

# ***Australasian Journal of Herpetology***

Hoser, R. T. 2020. 3 new tribes, 3 new subtribes, 5 new genera, 3 new subgenera, 39 new species and 11 new subspecies of mainly small ground-dwelling frogs from Australia. *Australasian Journal of Herpetology* 50-51:1-128.

ISSN 1836-5698 (Print)  
ISSN 1836-5779 (Online)

ISSUE 51, PUBLISHED 10 OCTOBER 2020

# Australasian Journal of Herpetology

ISSN 1836-5698 (Print)  
ISSN 1836-5779 (Online)



Hoser, R. T. 2020. 3 new tribes, 3 new subtribes, 5 new genera, 3 new subgenera, 39 new species and 11 new subspecies of mainly small ground-dwelling frogs from Australia. *Australasian Journal of Herpetology* 50-51:1-128.

ISSUE 51, PUBLISHED 10 OCTOBER 2020

**CONTINUED FROM AUSTRALASIAN JOURNAL OF HERPETOLOGY ISSUE 50 ...**

**Etymology:** *P. semimarmorata burrelli subsp. nov.* is named in honour of Roly Burrell, formerly of Ultimate Reptile Suppliers, Burton (Adelaide), South Australia, Australia, for services to herpetology over many decades, including through captive breeding of large numbers of sought after reptiles for the Australian pet trade, thereby reducing collecting pressure on wild animals. Burrell has also run one of Adelaide's best known snake catcher businesses for some decades.

**A NEW SUBGENUS WITHIN CRINIA TSCHUDI, 1838****OXYODELLA SUBGEN. NOV.**

**LSIDurn:lsid:zoobank.org:act:BD9E973A-9F29-4EFA-8745-A75248EB057B**

**Type species:** *Crinia (Oxyodella) oxeyi sp. nov.*

**Diagnosis:** Frogs in the subgenus *Oxyodella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lowingdella subgen. nov.*, type species *Crinia (Lowingdella) lowingae sp. nov.*), by the following unique suite of characters:

Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered darker grey (not black) flecks; adults usually less than 18 mm (body length) and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits

are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular, rarely coarsely granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** Most of Queensland and adjoining parts of north-west New South Wales and the top third of the Northern Territory, possibly extending to Western Australia.

**Etymology:** The new subgenus *Oxyodella subgen. nov.* is named in honour of a deceased Great Dane dog, named Oxyuranus or "Oxy" for short. This "Noble" "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. The "della", suffix reflects the Latin word for noble or distinguished, as this dog was!

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

**Content:** *Crinia (Oxyodella) oxeyi sp. nov.* (type species); *C. (Oxyodella) crottyi sp. nov.*; *C. (Oxyodella) deserticola* (Liem and Ingram, 1977); *C. (Oxyodella) sloppi sp. nov.*

**CRINIA (OXYODELLA) OXEYI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:1F1C1FEE-83F5-41C1-BF3B-A5F63DC867D7**

**Holotype:** A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J29359 collected from Annan River, 5.7 km south on the Cooktown-Lakeland Downs Road, far north Queensland, Australia, Latitude -15.6833 S., Longitude 145.1667 E. This government-owned facility allows access to its holdings.

**Paratype:** A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J29491 collected from Annan River, 5.7 km south on Cooktown-Lakeland Downs Road, far north Queensland, Australia, Latitude -15.6833 S., Longitude 145.1667 E.

**Diagnosis:** The three species *Crinia (Oxyodella) oxeyi sp. nov.* from the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula, *C. crottyi sp. nov.* from Townsville / Charters Towers and nearby areas south along the Queensland Coast and *C. sloppi sp. nov.* from the Gulf of Carpentaria region (all in Australia) have until now been treated as northern populations of the putative species *C. (Oxyodella) deserticola* (Liem and Ingram, 1977), with a type locality of Charleville, South-west Queensland, Australia.

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

1/ *C. (Oxyodella) deserticola* (Liem and Ingram, 1977) is a frog with a generally mud brown to greyish

brown dorsum with indistinct markings. Behind the eyes is an indistinct dark brown triangle, the tip (at the posterior end) in turn meeting a broad dark patch which has flankward extensions giving an ill-defined lighter v-shaped patch in the neck region. Behind the second dark patch is a wide lighter, beige to grey zone followed by another indistinct broad darker band across the lower back, with light colouration beyond that to the anal region. Mid to lower flanks are whitish and without any obvious markings. There is no obvious colour or flush of colour in the area of the upper arm pit.

There is no obvious dark patch or marking behind the eye. Upper surface of the thigh is light grey with ill-defined dark grey bands.

The tadpole has two upper rows of teeth and three lower rows (depicted in Liem and Ingram, 1977) on page 256, Fig 1 F.

*C. (Oxyodella) deserticola* (Liem and Ingram, 1977) is depicted in life in Anstis (2013) on page 545 at top left and Cogger (2014) on page 76 at bottom right.

2/ *C. (Oxyodella) oxeyi sp. nov.* is readily separated from the other three species by the following characters: There is an obvious and well defined and well bounded, dark marking or patch, more-or-less rectangular in shape and deflecting downwards at the posterior end, situated behind the eye. Dark markings on the dorsum are well defined. The skin on the dorsum has a large number of blunt tubercles across the surface. The upper surface of the upper arm has a well defined and obvious orange patch. The upper surface of the upper thigh is also orange in colour, with thick dark brown cross-bands. Darker markings on the otherwise pale lower forelimbs are obvious.

Tadpoles have one row of upper teeth and three rows of lower teeth as shown in Anstis (2013) on page 547 at bottom.

*C. (Oxyodella) oxeyi sp. nov.* is depicted in life on page 545 of Anstis (2013) at right top and centre.

3/ *C. (Oxyodella) crottyi sp. nov.* is readily separated from the other three species by the following characters: Most of the dorsum is beige in colour, with well-defined medium brown markings on the upper body. Besides the preceding, the dorsum is characterised by the presence of large irregular patches of bright yellow overlaying the other sections, this character alone separating this species from the other three. Other than a slight and barely discernable peppering, there is no obvious or well-marked rectangle or patch behind the eye.

Many specimens have tiny orange spots and tubercles scattered across the dorsum, in particular on the head between the eyes.

Upper arm either has a yellow patch on the upper surface, or at least a yellow flush. There are either no markings or no obvious markings on the lower forelimbs.

*C. (Oxyodella) crottyi sp. nov.* in life is depicted in

Vanderduys (2012) on page 137 at bottom left.

4/ *C. (Oxyodella) sloppi sp. nov.* is readily separated from the other three species by the following characters: A dark reddish-brown frog with ill-defined markings on the dorsum. The anterior of the snout, from the top of the eyes forward is light brown. Behind that is a single large area of chocolate brown, the being equivalent to the two dark areas and intervening light v-shape seen in *C. (Oxyodella) deserticola*. Behind the large dark area is a broad band of medium brown followed by more chocolate brown which occupies most of the rear of the upper body, save for a small ill-defined lighter triangle in the centre of this zone, with the tip pointing posteriorly. The entirety of the area from the side of the snout, posterior to the eye and the flanks is a distinctive lead grey colour. There is no obvious square or shape of any form behind the eye.

Markings on the forelimbs are indistinct, but on the upper surfaces of the hindlimbs are a distinctive combination of chocolate brown and charcoal black cross bands. The dorsum is smooth save for scattered blunt orange coloured tubercles of moderate to large size, being most prominent on the upper flanks and adjacent dorsum.

Upper surfaces of the upper arms are a light brown colour.

A photo of *C. (Oxyodella) sloppi sp. nov.* in life, taken by Matt Clancy of Victoria can be found online at: <https://www.flickr.com/photos/88708273@N03/24330380469/>

Photos of all four preceding species can also be found online at:

<http://www.flickr.com>

by typing in the search term "Crinia deserticola".

The four preceding species constitute the entirety of the subgenus *Oxyodella subgen. nov.*

Frogs in the subgenus *Oxyodella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lowingdella subgen. nov.*, type species *Crinia (Lowingdella) lowingae sp. nov.*), by the following unique suite of characters: Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered

darker grey (not black) flecks; adults usually less than 18 mm and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** *Crinia (Oxydella) oxeyi sp. nov.* occurs in the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula.

**Etymology:** The new species *Crinia (Oxydella) oxeyi sp. nov.* is named in honour of a deceased Great Dane dog, named Oxyuranus or "Oxy" for short. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years until his death from heart disease in 2012 and it is appropriate his services to science be recognized. The spelling "oxeyi" is deliberate and chosen to ensure there is no risk of any homonym with other species names being created or already created.

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

I should also mention that designation of the scientific names "oxeyi", "crotty" and "sloppi" are also made in view of the fact they are short and easy to remember and are part of my overall intent to make science and nomenclature more user friendly and available to as wide an audience as possible.

**CRINIA (OXYODELLA) CROTTYI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:FB988E5E-EDE2-414F-AA30-E908EA9C2BA1**

**Holotype:** A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J66090 collected from Townsville Common, Townsville, Queensland, Australia, Latitude -19.2417 S., Longitude 146.7583 E. This facility allows access to its holdings.

**Paratypes:** 14 preserved specimens at the

Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J65549, J65685, J66086, J66087, J66088, J66089, J66091, J82311, J82312, J82313, J68241, J68242, J94433 and J94434 all collected from Townsville, Queensland, Australia, Latitude -19.2417 S., Longitude 146.7583 E.

**Diagnosis:** The three species *Crinia (Oxydella) oxeyi sp. nov.* from the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula, *C. crottyi sp. nov.* from Townsville / Charters Towers and nearby areas south along the Queensland Coast and *C. sloppi sp. nov.* from the Gulf of Carpentaria region (all in Australia) have until now been treated as northern populations of the putative species *C. (Oxydella) deserticola* (Liem and Ingram, 1977), with a type locality of Charleville, South-west Queensland, Australia.

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

1/ *C. (Oxydella) deserticola* (Liem and Ingram, 1977) is a frog with a generally mud brown to greyish brown dorsum with indistinct markings. Behind the eyes is an indistinct dark brown triangle, the tip (at the posterior end) in turn meeting a broad dark patch which has flankward extensions giving an ill-defined lighter v-shaped patch in the neck region. Behind the second dark patch is a wide lighter, beige to grey zone followed by another indistinct broad darker band across the lower back, with light colouration beyond that to the anal region. Mid to lower flanks are whitish and without any obvious markings. There is no obvious colour or flush of colour in the area of the upper arm pit.

There is no obvious dark patch or marking behind the eye. Upper surface of the thigh is light grey with ill-defined dark grey bands.

The tadpole has two upper rows of teeth and three lower rows (depicted in Liem and Ingram, 1977) on page 256, Fig 1 F.

*C. (Oxydella) deserticola* (Liem and Ingram, 1977) is depicted in life in Anstis (2013) on page 545 at top left and Cogger (2014) on page 76 at bottom right.

2/ *C. (Oxydella) oxeyi sp. nov.* is readily separated from the other three species by the following characters: There is an obvious and well defined and well bounded, dark marking or patch, more-or-less rectangular in shape and deflecting downwards at the posterior end, situated behind the eye. Dark markings on the dorsum are well defined. The skin on the dorsum has a large number of blunt tubercles across the surface. The upper surface of the upper arm has a well defined and obvious orange patch. The upper surface of the upper thigh is also orange in colour, with thick dark brown cross-bands. Darker markings on the otherwise pale lower forelimbs are obvious. Tadpoles have one row of upper teeth, three rows of lower teeth as seen in Anstis (2013), p. 547 bottom.

*C. (Oxyodella) oxeyi sp. nov.* is depicted in life on page 545 of Anstis (2013) at right top and centre.

3/ *C. (Oxyodella) crottyi sp. nov.* is readily separated from the other three species by the following characters: Most of the dorsum is beige in colour, with well-defined medium brown markings on the upper body. Besides the preceding, the dorsum is characterised by the presence of large irregular patches of bright yellow overlaying the other sections, this character alone separating this species from the other three. Other than a slight and barely discernable peppering, there is no obvious or well-marked rectangle or patch behind the eye.

Many specimens have tiny orange spots and tubercles scattered across the dorsum, in particular on the head between the eyes.

Upper arm either has a yellow patch on the upper surface, or at least a yellow flush. There are either no markings or no obvious markings on the lower forelimbs.

*C. (Oxyodella) crottyi sp. nov.* in life is depicted in Vanderduys (2012) on page 137 at bottom left.

4/ *C. (Oxyodella) sloppi sp. nov.* is readily separated from the other three species by the following characters: A dark reddish-brown frog with ill-defined markings on the dorsum. The anterior of the snout, from the top of the eyes forward is light brown. Behind that is a single large area of chocolate brown, the being equivalent to the two dark areas and intervening light v-shape seen in *C. (Oxyodella) deserticola*. Behind the large dark area is a broad band of medium brown followed by more chocolate brown which occupies most of the rear of the upper body, save for a small ill-defined lighter triangle in the centre of this zone, with the tip pointing posteriorly. The entirety of the area from the side of the snout, posterior to the eye and the flanks is a distinctive lead grey colour. There is no obvious square or shape of any form behind the eye.

Markings on the forelimbs are indistinct, but on the upper surfaces of the hindlimbs are a distinctive combination of chocolate brown and charcoal black cross bands. The dorsum is smooth save for scattered blunt orange coloured tubercles of moderate to large size, being most prominent on the upper flanks and adjacent dorsum.

Upper surfaces of the upper arms are a light brown colour.

A photo of *C. (Oxyodella) sloppi sp. nov.* in life taken by Matt Clancy of Victoria can be found online at: <https://www.flickr.com/photos/88708273@N03/24330380469/>

Photos of all four preceding species can also be found online at:

<http://www.flickr.com>

by typing in the search term "Crinia deserticola".

The four preceding species constitute the entirety of

the subgenus *Oxyodella subgen. nov.*.

Frogs in the subgenus *Oxyodella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lovingdella subgen. nov.*, type species *Crinia (Lovingdella) lovingae sp. nov.*), by the following unique suite of characters: Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered darker grey (not black) flecks; adults usually less than 18 mm and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** *Crinia (Oxyodella) crottyi sp. nov.* occurs from Townsville / Charters Towers and nearby areas south along the Queensland Coast.

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

**CRINIA (OXYODELLA) SLOPPI SP. NOV.**

LSIDurn:lsid:zoobank.org:act:E2245953-1303-45E7-BEE3-D1461D17E418

**Holotype:** A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J27223 collected from Wills Creek, Karumba Rd, Normanton, Queensland, Australia, Latitude - 17.5667 S., Longitude 140.9667 E. This government-owned facility allows access to its holdings.

**Paratypes:** 1/ Nine preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J27221, J27222, J27224, J67813, J67827, J70677, J75740, J84199 and J84200 all collected from immediately adjacent to Normanton, Queensland, Australia, Latitude - 17.655 S., Longitude 141.1319 E. 2/ Two preserved specimens at the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J55814 and J55815, both collected from 1.6 km south of Burketown, Queensland, Australia, Latitude -17.7167 S., Longitude 139.55 S.

**Diagnosis:** The three species *Crinia (Oxyodella) oxeyi sp. nov.* from the wet tropics of north Queensland and nearby parts of eastern Cape York Peninsula, *C. crottyi sp. nov.* from Townsville / Charters Towers and nearby areas south along the Queensland Coast and *C. sloppi sp. nov.* from the Gulf of Carpentaria region (all in Australia) have until now been treated as northern populations of the putative species *C. (Oxyodella) deserticola* (Liem and Ingram, 1977), with a type locality of Charleville, South-west Queensland, Australia.

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

1/ *C. (Oxyodella) deserticola* (Liem and Ingram, 1977) is a frog with a generally mud brown to greyish brown dorsum with indistinct markings. Behind the eyes is an indistinct dark brown triangle, the tip (at the posterior end) in turn meeting a broad dark patch which has flankward extensions giving an ill-defined lighter v-shaped patch in the neck region. Behind the second dark patch is a wide lighter, beige to grey zone followed by another indistinct broad darker band across the lower back, with light colouration beyond that to the anal region. Mid to lower flanks are whitish and without any obvious markings. There is no obvious colour or flush of colour in the area of the upper arm pit.

There is no obvious dark patch or marking behind the eye. Upper surface of the thigh is light grey with ill-defined dark grey bands.

The tadpole has two upper rows of teeth and three lower rows (depicted in Liem and Ingram, 1977) on page 256, Fig 1 F.

*C. (Oxyodella) deserticola* (Liem and Ingram, 1977) is depicted in life in Anstis (2013) on page 545 at top left and Cogger (2014) on page 76 at bottom right.

2/ *C. (Oxyodella) oxeyi sp. nov.* is readily separated

from the other three species by the following characters: There is an obvious and well defined and well bounded, dark marking or patch, more-or-less rectangular in shape and deflecting downwards at the posterior end, situated behind the eye. Dark markings on the dorsum are well defined. The skin on the dorsum has a large number of blunt tubercles across the surface. The upper surface of the upper arm has a well defined and obvious orange patch. The upper surface of the upper thigh is also orange in colour, with thick dark brown cross-bands. Darker markings on the otherwise pale lower forelimbs are obvious. Tadpoles have one row of upper teeth and three rows of lower teeth as shown in Anstis (2013) on page 547 at bottom.

*C. (Oxyodella) oxeyi sp. nov.* is depicted in life on page 545 of Anstis (2013) at right top and centre.

3/ *C. (Oxyodella) crottyi sp. nov.* is readily separated from the other three species by the following characters: Most of the dorsum is beige in colour, with well-defined medium brown markings on the upper body. Besides the preceding, the dorsum is characterised by the presence of large irregular patches of bright yellow overlaying the other sections, this character alone separating this species from the other three. Other than a slight and barely discernable peppering, there is no obvious or well-marked rectangle or patch behind the eye. Many specimens have tiny orange spots and tubercles scattered across the dorsum, in particular on the head between the eyes.

Upper arm either has a yellow patch on the upper surface, or at least a yellow flush. There are either no markings or no obvious markings on the lower forelimbs.

*C. (Oxyodella) crottyi sp. nov.* in life is depicted in Vanderduys (2012) on page 137 at bottom left.

4/ *C. (Oxyodella) sloppi sp. nov.* is readily separated from the other three species by the following characters: A dark reddish-brown frog with ill-defined markings on the dorsum. The anterior of the snout, from the top of the eyes forward is light brown. Behind that is a single large area of chocolate brown, the being equivalent to the two dark areas and intervening light v-shape seen in *C. (Oxyodella) deserticola*. Behind the large dark area is a broad band of medium brown followed by more chocolate brown which occupies most of the rear of the upper body, save for a small ill-defined lighter triangle in the centre of this zone, with the tip pointing posteriorly. The entirety of the area from the side of the snout, posterior to the eye and the flanks is a distinctive lead grey colour. There is no obvious square or shape of any form behind the eye.

Markings on the forelimbs are indistinct, but on the upper surfaces of the hindlimbs are a distinctive combination of chocolate brown and charcoal black cross bands. The dorsum is smooth save for

scattered blunt orange coloured tubercles of moderate to large size, being most prominent on the upper flanks and adjacent dorsum.

Upper surfaces of the upper arms are a light brown colour.

A photo of *C. (Oxydella) sloppi sp. nov.* in life taken by Matt Clancy of Victoria can be found online at: <https://www.flickr.com/photos/88708273@N03/24330380469/>

Photos of all four preceding species can also be found online at:

<http://www.flickr.com>

by typing in the search term "Crinia deserticola".

The four preceding species constitute the entirety of the subgenus *Oxydella subgen. nov.*

Frogs in the subgenus *Oxydella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Lowingdella subgen. nov.*, type species *Crinia (Lowingdella) lowingae sp. nov.*), by the following unique suite of characters: Belly is coarsely granular; adults have more-or-less distinct dermal fringes on the toes; hind side of thighs is not bright red or pink; neither sex has a median line on the throat; throat of breeding male is white or grey; chin only dark; white pectoral spots tiny, inconspicuous or absent; belly of female is white and speckled with grey; tympanum tiny but distinct; belly whitish, with at most a few scattered darker grey (not black) flecks; adults usually less than 18 mm and lacking a broad well-defined dark brown vertebral zone finely edged with white as the upper edge of a wide creamish-beige band running along the upper flank.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the

larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** *Crinia (Oxydella) sloppi sp. nov.* is only known from the Gulf of Carpentaria in Queensland, Australia but may include populations to the west into the Northern Territory, Australia.

