); *B.* (*Ratiobrunneis*) *granti* (Boulenger, 1914).

ALBOGIBBA* (*ALBOGIBBA*) *INGENS SP. NOV.

LSIDurn:lsid:zoobank.org:act:DFF9FB1D-9B0B-4AB3-B787-188F6417AB0A

Holotype: A preserved specimen at the American Museum of Natural History, Manhatten, New York, USA, reptile collection, specimen number AMNH 49691 collected from 6 kilometers southwest of the Bernhard Camp, 1200 meters, Idenburg River region, Irian Jaya, Indonesia, Latitude -3.48 S., Longitude 139.2 E.

This facility allows access to its holdings.

Paratypes: Two preserved specimens at the American Museum of Natural History, Manhatten, New York, USA, reptile collection, specimen numbers AMNH 49695 and AMNH 49697 collected from 4 kilometers southwest of the Bernhard Camp, 1200 meters, Idenburg River region, Irian Jaya, Indonesia, Latitude -3.48 S., Longitude 139.2 E.

Diagnosis: *Albogibba ingens sp. nov*. has until now been treated as a north-west population of *A. humeralis* (Boulenger, 1912), known in most texts as *Nyctimystes humeralis* (e.g. Zweifel 1958 or Menzies 2006).

Both would key out as *A. humeralis* in both Zweifel (1958) or Menzies (2006).

A. ingens sp. nov. is readily separated from *A. humeralis* by the following suite of characters: Iris is reddish-brown; white tubercles on the flanks are broad and blunt in profile and sometimes yellowish instead of white; flanks and venter are white or yellow; upper lip has a thick yellow or white bar of consistent thickness running from tip of snout along top of mouth; fingers yellow or white and toes orangeish. Dorsum usually a brilliant emerald green. Dorsum and legs smooth and covered with numerous tiny evenly spaced granules. Forearms have numerous tubercles.

By contrast *A. humeralis* has a brown iris; white tubercles on flanks are not broad or flattened, but well defined and more-or-less conical in shape or pointed. There is no thick yellow bar of consistent thickness running from tip of snout along top of mouth, but instead either simply the normal greenish colour of the upper surface, or sometimes a very thin, narrow white edge (hairline). Toes are greenish and pads light green or sometimes yellowish in males. Venter is whitish. Dorsum varies in colour, but is invariably green, sometimes with indistinct mottling and only sometimes covered with numerous tiny evenly spaced granules.

Forearms not with numerous tubercles.

Both *A. ingens sp. nov.* and *A. humeralis* sometimes have scattered yellow spots or rings on the dorsum and sometimes a red, brown or violet flush on the flanks. Males usually have a yellowish throat, versus cream or white in females.

Both *A. ingens sp. nov.* and *A. humeralis* comprising the entirety of the nominate subgenus *Albogibba gen. nov.* are separated from the two species in the other subgenus *Ratiobrunneis subgen. nov*. by the following: Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus (these two species), the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm).

These characters also separate *A. ingens sp. nov.* and *A. humeralis* from all other tree frogs in Australia and New Guinea.

Ratiobrunneis subgen. nov. are similar in most respects to *A. ingens sp. nov.* and *A. humeralis* but are separated as follows: Male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks.

Photos of a male *A. ingens sp. nov.* in life from near the type locality can be found at:

https://www.naturepl.com/stock-photo-tree-frog-nature-image01361627.html

and

https://timlaman.photoshelter.com/image/I0000WOJyFmCZ70g

A photo of a female *A. humeralis* in life can be found in Menzies (1976) on plate 8 at top left and Menzies (2006) at photo 90 (same image).

Distribution: *A. ingens sp. nov.* is distributed on the northern side of the central cordillera of New Guinea west of the Huon Peninsula in Papua New guinea, at least as far west as the Mamberamo River in Irian Jaya. *A. humeralis* occurs south of the central cordillera, including in Central Province, Papua New guinea.

Etymology: "*Ingens*" is Latin for "huge", or "big". As the adults of this species are very large, the species name is appropriate.

OCCULTATAHYLA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:1CDD42D2-B7BC-4F75-ABF0-F57A8383CFC2

Type species: *Nyctimystes semipalmata* Parker, 1936.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin.

Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen.*

nov., *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Webpede subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique “reticulated” palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc.

The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to

vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov*. diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov*. as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov*. diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: New Guinea and immediately adjacent islands on the continental shelf.