**Etymology:** The new species *Crinia (Oxydella) sloppi sp. nov.* is named in honour of an eight year old as of 2020 (born August 2012) Great Dane dog, named Sloop. This "family member" loyally guarded the wildlife research and conservation facility here in Australia from thieves, 24/7 for 8 years and it is appropriate his services to science be recognized.

#### **A SECOND NEW SUBGENUS WITHIN CRINIA TSCHUDI, 1838**

##### **LOWINGDELLA SUBGEN. NOV.**

**LSIDurn:lsid:zoobank.org:act:DF3BA4F6-AC21-4F99-845E-FBA53B8E7216**

**Type species:** *Crinia (Lowingdella) lowingae sp. nov.*

**Diagnosis:** Frogs in the subgenus *Lowingdella subgen. nov.* a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella subgen. nov.*, type species *Crinia (Oxydella) oxeyi sp. nov.*), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on the toes; hind side of thighs is not bright pink or red.

In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black



markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** South-east Australia in an arc generally including the moist parts of south-east Queensland, the adjoining coast of Queensland and northern New South Wales and the Murray Darling Basin, including most of New South Wales, northern Victoria and south-east South Australia.

**Etymology:** *Lowingdella* subgen. nov. is named in honour of Vicki Lowing of Rockbank, Victoria, Australia, better known as the Crocodile lady for her work over some decades educating people about Crocodiles. This has included correcting the devastatingly damaging message put out by the Steve and Terri Irwin business via their TV shows, their message being that you can be a rich and famous hero by attacking and abusing crocodiles for the purposes of cheap entertainment and making a fast income.

In 2020, the Victorian Wildlife Department has conducted numerous raids on Lowing's facility at Rockbank with a view to ending her good work with crocodiles as it allegedly impedes and competes with the Irwin business and that of the Melbourne Zoo / Zoos Victoria business, who also send the anti-conservation message to people that Crocodiles are to be feared and loathed.

Both see Lowing as a competitor in the "crocodile business" and would prefer to have themselves seen as the only "experts" in the Crocodile space and the income stream this brings them.

**Content:** *Crinia (Lowingdella) lowingae* sp. nov. (type species); *C. (Lowingdella) maateni* sp. nov.; *C. (Lowingdella) parinsignifera* (Main, 1957); *C. (Lowingdella) stevebennetti* sp. nov.; *C. (Lowingdella) tinnula* (Straughan and Main, 1956).

**CRINIA (LOWINGDELLA) LOWINGAE SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:6C29885D-CF99-43D8-942A-3BE0EA5C02EF**

**Holotype:** A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.165529 collected from 2.5km along Digger's Camp Road in Yuraygir National Park, New South Wales, Australia, Latitude -29.8292 S., Longitude 153.2719 E. This government-owned facility allows access to its holdings.

**Paratypes:** 1/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.165524, collected at the Double Crossing Creek, Pacific Hwy. South Woolgoolga, New South Wales, Australia, Latitude -30.1361 S., Longitude 153.1930 E. 2/ A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.183128 collected at Red Rock, New South Wales, Australia, Latitude -29.983 S., Longitude 153.233 E.

**Diagnosis:** The two species *Crinia (Lowingdella) lowingae* sp. nov. from coastal swamps in a region between Woody Head and Coffs Harbour in New South Wales and *C. (Lowingdella) stevebennetti* sp. nov. from coastal swamps south of Port Macquarie to as far south as the central coast of New South Wales have both until now been generally treated as southern populations of *C. (Lowingdella) tinnula* (Straughan and Main, 1956), with a type locality of Rose Creek, Beerburum, (between Brisbane and the Sunshine Coast) in South-east Queensland, Australia, being a species inhabiting coastal swamps from south-east Queensland and far northern New South Wales.

That more than one species had been lumped under the label *C. tinnula* has been known for many years. Read *et al.* (2001) showed species level genetic distinctions between a putative population of *C. tinnula* from Myall Lakes, National Park, just north of Newcastle, New South Wales and what they called an undescribed species from Coffs Harbour, New South Wales.

With these two species being allopatric and clearly morphologically divergent from south-east Queensland *C. tinnula* (being the type for the genus), it is somewhat scandalous that with all the money ostensibly being spent by the NSW State Government on scientific research on wildlife, with literally hundreds of so-called scientists on the government gravy train payroll, that these two vulnerable species have remained effectively quarantined from science by being unnamed for two decades.

Hence, while taking pleasure in bringing two new species to the attention of the global scientific community, I must state that I would have preferred someone else had done this task 20 years earlier! The three species, *C. (Lowingdella) tinnula* (Straughan and Main, 1956), *C. lowingae* sp. nov. and *C. stevebennetti* sp. nov. are readily separated from one another as follows:

1/ *C. tinnula* (Straughan and Main, 1956), is a frog with distinctive dorsal pattern, including well-defined yellowish-white line on the rear upper lip region, numerous tiny black specks are on the upper parts of upper forelimbs. In males, the belly is peppered heavily grey, with a distinctive thin white line running down the medial line from the snout, under the throat to level with the forearms. This is broken by a thin white cross line running to the forelimbs and the longitudinally running white line runs posterior to this point to the end of the body. Most of the gular area is mainly white, although with heavy peppering on the edges.

In both sexes, there are distinct dark brown markings interposed with white or light brown markings on the upper labial area. Most specimens (but not all) have a dark orange-red stripe down the middle of back. Iris is reddish.

*C. tinnula* (Straughan and Main, 1956) is depicted on page 141 of Vanderduys (2012) in the bottom two images, Anstis (2013) on page 587 (top two images) and Cogger (2014) on page 86, in bottom two images (dorsum and venter of male).

2/ *C. lowingae* sp. nov. is separated from the other two species by having an ill-defined dorsal pattern. Colour is whitish grey under eye and there are no well defined markings on upper labial area.

There is usually no dark orange-red-stripe down the middle of the back.

Iris is brown.

Ventrally, males have a completely greyish gular region, with an indistinct row of somewhat merged tiny white dots forming a line down the centre to the level of the upper arms. The line ends here as does the greyish colour. The belly of the frog is otherwise whitish, but not an immaculate colour, being lightly flecked or specked with a semi-translucent grey.

Undersides of limbs are greyish purple.

There is no discernable line under the belly running between the arms.

In both sexes there is a brown iris, and ill defined dorsal pattern.

Colour is whitish grey under eye and there are no well defined markings on upper labial area.

Usually there is no dark orange-red-stripe down middle of the back.

A dorsal shot of *C. lowingae* sp. nov. is depicted in life at:

<https://www.flickr.com/photos/14807473@N08/27624337911>

and venter of a male at:

<https://www.flickr.com/photos/14807473@N08/27086354354/>

3/ *C. stevebennetti* sp. nov. is similar in most respects to *C. tinnula* but is separated from that species as follows: Orange-yellow iris and well defined dorsal pattern; beige under eye. Moderate to

well-defined pattern on upper labial area. There is usually a dark orange-red-stripe down middle of back. No numerous tiny black specks are on the upper parts of upper forelimbs.

The venter of males is characterised by a mainly white gular region and a belly that is mainly whitish but with a patchwork of semi-distinctive dark brownish grey markings away from the medial line extending to the flanks. Unique to males of this species is the presence of numerous bright yellow spots on a greyish brown background on the undersurfaces of the upper arms and upper hindlimbs.

Under the body, running from the snout to the rear is a thick wide line of whitish-yellow, and a somewhat thinner, but still thick whitish-yellow line running to the axilla of each forearm.

Darkening of the gular region is restricted to the sides of the broad median line and not the jawline as seen in *C. tinnula*. It is also in the form of marbling rather than peppering.

A photo of the dorsum of *C. stevebennetti* sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/14807473@N08/3914008567/>

and

<https://www.flickr.com/photos/14807473@N08/3558441336/>

and

<https://www.flickr.com/photos/pokerchampdaniel/3568281077/>

A photo of the ventral surface of a male is depicted in Anstis (2013) on page 587 at bottom right.

The three preceding species are separated from the other two members of the subgenus *Lowingdella* subgen. nov., namely *C. (Lowingdella) parinsignifera* (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. by the presence in one form or other of a median white line down the centre of the throat, versus an absence.

Frogs in the subgenus *Lowingdella* subgen. nov. a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella* subgen. nov., type species *Crinia (Oxydella) oxeyi* sp. nov.), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on

the toes; hind side of thighs is not bright pink or red. In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** *Crinia (Lowingdella) lowingae* sp. nov. appears to be restricted to coastal swamps in a region between Woody Head and south along the coast to about Coffs Harbour in New South Wales

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

**CRINIA (LOWINGDELLA) STEVBENNETTI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:0C1924BB-B69A-4AB1-AA8A-4604B59DB8F1**

**Holotype:** A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.165449 collected from Myall Quays Estate, Tea Gardens, New South Wales, Australia, Latitude -32.6467 S., Longitude 152.1644 E. This government-owned facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen numbers R.147106 and R.148261 collected from Tea Gardens, New South Wales, Australia, Latitude -32.6467 S., Longitude 152.1644 E.

**Diagnosis:** The two species *Crinia (Lowingdella) lowingae* sp. nov. from coastal swamps in a region between Woody Head and Coffs Harbour in New South Wales and *C. (Lowingdella) stevbennetti* sp. nov. from coastal swamps south of Port Macquarie to as far south as the central coast of New South Wales have both until now been generally treated as southern populations of *C. (Lowingdella) tinnula* (Straughan and Main, 1956), with a type locality of Rose Creek, Beerburum, (between Brisbane and the Sunshine Coast) in South-east Queensland, Australia, being a species inhabiting coastal swamps from south-east Queensland and far northern New South Wales.

That more than one species had been lumped under the label *C. tinnula* has been known for many years. Read *et al.* (2001) showed species level genetic distinctions between a putative population of *C. tinnula* from Myall Lakes, National Park, just north of Newcastle, New South Wales and what they called an undescribed species from Coffs Harbour, New South Wales.

With these two species being allopatric and clearly morphologically divergent from south-east Queensland *C. tinnula* (being the type for the genus), it is somewhat scandalous that with all the money ostensibly being spent by the NSW State Government on scientific research on wildlife, with literally hundreds of so-called scientists on the government gravy train payroll, that these two vulnerable species have remained effectively quarantined from science by being unnamed for two decades.

Hence, while taking pleasure in bringing two new species to the attention of the global scientific community, I must state that I would have preferred someone else had done this task 20 years earlier! The three species, *C. (Lowingdella) tinnula* (Straughan and Main, 1956), *C. lowingae* sp. nov. and *C. stevbennetti* sp. nov. are readily separated from one another as follows:

1/ *C. tinnula* (Straughan and Main, 1956), is a frog with distinctive dorsal pattern, including well-defined yellowish-white line on the rear upper lip region, numerous tiny black specks are on the upper parts of upper forelimbs. In males, the belly is peppered heavily grey, with a distinctive thin white line running down the medial line from the snout, under the throat to level with the forearms. This is broken by a thin white cross line running to the forelimbs and the longitudinally running white line runs posterior to this point to the end of the body. Most of the gular area is

mainly white, although with heavy peppering on the edges.

In both sexes, there are distinct dark brown markings interposed with white or light brown markings on the upper labial area. Most specimens (but not all) have a dark orange-red-stripe down the middle of back. Iris is reddish.

*C. tinnula* (Straughan and Main, 1956) is depicted on page 141 of Vanderduys (2012) in bottom two images, Anstis (2013) on page 587 (top two images) and Cogger (2014) on page 86, in bottom two images (dorsum and venter of male).

2/ *C. lowingae* sp. nov. is separated from the other two species by having an ill-defined dorsal pattern.

Colour is whitish grey under eye and there are no well defined markings on upper labial area.

There is usually no dark orange-red-stripe down the middle of the back.

Iris is brown.

Ventrally, males have a completely greyish gular region, with an indistinct row of somewhat merged tiny white dots forming a line down the centre to the level of the upper arms. The line ends here as does the greyish colour. The belly of the frog is otherwise whitish, but not an immaculate colour, being lightly flecked or specked with a semi-translucent grey.

Undersides of limbs are greyish purple.

There is no discernable line under the belly running between the arms.

In both sexes there is a brown iris, and ill defined dorsal pattern.

Colour is whitish grey under eye and there are no well defined markings on upper labial area.

Usually there is no dark orange-red-stripe down middle of the back.

A dorsal shot of *C. lowingae* sp. nov. is depicted in life at:

<https://www.flickr.com/photos/14807473@N08/27624337911>

and venter of a male at:

<https://www.flickr.com/photos/14807473@N08/27086354354/>

3/ *C. stevebennetti* sp. nov. is similar in most respects to *C. tinnula* as defined above, but is separated from that species as follows: Orange-yellow iris and well defined dorsal pattern; beige under eye. Moderate to well-defined pattern on upper labial area. There is usually a dark orange-red-stripe down middle of back. No numerous tiny black specks are on the upper parts of upper forelimbs.

The venter of males is characterised by a mainly white gular region and a belly that is mainly whitish but with a patchwork of semi-distinctive dark brownish grey markings away from the medial line extending to the flanks. Unique to males of this species is the presence of numerous bright yellow spots on a greyish brown background on the

undersurfaces of the upper arms and upper hindlimbs.

Under the body, running from the snout to the rear is a thick wide line of whitish-yellow, and a somewhat thinner, but still thick whitish-yellow line running to the axilla of each forearm.

Darkening of the gular region is restricted to the sides of the broad median line and not the jawline as seen in *C. tinnula*. It is also in the form of marbling rather than peppering.

A photo of the dorsum of *C. stevebennetti* sp. nov. in life is depicted online at:

<https://www.flickr.com/photos/14807473@N08/3914008567/>

and

<https://www.flickr.com/photos/14807473@N08/3558441336/>

and

<https://www.flickr.com/photos/pokerchampdaniel/3568281077/>

A photo of the ventral surface of a male is depicted in Anstis (2013) on page 587 at bottom right.

The three preceding species are separated from the other two members of the subgenus *Lowingdella* subgen. nov., namely *C. (Lowingdella) parinsignifera* (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. by the presence in one form or other of a median of white line down the centre of the throat, versus an absence.

Frogs in the subgenus *Lowingdella* subgen. nov. a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella* subgen. nov., type species *Crinia (Oxydella) oxeyi* sp. nov.), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on the toes; hind side of thighs is not bright pink or red. In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is

uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** *Crinia (Lowingdella) stevebennetti* sp. nov. appears to be restricted to coastal swamps in a region between Port Macquarie and south to the central coast region of New South Wales.

**Etymology:** *C. stevebennetti* sp. nov. is named in honour of Steve Bennett of Narre Warren South, Victoria, Australia in recognition of valuable contributions to herpetology by way of assisting myself in numerous research projects over more than three decades. He has also worked extensively in the relevant region immediately north of Newcastle in New South Wales which is where this species first became known.

**CRINIA (LOWINGDELLA) MAATENI SP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:311C6908-A58F-46BF-B8D8-20FC3A1FF05A

**Holotype:** A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J33313 collected from Mimosa Creek, Blackdown Tableland, Queensland, Australia, Latitude -23.7833 S., Longitude 149.0833 E. This government-owned facility allows access to its holdings.

**Paratypes:** 16 preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J33314- J33329 collected from Mimosa Creek, Blackdown Tableland, Queensland, Australia, Latitude -23.7833 S.,

Longitude 149.0833 E.

**Diagnosis:** Until now *Crinia (Lowingdella) maateni* sp. nov. from coastal Queensland, south of about Rockhampton, including east flowing drainage basins, and nearby coastal parts of northern New South Wales, has been treated as a northern population of *Crinia (Lowingdella) parinsignifera* (Main, 1957), with a distribution otherwise centred on the Murray Darling Basin in south-west Queensland, New South Wales, northern Victoria and south-east South Australia, including the type locality of Kingston on Murray, South Australia.

The east coast specimens are sufficiently divergent to be treated as a separate species in line with other frog taxa similarly affected by the Great Dividing Range in this same region as seen for example in *Ranaster salmini* (Steindachner, 1867) from the Murray Darling basin and *R. snakemansbogensis* Hoser, 2020, which were shown to be different species based on morphology and previously published genetic studies as cited by Hoser (2020). *C. maateni* sp. nov. is most readily separated from *C. parinsignifera* by the presence of two or more large and extended lines of folded skin running longitudinally down the mid-back in a wavy line on either side of the central median.

By contrast most specimens of *C. parinsignifera* have a dorsum punctuated by large tubercles or at best small and irregular folds of skin.

*C. maateni* sp. nov. has a dorsum that consists more-or-less of a pattern incorporating reasonably well-defined longitudinal lines running down the sides of the top of the dorsal surface and near striped pattern in the central region of the back as well, versus an obviously blotched appearance on the mid dorsum and an irregular light zone on the sides of the dorsum, not appearing as any sort of line.

Spines on the upper surface of the middle hind legs are large and close together in *C. maateni* sp. nov., versus well spaced apart in *C. parinsignifera*. Upper surface of upper arm in *C. maateni* sp. nov. is light orange, versus light yellow in *C. parinsignifera* (as seen in the image of a specimen of that species from Kangaroo Ground, Victoria published with this paper on the front cover of *Australasian Journal of Herpetology* Issue 51). In *C. maateni* sp. nov. the dark patch behind the eye is prominent and well defined, versus usually (but not always), not so in *C. parinsignifera* (again as seen in the image of a specimen of that species from Kangaroo Ground, Victoria published with this paper on the front cover of *Australasian Journal of Herpetology* Issue 51).

*C. maateni* sp. nov. usually has a reddish or chocolate brown dorsum, versus usually yellowish-brown in *C. parinsignifera*.

Photos of *C. maateni* sp. nov. in life can be found in Anstis (2013) on page 564 at top right and online at: <https://www.flickr.com/photos/euprepiosaur/>

8471986011/

and

<https://www.flickr.com/photos/smacdonald/15087966295/>

Photos of *C. parinsignifera* in life can be found in Anstis (2013) on page 565 bottom left, Cogger (2014) on page 80 at top and online at:

<https://www.flickr.com/photos/23031163@N03/3838947107/>

and

<https://www.flickr.com/photos/14807473@N08/3095373682/>

and

<https://www.flickr.com/photos/88708273@N03/15026834515/>

and

<https://www.flickr.com/photos/136643623@N03/28073098163/>

and the front cover of *Australasian Journal of Herpetology* Issue 51.

*C. (Lowingdella) parinsignifera* (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. are depicted side by side in Vanderduys (2012) on page 138, with *C. parinsignifera* on the right and *C. maateni* sp. nov. on the left.

*C. (Lowingdella) parinsignifera* (Main, 1957) and *C. (Lowingdella) maateni* sp. nov. are separated from the three other species in the subgenus *Lowingdella* subgen. nov., namely *Crinia (Lowingdella) lowingae* sp. nov. from coastal swamps in a region between Woody Head and Coffs Harbour in New South Wales, *C. (Lowingdella) stevebennetti* sp. nov. from coastal swamps south of Port Macquarie to as far south as the central coast of New South Wales and *C. (Lowingdella) tinnula* (Straughan and Main, 1956) from coastal south-east Queensland and the very far north-east of New South Wales by the absence in one form or other of a median white line down the centre of the throat, versus a presence.

Frogs in the subgenus *Lowingdella* subgen. nov. a subgenus of *Crinia* are readily separated from all other *Crinia* species (all other subgenera, being *Crinia* Tschudi, 1839, type species: *Crinia georgiana* Tschudi, 1838, *Ranidella* Girard, 1853, type species: *Crinia signifera* Girard, 1853, *Tylerdella* Wells and Wellington, 1985, type species: *Ranidella remota* Tyler and Parker, 1974, *Bryobatrachus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994, type species: *Bryobatrachus nimbus* Rounsevell, Ziegeler, Brown, Davies, and Littlejohn, 1994 and *Oxydella* subgen. nov., type species *Crinia (Oxydella) oxeyi* sp. nov.), by the following unique suite of characters: Dorsum is mainly smooth, but with scattered tubercles and carbuncles. Moderately granular belly, finely granular throat; tiny adult size of 20 mm snout-vent or less; adult with more or less dermal fringes on the toes; hind side of thighs is not bright pink or red.

In males, the throat of the breeding male is white or grey, chin only dark (or has some darkening on it, near the centre, sides of mouth or both and gular area is noticeably darker than the lighter belly beyond or if not so, then bounded by a somewhat distinctive white line running across the belly between the front legs and commonly a white medial line running from the snout, along the mid section of the gular region and often the entire length of the belly; white pectoral spots inconspicuous or absent. Belly of female is uniform and whitish (not immaculate or ivory white), sometimes speckled with grey.