Etymology: In Latin, “Occultata” means “hidden”, and with “*Hyla*” meaning “tree frog”, the genus name in effect means hidden tree frog. This reflects the excellent camoflague in the wild state of these species.

Content: *Occultatahyla semipalmatus* (Parker, 1936) (type species); *O. avocalis* (Zweifel, 1958); *O. daymani* (Zweifel, 1958); *O. fluviatilis* (Zweifel, 1958); *O. foricula* (Tyler, 1963); *O. perimetri* (Zweifel, 1958); *O. rueppelli* (Boettger, 1895).

WEBPEDE SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:96A567B5-A1A4-44DF-8336-6B97080036D8

Type species: *Hyla rueppelli* Boettger, 1895.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters: Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Webpede subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections. Fingers with much webbing, the outer finger webbed almost to disc.

According to Duellman *et al.* (2016), *Occultatahyla gen. nov*. diverged 16.7 MYA from its nearest living relatives in other genera.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by

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variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

The other four genera including species previously treated as being within *Nyctimystes* are dealt with elsewhere in this paper.

Distribution: The single species constituting this subgenus is known only from Halmahera and Morotai Islands in the Moluccas, Indonesia.

Etymology: "Webpede" is derived from the Latin words "web" meaning "web" in English and the Latin "Pede" meaning "paw", or in the context of a frog, the hand or front foot.

Content: *Occultatahyla* **(***Webpede*) *rueppelli* (Boettger, 1895) (monotypic).

NIGREOSOCULUS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:8FB6CBD7-F9BC-4C0C-8D2A-071067F436C2

Type species: *Nyctimystes cheesmani* Tyler, 1964.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc.

The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov.* as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov.* diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: New Guinea, including offshore islands on the continental shelf.

Etymology: In Latin *Nigreosoculus* means black eye, in reflection of the near black iris in some species.

Content: *Nigreosoculus cheesmani* (Tyler, 1964) (type species); *N. bivocalis* (Kraus, 2012); *N. calcaratus* (Menzies, 2014); *N. eucavatus* (Menzies, 2014); *N. intercastellus* (Kraus, 2012); *N. kuduki* (Richards, 2007); *N. latratus* (Menzies, 2014); *N. montana* (Peters and Doria, 1878); *N. obsoletus* (Lönnberg, 1900); *N. persimilis* (Zweifel, 1958); *N. traunae* (Menzies, 2014).

BADIOHYLINA SUBTRIBE NOV.

BADIOHYLA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:D0D7D60F-CD8F-454D-9EBB-357AEF6BF5CD

Type species: *Nyctimystes kubori* Zweifel, 1958.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines.

There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov.* are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov.* by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov.* are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50

to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov.* which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Species within *Badiohyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Albogibba gen. nov.*) by having a unique "reticulated" palpebral venation, half-webbed fingers and a size in males with SVL to maximum of 50 mm to 100 mm depending on the species. They are further defined as follows: The snout is relatively short, blunt and high (E-N/IN 0.94), with distinct canthus rostralis and oblique loreal region. The vomerine teeth are in two patches between the posterior edges of the choanae.

The palpebral venation forms a heavy reticulum. The tympanum is distinct and is separated from the eye by approximately the diameter of the tympanum. A fold of skin passes from the posterior corner of the eye, over the upper edge of the tympanum and down, becoming indistinct above the insertion of the forelimb. The skin of the dorsum is minutely roughened, that of the venter coarsely granular. A row of tubercles is present along the outer edge of the forearm and there is a similar row on the tarsus. There is only a slight suggestion of a heel tubercle. The outer fingers are approximately half-webbed, the toes, except the fourth toe, are webbed to the disc. The body and head are light brown to purple dorsally, either with irregular dark brown blotches or markings absent. The legs have a similar ground color, with or without irregular darker spots and bands present on the tibia.

Species within *Albogibba gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.* and *Badiohyla gen. nov.*) by one or other of the following unique suites of characters:

1/ Being a large species (males to 100 mm. in snout to vent length); of a uniform dorsal coloration (green in life, purple in alcohol-preserved specimens); palpebral venation is a reticulum without obvious orientation and in the nominate subgenus of this genus, the male bears a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) (nominate subgenus *Albogibba subgen. nov.*), or:

2/ As above, but male SVL of up to 80 mm; not including a spine-like process on the anterior surface of the proximal part of the humerus (upper arm) in males and with a unique dorsal pattern of black vermiculations on the body and limbs, with unmarked greyish lower flanks (*Ratiobrunneis subgen. nov.*).