In both sexes the markings on the belly are indistinct as opposed to bold in other subgenera.

The palm of the hand is smooth.

Belly a light greyish or white with grey (sometimes brownish) mottling, peppering or blotches in some form (as in not immaculate white) and no black markings of any sort on the belly; tympanum obscure but distinct.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotoid and flank glands are either absent or not evident externally. Phalanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** *Crinia (Lowingdella) maateni* sp. nov. is found in coastal Queensland, south of about Rockhampton, including east flowing drainage basins, such as the Fitzroy River System, and nearby coastal parts of northern New South Wales, Australia.

*Crinia (Lowingdella) parinsignifera* (Main, 1957) is confined to west-flowing drainage basins of the Murray-Darling Basin in Queensland, New South Wales, Victoria and South Australia, Australia and south of the Great Dividing Range in the outer northern suburbs of Melbourne (e.g. Kangaroo Ground).

Potentially contrary to the preceding, *C. maateni* sp. nov. are found in the Barakula State Forest in south-east Queensland, north-west of Miles in South-east Queensland.

**Etymology:** Named in honour Frits Maaten, former co-owner (with Andy Stevens) of a successful wildlife

conservation business in the form of the Monbulk Animal Kingdom in Victoria, Australia in the 1970's and 1980's. They were victims of their own success and as a result had their enterprise shut down at gunpoint by the State Government wildlife department who also happened to own a dysfunctional animal abusing zoo down the road from the Maaten's.

That facility, the loss-making Healesville Sanctuary, besides having a shocking record with respect to wildlife keeping and even public safety, only continues to operate as a business enterprise because the suffering Victorian taxpayer bails out their never ending financial mismanagement. But when competitor and government regulator are the same entity (State Government Wildlife Department owns and controls Healesville Sanctuary), there is no place for a successful and properly run wildlife conservation business such as that owned and operated by Maaten and Stevens.

The wildlife department and their Healesville Sanctuary saw Maaten and Stevens as taking clients they thought they have a right to own. Maaten and Stevens also managed to breed species of wildlife that staff at Healesville Sanctuary were incapable of breeding. They saw Maaten and Stevens as stealing favourable publicity that they would otherwise liked to have had.

By shutting down the Monbulk Animal Kingdom at gunpoint, the Healesville Sanctuary were given their long desired monopoly in the zoo business space east of Melbourne, Australia.

That situation remains the case, more than two decades later in year 2020.

**CRINIA (CRINIA) MERCEICAI SP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:61237DD7-9967-4E8B-BBF9-5EE6A9316B29

**Holotype:** A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R97665 collected from Hellfire Bay, Cape Le Grand National Park, Western Australia, Australia, Latitude -34.0167 S., Longitude 122.1833 E. This government-owned facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R97633 and R67734 collected from Hellfire Bay, Cape Le Grand National Park, Western Australia, Australia, Latitude -34.0167 S., Longitude 122.1833 E.

**Diagnosis:** Until now, *C. merceicai sp. nov.* found along the southern coast of Western Australia from Cape Arid in the east, west to about Cheyne Bay, and then extending inland towards the Darling Range near the south-side of Perth in Western Australia, but away from the coast has been treated as an eastern population of putative *Crinia georgiana* Tschudi, 1838, as currently recognized (*sensu* Cogger 2014 or

Anstis 2013).

The identification of *C. merceicai sp. nov.* as a divergent species from *C. georgiana* was confirmed by Edwards (2007), who found each diverged from one another about 1.5 MYA.

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

The second, morphologically divergent species, *C. merceicai sp. nov.* is readily separated from the preceding species by being generally yellowish brown (usually) to light chocolate brown, with a yellowish white venter, which has extensive markings and spots overlaying tubercles, especially anteriorly.

*C. merceicai sp. nov.* has a yellow-brown iris, versus light orange in *C. georgiana*.

The upper lip below the eye is always striped in *C. merceicai sp. nov.*, versus striped or spotted in *C. georgiana*. The broken red or orange line running around the top of the eye is prominent in *C. georgiana* versus not so, or absent in *C. merceicai sp. nov.*

Dorsal pattern in both species varies in both sexes and may be with or without obvious dorsal striping.

The three available synonyms for *C. georgiana* with a type locality of King George's Sound (Albany), Western Australia, were checked.

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

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

*C. merceicai sp. nov.* from Esperance is depicted in life online at:

<http://esperancewildlife.blogspot.com/2008/05/quacking-frog-crinia-georgiana.html> (several images).

*C. georgiana* in life is depicted in Tyler *et al.* (1994), Anstis (2013) on page 554 (all images) and Cogger (2014) on page 79 top left.

Both *C. merceicai sp. nov.* and *C. georgiana* are readily separated from all other species in the genus *Crinia* Tschudi, 1838 (including all subgenera) by the

following unique suite of characters: Belly granular; adults sometimes with lateral seams but without distinct dermal fringes on the toes; hind side of thighs bright pink or red.

The genus *Crinia* Tschudi, 1838 is readily separated from all other Australasian Myobatrachidae by the following unique suite of characters: Small terrestrial frogs that are found in most parts of Australia and southern New Guinea, except extremely arid areas. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are usually absent, but present as very small clusters or short rows in some species. The tongue is small, narrow, oval and free from behind (as in not adhering at the rear). Horizontal pupil. Tympanum is hidden, indistinct or tiny. Fingers without webbing, but may be fringed. Parotid and flank glands are either absent or not evident externally. Phlanges are simple, tips of digits are not or very slightly dilated, but certainly without distinct discs. No dermal brood pouches. Belly is moderately to slightly granular. Females are the larger sex (derived from Cogger 2014 with errors corrected).

**Distribution:** *C. merceicai* sp. nov. is found along the southern coast of Western Australia from Cape Arid in the east, west to about Cheyne Bay and then extending inland towards the Darling Range near the south-side of Perth (Harvey and Waroona area) in Western Australia, but otherwise away from the coast (see Fig. 3.2 on page 73 of Edwards (2007) for detail).

**Etymology:** *C. merceicai* sp. nov. is named in honour of Dave Merceica of the Sunshine Coast, Queensland, Australia, previously of Bacchus Marsh and Hillside in Victoria, an avid reptile keeper for many years in recognition of his services to other herpetologists and wildlife research as part of his long-term conservation ethic, including through considerable logistical support for a number of regional herpetological societies in Australia.

**WELLINGTONDELLA GEN. NOV.**

**LSIDurn:** [zoobank.org/act:0DEB71F2-77D2-436C-937A-3349B280A208](https://zoobank.org/act:0DEB71F2-77D2-436C-937A-3349B280A208)

**Type species:** *Crinia rosea* Harrison, 1927.

**Diagnosis:** Until now, most authors including Anstis (2013) and Cogger (2014) have treated the genus *Geocrinia* Blake, 1973, type species *Pterophrynus laevis* Günther, 1864 as including species from south-east and south-west Australia, largely being within two more-or-less separate lineages.

Wells and Wellington (1985) transferred all Western Australian species to their newly erected genus *Hesperocrinia* Wells and Wellington, 1985, with a type species of *Crinia leai* Fletcher, 1898.

However molecular studies (e.g. Read *et al.* 2001) have shown *Crinia leai* Fletcher, 1898 to be more closely related to the east Australian species than the

others from Western Australia, meaning that the best placement for that taxon is within *Geocrinia* and the remaining quite divergent West Australian species should in turn be placed in a new genus, herein named *Wellingtondella* gen. nov.

Morphological and biological evidence as summed up in Anstis (2013) confirms the preceding contention.

Based on the preceding *Hesperocrinia* is herein retained as a subgenus, within *Geocrinia*.

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* gen. nov. are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

Frogs in the subgenus *Hesperocrinia* Wells and Wellington, 1985, herein treated as a complex of three species, two of which are formally named in this paper for the first time, are separated from other species in the nominate subgenus of *Geocrinia* and the genus *Wellingtondella* gen. nov. by having toes with slight terminal expansions and with distinct subarticular tubercles; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe and a belly that is brown, yellow-brown or green-grey in colour.

Frogs in the genus *Geocrinia* are separated from the species within *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

*Geocrinia* (both subgenera) are separated from *Wellingtondella* gen. nov. by having diphasic calls and terrestrial egg deposition with aquatic tadpoles.



*Wellingtondella* gen. nov. in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *Geocrinia (Hesperocrinia) brianbarnetti* sp. nov. all from south-west Australia.

The genus *Wellingtondella* gen. nov. includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

**Distribution:** *Wellingtondella* gen. nov. is confined to wetter parts of far south-west Western Australia.

**Etymology:** *Wellingtondella* gen. nov. is named in honour of Cliff Ross Wellington of Ramornie, New South Wales, Australia, (about 485 km north of Sydney), previously of Woy Woy, New South Wales, Australia in recognition of his immense services to herpetology in Australia. While best known for his co-authorship of landmark publications Wells and Wellington (1984 and 1985) his contributions to herpetology go well beyond these papers both before and since the time they were published, including numerous other important published works and services to conservation.

They include his petitioning the ICZN to stamp out the nefarious and dishonest practice of taxonomic vandalism and numerous conservation programs for rare and threatened species in New South Wales, especially in relation to frogs.

Wellington was also the first herpetologist in the world to demonstrate the significance of toxic chemicals in waterways inhibiting the spread of Chytrid fungus and thereby inadvertently helping vulnerable species of frogs evade extinction caused by the same fungus. This included several species from the Sydney and Blue Mountains regions of New South Wales.

**Content:** *Wellingtondella rosea* (Harrison, 1927) (type species); *W. alba* (Wardell-Johnson and Roberts, 1989); *W. lutea* (Main, 1963); *W. vitellina* (Wardell-Johnson and Roberts, 1989).

**GEOCRINIA (HESPEROCRINIA) BRETTBARNETTI SP. NOV.**

**LSID**urn:lsid:zoobank.org:act:0693EF78-5757-4673-95A9-1886C703C687

**Holotype:** A preserved male specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R166532

collected from the Shannon Area, Western Australia, Latitude -34.8194 S., Longitude 116.3025 E. This government-owned facility allows access to its holdings.

**Paratypes:** Four preserved specimens, at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R86438, R86439, R86440 and R29145 all collected from near Broke Inlet, Western Australia Latitude -34.8667 S., Longitude 116.35 E.

**Diagnosis:** Until now, both *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *G. brianbarnetti* sp. nov. have been treated as two distinct south-eastern populations of the putative species *G. leai* (Fletcher, 1898). However Edwards (2007), found species-level divergences between the three allopatric populations. As they are also morphologically divergent and evolving as separate species, it is appropriate that all three are formally identified and named as done in this paper. This means two species are formally named for the first time.

The three species constitute the entirety of the subgenus *Hesperocrinia* Wells and Wellington, 1985 as defined in this paper, the genus (or subgenus) concept being new and different from that of the original authors, Wells and Wellington (1985).

The type locality of *Crinia leai* Fletcher, 1898 (now placed in *Geocrinia* Blake, 1973, with a type species of *Pterophrynus laevis* Günther, 1864) is Bridgetown and Pipe Clay Creek (near Jarrahdale), Western Australia, Australia and hence this taxon represents the western population of the subgenus *Hesperocrinia*.

The putative species *Crinia michaelsoni* Werner, 1914 was synonymised with with *G. leai* (Fletcher, 1898) by Cogger *et al.* (1983) and that taxon had a type locality of Donnybrook, Western Australia, which along with the type of *G. leai* is of the western population of the subgenus *Hesperocrinia*.

In other words the newer name is not available for the two populations herein referred to as *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *G. brianbarnetti* sp. nov..

The distribution of each of the three species is laid out in Fig. 5.2 of Edwards (2007) at top of page 125. The three species as identified by Edwards (2007) in Fig 5.2 from west to east, using the taxonomy and nomenclature of this paper are *G. laevis* (AKA Western lineage), occurring north and west of Warren and Donnelly, Western Australia, *G. brettbarnetti* sp. nov. being restricted to the Shannon-Gardner River catchment (AKA Shannon-Gardner lineage) and *G. brianbarnetti* sp. nov. from Walpole eastwards along the southern coast and nearby hinterland east to Two People's Bay of Western Australia, Australia (AKA south-east coastal lineage). Edwards (2007) at bottom of page 125 gave sequence divergences for each of the three species

indicating 2-3 million years divergence from one another.

They are separated from one another as follows:

*G. leai* is a generally yellowish to yellowish-brown coloured frog (adults) characterised by a semi-distinct dorsal pattern consisting of a dark greyish-brown or brown mid-dorsal stripe running down the mid back being as wide as the distance between the eyes. The boundary between this and the lighter upper flanks is not distinct. The mid dorsal area is also punctuated by small, raised irregular dark tubercular spots, slightly more prevalent near the mid outer edges. The flanks, while unicolour have a small number of semidistinct dark brown spots of small size on the lower flanks. Upper surfaces of the fore and hind limbs have limited dark flecks or markings, themselves only semidistinct, tending to form broken indistinct crossbands on the upper surfaces of the hind limbs. Iris is orange to red in colour. Crown across and between the eyes is yellow to orange brown.

*G. brettbarnetti sp. nov.* is a mainly grey frog both dorsally and on the sides, with strong russet flushes on the upper sides of the dorsum and on the upper surfaces of the upper arm (essentially brown) and to a lesser extent on the upper surfaces of the hind limbs (where it is a flush over grey and darker crossbands on the upper surfaces of the hind leg. Iris is chocolate brown. The upper surfaces of the back legs are grey and darker spots forming crossbands are also obvious. Crown across and between the eyes is light grey brown to chocolate brown.

*G. brianbarnetti sp. nov.* is a well-marked frog with a well-defined yellow or orange crown across and between the eyes, a dark, usually unicolour mid-dorsal stripe expanded to the width of between the eyes, which in some specimens is broken by a lighter mid-dorsal line down the mid section of most of the back. The wide mid dorsal stripe is bounded on the outer edge by a light (often near white boundary) at the leading edge of yellowish (brown or orange) upper flank in turn bounded by a fairly well-demarcated lower flank, which is dark brown in colour. Iris is yellow to brownish-yellow.

In both *G. leai* and *G. brettbarnetti sp. nov.* the metamorphosing tadpole is generally greyish in colour, without obvious dorsal markings or colouration. By contrast these tadpoles in *G. brianbarnetti sp. nov.* are well marked dorsally with bright orange-red on a beige background. The orange-red is particularly prominent on the upper limbs and the mid-dorsal line.

Anstis (2013) outlines various other differences between the tadpoles of both *G. leai* and *G. brianbarnetti sp. nov.* which she identifies as "southern" form of *G. leai*.

Photos of *G. leai* can be found in Storr, Smith and Johnstone (1994), plate 2, image 2, Cogger (2014)

on page 89 bottom and Anstis (2013) page 600 at top right.

*G. brianbarnetti sp. nov.* is depicted in Anstis (2013) page 600 at top left, middle right and middle bottom. Colour images of all three species *G. leai*, *G. brettbarnetti sp. nov.* and *G. brianbarnetti sp. nov.* in life can be found online at: <http://www.flickr.com> by typing in the search string "Geocrinia leai".

Frogs in the subgenus *Hesperocrinia* Wells and Wellington, 1985, herein treated as a complex of three species, two of which are formally named in this paper for the first time, are separated from other species in the nominate subgenus of *Geocrinia* and *Wellingtondella gen. nov.* by having toes with slight terminal expansions and with distinct subarticular tubercles; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe and a belly that is brown, yellow-brown or green-grey in colour.

Frogs in the genus *Geocrinia* are separated from the species within *Wellingtondella gen. nov.* by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella gen. nov.* are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

*Geocrinia* (both subgenera) are separated from *Wellingtondella gen. nov.* by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella gen. nov.* in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti sp. nov.* and *Geocrinia (Hesperocrinia) brianbarnetti sp. nov.* all from south-west Australia.

The genus *Wellingtondella gen. nov.* includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea*

(Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* *gen. nov.* are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden;

outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

**Distribution:** *G. brettbarnetti* *sp. nov.* is restricted to the Shannon-Gardner River catchment (AKA Shannon-Gardner lineage of Edwards 2007) and due to the very restricted distribution, must be regarded as a vulnerable or threatened species, meaning habitat where it occurs should be both protected and proactively managed.

**Etymology:** The species *G. brettbarnetti* *sp. nov.* is named in honour of Brett Barnett of Sunshine, Victoria, Australia, who like (and often with) his father Brian Barnett has devoted his life to furthering herpetology in Australia, including through active management of the Victorian Herpetological Society in many administrative and logistical roles over many decades, including managing security and many large, successful and at times difficult to manage, reptile breeder expos at the Melbourne Showgrounds.

**GEOCRINIA (HESPEROCRINIA) BRIANBARNETTI SP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:DD12BE1C-20DA-4E09-9B52-5DEFEC217F42

**Holotype:** A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R120057 collected from 6 KM west of Albany, Western Australia, Australia, Latitude -35.0333 S., Longitude 117.8167 E. This government-owned facility allows access to its holdings.

**Paratypes:** Seven preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R116137-R116143 all collected from 8 KM west of Albany, Western Australia, Australia, Latitude -35.0167 S., Longitude 117.7916 E.

**Diagnosis:** Until now, both *Geocrinia* (*Hesperocrinia*) *brettbarnetti* *sp. nov.* and *G. brianbarnetti* *sp. nov.* have been treated as two distinct south-eastern populations of the putative species *G. leai* (Fletcher,

1898). However Edwards (2007), found species-level divergences between the three allopatric populations. As they are also morphologically divergent and evolving as separate species, it is appropriate that all three are formally identified and named as done in this paper. This means two species are formally named for the first time.

The three species constitute the entirety of the subgenus *Hesperocrinia* Wells and Wellington, 1985 as defined in this paper, the genus (or subgenus) concept being new and different from that of the original authors, Wells and Wellington (1985).

The type locality of *Crinia leai* Fletcher, 1898 (now placed in *Geocrinia* Blake, 1973, with a type species of *Pterophrynus laevis* Günther, 1864) is Bridgetown and Pipe Clay Creek (near Jarrahdale), Western Australia, Australia and hence this taxon represents the western population of the subgenus *Hesperocrinia*.

The putative species *Crinia michaelsoni* Werner, 1914 was synonymised with *G. leai* (Fletcher, 1898) by Cogger *et al.* (1983) and that taxon had a type locality of Donnybrook, Western Australia, which along with the type of *G. leai* is of the western population of the subgenus *Hesperocrinia*.

In other words the newer name is not available for the two populations herein referred to as *Geocrinia* (*Hesperocrinia*) *brettbarnetti* *sp. nov.* and *G. brianbarnetti* *sp. nov.*

The distribution of each of the three species is laid out in Fig. 5.2 of Edwards (2007) at top of page 125. The three species as identified by Edwards (2007) in Fig 5.2 from west to east, using the taxonomy and nomenclature of this paper are *G. laevis* (AKA Western lineage), occurring north and west of Warren and Donnelly, Western Australia, *G. brettbarnetti* *sp. nov.* being restricted to the Shannon-Gardner River catchment (AKA Shannon-Gardner lineage) and *G. brianbarnetti* *sp. nov.* from Walpole eastwards along the southern coast and nearby hinterland east to Two People's Bay of Western Australia, Australia (AKA south-east coastal lineage). Edwards (2007) at bottom of page 125 gave sequence divergences for each of the three species indicating 2-3 million years divergence from one another.

They are separated from one another as follows: *G. leai* is a generally yellowish to yellowish-brown coloured frog (adults) characterised by a semi-distinct dorsal pattern consisting of a dark greyish-brown or brown mid-dorsal stripe running down the mid back being as wide as the distance between the eyes. The boundary between this and the lighter upper flanks is not distinct. The mid dorsal area is also punctuated by small, raised irregular dark tubercular spots, slightly more prevalent near the mid outer edges. The flanks, while unicolour have a small number of semidistinct dark brown spots of

small size on the lower flanks. Upper surfaces of the fore and hind limbs have limited dark flecks or markings, themselves only semidistinct, tending to form broken indistinct crossbands on the upper surfaces of the hind limbs. Iris is orange to red in colour. Crown across and between the eyes is yellow to orange brown.

*G. brettbarnetti* sp. nov. is a mainly grey frog both dorsally and on the sides, with strong russet flushes on the upper sides of the dorsum and on the upper surfaces of the upper arm (essentially brown) and to a lesser extent on the upper surfaces of the hind limbs (where it is a flush over grey and darker crossbands on the upper surfaces of the hind leg. Iris is chocolate brown. The upper surfaces of the back legs are grey and darker spots forming crossbands are also obvious. Crown across and between the eyes is light grey brown to chocolate brown.

*G. brianbarnetti* sp. nov. is a well-marked frog with a well-defined yellow or orange crown across and between the eyes, a dark, usually unicolour mid-dorsal stripe expanded to the width of between the eyes, which in some specimens is broken by a lighter mid-dorsal line down the mid section of most of the back. The wide mid dorsal stripe is bounded on the outer edge by a light (often near white boundary) at the leading edge of yellowish (brown or orange) upper flank in turn bounded by a fairly well-demarcated lower flank, which is dark brown in colour. Iris is yellow to brownish-yellow.

In both *G. leai* and *G. brettbarnetti* sp. nov. the metamorphosing tadpole is generally greyish in colour, without obvious dorsal markings or colouration. By contrast these tadpoles in *G. brianbarnetti* sp. nov. are well marked dorsally with bright orange-red on a beige background. The orange-red is particularly prominent on the upper limbs and the mid-dorsal line.

Anstis (2013) outlines various other differences between the tadpoles of both *G. leai* and *G. brianbarnetti* sp. nov. which she identifies as "southern" form of *G. leai*.

Photos of *G. leai* can be found in Storr, Smith and Johnstone (1994), plate 2, image 2, Cogger (2014) on page 89 bottom and Anstis (2013) page 600 at top right.

*G. brianbarnetti* sp. nov. is depicted in Anstis (2013) page 600 at top left, middle right and middle bottom. Colour images of all three species *G. leai*, *G. brettbarnetti* sp. nov. and *G. brianbarnetti* sp. nov. in life can be found online at: <http://www.flickr.com> by typing in the search string "Geocrinia leai".

Frogs in the subgenus *Hesperocrinia* Wells and Wellington, 1985, herein treated as a complex of three species, two of which are formally named in this paper for the first time, are separated from other species in the nominate subgenus of *Geocrinia* and *Wellingtondella* gen. nov. by having toes with slight

terminal expansions and with distinct subarticular tubercles; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe and a belly that is brown, yellow-brown or green-grey in colour.

Frogs in the genus *Geocrinia* are separated from the species within *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

*Geocrinia* (both subgenera) are separated from *Wellingtondella* gen. nov. by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella* gen. nov. in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia* (*Hesperocrinia*) *leai* (Fletcher, 1898) as type species, *Geocrinia* (*Hesperocrinia*) *brettbarnetti* sp. nov. and *Geocrinia* (*Hesperocrinia*) *brianbarnetti* sp. nov. all from south-west Australia.

The genus *Wellingtondella* gen. nov. includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* gen. nov. are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood

pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phalanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

**Distribution:** *G. brianbarnetti* sp. nov. is restricted to the region from Walpole eastwards along the southern coast and nearby hinterland, east to Two People's Bay of Western Australia, Australia (AKA south-east coastal lineage according to Edwards 2007).

**Etymology:** The species *G. brianbarnetti* sp. nov. is named in honour of Brian Barnett of Sunshine, Victoria, Australia, who like (and often with) his son Brett Barnett has devoted his life to furthering herpetology in Australia, including through active management of the Victorian Herpetological Society in many roles over many decades.

Two other family members, Lani (former wife of Brian Barnett) and Tye (AKA Taipan), younger son of Brian Barnett are also formally recognized herein for their major contributions to herpetology and have previously had species formally named in their honour.

**GEOCRINIA LAEVIS GRAMPIANSENSIS SUBSP. NOV.**

**LSIDurn:**lsid:zoobank.org:act:FEF2295D-DD04-4A1E-A354-4D4F3D8FF3DB

**Holotype:** A preserved male specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D23575 collected from Forest Lodge, Grampians, Victoria, Australia, Latitude -37.17 S., Longitude 142.35 E. This government-owned facility allows access to its holdings.

**Paratypes:** Fourteen preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D23576, D23577, D23578, D23579, D23580, D23581, D24314, D68570, D68571, D68572, D72234, D72235, D72236, D72237 all collected from The Grampians, Victoria, Australia.

**Diagnosis:** Until now, the *G. laevis grampiansensis* subsp. nov. from the Grampians region of Victoria has been treated as nominate *G. laevis* Günther, 1864, with a type locality of Tasmania.

However both forms are morphologically divergent and geographically separated (allopatric) and therefore warrant taxonomic separation.

While they are probably separate species, the newly named form is herein conservatively named as a subspecies in the absence of a molecular basis to separate the forms (as in no comparative molecular study has been done).

*G. laevis grampiansensis* subsp. nov. is separated from *G. laevis* by having a dorsum covered with numerous (usually orange-tipped) tubercles, those on the sides of the back and upper flanks being largest

and most prominent. While there is often a russet sheen or semidistinct ill-defined russet or brown markings on the dorsum, there are no obvious and well-defined orange blotches or spots on smooth skin on the sides of the back and/or upper flanks (as seen in *G. laevis laevis*). The iris is yellow or yellowish. The dorsum has an obvious greyish wash throughout.

*G. laevis laevis* by contrast has a smooth dorsum, or sometimes has very few and widely scattered tiny tubercles at the rear of the dorsum. There are obvious and well-defined medium to large orange blotches or spots on smooth skin on the sides of the back and/or upper flanks (not seen in *G. laevis grampiansensis* subsp. nov.). The iris is brown or brownish. The dorsum is not covered with numerous usually orange-tipped tubercles, those on the sides of the back and upper flanks being largest and most prominent as seen in *G. laevis grampiansensis* subsp. nov.. There is no obvious greyish wash throughout the upper surface of the dorsum as seen in *G. laevis grampiansensis* subsp. nov..

The underside of the chin in *G. laevis laevis* is mainly white, versus heavily peppered greyish in *G. laevis grampiansensis* subsp. nov.. The belly of *G. laevis grampiansensis* subsp. nov. is also heavily peppered throughout versus boldly marked with black and white in *G. laevis laevis*.

Photos of *G. laevis grampiansensis* subsp. nov. in life can be seen online at:

<https://www.flickr.com/photos/88708273@N03/8743396751/>

and

<https://www.flickr.com/photos/88708273@N03/8743399897/>

and

<https://www.flickr.com/photos/14807473@N08/3445319297/>

and

<https://www.flickr.com/photos/88708273@N03/8744513418/>

A photo of the venter of this species can be seen online at:

<https://www.flickr.com/photos/whawha88/13162642714/>

Photos of *G. laevis laevis* in life can be seen in Anstis (2013) on page 595 at top

and online at:

<https://www.flickr.com/photos/126002448@N02/33642728361/>

and

<https://www.flickr.com/photos/126002448@N02/33772084545/>

*G. laevis laevis* dorsal and ventral views can be seen in Cogger (2014) on page 88 in the bottom two images.

*G. laevis* (both subspecies) are separated from the

morphologically similar species *G. victoriana* (Boulenger, 1888) (all three subspecies as defined in this paper), by having a mating call that is a cra-a-a-a-a-ack, cra-a-ack, cra-a-ack, cra-a-ack, etc, sound, versus cr-r-rack, cr-r-rack, cr-r-raxk, pip, pip, pip, pip-pip-pip-pip-pip-pip-pip.

*G. laevis* and *G. victoriana* constitute the entirety of the (nominative) subgenus *Geocrinia*, within the genus *Geocrinia* Blake, 1973.

Frogs in the genus *Geocrinia* are separated from the species within the morphologically similar genus *Wellingtondella* *gen. nov.* by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx. The nominative subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* (the only other subgenus within *Geocrinia*) by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* *gen. nov.* are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

*Geocrinia* (both subgenera) are separated from *Wellingtondella* *gen. nov.* by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella* *gen. nov.* in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti* *sp. nov.* and *Geocrinia (Hesperocrinia) brianbarnetti* *sp. nov.* all from south-west Australia.

The genus *Wellingtondella* *gen. nov.* includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* *gen. nov.* are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth

are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phalanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

**Distribution:** *G. laevis grampiansensis* *subsp. nov.* is presently only known from the Grampians in western Victoria. Populations assigned to putative *G. laevis* from southern Victoria appear to be morphologically divergent from both the Grampians and Tasmanian animals, but more similar to the Grampians taxon and may ultimately be referred to it. Images of these frogs can be found in Anstis (2013) on page 595 at bottom and page 596 (all four images).

It is likely that true *G. laevis laevis* is in fact confined to Tasmania and immediately offshore islands.

**Etymology:** *G. laevis grampiansensis* *subsp. nov.* is named with reference to the location it is known to occur, being the Grampians, a mountainous region, which is mainly a National Park, in south-western Victoria, away from the southern coast.

**GEOCRINIA VICTORIANA OTWAYSSENSIS SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:712D150E-DFEA-4655-9AD8-900A5251B87D**

**Holotype:** A preserved female specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D47155 collected from Old Wonga Road, Otway Ranges, Victoria, Australia, Latitude -38.45 S., Longitude 143.53 E. This government-owned facility allows access to its holdings.

**Paratype:** A preserved female specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D43397 collected from 10.5 km south-east of Irrewillipe, Victoria, Australia, Latitude -38.48 S., Longitude 143.5 E.

**Diagnosis:** Until now, *Geocrinia victoriana otwaysensis* *subsp. nov.* from the Otway Ranges area of Victoria, has been treated as a divergent population of *Geocrinia victoriana* (Boulenger, 1888) with a type locality of Warragul, south-east of Melbourne, Victoria, Australia. Putative *G. victoriana* occurs across wetter parts of southern and eastern Victoria, excluding alpine regions, with the distribution becoming fragmented as one moves west of Melbourne, being generally confined to higher and wetter areas. In East Gippsland, east of Bairnsdale, Victoria, the subspecies *G. victoriana logani* *subsp. nov.* occurs in coastal and near coastal areas to the New South Wales border and north along the coast to at least Eden, New South Wales.

The population from the Otway Ranges is well-known to be morphologically divergent from others in Victoria, including those in the Ballarat region, which by distance is proximal to the Otways region, but separated from it by a relatively flat region. While it is most likely that full species-level recognition is appropriate for this population, no comparative molecular studies on populations of *G. victoriana* across Victoria have been published and so in this paper I have conservatively named the Otways population and similarly divergent East Gippsland population as new subspecies.

The name *Crinia froggatti* Fletcher, 1891 applies to specimens from Buninyong and Gong Gong, near Ballarat in Victoria and so cannot be used for the Otways population or that from east Gippsland. With no available names, the Otways population is formally named *Geocrinia victoriana otwaysensis* subsp. nov. and the east Gippsland population is named *G. victoriana logani* subsp. nov..

*Geocrinia victoriana otwaysensis* subsp. nov. is readily separated from all other *Geocrinia victoriana* (herein identified as *Geocrinia victoriana victoriana* or *G. victoriana logani* subsp. nov.) by having numerous expanded spots across the dorsum and flanks. The condition of expanded spots is sometimes seen in nominate *Geocrinia victoriana victoriana* (but not *G. victoriana logani* subsp. nov.) but when this is the case, the expanded spots are either small (instead of medium or large), or if large, there is only one or two present, as opposed to many.

From the dorsal view, pre-metamorphosing tadpoles of *G. victoriana victoriana* and *G. victoriana logani* subsp. nov. are a dark greyish-black in colour, versus a strongly peppered light brown in *G. victoriana otwaysensis* subsp. nov..

*G. victoriana logani* subsp. nov. is similar in most respects to *G. victoriana victoriana* as defined above, but is separated from that subspecies by the following characters: no enlarged spots on the dorsum; possession of a well defined dorsal pattern consisting of two, sometimes broken, dark brown stripes, sometimes formed by blotches and at other times as a continuous line, running from behind each eye, down the back to the posterior. The central region between is a lighter brown. Upper flanks are light brown and lower flanks darker, but the demarcation of each zone is not always well defined. Venter is light. On the upper surfaces of both hind and fore-limbs, dark markings on a lighter background are well-defined, which is not the case in *G. victoriana victoriana*. The upper labial region and front of snout has numerous small darker markings on a lighter background, versus only a few large dark markings over a light background in *G. victoriana victoriana*.

*G. victoriana otwaysensis* subsp. nov. in life is depicted in Anstis (2013) on page 610 (all photos)

and online at:

<https://www.flickr.com/photos/126002448@N02/33489508005/>

*Geocrinia victoriana victoriana* in life from east of Melbourne, Victoria, Australia is depicted online at: <https://www.flickr.com/photos/jono-dashper/44487345251/>

and

<https://www.flickr.com/photos/88708273@N03/41643684182/>

and

<https://www.flickr.com/photos/23031163@N03/26275046344/>

*G. victoriana logani* subsp. nov. is depicted in life online at:

<https://www.flickr.com/photos/68921296@N06/13709439403/>

and

<https://www.flickr.com/photos/58349528@N02/25483347914/>

and

<https://www.flickr.com/photos/akashsherping/13795350524/>

and

<https://www.flickr.com/photos/14807473@N08/5717539060/>

*G. laevis* (both subspecies) are separated from the morphologically similar species *G. victoriana* (Boulenger, 1888) (all three subspecies as defined in this paper), by having a mating call that is a cra-a-a-a-a-ack, cra-a-ack, cra-a-ack, cra-a-ack, etc, sound, versus cr-r-rack, cr-r-rack, cr-r-raxk, pip, pip, pip-pip-pip-pip-pip-pip in *G. victoriana*.

*G. laevis* and *G. victoriana* constitute the entirety of the (nominate) subgenus *Geocrinia*, within the genus *Geocrinia* Blake, 1973.

Frogs in the genus *Geocrinia* are separated from the species within the morphologically similar genus *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the inner finger with at most a single very short phalanx.

The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* (the only other subgenus within *Geocrinia*) by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

*Geocrinia* (both subgenera) are separated from

*Wellingtondella gen. nov.* by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella gen. nov.* in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti sp. nov.* and *Geocrinia (Hesperocrinia) brianbarnetti sp. nov.* all from south-west Australia.

The genus *Wellingtondella gen. nov.* includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella gen. nov.* are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden;

outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

**Distribution:** *Geocrinia victoriana otwaysensis subsp. nov.* appears to be a disjunct population restricted to the Otway Ranges area in coastal south-west Victoria, Australia. Populations found east of Ararat, across the north of Melbourne and including most of eastern Victoria and far south-east New South Wales are of the nominate subspecies *Geocrinia victoriana victoriana*.

**Etymology:** The subspecies *Geocrinia victoriana otwaysensis subsp. nov.* is named in recognition of where the population is found.

**GEOCRINIA VICTORIANA LOGANI SUBSP. NOV.**

LSIDurn:lsid:zoobank.org:act:9BC9EF8B-74F0-48A7-AF74-FD5980763FED

**Holotype:** A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D24265 collected from Cann River, Victoria, Australia, Latitude -37.57 S., Longitude

149.15 E. This government-owned facility allows access to its holdings.

**Paratypes:** Four preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D2196, D24201, D24245 and D24266 all from within 10 km of the type locality (Cann River, Victoria).

**Diagnosis:** Until now, *G. victoriana logani subsp. nov.* from East Gippsland, Victoria (east of Bairnsdale) and also found in nearby New South Wales on the far south coast, at least as far north as Eden in New South Wales, has been treated as a divergent and disjunct population of *Geocrinia victoriana* (Boulenger, 1888) with a type locality of Warragul, south-east of Melbourne, Victoria, Australia.

The population from the Otway Ranges is well-known to be morphologically divergent from others in Victoria, including those in the Ballarat region, which by distance is proximal to the Otways region, but separated from it by a relatively flat region. While it is most likely that full species-level recognition is appropriate for this population, no comparative molecular studies on populations of *G. victoriana* across Victoria have been published and so in this paper I have conservatively named the Otways population and similarly divergent East Gippsland population as new subspecies.

The name *Crinia froggatti* Fletcher, 1891 applies to specimens from Buninyong and Gong Gong, near Ballarat in Victoria and so cannot be used for the Otways population or that from east Gippsland. With no available names, the Otways population is formally named *Geocrinia victoriana otwaysensis subsp. nov.* and the east Gippsland population is named *G. victoriana logani subsp. nov.*

*Geocrinia victoriana otwaysensis subsp. nov.* is readily separated from all other *Geocrinia victoriana* (herein identified as *Geocrinia victoriana victoriana* or *G. victoriana logani subsp. nov.*) by having numerous expanded spots across the dorsum and flanks. The condition of expanded spots is sometimes seen in nominate *Geocrinia victoriana victoriana* (but not *G. victoriana logani subsp. nov.*) but when this is the case, the expanded spots are either small (instead of medium or large), or if large, there is only one or two present, as opposed to many.

From the dorsal view, pre-metamorphosing tadpoles of *G. victoriana victoriana* and *G. victoriana logani subsp. nov.* are a dark greyish-black in colour, versus a strongly peppered light brown in *G. victoriana otwaysensis subsp. nov.*

*G. victoriana logani subsp. nov.* is similar in most respects to *G. victoriana victoriana* as defined above, but is separated from that subspecies (and in turn *G. victoriana otwaysensis subsp. nov.*) by the following characters: no enlarged spots on the dorsum; possession of a well defined dorsal pattern consisting



of two, sometimes broken, dark brown stripes, sometimes formed by blotches and at other times as a continuous line, running from behind each eye, down the back to the posterior. The central region between is a lighter brown. Upper flanks are light brown and lower flanks darker, but the demarcation of each zone is not always well defined. Venter is light. On the upper surfaces of both hind and forelimbs, dark markings on a lighter background are well-defined, which is not the case in *G. victoriana victoriana*. The upper labial region and front of snout has numerous small darker markings on a lighter background, versus only a few large dark markings over a light background in *G. victoriana victoriana*.

*G. victoriana otwaysensis* subsp. nov. in life is depicted in Anstis (2013) on page 610 (all photos) and online at:

<https://www.flickr.com/photos/126002448@N02/33489508005/>

*Geocrinia victoriana victoriana* in life from east of Melbourne, Victoria, Australia is depicted online at: <https://www.flickr.com/photos/jono-dashper/44487345251/>

and

<https://www.flickr.com/photos/88708273@N03/41643684182/>

and

<https://www.flickr.com/photos/23031163@N03/26275046344/>

*G. victoriana logani* subsp. nov. is depicted in life online at:

<https://www.flickr.com/photos/68921296@N06/13709439403/>

and

<https://www.flickr.com/photos/58349528@N02/25483347914/>

and

<https://www.flickr.com/photos/akashsherping/13795350524/>

and

<https://www.flickr.com/photos/14807473@N08/5717539060/>

*G. laevis* (both subspecies) are separated from the morphologically similar species *G. victoriana* (Boulenger, 1888) (all three subspecies as defined in this paper), by having a mating call that is a cra-a-a-a-ack, cra-a-ack, cra-a-ack, cra-a-ack, etc, sound, versus cr-r-rack, cr-r-rack, cr-r-raxk, pip, pip, pip, pip-pip-pip-pip-pip-pip in *G. victoriana*.

*G. laevis* and *G. victoriana* constitute the entirety of the (n nominate) subgenus *Geocrinia*, within the genus *Geocrinia* Blake, 1973.

Frogs in the genus *Geocrinia* are separated from the species within the morphologically similar genus *Wellingtondella* gen. nov. by having the inner finger and inner toe highly reduced, the latter being not more than half the length of the second toe and the

inner finger with at most a single very short phalanx. The nominate subgenus of *Geocrinia* is in turn separated from subgenus *Hesperocrinia* (the only other subgenus within *Geocrinia*) by having toes without terminal expansions of any sort and without subarticular tubercles, or if present, extremely indistinct.

Frogs within *Wellingtondella* gen. nov. are separated from *Geocrinia* (both subgenera) by having toes without any terminal expansions and without subarticular tubercles, or if present, extremely indistinct; inner finger and inner toe not reduced, the latter being about two thirds the length of the second toe.

*Geocrinia* (both subgenera) are separated from *Wellingtondella* gen. nov. by having diphasic calls and terrestrial egg deposition with aquatic tadpoles. *Wellingtondella* gen. nov. in turn is separated from *Geocrinia* (both subgenera) by having simpler pulsed calls and terrestrial egg deposition with nonfeeding tadpoles confined to a terrestrial nest (Roberts, 1993 and Roberts *et al.* 1990).