According to Duellman *et al.* (2016), each of the six preceding genera had the following divergences from one another.

Nyctimystes Stejneger, 1916 diverged 14.8 MYA from its nearest living relatives in other genera.

The subgenus *Magnummanibus subgen. nov.* diverged 11.5 MYA from its nearest living relatives in the nominate subgenus.

Occultatahyla gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

Nigreosoculus gen. nov. diverged 14.8 MYA from its nearest living relatives in other genera.

Magnumoculus gen. nov. diverged 13 MYA from its nearest living relatives, being *Badiohyla gen. nov.*.

Badiohyla gen. nov. diverged 13 MYA from its nearest living relatives being *Magnumoculus gen. nov.*.

In turn both *Magnumoculus gen. nov.* and *Badiohyla gen. nov*. as a pair diverged from their nearest living relatives 22 MYA being *Nyctimystes* and other genera.

Albogibba gen. nov. diverged 16.7 MYA from its nearest living relatives in other genera.

The subgenus *Ratiobrunneis subgen. nov*. diverged 10 MYA from its nearest living relatives in the nominate subgenus.

Distribution: Confined to the highlands of the central cordillera of New Guinea.

Etymology: In Latin "*Badio*" means the colour beige and "*Hyla*" is a tree frog. Many specimens in this tree frog genus are in fact beige coloured, meaning that the genus name is entirely descriptive.

Content: *Badiohyla kubori* (Zweifel, 1958) (type species); *B. gularis* (Parker, 1936).

MAGNUMOCULUS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:7CC692B4-52AB-48BC-84C2-4BF322A74060

Type species: *Nyctimystes narinosa* Zweifel, 1958.

Diagnosis: Species of *Nyctimystes*, *Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.* are separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following suite of characters:

Large dark eyes, which have vertically elliptical pupils and a lower eyelid with a characteristic reticulum or palpebral venation of fine pigmented lines. There is usually a distinct, crenulated skin fold along the hind edge of the forearm and the foot, the heel often having a small flap of skin. Males are usually considerably smaller than females.

Nyctimystes Stejneger, 1916 as defined in this paper, are separated from the other five genera (*Occultatahyla gen. nov.*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by having sparse, broken vertically-oriented palpebral venation across the nictitating membrane and in having adult males without vocal slits.

Frogs in the subgenus *Magnummanibus subgen. nov*. are separated from those in the nominate subgenus *Nyctimystes* and the subgenus *Asperohyla subgen. nov*. by their possession of very long, prominent heel lappets.

Frogs in the subgenus *Asperohyla subgen. nov*. are separated from the other two subgenera by having a completely hidden tympanum and a dorsal skin roughened by tiny, conical asperities rather than by variable sized and more rounded irregularities as seen in some other New Guinea tree frog species; iris is brown in life.

Species within *Occultatahyla gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by large size (adult females 50 to 84 mm. in snout to vent length); internarial distance distinctly smaller than distance from eye to naris (E-N/IN averages 1.34 (range 1.2-1.5)); the head is broad, flattish, with depressed snout, closely spaced nares, and oblique loreal region. Palpebral venation is in oblique lines (more vertical than horizontal and with few horizontal interconnections), with a few horizontal interconnections. A dermal fold passes from the posterior corner of the eye over the upper edge of the tympanum and down to the insertion of the forelimb, sometimes becoming obscure when leaving the tympanum. The outer fingers are approximately half-webbed, the third and fifth toes webbed to the disc. A light-coloured dermal ridge or series of tubercles extends from the elbow to the disc of the fourth finger. A similar but less distinct ridge or line of tubercles occupies the outer edge of the tarsus and fifth toe. A very small heel tubercle is present. The skin of the dorsum is smooth to very slightly granular, that of the venter is always coarsely granulate. Slit-like, vocal sac openings are usually present in the floor of the mouth. A small patch of very fine horny tubercles is found on the first finger of males. The iris is dark or black in colour.

Exceptional to the preceding is the subgenus *Planusrususpes subgen. nov*. which conforms to the above genus diagnosis, save for the following differences: The heel is without a tubercle, or in rare cases has a very small one. The skin is smooth above, granular below. A weak, wavy fold is present on the outer surface of the forearm. The head is broader than long; the canthus rostralis is not distinct; the loreal region is oblique; Unique to this subgenus is that the palpebral venation is distinct, but is reduced to individual pigment spots and thin, meandering lines, although the lines are still mainly oriented largely in a vertical direction, with few horizontal interconnections.

Species within *Nigreosoculus gen. nov*. are separated from the other five genera (*Nyctimystes*, *Occultatahyla gen. nov.*, *Magnumoculus gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: Vocal slits present; a very small heel tubercle; basal webbing on the hand; exposed tympanum; vertical lines of palpebral reticulum oriented obliquely and with relatively few horizontal cross-connections; pale-tan to near black iris; rear of thighs barred/mottled with brown, caramel, or blue-gray.

Species within *Magnumoculus gen. nov.* are separated from the other five genera (*Nyctimystes*, *Nigreosoculus gen. nov.*, *Occultatahyla gen. nov.*, *Badiohyla gen. nov.* and *Albogibba gen. nov.*) by the following suite of characters: The head is broad (HL/HW <1.0), the snout high and blunt, the canthus rostralis distinct, broadly spaced nostrils (EN/IN ratio <1), and the loreal region nearly vertical. A strong, slightly curved, supratympanic fold begins at the posterior corner of the eye and disappears above the insertion of the forelimb. The tympanum is small but distinct. The hands have little webbing; the outer fingers are about one-quarter webbed. The vomerine teeth are in two patches between the internal nares, nearly on a line connecting the posterior margins of the nares. The skin is minutely granular

above, coarser beneath. There is no tubercle on the heel. A nearly straight, very slightly crenulated fold of skin is present on the outer surface of the forearm. A moderate body size (40-60 mm S-V), predominantly brown colouration, an eyelid venation composed of a network with numerous horizontal connections with relatively few vertical interconnections. There is decoration on the forearm and tarsus in the form of rows of (often white-tipped) tubercles.

Distribution: New Guinea, including offshore islands on the continental shelf.

Etymology: In Latin "*Magnumoculus*" means big eyes, in reflection of the big eyes in all species.

Content: *Magnumoculus narinosus* (Zweifel, 1958) (type species); *N. ocreptus* (Menzies, 2014); *N. myolae* (Menzies, 2014); *N. cryptochrysos* (Kraus, 2012).

PELODRYANINI TRIBE NOV.

***PELODRYAS* GÜNTHER, 1858.**

Type species: *Rana caerulea* White, 1790.

Diagnosis: Species in the genus *Pelodryas* Günther, 1858 are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colour in life is usually a near unform emerald-green in life, but varies from dark purplish-green to fawn or at times even blue, often with scattered white or yellow spots or dots; there is no obvious white stripe running along the edge of the lower jaw; the hind side of thighs lacks black or yellow marbling, either being plain or sometimes pinkish or orangeish; hind edge of forearm is smooth, or with at most a few, low, discontinuous tubercles; the skin on top is smooth or slightly leathery; venter is white and coarsely granular; hind edge of foot is smooth; fingers have conspicuous webbing, but reaching no further than the base of the penultimate phalanx of the fourth finger; toes are about 2/3 webbed; finger and toe discs are large and obvious; vomerine teeth present and prominent, between and behind the choanae; there is obvious thick, supratympanic gland and the tympanum is large and obvious.

Duellman *et al.* (2016) found that the four named and currently recognized species within this genus diverged from their nearest living relatives, 24.7 MYA, these being species within the genus *Shireenhoserhylea gen. nov..*

Distribution: Most parts of continental Australia, except the coldest regions as well as parts of New Guinea. Because the most common species *P. caerulea* (White, 1790) is often commensal of human habitation and a popular pet, the distribution has expanded in Australia and New Guinea in modern times.

Content: *Pelodryas caerulea* (White, 1790) (type species); *P. cavernicola* (Tyler and Davies, 1979); *P. splendida* (Tyler, Davies and Martin, 1977); *P. gilleni* (Spencer, 1896).

SHIREENHOSERHYLINA SUBTRIBE NOV.

SHIREENHOSERHYLEA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:A50DB4CA-5049-4818-9BF2-98ECA036D81C

Type species: *Hyla chloris* Boulenger, 1893.

Diagnosis: Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

The taxon *S. luteiventris* (Ogilby, 1907), originally described as "*Hyla luteiventris*" with a type locality of Brisbane, Queensland, is herein resurrected from the synonymy of *S. gracilenta* (Peters, 1869) with a type locality of Mackay, North Queensland.

Differences between the two nominate taxa are explained in Anstis (2013) on pages 209-211, where she treats them as a single species but also notes "appears to comprise more than one species awaiting further description".