The subgenus *Geocrinia* includes the species *G. laevis* (Günther, 1864) as type species, and *G. victoriana* (Boulenger, 1888), including a newly named subspecies for the first species and two new subspecies for the second.

The subgenus *Hesperocrinia* includes the type species *Geocrinia (Hesperocrinia) leai* (Fletcher, 1898) as type species, *Geocrinia (Hesperocrinia) brettbarnetti* sp. nov. and *Geocrinia (Hesperocrinia) brianbarnetti* sp. nov. all from south-west Australia.

The genus *Wellingtondella* gen. nov. includes *W. rosea* (Harrison, 1927) as type species, *W. alba* (Wardell-Johnson and Roberts, 1989), *W. lutea* (Main, 1963) and *W. vitellina* (Wardell-Johnson and Roberts, 1989).

All of *Geocrinia*, *Hesperocrinia* and *Wellingtondella* gen. nov. are separated from all other Australasian frog species within the Myobatrachidae by the following unique suite of characters:

Tongue does not adhere to the floor of the mouth posteriorly; tongue is small and/or narrowly oval; prevomer is much reduced or absent; vomerine teeth are present but tiny; maxillary teeth present. A large frontoparietal foramen is present in adults. Horizontal pupil; tympanum is indistinct or hidden;

outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No dermal brood pouches; first finger is normal or if vestigial, there is no dorsolateral skin fold; Terminal phlanges pointed and not T-shaped; tips of fingers and toes lack distinct discs, being not, or very slightly dilated; belly smooth or slightly granular.

**Distribution:** *G. victoriana logani* subsp. nov. is found in East Gippsland, Victoria commencing east of Bairnsdale and also found in nearby New South Wales on the far south coast, at least as far north as

Eden in New South Wales.

**Etymology:** The subspecies *G. victoriana logani* *subsp. nov.* is named in honour of Clinton Logan of Genoa, Victoria, in recognition of his services to herpetology over many years (with grateful thanks to his wife, Debbie), including assisting with relevant fieldwork and studies on this subspecies and other frogs in the same region over many years, both by myself and other respected Victorian (Australia) herpetologists, including in particular Rob Valentic.

**PARACRINIA LENHOSERI SP. NOV.**

**LSID**[Durn:lsid:zoobank.org:act:641431A9-EE8A-45E5-B458-BD50C01489FE](https://zoobank.org/act:641431A9-EE8A-45E5-B458-BD50C01489FE)

**Holotype:** A preserved specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D22285, collected 1.6 km North-east of Bittern, Victoria, Australia, Latitude -38.3 S., Longitude 145.18 E. This government-owned facility allows access to its holdings.

**Paratypes:** Nine preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D22286- D22293, D44333-D44334 all collected 1.6 km North-east of Bittern, Victoria, Australia, Latitude -38.3 S., Longitude 145.18 E.

**Diagnosis:** Until now, both *Paracrinia lenhoseri* *sp. nov.* and *P. funki* *sp. nov.* have been treated as populations of *P. haswelli* (Fletcher, 1894), with a type locality of Jervis Bay in New South Wales, Australia. Numerous field surveys by myself across the entire known range of putative *P. haswelli* from south-east of Melbourne, along the southern Victorian coastline, into southern New South Wales and along the coast to the mid north coast of New South Wales, including inspection of many hundreds of live specimens of all sex and age as well as tadpoles at various stages of development has confirmed that apparently allopatric populations are divergent and in need of species-level recognition.

The type form appears to be found from about Ourimbah on the New South Wales Central coast, Latitude 33.2154 S., Longitude 151.225 E., being about 78 km north of the Sydney Central Business District, south along the NSW coast to the Corunna State Forest on the New South Wales South Coast, Latitude -36.2799 S., Longitude 150.1261 E.

*P. lenhoseri* *sp. nov.* is found from about Kiah in the Bega Valley of far southern New South Wales, Latitude -37.15 S., Longitude 149.85 E., across southern Victoria to the lower Mornington Peninsula, Latitude -38.3 S., Longitude 145.18 E., south-east of Melbourne, Australia.

*P. funki* *sp. nov.* occurs north of Newcastle New South Wales (NSW), along the NSW North coast at least as far north as Nabiac, New South Wales, Latitude -32.1235 S., Longitude 152.3987 E., with further unconfirmed reports and isolated specimens found further north on the New South Wales north

coast, the most northern museum voucher specimen being 20 km north of Coffs Harbour Latitude -30.083 S., Longitude 153.200 E.

Where each species occurs they are usually abundant and easily found by collectors, either during or after rain.

*Paracrinia lenhoseri* *sp. nov.*, *P. funki* *sp. nov.* and *P. haswelli* are readily separated from one another as follows:

*P. lenhoseri* *sp. nov.* is the only species of the trio to have numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black.

*P. lenhoseri* *sp. nov.* is further separated from the other two species by well defined and prominent large salmon coloured blotches or markings on the upper surfaces of the hind limbs.

Both *P. lenhoseri* *sp. nov.* and *P. haswelli* have well defined black marks of some form on the back, versus ill defined in *P. funki* *sp. nov.*

*P. funki* *sp. nov.* is separated from both *P. lenhoseri* *sp. nov.* and *P. haswelli* by having a premetamorphosing tadpole that lacks prominent black blotches on the muscle of the tail as seen in the other two species.

*P. funki* *sp. nov.* has a dark snout tip, versus light in both *P. lenhoseri* *sp. nov.* and *P. haswelli*.

In case it was missed in the above, *P. haswelli* is separated from the other two species by the unique combination of not having numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black; a light snout tip; a premetamorphosing tadpole that has prominent black blotches on the muscle of the tail.

*P. haswelli* in life is depicted in Anstis (2013) on page 626 in all images, Cogger 2014 on page 100 at bottom, and online at:

<https://www.flickr.com/photos/shaneblackfnq/18226091658/>

and

<https://www.flickr.com/photos/shaneblackfnq/16391846764/>

and

<https://www.flickr.com/photos/14807473@N08/3557615613/>

and

<https://www.flickr.com/photos/126237772@N07/19747508771/>

and

<https://www.flickr.com/photos/shaneblackfnq/17014263685/>

*P. lenhoseri* *sp. nov.* is seen in life in images online at:

<https://www.flickr.com/photos/126002448@N02/24670657915/>

and

<https://www.flickr.com/photos/127392361@N04/31472328583/>

and

<https://www.flickr.com/photos/88708273@N03/13708519635/>

*P. funki sp. nov.* is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/3914787034/>

and

<https://www.flickr.com/photos/88708273@N03/996826943/>

The three preceding species, forming the entirety of the genus *Paracrinia* Heyer and Liem, 1976 are readily separated from all other Myobatrachidae frogs by the following unique suite of characters:

Average adult size 35 mm in length. Maxillary teeth present. A large frontoparietal foramen in adults. Vomerine teeth are present, although stated as absent in the original genus description of *Paracrinia*. They are in two short rows behind the level of the choanae. Iris golden brown. Head as long as broad and slightly depressed; snout somewhat pointed. Tongue is small, narrow, oval and free at the rear. Pupil horizontal. Indistinct tympanum. Toes fringed and without webbing. Phlanges simple, tips of fingers not or only slightly dilated. Terminal phlanges are pointed and not T-shaped. No dermal brood pouches. Paratoid glands and flank glands either absent or not visible externally. Belly slightly granular. Dorsal skin smooth or with tubercles, the amount and size of tubercles varying depending on species, locality and individual frog.

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Tadpoles of both *P. haswelli* and *P. funki sp. nov.* are depicted on pages 627 and 628 of Anstis (2013).

**Distribution:** *P. lenhoseri sp. nov.* is found from about Kiah in the Bega Valley of far southern New South Wales, Latitude -37.15 S., Longitude 149.85 E., across southern Victoria to the lower Mornington Peninsula, Latitude -38.3 S., Longitude 145.18 E., south-east of Melbourne, Australia, generally south or east of the summit of the Great Dividing Range.

**Etymology:** *P. lenhoseri sp. nov.* is named in honour of my late father, Leonard (Len) Donald Hoser, born in the UK, who spent over 30 years in Australia

before retiring back to the United Kingdom in his final years, in recognition of his countless contributions to herpetology over a period spanning more than 3 decades.

**PARACRINIA FUNKI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:2ECE1824-846D-46DF-B941-530B746E24FE**

**Holotype:** A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.184425 collected 3.5 km along the Old Aerodrome Road, Nahiic, New South Wales, Australia, Latitude -32.1235 S., Longitude 152.3987 E. This government-owned facility allows access to its holdings.

**Paratypes:** 1/ Four preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.184426, R.184427, R.184428 and R.184438 all collected 3.5 km along the Old Aerodrome Road, Nahiic, New South Wales, Australia, Latitude -32.1235 S., Longitude 152.3987 E. 2/ Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.158044, R.158057 and R.158061 all collected 1 km north north-west of Big Gibber Headland, Myall Lakes National Park, New South Wales, Australia, Latitude -32.4814 S., Longitude 152.4055 E.

**Diagnosis:** Until now, both *Paracrinia funki sp. nov.* and *P. lenhoseri sp. nov.* have been treated as populations of *P. haswelli* (Fletcher, 1894), with a type locality of Jervis Bay in New South Wales, Australia. Numerous field surveys by myself across the entire known range of putative *P. haswelli* from south-east of Melbourne, along the southern Victorian coastline, into southern New South Wales and along the coast to the mid north coast of New South Wales, including inspection of many hundreds of live specimens of all sex and age as well as tadpoles at various stages of development has confirmed that apparently allopatric populations are divergent and in need of species-level recognition.

The type form appears to be found from about Ourimbah on the New South Wales Central coast, Latitude 33.2154 S., Longitude 151.225 E., being about 78 km north of the Sydney Central Business District, south along the NSW coast to the Corunna State Forest on the New South Wales South Coast, Latitude -36.2799 S., Longitude 150.1261 E.

*P. lenhoseri sp. nov.* is found from about Kiah in the Bega Valley of far southern New South Wales, Latitude -37.15 S., Longitude 149.85 E., across southern Victoria to the lower Mornington Peninsula, Latitude -38.3 S., Longitude 145.18 E., south-east of Melbourne, Australia.

*P. funki sp. nov.* occurs north of Newcastle New South Wales, along the NSW North coast at least as far north as Nahiic, New South Wales, Latitude -32.1235 S., Longitude 152.3987 E., with further

unconfirmed reports and isolated specimens found further north on the New South Wales north coast, the most northern Australian museum voucher specimen being 20 km north of Coffs Harbour Latitude -30.083 S., Longitude 153.200 E.

Where each species occurs they are usually abundant and easily found by collectors.

*Paracrinia lenhoseri* sp. nov., *P. funki* sp. nov. and *P. haswelli* are readily separated from one another as follows:

*P. lenhoseri* sp. nov. is the only species of the trio to have numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black.

*P. lenhoseri* sp. nov. is further separated from the other two species by well defined and prominent large salmon coloured blotches or markings on the upper surfaces of the hind limbs.

Both *P. lenhoseri* sp. nov. and *P. haswelli* have well defined black marks of some form on the back, versus ill defined in *P. funki* sp. nov..

*P. funki* sp. nov. is separated from both *P. lenhoseri* sp. nov. and *P. haswelli* by having a premetamorphosing tadpole that lacks prominent black blotches on the muscle of the tail as seen in the other two species.

*P. funki* sp. nov. has a dark snout tip, versus light in both *P. lenhoseri* sp. nov. and *P. haswelli*.

In case it was missed in the above, *P. haswelli* is separated from the other two species by the unique combination of not having numerous well defined large tubercles scattered across the dorsum that have distinctive salmon tipped tubercles, at least sometimes surrounded by black; a light snout tip; a premetamorphosing tadpole that has prominent black blotches on the muscle of the tail.

*P. haswelli* in life is depicted in Anstis (2013) on page 626 in all images, Cogger 2014 on page 100 at bottom, and online at:

<https://www.flickr.com/photos/shaneblackfnq/18226091658/>

and

<https://www.flickr.com/photos/shaneblackfnq/16391846764/>

and

<https://www.flickr.com/photos/14807473@N08/3557615613/>

and

<https://www.flickr.com/photos/126237772@N07/19747508771/>

and

<https://www.flickr.com/photos/shaneblackfnq/17014263685/>

*P. lenhoseri* sp. nov. is seen in life in images online at:

<https://www.flickr.com/photos/126002448@N02/>

[24670657915/](https://www.flickr.com/photos/127392361@N04/31472328583/)

and

<https://www.flickr.com/photos/127392361@N04/31472328583/>

and

<https://www.flickr.com/photos/88708273@N03/13708519635/>

*P. funki* sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/3914787034/>

and

<https://www.flickr.com/photos/88708273@N03/9966826943/>

The three preceding species, forming the entirety of the genus *Paracrinia* Heyer and Liem, 1976 are readily separated from all other Myobatrachidae frogs by the following unique suite of characters:

Average adult size 35 mm in length. Maxillary teeth present. A large frontoparietal foramen in adults.

Vomerine teeth are present, although stated as absent in the original genus description of *Paracrinia*.

They are in two short rows behind the level of the choanae. Iris golden brown. Head as long as broad and slightly depressed; snout somewhat pointed.

Tongue is small, narrow, oval and free at the rear. Pupil horizontal. Indistinct tympanum. Toes fringed and without webbing. Phlanges simple, tips of fingers not or only slightly dilated. Terminal phlanges are pointed and not T-shaped. No dermal brood pouches. Paratoid glands and flank glands either absent or not visible externally. Belly slightly granular. Dorsal skin smooth or with tubercles, the amount and size of tubercles varying depending on species, locality and individual frog.

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

Dorsal colouration beige to brown above, often with a strong grey tinge, with irregular darker flecks and often with a faint, broad darker band along the middle of the back, that commences between or behind the eyes. Some specimens have a narrow pale vertebral stripe, most prominent on the posterior half of the body. There is a black band from the nostril to the eye, below the supratympanic ridge to the flanks. Venter is pale brown with paler spots. There is a bright orange-red patch on the base of each arm, groins and hindside of the thighs (modified from Cogger 2014).

153.200 E.

**Etymology:** *P. funki* sp. nov. is named in honour of Dr. Richard Funk of Mesa, Arizona, USA, previously of Florida, USA, in recognition of a lifetime's services and contributions to herpetology and wildlife conservation in general, in particular with regard to veterinary medicine and procedures.

**METACRINIA BETTYSWILEAE SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:CC305EAA-911A-4A20-AF1B-CEA50A62B3B4**

**Holotype:** A preserved 18 mm (snout-vent length / body length) adult specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R123330 collected from Mount Shadforth, Western Australia, Australia, Latitude -34.9678 S., Longitude 117.2797 E. This government-owned facility allows access to its holdings.

**Paratype:** A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R123331 collected from Mount Shadforth, Western Australia, Australia, Latitude -34.9678 S., Longitude 117.2797 E.

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

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

Only the western, population, identified by her as the main population, has an available name, being type form for the species *Metacrinia nichollsi* (Harrison, 1927), with a type locality of Pemberton, Western Australia. See Fig. 4.2 on page 101 of Edwards (2007), for exact distributions of each species as identified herein.

A second population from the south coast from Walpole in the west to Albany in the east in southern Western Australia, identified by Edwards (2007) as the "Southcoastal Lineage" is formally named as a new species, *M. bettyswileae* sp. nov. as is another outlier population confined to the Stirling Range National Park north-east of this area, identified by Edwards (2007) as the "Stirling Range Lineage", formally named herein as *M. wilhelminahughesae* sp. nov..

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

Morphological and genetic divergence of each lineage, made species level recognition the only

logical step to take when I was reviewing the taxonomy of the group and hence this formal description.

The three species are readily separated as follows:

*Metacrinia nichollsi* is readily separated from both other species by the presence of numerous closely-spaced large blunt, irregularly shaped tubercles on the middle and lower flanks. By contrast both other two species have relatively smooth skin on the mid and lower flanks with widely spaced small pointed tubercles that are mainly light tipped and encircled by dark in *M. bettyswileae* sp. nov. and mainly not light tipped and encircled by dark in *M. wilhelminahughesae* sp. nov..

While all three species have a dorsum covered with large blunt tubercles, bumps and welts, those which form folds in a linear arrangement are either absent or very limited in *M. nichollsi* and *M. wilhelminahughesae* sp. nov. but prominent in *M. bettyswileae* sp. nov..

The dorsum of both *M. nichollsi* and *M. bettyswileae* sp. nov. is generally dark grey or brown, often heavily overlain with red, brown or orange, whereas the dorsum of *M. wilhelminahughesae* sp. nov. is usually distinctly lighter in colour, being mainly beige, light brown or a light brownish grey.

*M. nichollsi* commonly has an obvious small to medium tympanum, usually of irregular diamond shape, although specimens without an obvious tympanum are also common. In both *M. bettyswileae* sp. nov. and *M. wilhelminahughesae* sp. nov. absence of a (visible) tympanum appears to be the usual state.

*Metacrinia nichollsi* in life is depicted in Anstis (2013) on page 617 at top right and middle right and online at:

<https://www.flickr.com/photos/fins72/38930714251/>

and

<https://www.flickr.com/photos/fins72/27153941029/>

*M. bettyswileae* sp. nov. is depicted in life in Anstis (2013) on page 617 at top left and online at:

<https://www.flickr.com/photos/euprepiosaur/30766600206/>

and

<https://www.flickr.com/photos/wacrakey/27485527484/>

and

<https://www.flickr.com/photos/23031163@N03/29903436420/>

and

<https://www.flickr.com/photos/23031163@N03/29934015530/>

and

<https://www.flickr.com/photos/wacrakey/30573912057/>

and

<https://www.flickr.com/photos/wacrakey/28099931805/>

and

<https://www.flickr.com/photos/wacrakey/43698034250/>

and

<https://www.inaturalist.org/observations/53473984>

and

<https://www.inaturalist.org/observations/41152903>

and

<https://www.inaturalist.org/observations/43023607>

The three preceding species within the genus *Metacrinia* Parker, 1940, constituting the entirety of the genus are readily separated from all other Australasian Myobatrachidae frogs by the following unique suite of characters: A small stubby toad-like froglet whose hindlimb when adpressed reaches well beyond the tympanum. A large frontoparietal foramen in adults. Pupil horizontal. Tympanum may be present or absent. Tongue small and narrowly oval; prevomer much reduced or absent; tongue does not adhere to the floor of the mouth at the rear; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No maxillary teeth; no terminal discs on fingers or toes; belly granular. A fold of skin extends back from each eyelid. There is a bright orange, yellow or red granular spot at the base of each forelimb. Similar spotting is in front of the thighs and the hind limbs. Males often have darker throats (adapted from Cogger 2014).

**Distribution:** *M. bettyswileae* sp. nov. is confined to the south coast of south-western Australia from Walpole in the west to Albany in the east in Western Australia, Australia.

**Etymology:** *M. bettyswileae* sp. nov. is named in honour of Betty Swile of Sunnyside, Athlone, Cape Town, South Africa for services to primate welfare.

**METACRINIA WILHELMINAHUGHESAE SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:FB6FD8A6-6AA1-49F5-97CE-9910AE10F8DD**

**Holotype:** A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R141980, collected from Bluff Knoll, Stirling Range National Park, Western Australia, Australia, Latitude -34.3747 S., Longitude 118.2381 E. This government-owned facility allows access to its holdings.

**Paratypes:** Ten preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R141981, R141982, R141983, R141984, R141985, R141986, R36436, R38696, R47774, R47775 all collected from the Stirling Range National Park, Western Australia, Australia.

**Diagnosis:** The until now monotypic genus *Metacrinia* Parker, 1940, with the type species *Pseudophryne nichollsi* Harrison, 1927 known only

from south-west Western Australia, is split into three species, each being morphologically and genetically divergent.

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

Only the western, population, identified by her as the main population, has an available name, being type form for the species *Metacrinia nichollsi* (Harrison, 1927), with a type locality of Pemberton, Western Australia. See Fig. 4.2 on page 101 of Edwards (2007), for exact distributions of each species as identified herein.

A second population from the south coast from Walpole in the west to Albany in the east in southern Western Australia, identified by Edwards (2007) as the "Southcoastal Lineage" is formally named as a new species, *M. bettyswileae* sp. nov. as is another outlier population confined to the Stirling Range National Park north-east of this area, identified by Edwards (2007) as the "Stirling Range Lineage", formally named herein as *M. wilhelminahughesae* sp. nov..