Hence *S. luteiventris* (Ogilby, 1907) appears in the list of species within this genus.

The species *S. megaviridis sp. nov.* from Eungella, near Mackay in north Queensland, formally described herein, has until now been treated as a northern population of "*Hyla chloris* Boulenger, 1893" from the Richmond River, in New South Wales.

However in many respects this taxon is intermediate between the two forms now known as *S. chloris* (Boulenger, 1893) and *S. xanthomera* (Davies, McDonald, and Adams, 1986), which have a 4 MYA divergence from one another according to Duellman *et al.* (2016).

Because the Eungella population is also reproductively isolated from both other populations, as well as being clearly divergent morphologically, it is herein formally named as a new species, *S. megaviridis sp. nov..*

The most closely related species to this genus (*Shireenhoserhylea gen. nov.*) are the morphologically divergent species within the genus *Pelodryas* Günther, 1858, type species being *Rana caerulea* White, 1790. According to Duellman *et al.* (2016) the two species groups diverged 24.7 MYA, making genus level division a common-sense decision.

The *Litoria kumae* Menzies and Tyler, 2004 species group, being the New Guinea members of the genus *Shireenhoserhylea gen. nov.*, as well as *S. bella* (McDonald, Rowley, Richards and Frankham, 2016) from Cape York, Australia had according to Duellman *et al.* (2016) diverged from the Australian *Hyla chloris* Boulenger, 1893 group 16.6 MYA.

Therefore the mainly New Guinea group is herein placed in a new subgenus *Emeraldhyla subgen. nov.*.

Distribution: Wetter parts of the east coast of Australia, excluding colder parts of the far south, New Guinea and

offshore islands. The nominate subgenus *Shireenhoserhylea subgen. nov.* is restricted to the East Coast of Australia, south of the northern wet tropics in Queensland. The subgenus *Emeraldhyla subgen. nov.* occurs in New Guinea and offshore islands as well as the far north of Cape York, Queensland.

Etymology: Named in honour of Shireen Hoser, of Park Orchards, Victoria, Australia, who also happens to be my wife, in recognition of decades of work supporting wildlife conservation globally, including successfully defending herpetology against taxonomic vandalism by members of the Wolfgang Wüster gang of thieves in the 1990's. This was done via a successful submission to the ICZN in 1998. That submission, (Hoser 1998), successfully stopped Robert Sprackland illegally renaming the species originally described as *Odatria keithhornei* Wells and Wellington, 1985 the obscenely coined name "*Varanus teriae*" being that of Sprackland's wife.

The ICZN correctly struck out the illegally coined patronym of Sprackland, this being the second ruling by the ICZN in favour of the Wells and Wellington papers, which was not so much a defence of Wells and Wellington (1985), but rather a defence of the *International Code of Zoological Nomenclature* and the rules that are supposed to bind all scientists.

Content: *Shireenhoserhylea chloris* (Boulenger, 1893) (type species); *S. aruensis* (Horst, 1883); *S. auae* (Menzies and Tyler, 2004); *S. bella* (McDonald, Rowley, Richards and Frankham, 2016); *S. callista* (Kraus, 2013); *S. elkeae* (Günther and Richards, 2000); *S. eschata* (Kraus and Allison, 2009); *S. gracilenta* (Peters, 1869); *S. kumae* (Menzies and Tyler, 2004); *S. luteiventris* (Ogilby, 1907); *S. megaviridis sp. nov.*; *S. robinsonae* (Oliver, Stuart-Fox and Richards 2008); *S. xanthomera* (Davies, McDonald, and Adams, 1986).

EMERALDHYLA SUBGEN. NOV.

LSIDurn:lsid:zoobank.org:act:F0C25610-5D1F-40E6-B0CC-E343EC59991E

Type species: *Litoria kumae* Menzies and Tyler, 2004.

Diagnosis: Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters:

Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

The *Litoria kumae* Menzies and Tyler, 2004 species group, being the New Guinea members of the genus

Shireenhoserhylea gen. nov., as well as *S. bella* (McDonald, Rowley, Richards and Frankham, 2016) from Cape York, Australia had according to Duellman *et al.* (2016) diverged from the Australian *Hyla chloris* Boulenger, 1893 group 16.6 MYA. Therefore the mainly New Guinea group is herein placed in this new subgenus *Emeraldhyla subgen. nov.*.

Distribution: Species within *Emeraldhyla subgen. nov.* are found in New Guinea, including offshore islands as well as the northern parts of Cape York, Australia.

Etymology: *Emeraldhyla* literally means Emerald green tree frog, which is exactly what these species are!

Content: *Shireenhoserhylea* (*Emeraldhyla*) *kumae* (Menzies and Tyler, 2004); (type species); *S.* (*Emeraldhyla*) *aruensis* (Horst, 1883); *S.* (*Emeraldhyla*) *auae* (Menzies and Tyler, 2004); *S.* (*Emeraldhyla*) *bella* (McDonald, Rowley, Richards and Frankham, 2016); *S.* (*Emeraldhyla*) *callista* (Kraus, 2013); *S.* (*Emeraldhyla*) *elkeae* (Günther and Richards, 2000); *S.* (*Emeraldhyla*) *eschata* (Kraus and Allison, 2009); *S.* (*Emeraldhyla*) *robinsonae* (Oliver, Stuart-Fox and Richards 2008).

SHIREENHOSERHYLEA (SHIREENHOSERHYLEA) MEGAVIRIDIS SP. NOV.

LSIDurn:lsid:zoobank.org:act:3541C57B-6D88-4D1A-AC3E-4E95ABF9E6AD

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J35941, collected from Broken River, Eungella National Park, (near Mackay), Queensland, Australia, Latitude -21.175 S., Longitude 148.5083 E.

This government-owned facility allows access to its holdings.

Paratypes: Ten preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J35906, J35912, J35965, J35970, J35979, J35980, J36002, J36007, J36016 and J36025 all collected from within 10 km of the type locality above.

Diagnosis: *Shireenhoserhylea megaviridis sp. nov.* has until now been treated as a population of *S. chloris* (Boulenger, 1893) known in most texts as "*Litoria chloris*", including in Anstis (2013) and Cogger (2014). A more northerly (wet tropics in Queensland) population previously treated as *S. chloris* was formally named in

1986 and is herein known as *S. xanthomera* (Davies, McDonald, and Adams, 1986).

According to Duellman *et al.* (2016), the two preceding species diverged from one another 4 MYA.

In many respects *S. megaviridis sp. nov.* is intermediate between the two forms, but due to divergence between each, as well as geographic disjunction, it is appropriate that this population be treated as a full species as opposed to subspecies of one or other.

S. megaviridis sp. nov. would key as *S. chloris* (as "*Litoria chloris*") in Anstis (2013) or Cogger (2014).

The morphologically similar and closely related *S. xanthomera* is separated from both *S. megaviridis sp. nov.* and *S. chloris* by having bright orange-yellow sides and upper arms, hands and feet as well as inner surfaces of thighs being bright orange, with whitish or yellow undersides.

This is opposed to light yellow sides and upper arms, hands and feet as well as inner surfaces of thighs being dark purplish-red or brown often with a purple surface in *S. chloris.*

S. megaviridis sp. nov. is separated from both *S. xanthomera* and *S. chloris* by having brilliant blue on the inner surfaces of the thighs.

The tadpoles of *S. xanthomera* are separated from both *S. megaviridis sp. nov.* and *S. chloris* by having a narrowly arched jaw sheath, versus not so narrow in the other two species.

S. megaviridis sp. nov. is separated from *S. chloris* by the expansion of flash colour under the lower left leg to occupy the entire lower surface, versus not so in *S. chloris.*

The upper arm of *S. megaviridis sp. nov.* is usually yellow, versus usually greenish-yellow in *S. chloris.*

In dorsal colouration, pre-metamorphosing tadpoles of *S. megaviridis sp. nov.* are like those of *S. xanthomera* and not *S. chloris.* In *S. chloris* the anterior of the tadpole is greyish with peppering and any markings are indistinct. There are no obvious spots or blotches, with two spots on the snout anterior to the eyes being indistinct. Only the anterior fringe is pale.

By contrast the relevant tadpoles of both *S. xanthomera* and *S. megaviridis sp. nov.* have a generally pale anterior end and snout, with two distinct large greyish brown dots on the snout anterior to the eyes. Anteriorly, the relevant *S. xanthomera* are whitish, versus yellowish-brown in *S. megaviridis sp. nov..*

The other two species within the subgenus *Shireenhoserhylea gen. nov.*, namely *S. gracilenta* (Peters, 1869) and *S. luteiventris* (Ogilby, 1907) are both separated from the three preceding species by the following characters: The green colour of the forearms stops abruptly with a sharp edge at the elbow. The skin covering the tympanum is finely granular. The rim of the lower jaw, especially near the tip of the snout is narrowly edged with white.