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

Morphological and genetic divergence of each lineage, made species level recognition the only logical step to take when I was reviewing the taxonomy of the group and hence this formal description.

The three species are readily separated as follows: *Metacrinia nichollsi* is readily separated from both other species by the presence of numerous closely-spaced large blunt, irregularly shaped tubercles on the middle and lower flanks. By contrast both other two species have relatively smooth skin on the mid and lower flanks with widely spaced small pointed tubercles that are mainly light tipped and encircled by dark in *M. bettyswileae* sp. nov. and mainly not light tipped and encircled by dark in *M. wilhelminahughesae* sp. nov..

While all three species have a dorsum covered with large blunt tubercles, bumps and welts, those which form folds in a linear arrangement are either absent or very limited in *M. nichollsi* and *M. wilhelminahughesae* sp. nov. but prominent in *M. bettyswileae* sp. nov..

The dorsum of both *M. nichollsi* and *M. bettyswileae* sp. nov. is generally dark grey or brown, often heavily overlain with red, brown or orange, whereas the dorsum of *M. wilhelminahughesae* sp. nov. is usually distinctly lighter in colour, being mainly beige, light brown or a light brownish grey.

*M. nichollsi* commonly has an obvious small to

medium tympanum, usually of irregular diamond shape, although specimens without an obvious tympanum are also common. In both *M. bettyswileae* sp. nov. and *M. wilhelminahughesae* sp. nov. absence of a (visible) tympanum appears to be the usual state.

*Metacrinia nichollsi* in life is depicted in Anstis (2013) on page 617 at top right and middle right and online at:

<https://www.flickr.com/photos/fins72/38930714251/>  
and

<https://www.flickr.com/photos/fins72/27153941029/>  
*M. bettyswileae* sp. nov. is depicted in life in Anstis (2013) on page 617 at top left and online at:

<https://www.flickr.com/photos/euprepiosaur/30766600206/>  
and

<https://www.flickr.com/photos/wacrakey/27485527484/>  
and

<https://www.flickr.com/photos/23031163@N03/29903436420/>  
and

<https://www.flickr.com/photos/23031163@N03/29934015530/>  
and

<https://www.flickr.com/photos/wacrakey/30573912057/>  
and

<https://www.flickr.com/photos/wacrakey/28099931805/>  
and

<https://www.flickr.com/photos/wacrakey/43698034250/>  
and

<https://www.inaturalist.org/observations/53473984>  
and

<https://www.inaturalist.org/observations/41152903>  
and

<https://www.inaturalist.org/observations/43023607>  
The three preceding species within the genus *Metacrinia* Parker, 1940, constituting the entirety of the genus are readily separated from all other Australasian Myobatrachidae frogs by the following unique suite of characters: A small stubby toad-like froglet whose hindlimb when adpressed reaches well beyond the tympanum. A large frontoparietal foramen in adults. Pupil horizontal. Tympanum may be present or absent. Tongue small and narrowly oval; prevomer much reduced or absent; tongue does not adhere to the floor of the mouth at the rear; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle. No maxillary teeth; no terminal discs on fingers or toes; belly granular. A fold of skin extends back from each eyelid. There is a bright orange, yellow or red granular spot at the base

of each forelimb. Similar spotting is in front of the thighs and the hind limbs. Males often have darker throats (adapted from Cogger 2014).

**Distribution:** *M. wilhelminahughesae* sp. nov. is confined to the Stirling Range National Park of southern Western Australia, Australia, away from the south coastal strip.

**Etymology:** *M. wilhelminahughesae* sp. nov. is named in honour of Wilhelmina Hughes (AKA Winnie) of Silverton, Cape Town, South Africa for services to primate welfare.

**A NEW SUBGENUS WITHIN *UPEROLEIA* GRAY, 1841.**

***QUASIUPEROLEIA* SUBGEN. NOV.**

**LSIDurn:lsid:zoobank.org:act:323B9966-627C-452C-9147-48BC020DADEA**

**Type species:** *Pseudophryne mjobergii* Andersson, 1913.

**Diagnosis:** The genus *Uperoleia* Gray, 1841, as defined by Cogger (2014), has been an established genus-level concept for decades as seen by an essentially identical concept by Cogger *et al.* (1983). Since 1983, only Wells and Wellington (1985) have provided a dissenting position, breaking up the genus as accepted, three ways, splitting off two of the more morphologically divergent groups.

A molecular phylogeny for the genus as recognized by Cogger *et al.* (1983) and all other authors since, excluding Wells and Wellington was produced by Catullo and Keogh (2014). It showed the species within the putative genus *Hosmeria* Wells and Wellington, 1985, type species *Uperoleia marmorata laevigata* Keferstein, 1867, to have diverged from other species within putative *Uperoleia* about 17 MYA (see Fig. 5 on page 114). On this basis, the eastern Australian clade is herein recognized as a genus separate from *Uperoleia*, comprising the species *H. laevigata* (Keferstein, 1867), *H. fusca* (Davies, McDonald and Corben, 1986), *H. martini* (Davies and Littlejohn, 1986), *H. shuddafakup* sp. nov. and *H. tyleri* (Davies and Littlejohn, 1986).

The genus name *Prohartia* Wells and Wellington, 1985, type species: *Pseudophryne fimbriatus* Parker, 1926 is herein accepted as a valid subgenus within *Uperoleia* on the basis of the molecular results of Catullo and Keogh (2014). This showed a divergence of just under 10 MYA from the nominate group of species within the genus, *Uperoleia* Gray, 1841, type species *U. marmorata* Gray, 1841 by monotypy.

The genus name *Glauertia* Loveridge, 1933, type species *Glauertia russelli* Loveridge 1933 by monotypy is closely related to *U. marmorata* and is therefore treated as a synonym of *Uperoleia*.

Catullo and Keogh (2014) found a divergence between relevant species being less than 8 MYA.

Two species within putative *Uperoleia* were shown by Catullo and Keogh (2014), to be closely related to

one another and yet 11 MYA divergent from all other species in the genus *Uperoleia*. *Pseudophryne mjobergii* Andersson, 1913 and the closely related *U. micromeles* Tyler, Davies and Martin, 1981 form the entirety of the subgenus *Quasiuperoleia subgen. nov.* These two species are readily separated from all other species in the genus *Uperoleia* Gray, 1841, including subgenus *Prohartia* Wells and Wellington, 1985, as well as species in the genus *Hosmeria* Wells and Wellington, 1985, by the following suite of characters: Adults about 25 mm, body length; toes fringed with basal webbing; internarial distance greater than eye-naris distance; skin moderately to very warty above; very prominent parotoid glands and one or other of: 1/ A few maxillary teeth present (*U. micromeles*), or 2/ Maxillary teeth present in a series and the presence of a distinctive tubercle or flap on the heel (*U. mjobergii*).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters:

Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phalanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *Uperoleia* Gray, 1841 is found in most parts of continental Australia, with one species known to extend to southern New Guinea near Cape York, Queensland.

*Quasiuperoleia subgen. nov.* is found in the Pilbara region of Western Australia, to the southern edge of the Kimberley bioregion, extending across the northern Arid zone into the mid-central region of the Northern Territory, Australia.

Both described species are closely related.

Catullo and Keogh (2014) estimated a divergence of 1.22 MYA between both species, based on samples from across the ranges of both taxa.

**Etymology:** Quasi- means, “apparently but not really”, “seemingly”, or “being partly or almost”, with reference to the fact that the said species are almost *Uperoleia*.

**Content:** *Uperoleia (Quasiuperoleia) mjobergii* (Andersson, 1913) (type species); *U. (Quasiuperoleia) micromeles* Tyler, Davies and Martin, 1981.

### **HOSMERIA SHUDDAFAKUP SP. NOV.**

LSIDurn:lsid:zoobank.org:act:4C51C2B3-1C94-47D6-9A52-1EA06A8A0087

**Holotype:** A preserved male specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J86589 collected from Thanes Creek, Durikai State Forest, west of Warwick, Queensland, Australia, Latitude -28.2881 S., Longitude 151.6964 E. This government-owned facility allows access to its holdings.

**Paratype:** A preserved female specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J86606 collected from Thanes Creek, Durikai State Forest, west of Warwick, Queensland, Australia, Latitude -28.2881 S., Longitude 151.6964 E.

**Diagnosis:** Until now, *Hosmeria shuddafakup sp. nov.* has been treated as a Queensland, or northern population of *H. laevigata* (Keferstein, 1867), with a type locality of Randwick (Sydney), New South Wales.

The genetic study of Clulow *et al.* (2016) indicated that the northern population of putative “*Uperoleia laevigata*” had species-level divergence from the type population from further south. Morphological evidence confirms this contention and so that taxon is named as a new species herein.

The two species are separated from one another as follows:

*H. laevigata* has a dorsum covered with numerous tightly spaced, small, but prominent orange tipped tubercles that are pointed, but of somewhat irregular shape and in prominent rows on the upper surfaces of the hind legs. The background colour of the upper flanks are of a similar greyish brown to the dorsum. The oversized parotoid glands on the back of the head are more-or-less diamond-shaped but with rounded edges.

*H. shuddafakup sp. nov.* has tubercles on the dorsum, but these are moderately, as opposed to tightly-spaced and whereas most if not all are orange-tipped in *H. laevigata*, this is not the case for *H. shuddafakup sp. nov.*, where some, but not most are orange-tipped. The orange tipped tubercles do not strongly contrast with the greyish or brown dorsum in *H. shuddafakup sp. nov.*, which is the case for *H. laevigata*. There is a fairly obvious demarcation between the darker dorsum and the lighter surface of the upper flank in *H. shuddafakup sp. nov.* again in contrast to the state in *H. laevigata*.

The oversized parotoid glands on the back of the head are more-or-less oval-shaped.

Adult male *H. laevigata* has a generally blackish under throat region, versus whitish, but heavily peppered or marbled with black in *H. shuddafakup sp. nov.*



Images of *H. shuddafakup sp. nov.* in life can be found in Vanderduys (2012) on page 172 at bottom and online at:

<https://www.flickr.com/photos/smacdonald/3201846955/>

and

<https://www.flickr.com/photos/rocknvole/6256767734/>

Images of *H. laevigata* in life can be found on page 87 of Tyler (1992), on page 125 of Cogger (2014), bottom left, Anstis (2013) on page 724 (all images) and online at:

<https://www.flickr.com/photos/shaneblackfnq/15152188723/i>

and

<https://www.flickr.com/photos/126002448@N02/15121247017/>

and

<https://www.flickr.com/photos/12742129@N07/49103585128/>

and

[https://www.flickr.com/photos/jono\\_hooper/27874378436/](https://www.flickr.com/photos/jono_hooper/27874378436/)

Both *H. shuddafakup sp. nov.* and *H. laevigata* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum is grey, olive or brown, with blackish spots, bars or reticulations, usually of irregular form; including a light triangular patch on the head between the eyes and towards the snout (sometimes darker edged); and obscure blotches or bands on the limbs, in particular the hindlimbs. Maxillary teeth present in a well-developed series; two moderate metatarsal tubercles, that are not strongly compressed; no tubercle or flap on the heel; toes fringed and without a trace of webbing; chest and abdomen are pale with a strong purplish tinge, especially at the distal parts, with at most sparse peppering of darker pigment on the otherwise whitish ventral surface; the entire ventral surfaces are smooth, not granular; adult body length of 25 mm or more and the presence of large well-developed oversized parotoid glands.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomerine is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *H. shuddafakup sp. nov.* occurs in south-east Queensland, north of the ranges on the NSW, Queensland border, extending at least as far north as the Blackdown Tableland National Park.

The distributional limits of *H. laevigata* is not known, but believed to include most of New South Wales east of the flat regions to the west of that state, extending into far north-east Victoria.

**Etymology:** In mid 2019, I was camping in Paul Woolf's borrowed car (see etymology for *Bufo* *woolfi sp. nov.*) by a swamp with a Gidjhal elder of the local Aboriginal tribe from Warwick in south-east Queensland, when a frog next to our parked car made a penetrating nasal buzz lasting just under half a second and being repeated every 2-3 seconds. He yelled out "shuddafakup". The froglet I then caught making this noise is of this taxon and hence the name.

**HOSMERIA SHIRENSBOGENSIS SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:D2010B70-2F80-4AD7-9382-EA518001075C**

**Holotype:** A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.184120 collected at Heaton Rd Dam, Wattagan State Forest, New South Wales, Australia, Latitude -32.9934 S., Longitude 151.4455 E. This government-owned facility allows access to its holdings.

**Paratypes:** Three preserved specimens at the Australian Museum in Sydney, New South Wales, Australia, specimen numbers R.138913, R.138914 and R.138915 all collected at the corner of Mount Faulk and Heaton Rds, Awaba State Forest, New South Wales, Australia, Latitude -32.9944 S., Longitude 151.4455 E.

**Diagnosis:** Until now, *H. shirensbogensis sp. nov.* of New South Wales and South-east Queensland has been treated as conspecific with *H. fusca* (Davies, McDonald and Corben, 1986), with a type locality of Eungella, Queensland and restricted to that general part of Australia, (mid-eastern Queensland).

Their ranges abut at the Conondale Range in south-east Queensland (north of Brisbane), with *H. shirensbogensis sp. nov.* being distributed fairly continuously south of there to the Sydney region in New South Wales in coastal and near coastal areas, and *H. fusca* north of there, being patchily distributed as far north as the type locality in wetter hilly areas and immediate environs.

Adult *H. shirensbogensis sp. nov.* are readily separated from *H. fusca* by the presence of a yellow colour inside the thigh (see for example the image in Cogger 2014 at page123), versus reddish orange in colour in *H. fusca*. Enlarged tubercles on the dorsum of *H. shirensbogensis sp. nov.* are mainly tipped orange, versus mainly tipped brown in *H. fusca*.

*H. shirensbogensis sp. nov.* in life is depicted in

Anstis (2013) on page 715 (all images), Cogger (2014) on page 123, top right and online at: <https://www.flickr.com/photos/58349528@N02/29280611284/>

and

<https://www.flickr.com/photos/23031163@N03/16992321511/>

and

<https://www.flickr.com/photos/ianbool/10393353633/>

and

<https://www.flickr.com/photos/ianbool/10876665173/>  
An image of *H. fusca* in life can be found online at: <https://www.flickr.com/photos/reptileshots/24091161397/>

Both *H. shirensbogensis* sp. nov. and *H. fusca* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Maxillary teeth are present in a well developed series; there is no tubercle or flap on the heel; the chest and abdomen are strongly pigmented; parotoid glands are moderate and they are not or scarcely raised above the surface of the head and neck; there is an absence of two rows of distinctive whitish-yellow tubercles along the upper surface of the forearms and the tubercles on the dorsum are not yellow-tipped (as seen in the morphologically similar *Uperoleia (Prohartia) altissima* Davies, Watson, McDonald, Trenerry and Werren, 1993).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *H. shirensbogensis* sp. nov. occurs from New South Wales, north of the Sydney metropolitan area, along the coast and nearby ranges to South-east Queensland at the Conondale Range north of Brisbane. From there, *H. fusca* (Davies, McDonald and Corben, 1986) is patchily distributed as far north as the type locality (Eungella, near Mackay, Queensland) in wetter hilly areas and immediate environs. The two species may be sympatric where their ranges abut.

Molecular evidence published by Catulla and Scott Keogh (2014) at Fig. 3. indicates species level divergence between the two species as identified herein.

**Etymology:** In mid 2019, I was doing fieldwork on the New South Wales north coast just before visiting a pair of well-known herpetologists, Richard Wells and Cliff Ross Wellington at a venue somewhere between Brisbane and Sydney.

My wife Shireen Hoser was able to relieve herself at a public toilet and because it predated the Covid-19 pandemic, there was still toilet paper available for her to wipe her bottom. While she was relieving her bowels of Paul Woolf's cooking from the previous few nights (see etymology for *Bufo* *woolfi* sp. nov.), I jumped a fence and located several specimens of this frog species. They were hiding under some rubbish next to a flooded swamp. In Australia a swamp is commonly also referred to as a "bog". Because the place became known as "Shireen's Bog" because she also did a "bog" there, it is appropriate that the species be known as *H. shirensbogensis* sp. nov..

**UPEROLEIA (UPEROLEIA) JADEHARRISAE SP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:6DC0091A-03A7-426D-B647-4F6F9BC8B627

**Holotype:** A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R23834 collected from 5.8 km east of Victoria River, on the Victoria Highway, Northern Territory, Australia, Latitude -15.60 S., Longitude 131.15 E. This government-owned facility allows access to its holdings.

**Paratype:** A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R23835 collected from 12.9 km east of Victoria River, on the Victoria Highway, Northern Territory, Australia, Latitude -15.60 S., Longitude 131.23 E.

**Diagnosis:** *Uperoleia jadeharrisae* sp. nov., *U. keilleri* sp. nov. and *U. lowryi* sp. nov. have until now all been treated as putative *U. borealis* Tyler, Davies and Martin, 1981, with a type locality of Lake Argyle Tourist Village, East Kimberley District, Western Australia, Australia. However these taxa are all morphologically distinct from *U. borealis* of the type form and the evidence of Catullo and Scott Keogh (2014) indicates species-level genetic divergences of each as well. The four populations also conform with other similarly constrained taxa in the Kimberley/Victoria River regions of north-west Australia in terms of distributions shaped by historical placement of escarpments and drainage basins, including those during of ice-age maxima.

*U. borealis* Tyler, Davies and Martin, 1981 is effectively confined to the Ord River drainage system of far north-east Western Australia.

*U. jadeharrisae* sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region. It appears to

be more similar to *U. borealis* than the following two species.

*U. keilleri sp. nov.* is effectively restricted to the Fitzroy River basin in the south-west Kimberley District and some smaller systems to the north along the coast, as far north as the Prince Regent River, north-west, Western Australia.

*U. lowryi sp. nov.* is similar in most respects to *U. keilleri sp. nov.* and appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia.

The three preceding newly named species are separated from *U. borealis* as follows:

*U. jadeharrisae sp. nov.* and *U. borealis* are of similar colouration. Both have a generally reddish-brown dorsum, with underlying indistinct darker markings. The parotoid glands are light brown to orange in colour and of different colour to the surrounding pigment. The dorsum is generally granular, with a small number of larger and blunt tubercles most common in an irregular line down each side of the back, which are not at all distinct due to being the same colour as surrounding skin.

*U. jadeharrisae sp. nov.* has fingers that are not fringed, versus fringed slightly in *U. borealis*.

*U. jadeharrisae sp. nov.* has parotoid glands that rise abruptly from the surrounding skin, versus not so in *U. borealis*. *U. jadeharrisae sp. nov.* has virtually no webbing on the toes, versus slight webbing in *U. borealis*.

*U. jadeharrisae sp. nov.* is also notably different to *U. borealis* in that the dorsum has bold blackspots or markings encircling brown tipped tubercles, and bold black or purplish-black markings on the upper surfaces of the legs, which are not seen in *U. borealis*

Contrary to reports in the literature (e.g. Davies 1987), both *U. borealis* and *U. jadeharrisae sp. nov.* do have a mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), being of moderate thickness, but it is of similar colour to the dorsum and very indistinct.

*U. keilleri sp. nov.* is readily separated from both *U. borealis* and *U. jadeharrisae sp. nov.* by being a generally charcoal blackish coloured frog. A very thin red mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), is present, which against the charcoal black background colour of the dorsum, readily separates this species from *U. borealis* and *U. jadeharrisae sp. nov.* as well as *U. lowryi sp. nov.*

In turn *U. lowryi sp. nov.* is separated from *U. keilleri sp. nov.* by having a very thin white or yellow mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), and a dorsum which is mottled and marbled beige and charcoal in colour, giving the frog a somewhat whitish or marble

colour type of appearance, even though the back is also predominately covered with blackish pigment. The extremely large parotoid glands of *U. lowryi sp. nov.* are not with blackish pigment, but instead beige with about four irregular shaped orangeish blotches with blackish peppering at the outer edges, By contrast the parotoid glands of *U. keilleri sp. nov.* are somewhat smaller and of the same blackish colour as the rest of the dorsum.

*U. lowryi sp. nov.* is further separated from *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* by having well defined blotches or cross-bands on the upper surfaces of fore and hind limbs, superimposed on otherwise beige or yellowish surfaces. *U. lowryi sp. nov.* is unlike *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* in that the lower flanks have small scattered darker spots or blotches on an otherwise lighter background. In *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* the flanks grade from the darker dorsal colour to lighter, near white at the lower edge and without spots, blotches, or other obvious markings.

All of *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* have tiny pink markings between the eye and the upper axilla of the forearm, which are distinct in *U. keilleri sp. nov.* and indistinct in the other two species. These markings are absent in *U. lowryi sp. nov.*

*U. borealis* in life is depicted in Anstis (2013) on page 705 in all images and Eipper and Rowland (2018) page 93 at bottom, and online at:

<https://www.flickr.com/photos/88708273@N03/16359750469/>

and

<https://www.flickr.com/photos/23031163@N03/8507485347/>

and

<https://www.flickr.com/photos/88708273@N03/16600750347/>

and

<https://www.flickr.com/photos/126002448@N02/15307440612/>

*U. keilleri* in life is depicted online at:

<https://www.flickr.com/photos/angusmcnab/5977205014/>

and

<https://www.flickr.com/photos/78180980@N02/7650841344/>

A specimen morphologically similar to *U. lowryi* in life from Home Valley Station, Kimberleys, Western Australia is depicted online at:

<https://www.flickr.com/photos/robertwhyte/14176359167/>

All of *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.* are separated from all other species within the genera *Uperoleia* Gray, 1841

and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum with numerous tubercles, venter smooth; venter whitish, with grey stippling on the throat. Flanks not obviously speckled with brown and white. Thigh, groin and behind knee markings are orange or reddish. Fourth finger is equal to second. Minimal webbing on toes, being less than half webbed, and toes with broad fringes. Maxillary teeth absent; metatarsal tubercles are small but prominent.

I note that previously published keys for the species *U. borealis*, *U. jadeharrisae* sp. nov., *U. keilleri* sp. nov. and *U. lowryi* sp. nov., all defined by the relevant authors as "*U. borealis*" are erroneous and will not separate the relevant species from others in the genus *Uperoleia* as defined by them (e.g. Cogger 2014, who erroneously states on page 119 "no indication of pale vertebral stripe" for *U. borealis*, even though his depicted specimen on page 121 does in fact have one).

Mentioning of one or more errors in Cogger (2014), should not in any way detract from the overall quality and utility of this magnificent work (and predecessors) by Cogger and one should realise that a work of this magnitude, will by definition have numerous errors for a variety of reasons and regardless of the best possible intentions by the author.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. jadeharrisae* sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region.

**Etymology:** *U. jadeharrisae* sp. nov. is named in honour of Jade Leigh Harris of remote Rocklands, in the general area of Mitchell's Plain in southern Africa in recognition of services to welfare of elderly Africans in remote places and assisting this author in locating a large number of Cape Cobras *Naja nivea* Linnaeus, 1758 and other species of fauna in the informal local rubbish tip situated at the west side of the road at the corner of Jakes Gerwel Drive and Cape Flats Road.

**UPEROLEIA (UPEROLEIA) KEILLERI SP. NOV.**  
**LSIDurn:lsid:zoobank.org:act:AA772094-AA2E-4D88-8FCA-3BD27EF3BF6B**

**Holotype:** A preserved adult female specimen (29 mm long and 2.2. grams) at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R171529 collected from the Harding Range, West Kimberley District, Western Australia, Australia, Latitude -16.3231 S., Longitude 124.7589 E. This government-owned facility allows access to its holdings.

**Paratypes:** Nine preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R171516-R171522, R171528 and R171529 all collected from the type locality of the Harding Range, West Kimberley District, Western Australia, Australia, Latitude -16.3231 S., Longitude 124.7589 E.

**Diagnosis:** *Uperoleia keilleri* sp. nov., *U. jadeharrisae* sp. nov. and *U. lowryi* sp. nov. have until now all been treated as putative *U. borealis* Tyler, Davies and Martin, 1981, with a type locality of Lake Argyle Tourist Village, East Kimberley District, Western Australia, Australia. However these taxa are all morphologically distinct from *U. borealis* of the type form and the evidence of Catullo and Scott Keogh (2014) indicates species-level genetic divergences of each as well. The four populations also conform with other similarly constrained taxa in the Kimberley/Victoria River regions of north-west Australia in terms of distributions shaped by historical placement of escarpments and drainage basins, including those during of ice-age maxima.

*U. borealis* Tyler, Davies and Martin, 1981 is effectively confined to the Ord River drainage system of far north-east Western Australia.

*U. jadeharrisae* sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region. It appears to be more similar to *U. borealis* than the following two species.

*U. keilleri* sp. nov. is effectively restricted to the Fitzroy River basin in the south-west Kimberley District and some smaller systems to the north along the coast, as far north as the Prince Regent River, north-west, Western Australia.

*U. lowryi* sp. nov. is similar in most respects to *U. keilleri* sp. nov. and appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia.

The three preceding newly named species are separated from *U. borealis* as follows:

*U. jadeharrisae* sp. nov. and *U. borealis* are of similar colouration. Both have a generally reddish-brown dorsum, with underlying indistinct darker markings.

The parotoid glands are light brown to orange in colour and of different colour to the surrounding pigment. The dorsum is generally granular, with a small number of larger and blunt tubercles most common in an irregular line down each side of the back, which are not at all distinct due to being the same colour as surrounding skin.

*U. jadeharrisae sp. nov.* has fingers that are not fringed, versus fringed slightly in *U. borealis*.

*U. jadeharrisae sp. nov.* has parotoid glands that rise abruptly from the surrounding skin, versus not so in *U. borealis*. *U. jadeharrisae sp. nov.* has virtually no webbing on the toes, versus slight webbing in *U. borealis*.

*U. jadeharrisae sp. nov.* is also notably different to *U. borealis* in that the dorsum has bold blackspots or markings encircling brown tipped tubercles, and bold black or purplish-black markings on the upper surfaces of the legs, which are not seen in *U. borealis*.

Contrary to reports in the literature (e.g. Davies 1987), both *U. borealis* and *U. jadeharrisae sp. nov.* do have a mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), being of moderate thickness, but it is of similar colour to the dorsum and very indistinct.

*U. keilleri sp. nov.* is readily separated from both *U. borealis* and *U. jadeharrisae sp. nov.* by being a generally charcoal blackish coloured frog. A very thin red mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), is present, which against the charcoal black background colour of the dorsum, readily separates this species from *U. borealis* and *U. jadeharrisae sp. nov.* as well as *U. lowryi sp. nov.*

In turn *U. lowryi sp. nov.* is separated from *U. keilleri sp. nov.* by having a very thin white or yellow mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), and a dorsum which is mottled and marbled beige and charcoal in colour, giving the frog a somewhat whitish or marble colour type of appearance, even though the back is also predominately covered with blackish pigment. The extremely large parotoid glands of *U. lowryi sp. nov.* are not with blackish pigment, but instead beige with about four irregular shaped orangeish blotches with blackish peppering at the outer edges,

By contrast the parotoid glands of *U. keilleri sp. nov.* are somewhat smaller and of the same blackish colour as the rest of the dorsum.

*U. lowryi sp. nov.* is further separated from *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* by having well defined blotches or cross-bands on the upper surfaces of fore and hind limbs, superimposed on otherwise beige or yellowish surfaces. *U. lowryi sp. nov.* is unlike *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* in that the lower flanks have small scattered darker spots or blotches on an

otherwise lighter background. In *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* the flanks grade from the darker dorsal colour to lighter, near white at the lower edge and without spots, blotches, or other obvious markings.

All of *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* have tiny pink markings between the eye and the upper axilla of the forearm, which are distinct in *U. keilleri sp. nov.* and indistinct in the other two species. These markings are absent in *U. lowryi sp. nov.*

*U. borealis* in life is depicted in Anstis (2013) on page 705 in all images and Eipper and Rowland (2018) page 93 at bottom, and online at:

<https://www.flickr.com/photos/88708273@N03/16359750469/>

and

<https://www.flickr.com/photos/23031163@N03/8507485347/>

and

<https://www.flickr.com/photos/88708273@N03/16600750347/>

and

<https://www.flickr.com/photos/126002448@N02/15307440612/>

*U. keilleri* in life is depicted online at:

<https://www.flickr.com/photos/angusmcnab/5977205014/>

and

<https://www.flickr.com/photos/78180980@N02/7650841344/>

A specimen morphologically similar to *U. lowryi* in life from Home Valley Station, Kimberleys, Western Australia is depicted online at:

<https://www.flickr.com/photos/robertwhyte/14176359167/>

All of *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum with numerous tubercles, venter smooth; venter whitish, with grey stippling on the throat. Flanks not obviously speckled with brown and white. Thigh, groin and behind knee markings are orange or reddish. Fourth finger is equal to second. Minimal webbing on toes, being less than half webbed, and toes with broad fringes. Maxillary teeth absent; metatarsal tubercles are small but prominent.

I note that previously published keys for the species *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.*, all defined by the relevant authors as "*U. borealis*" are erroneous and will not separate the relevant species from others in the genus *Uperoleia* as defined by them (e.g. Cogger 2014, who erroneously states on page 119 "no indication of pale vertebral stripe" for *U. borealis*,

even though his depicted specimen on page 121 does in fact have one).

Mentioning of one or more errors in Cogger (2014) in this or any other paper by myself (or differences of opinion on taxonomy), should not in any way detract from the overall quality and utility of this magnificent work (and predecessors) by Cogger and one should realise that a work of this magnitude, will by definition have numerous errors for a variety of reasons and regardless of the best possible intentions by the author.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. keilleri* sp. nov. is effectively restricted to the Fitzroy River basin in the south-west Kimberley District and some smaller systems to the north along the coast, as far north as the Prince Regent River, north-west, Western Australia. This includes inland parts of the Fitzroy River basin and tributaries.

**Etymology:** *U. keilleri* sp. nov. is named in honour of Darren Keiller, a well known snake controller based in Geelong, Victoria, Australia, for services to wildlife conservation and public safety spanning many years.

**UPEROLEIA (UPEROLEIA) LOWRYI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:B2E7BD53-74C4-48E4-BBC2-555EB388B352**

**Holotype:** A preserved 14 mm long specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R165840 collected from Bigge Island, West Kimberley District, Western Australia, Australia, Latitude -14.4833 S., Longitude 125.1667 E. This government-owned facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R165841 and R165842 collected from Bigge Island, West Kimberley District, Western Australia, Australia, Latitude -14.4833 S., Longitude 125.1667 E.

**Diagnosis:** *Uperoleia lowryi* sp. nov., *U. keilleri* sp. nov. and *U. jadeharrisae* sp. nov. have until now all been treated as putative *U. borealis* Tyler, Davies and Martin, 1981, with a type locality of Lake Argyle Tourist Village, East Kimberley District, Western

Australia, Australia. However these taxa are all morphologically distinct from *U. borealis* of the type form and the evidence of Catullo and Scott Keogh (2014) indicates species-level genetic divergences of each as well. The four populations also conform with other similarly constrained taxa in the Kimberley/ Victoria River regions of north-west Australia in terms of distributions shaped by historical placement of escarpments and drainage basins, including those during of ice-age maxima.

*U. borealis* Tyler, Davies and Martin, 1981 is effectively confined to the Ord River drainage system of far north-east Western Australia.

*U. jadeharrisae* sp. nov. is presently only known from the collection sites of holotype and paratype near the Victoria River in the Northern Territory and is presumably constrained to that region. It appears to be more similar to *U. borealis* than the following two species.

*U. keilleri* sp. nov. is effectively restricted to the Fitzroy River basin in the south-west Kimberley District and some smaller systems to the north along the coast, as far north as the Prince Regent River, north-west, Western Australia.

*U. lowryi* sp. nov. is similar in most respects to *U. keilleri* sp. nov. and appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia.

The three preceding newly named species are separated from *U. borealis* as follows:

*U. jadeharrisae* sp. nov. and *U. borealis* are of similar colouration. Both have a generally reddish-brown dorsum, with underlying indistinct darker markings. The parotoid glands are light brown to orange in colour and of different colour to the surrounding pigment. The dorsum is generally granular, with a small number of larger and blunt tubercles most common in an irregular line down each side of the back, which are not at all distinct due to being the same colour as surrounding skin.

*U. jadeharrisae* sp. nov. has fingers that are not fringed, versus fringed slightly in *U. borealis*.

*U. jadeharrisae* sp. nov. has parotoid glands glands that rise abruptly from the surrounding skin, versus not so in *U. borealis*. *U. jadeharrisae* sp. nov. has virtually no webbing on the toes, versus slight webbing in *U. borealis*.

*U. jadeharrisae* sp. nov. is also notably different to *U. borealis* in that the dorsum has bold blackspots or markings encircling brown tipped tubercles, and bold black or purplish-black markings on the upper surfaces of the legs, which are not seen in *U. borealis*.

Contrary to reports in the literature (e.g. Davies 1987), both *U. borealis* and *U. jadeharrisae* sp. nov. do have a mid-vertebral stripe (commencing from the

snout and running backwards down the dorsum), being of moderate thickness, but it is of similar colour to the dorsum and very indistinct.

*U. keilleri sp. nov.* is readily separated from both *U. borealis* and *U. jadeharrisae sp. nov.* by being a generally charcoal blackish coloured frog. A very thin red mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), is present, which against the charcoal black background colour of the dorsum, readily separates this species from *U. borealis* and *U. jadeharrisae sp. nov.* as well as *U. lowryi sp. nov.*

In turn *U. lowryi sp. nov.* is separated from *U. keilleri sp. nov.* by having a very thin white or yellow mid-vertebral stripe (commencing from the snout and running backwards down the dorsum), and a dorsum which is mottled and marbled beige and charcoal in colour, giving the frog a somewhat whitish or marble colour type of appearance, even though the back is also predominately covered with blackish pigment. The extremely large parotoid glands of *U. lowryi sp. nov.* are not with blackish pigment, but instead beige with about four irregular shaped orangeish blotches with blackish peppering at the outer edges, By contrast the parotoid glands of *U. keilleri sp. nov.* are somewhat smaller and of the same blackish colour as the rest of the dorsum.

*U. lowryi sp. nov.* is further separated from *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* by having well defined blotches or cross-bands on the upper surfaces of fore and hind limbs, superimposed on otherwise beige or yellowish surfaces. *U. lowryi sp. nov.* is unlike *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* in that the lower flanks have small scattered darker spots or blotches on an otherwise lighter background. In *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* the flanks grade from the darker dorsal colour to lighter, near white at the lower edge and without spots, blotches, or other obvious markings.

All of *U. keilleri sp. nov.*, *U. borealis* and *U. jadeharrisae sp. nov.* have tiny pink markings between the eye and the upper axilla of the forearm, which are distinct in *U. keilleri sp. nov.* and indistinct in the other two species. These markings are absent in *U. lowryi sp. nov.*

*U. borealis* in life is depicted in Anstis (2013) on page 705 in all images and Eipper and Rowland (2018) page 93 at bottom, and online at:

<https://www.flickr.com/photos/88708273@N03/16359750469/>

and

<https://www.flickr.com/photos/23031163@N03/8507485347/>

and

<https://www.flickr.com/photos/88708273@N03/16600750347/>

and

<https://www.flickr.com/photos/126002448@N02/15307440612/>

*U. keilleri* in life is depicted online at:

<https://www.flickr.com/photos/angusmcnab/5977205014/>

and

<https://www.flickr.com/photos/78180980@N02/7650841344/>

A specimen morphologically similar to *U. lowryi* in life from Home Valley Station, Kimberleys, Western Australia is depicted online at:

<https://www.flickr.com/photos/robertwhyte/14176359167/>

All of *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.* are separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Dorsum with numerous tubercles, venter smooth; venter whitish, with grey stippling on the throat. Flanks not obviously speckled with brown and white. Thigh, groin and behind knee markings are orange or reddish. Fourth finger is equal to second. Minimal webbing on toes, being less than half webbed, and toes with broad fringes. Maxillary teeth absent; metatarsal tubercles are small but prominent.

I note that previously published keys for the species *U. borealis*, *U. jadeharrisae sp. nov.*, *U. keilleri sp. nov.* and *U. lowryi sp. nov.*, all defined by the relevant authors as "*U. borealis*" are erroneous and will not separate the relevant species from others in the genus *Uperoleia* as defined by them (e.g. Cogger 2014, who erroneously states on page 119 "no indication of pale vertebral stripe" for *U. borealis*, even though his depicted specimen on page 121 does in fact have one).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. lowryi sp. nov.* appears to be found only on Bigge Island, north-west Kimberley (the type locality) and adjacent parts of the mainland in the north-west Kimberley District of Western Australia in a region approximately bound by Kalumburu in the

north and Augustus Island in the south and drainage basins flowing westwards from the adjoining mainland.

**Etymology:** *U. lowryi* sp. nov. is named in honour of Andrew Lowry of Cheltenham, Victoria, Australia, for services to wildlife conservation and herpetology spanning several decades.

**UPEROLEIA (UPEROLEIA) SHANESCARFFI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:5566E830-1D4B-4556-A5FF-9BFCE4A0C395**

**Holotype:** A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184324 collected from Mornington station, Kimberley District, Western Australia, Latitude -17.5108 S., Longitude 126.1068 E. This government-owned facility allows access to its holdings.

**Paratypes:** Three preserved specimens at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.184325-7 collected from Mornington station, Kimberley District, Western Australia, Latitude -17.5108 S., Longitude 126.1068 E.

**Diagnosis:** Until now, *U. shanesearffi* sp. nov. has been treated as a population of *U. crassa* Tyler, Davies and Martin, 1981 with a type locality of Mitchell Plateau, north-west Kimberley division of Western Australia. However it is sufficiently distinctive and biogeographically divergent to be recognized as a separate species.

*U. shanesearffi* sp. nov. appears to be confined to a region broadly corresponding to the Fitzroy River system in the south and south-west Kimberley division of Western Australia. *U. crassa* as herein recognized appears to be confined to a region north-west of here with drainages flowing west and not meeting the Fitzroy River system, even in times of glacial maxima and lowest sea levels. It appears that the relevant region was sufficiently arid in recent geological time frames to keep the populations apart. The two species *U. shanesearffi* sp. nov. and *U. crassa* are separated as follows: In *U. crassa* the dorsum is a pale beige colour and well marked with prominent dark brown blotches and prominent orange-tipped tubercles on dorsal and upper lateral surfaces. The upper surface of the upper arm is cream or light yellow. The oversized paratoid gland is cream to beige, and often with a strong orange flush. Upper lip area is mainly cream.

*U. shanesearffi* sp. nov. is a very different looking frog. The colouration of the dorsum is generally dull and with no well defined markings. There is no strong contrast between dark and light markings on the back. The dark pigment is reduced in darkness and intensity and the light is similarly darkened, making the frog a generally dull greyish brown colour. Dark pigment is also reduced in area to only include the

warty bumps on the back, as opposed to including surrounding skin in *U. crassa*. As already noted, the contrast between these darker spots (in this species) and the lighter areas is minimal, versus strong contrast between larger dark blotches (as opposed to just spots) and pale interspace in *U. crassa*.

The mainly dull coloured parotoid glands are smaller in size than in *U. crassa* being mainly greyish in colour and the lighter top section, while marked beige with an orange flush, is barely distinct from the surrounding skin. The upper surface of the upper arm has a well defined orange patch on it (usually larger and more prominent in females). The upper lip area is mainly grey.

Orange spotting at the tips of tubercles scattered across the dorsum and upper flanks in *U. crassa* is prominent. These spots are either absent, heavily reduced or indistinct in *U. shanesearffi* sp. nov.. *U. shanesearffi* sp. nov. from the type locality is depicted in life in Anstis (2013) on page 709 (top right), with *U. crassa* from the type locality of that species depicted in Anstis (2013) on page 709 in the three other photos.

*U. crassa* in life is also depicted in Cogger (2014) on page 134 bottom right, Eipper and Rowland (2018) on page 94 (top) and online at:

<https://www.flickr.com/photos/ianbool/50209194586/>

and

<https://www.flickr.com/photos/chrisjolly1989/24600138628/>

Both *U. shanesearffi* sp. nov. and *U. crassa* are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Diamond-shaped iris. No obvious mid vertebral stripe, save for some scattered raised orange-tipped tubercles more-or-less along the mid dorsal line running though an area of beige or cream without intruding darker blotches seen elsewhere on the dorsum, in *U. crassa* (but not in any way in *U. shanesearffi* sp. nov.); no maxillary teeth. Ventral surface slightly granular, whitish and without darker markings. Inner leg red (*U. crassa*) or dark orange (*U. shanesearffi* sp. nov.).

Toes slightly fringed and less than half webbed; Thigh and groin markings red; fourth finger longer than second.