Frogs in the the nominate subgenus *Shireenhoserhylea gen. nov.* are readily separated from those in the subgenus *Emeraldhyla subgen. nov.* by having an iris, or iris immediately above and below the pupil that is a brilliant red or bright orange in colour and whitish underneath, versus an iris that is yellow or dull orange in colour and strongly yellow to orange underneath in *Emeraldhyla subgen. nov.*.

Frogs in the genus *Shireenhoserhylea gen. nov.* are readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following unique suite of characters: Colour in life in normal conditions is usually a unform emerald green above, but occasionally may be fawn, green, purple-green or blue. Hind side of thighs more or less unform and without black and yellow marbling or spots. Hind edge of forearms are smooth or with at most a few low discontinuous tubercles; hind edge of foot is smooth. Fingers with conspicuous webbing that reaches at least as far as the punultimate phalanx of the fourth finger; Vomerine teeth present.

Photos of *L. chloris* in life can be found in Hoser (1989) on page 36, top two images, Vanderduys (2012) at page 30, both images, Cogger (2014) on p. 156 at bottom right and Anstis (2013) at page 168 both images.

Photos of *S. megaviridis sp. nov.* in life can be found in Anstis (2013) at page 170 (metamorphosed young), two top left images, and adults in life can be seen online at: https://lyrebird-gallery.smugmug.com/Frogs/Litoria-chloris/i-zHZKnxq

and:

https://www.flickr.com/photos/huntermccall/31855340567/

and:

https://www.flickr.com/photos/jaricornelis/38736419370/

and:

https://www.flickr.com/photos/reptileshots/24091549126/

and:

https://www.flickr.com/photos/reptileshots/31194264913/

and:

https://www.flickr.com/photos/144043627@N08/40530915481/

and:

https://www.flickr.com/photos/piazzi1969/5772240176/

Photos of *S. xanthomera* in life can be found in Vanderduys (2012) on page 78 in both images, Cogger (2014) on page 196 at top and Anstis (2013) on page 339 in all photos.

Distribution: Known with certainty only from the vicinity of Eungella National Park in north-east Queensland and generally south of the area known as the Burdekin Gap, north Queensland and north of the St. Lawrence Gap, east Queensland, both being major lowland biogeographical barriers in the Queensland region.

However based on specimens in State Museums, the potential limits of this taxon are likely to be Caithu State Forest, Latitude -19.58 S., Longitude 147.43 E. in the north and Bruce Highway at the junction of St. Lawrence, Latitude -22.3667 S., Longitude 149.45 E in the south and of course confined to the east by the Pacific Ocean and in the west of the coastal zone by drier lowland habitats.

Etymology: The word "mega" usually means lots and "viridis" means green and as the relevant species is very green, the species name *S. megaviridis sp. nov.* is wholly appropriate.

SUMMAVIRIDIS GEN. NOV.

LSIDurn:lsid:zoobank.org:act:6187EF08-0B88-40F9-837F-C0C06F50525F

Type species: *Hyla* (*Litoria*) *vagabunda* Peters and Doria, 1878.

Diagnosis: The genus *Summaviridis gen. nov.* is monotypic for a West Papuan species, *S. vagabunda* that does not appear to have close affinities to any other species or genus. Tyler (1968) placed it in a group on its own, although Menzies (2006) associated it with his so-called "*Litoria gracielenta* complex". However *S. vagabunda* has unwebbed hands, versus heavily webbed in the other species, which in effect scuttles any close association at the genus level.

Summaviridis gen. nov. are readily separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) by the following unique suite of characters: A broad head, short limbs, unwebbed fingers, a prominent fold of skin across the chest and (in life) a dark green dorsal colouration.

In further detail the *Summaviridis gen. nov.* is separated from all other Australasian (Australian and New Guinea) Tree Frogs (Pelodryadidae) as follows: The head is broader than long (HL/HW 0.951), its length slightly less than one-third of the snout to vent length (HL/S-V 0.310). The snout is rounded when viewed from above and in profile. The nostrils are more lateral than superior, their distance from the end of the snout slightly less than that from the eye. The distance between the eye and the naris is greater than the internarial span (E-N/IN 1.154). The canthus rostralis is straight and poorly defined. The eye is large, its diameter greater than the distance separating it from the nostril. Three-quarters of the tympanum is visible, the superior rim of the tympanic annulus is hidden beneath the supra-tympanic fold. The tympanal diameter is equivalent to two-thirds of the eye diameter. The vomerine teeth are in two broadly oval series situated between the choanae. The tongue is broadly cordiform with a deeply indented posterior border. The fingers are very long and slender with narrow lateral fringes; in decreasing order of length 3>4>2>1; unwebbed. The terminal discs and sub-articular tubercles are large and prominent. The hind limbs are short and slender with a TL/S-V ratio of 0.513. Toes in decreasing order of length 4>5>3 >2>1. The webbing between the outer and fourth toe reaches half-way up the penultimate phalanx on the fifth toe, and the sub-articular tubercle at the base of the penultimate phalanx on the fourth. The skin on the dorsal surfaces is smooth with a few minute flattened tubercles. The throat and chest are slightly tubercular; the abdomen, sides of the body and lower surface of the thighs are extremely granular. There is a conspicuous curved supra-tympanic fold, and a prominent skin fold across the chest. The dorsal surfaces are in life dark green and in preservative dark blue. There is a faint trace of a narrow white line above a broader brown line on the canthus rostralis, upper eyelid and supra-tympanic fold. The backs of the thighs are pale brown and marked with small irregularly-shaped, pale yellow spots. The backs of the tarsus and forearm are pale brown. The ventral surfaces are pale yellow with leaden blue patches at the angles of the jaws, and small faint brown spots on the remainder of the mandibular border and on the throat. Adult females are about 37 mm in body length (modified from Tyler, 1978).

Specimens of the morphologically similar *Llewellynura* Wells and Wellington, 1985 are readily separated by their much smaller adult size of less than 25 mm body length.

The species within the morphologically similar genus *Rotundaura gen. nov*. are separated from this genus (*Summaviridis gen. nov.*) by the tympanum being fully exposed and round, versus the upper surface being cut at the rear by a skin fold forming a straight line and a significantly blunter snout in *Rotundaura gen. nov*..

Distribution: The type species for *Summaviridis gen. nov.* is only known from the two types, a male and a female, being from Vogelkop Peninsula, Papua (New Guinea) (female) and Seram (= Ceram) Island, Molucca Islands, Indonesia.

Etymology: The name *Summaviridis* in Latin means intense or deep green in reflection of the colour of the dorsal surface of these frogs in life.

Content: *Summaviridis vagabunda* (Peters and Doria, 1878) (monotypic).

PUSTULATARANINI TRIBE NOV.

PUSTULATARANA GEN. NOV.

LSIDurn:lsid:zoobank.org:act:E2F68230-6BBB-4518-A9C2-C8432FE558DE

Type species: *Litoria longirostris* Tyler and Davies, 1977.

Diagnosis: The type species in this genus *Litoria longirostris* Tyler and Davies, 1977 is phylogenetically and morphologically closest to species within *Llewellynura* Wells and Wellington, 1985. However Duellman *et al.* (2016) found a divergence of 18 MYA between this and other living species within *Llewellynura.* Duellman *et al.* (2016) also found a divergence of 20.9 MYA between "*Litoria longirostris* Tyler and Davies, 1977" and species within the genus *Mahoneybatrachus* Wells and Wellington, 1985.

With such deep divergences between the three groups and obvious morphological divergence, the most sensible classification system (taxonomy) calls for them to be placed in three separate groups, or genera. Hence the erection of the genus *Pustulatarana gen. nov.* herein.

Because this genus is monotypic for "*Litoria longirostris* Tyler and Davies, 1977", the diagnosis for the species is the same as for the genus. The keys in Cogger (2014) and Anstis (2013) for this species taxon, in effect also diagnose this genus.

The single known living species within the genus *Pustulatarana gen. nov.* is readily separated from all other Australasian Tree Frogs (Pelodryadidae) by the following suite of characters: A smallish sized tree frog being 27 mm in body length. Brown to greenish brown or even yellow above, with obscure and irregular darker flecks and blotches. Creamy-white below, finely peppered with dark blackish-brown or shading of other lighter colour on the throat, with heavy concentrations of stippling on chin, chest and flanks of some specimens, and ...

... Continued in AJH Issue 46...

Hoser, R. T. 2020. For the first time ever! An overdue review and reclassification of Australasian Tree Frogs (Amphibia: Anura: Pelodryadidae), including formal descriptions of 12 tribes, 11 subtribes, 34 genera, 26 subgenera, 62 species and 12 subspecies new to science. *Australasian Journal of Herpetology* 44-46:1-192.

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