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil



rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. shanescarffi* sp. nov. appears to be confined to a region broadly corresponding to the Fitzroy River system in the south and south-west Kimberley division of Western Australia. *U. crassa* as herein recognized appears to be confined to a region north-west of here with drainages flowing west and not meeting the Fitzroy River system, even in times of glacial maxima and lowest sea levels. It appears that the relevant region was sufficiently arid in recent geological time frames to keep the populations apart.

**Etymology:** *U. shanescarffi* sp. nov. is named in honour of Shane Scarff of Heckenberg, a suburb in south-western Sydney, in the state of New South Wales, Australia, known for his snake breeding enterprise called Shane's Aussie Pythons, for services to wildlife conservation in Australia.

**UPEROLEIA (UPEROLEIA) MICRA DIVERGANS SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:82066330-A9B4-4618-810A-AD5832232705**

**Holotype:** A preserved adult male specimen at the Western Australian Museum, Perth, Western Australia, specimen number R164897 collected from Katers Island, Western Australia, Australia, Latitude 14.2656 S., Longitude; 125.3122 E.

**Paratype:** A preserved adult male specimen at the Western Australian Museum, Perth, Western Australia, specimen number R164898 collected from Katers Island, Western Australia, Australia, Latitude 14.2656 S., Longitude; 125.3122 E.

**Diagnosis:** The subspecies *Uperoleia micra divergans* subsp. nov. is similar in most respects to the nominate form of *Uperoleia micra* Doughty and Roberts, 2008, but is readily separated from that subspecies by having slightly lighter dorsal colouration, being generally medium brown, rather than dark brown to charcoal in colour and by the presence of inguinal glands that are an intense orange-red colouration.

Both *U. micra divergans* subsp. nov. and *Uperoleia micra micra* (the nominate form) are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: A small body size, presence of maxillary teeth, broadly exposed frontoparietal fontanelle, slightly tubercular skin on dorsum and upper limbs, moderately conspicuous parotoid and inguinal glands and less developed coccygeal glands, toes basally webbed, elongate inner metatarsal tubercle perpendicular to foot, light to dark brown or charcoal coloured dorsal surfaces with small darker spots, loreal and lateral zone stippled with bluish-white dots, pale orange-red femoral patches, sometimes intense

(darker) in colour, speckled and slightly granular ventral surface and high-pitched rasp as an advertisement call (modified from Doughty and Roberts, 2008).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomerine is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** At the present time *U. micra divergans* subsp. nov. is only known from Katers Island, Western Australia, Australia, Latitude 14.2656 S., Longitude; 125.3122 E in the north-east Kimberley division of Western Australia. However it almost certainly also occurs on the adjoining mainland of the same region in association with the relevant drainage systems and presumably constrained by drier intermediate zones.

**Etymology:** The subspecies name "divergans" refers to this taxon being morphologically divergent from the nominate form. The spelling is deliberate and intentional, is chosen to avoid creating any potential homonyms and should not be changed.

**UPEROLEIA (PROHARTIA) MARGWEEKSAE SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:F8C9E380-10D3-457C-9AC1-108DAAF0F846**

**Holotype:** A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen number R35075 collected at McMillans Road, Berrimah, Northern Territory, Australia, Latitude -12.438 S., Longitude 130.9533 E. This government-owned facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen numbers R20706 and R20705 collected from Stage 3, Kakadu National Park, Northern Territory, Australia, Latitude -13.083 S., Longitude 132.15 E.

**Diagnosis:** Until now, both *Uperoleia margweeksa* sp. nov. and *U. grantturneri* sp. nov. have been treated as populations of the widely distributed taxon *U. lithomoda* Tyler, Davies and Martin, 1981 with a type locality of Spillway Bridge, 11.5 km north-east of Lake Argyle Tourist Village, Western Australia, Australia.

Specimens consistent with this putative species are

found in a band from the East Kimberley district in Western Australia, across the Northern Territory and to the western edge of the Gulf of Carpentaria.

Morphologically divergent specimens from the top end of the Northern Territory in the region of Darwin and Arnhemland are herein treated as the new species *U. margweeksae sp. nov.*

The morphologically divergent, geographically disjunct whitish coloured specimens from the eastern edge of the Gulf of Carpentaria and the drier western parts of Cape York Peninsula, Queensland are herein formally named *U. grantturneri sp. nov.*

The three species are readily separated from one another as follows: *U. lithomoda* is characterised by having a dorsum covered with close spaced large blunt tubercles, sometimes lighter at the highest point. The flanks are brown with numerous tiny, yellow-white tubercles. In males there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, commencing on the upper parotoid gland and extending to near the rear leg. The pigment on either side of this fold is chocolate brown, with the raised blunt tubercles being reddish brown, but not particularly well defined in terms of colour.

A thin, well-defined white or yellow vertebral line runs from the tip of the snout to about level with the front limbs, at which point it terminates. Anterior of snout is mainly grey.

*U. margweeksae sp. nov.* is readily separated from *U. lithomoda* by having a dorsum that is more-or-less smooth but with scattered and relatively pointed tubercles across the dorsum, these becoming tiny on the upper flanks. Where in male *U. lithomoda* there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, this is reduced so as to be barely discernable. The reduction is both in the fold itself (no longer as an obvious fold) and in colouration in that there is a slight lightening of the zone to yellowish (rather than a well defined colour change), but not in any way as a distinctive white and broken line at the top of the flank as seen in *U. lithomoda*. Some of the scattered tubercles on the dorsum of *U. margweeksae sp. nov.* are brightly and distinctly orange-tipped, which is not seen in *U. lithomoda*.

The subspecies *U. margweeksae maximus subsp. nov.* occurring only on Groote Eylandt, is readily separated from *U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.* by being the only taxon in the complex which has significant amounts of dark peppering and pigment on the ventral surfaces.

The average snout-vent length (body length) of male *U. margweeksae maximus subsp. nov.* is relatively huge, being 24.6 mm (N=10), versus a range of 19.0-21.9 mm for all other species and subspecies in the complex (*U. margweeksae sp. nov.*, *U. lithomoda* and

*U. grantturneri sp. nov.*) (N=92) (Davies 1987), making this a distinctively large taxon in the complex. Females are also relatively larger in *U. margweeksae maximus subsp. nov.* as compared to in the other species (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*).

*U. grantturneri sp. nov.* comes across as a distinctively whiteish coloured frog.

The base colour of the dorsum is whitish, yellow, creamy or beige overlaid with a fairly distinctive randomised pattern of dark orange-brown blotches and spots. In addition to this there are scattered orange tipped tubercles mainly on the dorsum and with other tiny ones on the upper flanks.

Like in *U. lithomoda*, there is a thick, sometimes broken fold of skin along the upper flank, but because it is surrounded by similarly coloured yellow, cream or beige skin, it is not seen as an obvious fold line as in *U. lithomoda*, where the whitish line is sharply demarcated from the adjoining chocolate-brown skin. The dorsum of *U. grantturneri sp. nov.* is heavily covered with blunt warts, being not as densely packed as seen in *U. lithomoda*, but more so than seen in *U. margweeksae sp. nov.*

*U. margweeksae sp. nov.* has a bluish-grey iris, versus reddish brown in the other two species.

*U. lithomoda* has mainly reddish-brown flanks.

*U. margweeksae sp. nov.* has mainly greyish flanks.

*U. grantturneri sp. nov.* has mainly whitish flanks.

Premetamorphosing tadpoles of *U. lithomoda* when viewed from above are a dull greyish background colour, with indistinct darker grey mottling on the body and a slight darkening at the end of the tail. The muscle tissue of the tail is lightly peppered black top and bottom consistently along the length.

At the same stage and view *U. margweeksae sp. nov.* tadpoles are yellowish in colour with well-defined areas of black pigment. The tip of the snout has a distinctive short yellow/white bar extending to between the nostrils, the same bar being barely distinct in *U. lithomoda* at the same life stage. The tail tip is heavily pigmented black. The muscle tissue of the tail is heavily peppered black top and bottom consistently along the length.

At the same stage and view *U. grantturneri sp. nov.* tadpoles are generally a light grey colour when viewed from above and with only limited, but distinct, dark blackish flecks or markings, although like in *U. margweeksae sp. nov.* the darker markings or flecks are strongly contrasting. The tip of the tail is heavily pigmented black in similar manner to *U.*

*margweeksae sp. nov.*, however in contrast to both *U. lithomoda* and *U. margweeksae sp. nov.* the muscle tissue of the tail is characterised with scattered large black spots, as opposed to a consistent and continuous blackening of the upper surface.

*U. lithomoda* in life is depicted in Anstis (2013) on

page 727 at top left, top right and middle right, Tyler, Smith and Johnstone (1994) on plate 20, at top, and online at:

<https://www.flickr.com/photos/23031163@N03/8486378849/>

*U. margweeksae* sp. nov. is depicted in life in Anstis (2013) on pages 727 bottom right and 728 top left, Cogger (2014) on page 125, bottom right and online at:

<https://www.flickr.com/photos/ryanfrancis/32451097512/>

and

<https://www.flickr.com/photos/58349528@N02/49485781717/>

*U. grantturneri* sp. nov. is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/32481012315/>

and

<https://www.flickr.com/photos/euprepiosaur/6835095601/>

*U. lithomoda*, *U. margweeksae* sp. nov., and *U. grantturneri* sp. nov. are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Large parotoid glands usually tending to be creamish or cream on the upper surfaces; venter is cream, except for a blackish rim below the lower jaw; ventral surface is slightly to coarsely granular; belly and abdomen pale with at most some sparsely scattered stippling of darker pigment; inner thigh is orange (*U. lithomoda* and *U. grantturneri* sp. nov.) or pinkish (*U. margweeksae* sp. nov.). Toes without fringes and without or at most a trace of basal webbing; Maxillary teeth absent. Internarial distance is less than eye-naris distance. Outer metatarsal tubercle is larger than the inner, with both being small but conspicuous;

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. margweeksae* sp. nov. appears to be confined to the tropical north of the Northern Territory in the region of Darwin and Arnhemland and presumably extends further east to Groote Eylandt (see description of subspecies from Groote Eylandt below).

**Etymology:** *U. margweeksae* sp. nov. is named in honour of Marg Weeks of Croydon Hills (North Croydon), Victoria, Australia, sometimes known as the “Gorilla Doctor” in recognition of her many years of service to the female waxing and hair removal industry, including her specialty of removing hair from people’s feet.

**UPEROLEIA (PROHARTIA) MARGWEEKSAE MAXIMUS SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:822D768C-1321-486F-B47C-A94F08C67B4D**

**Holotype:** A preserved specimen at the South Australian Museum, Adelaide, South Australia, specimen number R25467 collected from 2.7 km east of Angurugu Airport, Groote Eylandt, Northern Territory, Australia, Latitude -13.97 S., Longitude 136.47 E. This government-owned facility allows access to its holdings.

**Paratypes:** Four preserved specimens at the South Australian Museum, Adelaide, South Australia, specimen numbers R25468- R25471 collected from 2.7 km east of Angurugu Airport, Groote Eylandt, Northern Territory, Australia, Latitude -13.97 S., Longitude 136.47 E.

**Diagnosis:** Until now, both *Uperoleia margweeksae* sp. nov. and *U. grantturneri* sp. nov. have been treated as populations of the widely distributed taxon *U. lithomoda* Tyler, Davies and Martin, 1981 with a type locality of Spillway Bridge, 11.5 km north-east of Lake Argyle Tourist Village, Western Australia, Australia.

Specimens consistent with this putative species are found in a band from the East Kimberley district in Western Australia, across the Northern Territory and to the western edge of the Gulf of Carpentaria. Morphologically divergent specimens from the top end of the Northern Territory in the region of Darwin and Arnhemland are herein treated as the new species *U. margweeksae* sp. nov..

The morphologically divergent, geographically disjunct whitish coloured specimens from the eastern edge of the Gulf of Carpentaria and the drier western parts of Cape York Peninsula, Queensland are herein formally named *U. grantturneri* sp. nov..

The three species are readily separated from one another as follows: *U. lithomoda* is characterised by having a dorsum covered with close spaced large blunt tubercles, sometimes lighter at the highest point. The flanks are brown with numerous tiny, yellow-white tubercles. In males there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, commencing on the upper parotoid gland and extending to near the rear leg. The pigment on either side of this fold is chocolate brown, with the raised blunt tubercles being reddish brown, but not particularly well defined in terms of colour.

A thin, well-defined white or yellow vertebral line runs

from the tip of the snout to about level with the front limbs, at which point it terminates. Anterior of snout is mainly grey.

*U. margweeksae sp. nov.* is readily separated from *U. lithomoda* by having a dorsum that is more-or-less smooth but with scattered and relatively pointed tubercles across the dorsum, these becoming tiny on the upper flanks. Where in male *U. lithomoda* there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, this is reduced so as to be barely discernable. The reduction is both in the fold itself (no longer as an obvious fold) and in colouration in that there is a slight lightening of the zone to yellowish (rather than a well defined colour change), but not in any way as a distinctive white and broken line at the top of the flank as seen in *U. lithomoda*. Some of the scattered tubercles on the dorsum of *U. margweeksae sp. nov.* are brightly and distinctly orange-tipped, which is not seen in *U. lithomoda*.

The subspecies *U. margweeksae maximus subsp. nov.* occurring only on Groote Eylandt, is readily separated from *U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.* by being the only taxon in the complex which has significant amounts of dark peppering and pigment on the ventral surfaces.

The average snout-vent length (body length) of male *U. margweeksae maximus subsp. nov.* is relatively huge, being 24.6 mm (N=10), versus a range of 19.0-21.9 mm for all other species and subspecies in the complex (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*) (N=92) (Davies 1987), making this a distinctively large taxon in the complex. Females are also relatively larger in *U. margweeksae maximus subsp. nov.* as compared to in the other species (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*).

*U. grantturneri sp. nov.* comes across as a distinctively whiteish coloured frog.

The base colour of the dorsum is whitish, yellow, creamy or beige overlaid with a fairly distinctive randomised pattern of dark orange-brown blotches and spots. In addition to this there are scattered orange tipped tubercles mainly on the dorsum and with other tiny ones on the upper flanks.

Like in *U. lithomoda*, there is a thick, sometimes broken fold of skin along the upper flank, but because it is surrounded by similarly coloured yellow, cream or beige skin, it is not seen as an obvious fold line as in *U. lithomoda*, where the whitish line is sharply demarcated from the adjoining chocolate-brown skin. The dorsum of *U. grantturneri sp. nov.* is heavily covered with blunt warts, being not as densely packed as seen in *U. lithomoda*, but more so than seen in *U. margweeksae sp. nov.*

*U. margweeksae sp. nov.* has a bluish-grey iris, versus reddish brown in the other two species.

*U. lithomoda* has mainly reddish-brown flanks.

*U. margweeksae sp. nov.* has mainly greyish flanks.

*U. grantturneri sp. nov.* has mainly whitish flanks.

Premetamorphosing tadpoles of *U. lithomoda* when viewed from above are a dull greyish background colour, with indistinct darker grey mottling on the body and a slight darkening at the end of the tail. The muscle tissue of the tail is lightly peppered black top and bottom consistently along the length.

At the same stage and view *U. margweeksae sp. nov.* tadpoles are yellowish in colour with well-defined areas of black pigment. The tip of the snout has a distinctive short yellow/white bar extending to between the nostrils, the same bar being barely distinct in *U. lithomoda* at the stage. The tail tip is heavily pigmented black. The muscle tissue of the tail is heavily peppered black top and bottom consistently along the length.

At the same stage and view *U. grantturneri sp. nov.* tadpoles are generally a light grey colour when viewed from above and with only limited, but distinct, dark blackish flecks or markings, although like in *U. margweeksae sp. nov.* the darker markings or flecks are strongly contrasting. The tip of the tail is heavily pigmented black in similar manner to *U. margweeksae sp. nov.*, however in contrast to both *U. lithomoda* and *U. margweeksae sp. nov.* the muscle tissue of the tail is characterised with scattered large black spots, as opposed to a consistent and continuous blackening of the upper surface.

*U. lithomoda* in life is depicted in Anstis (2013) on page 727 at top left, top right and middle right, Tyler, Smith and Johnstone (1994) on plate 20, at top, and online at:

<https://www.flickr.com/photos/23031163@N03/8486378849/>

*U. margweeksae sp. nov.* is depicted in life in Anstis (2013) on pages 727 bottom right and 728 top left, Cogger (2014) on page 125, bottom right and online at:

<https://www.flickr.com/photos/ryanfrancis/32451097512/>

and

<https://www.flickr.com/photos/58349528@N02/49485781717/>

*U. grantturneri sp. nov.* is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/32481012315/>

and

<https://www.flickr.com/photos/euprepiosaur/6835095601/>

*U. lithomoda*, *U. margweeksae sp. nov.* (nominate form and other subspecies from Groote Eylandt, namely *U. margweeksae maximus subsp. nov.*), and *U. grantturneri sp. nov.* are readily separated from all other species within the genera *Uperoleia* Gray, 1841

and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Large parotoid glands usually tending to be creamish or cream on the upper surfaces; venter is cream, except for a blackish rim below the lower jaw; ventral surface is slightly to coarsely granular; belly and abdomen pale with at most some sparsely scattered stippling of darker pigment; inner thigh is orange (*U. lithomoda* and *U. grantturneri* sp. nov.) or pinkish (*U. margweeksae* sp. nov.). Toes without fringes and without or at most a trace of basal webbing; Maxillary teeth absent. Internarial distance is less than eye-naris distance. Outer metatarsal tubercle is larger than the inner, with both being small but conspicuous;

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. margweeksae maximus* subsp. nov. is only known from Groote Eylandt, Northern Territory, Australia and is believed to be an insular subspecies.

**Etymology:** *U. margweeksae maximus* subsp. nov. is named in reflection of the greater size of the adults of this subspecies as compared to the nominate form and other closely related species.

**UPEROLEIA (PROHARTIA) GRANTTURNERI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:A43BD3AA-2F5F-4F57-A19F-502B39217662**

**Holotype:** A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J75722 collected from Forsayth-Georgetown Road, Queensland, Australia, Latitude -18.3656 S., Longitude 143.5228 E. This government-owned facility allows access to its holdings.

**Paratypes:** 1/ A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J75729 collected from Forsayth-Georgetown Road, Queensland, Australia, Latitude -18.3656 S., Longitude 143.5228 E.

2/ A preserved specimen in the Queensland Museum, Brisbane, Queensland, Australia, specimen number J77533 collected from Kendall River, Queensland, Australia, Latitude -13.7422 S., Longitude 142.1267 E.

3/ A preserved specimen in the Queensland

Museum, Brisbane, Queensland, Australia, specimen number J85141 collected near Normanton, 40km E of Chillagoe turnoff, Queensland, Australia, Latitude -17.3157 S., Longitude 141.5153 E.

4/ Two preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J64934 and J64938 collected at Marsupial Ck, via Croydon, Queensland, Australia, Latitude -18.2 S., Longitude 142.3 E.

5/ Five preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J65967, J65968, J65969, J88211 and J88212 all collected from the Georgetown-Croydon Road, Queensland, Australia, Latitude -18.2436 S., Longitude 142.7164 E.

6/ Two preserved specimens in the Queensland Museum, Brisbane, Queensland, Australia, specimen numbers J88811 and J88812 both collected at Lagoon Creek, Westmoreland Station, Latitude -17.5 S., Longitude 138.1 E.

**Diagnosis:** Until now, both *U. grantturneri* sp. nov. and *Uperoleia margweeksae* sp. nov. have been treated as populations of the widely distributed taxon *U. lithomoda* Tyler, Davies and Martin, 1981 with a type locality of Spillway Bridge, 11.5 km north-east of Lake Argyle Tourist Village, Western Australia, Australia.

Specimens consistent with this putative species are found in a band from the East Kimberley district in Western Australia, across the Northern Territory and to the western edge of the Gulf of Carpentaria.

Morphologically divergent specimens from the top end of the Northern Territory in the region of Darwin and Arnhemland are herein treated as the new species *U. margweeksae* sp. nov..

The morphologically divergent, geographically disjunct whitish coloured specimens from the eastern edge of the Gulf of Carpentaria and the drier western parts of Cape York Peninsula, Queensland are herein formally named *U. grantturneri* sp. nov..

The three species are readily separated from one another as follows: *U. lithomoda* is characterised by having a dorsum covered with close spaced large blunt tubercles, sometimes lighter at the highest point. The flanks are brown with numerous tiny, yellow-white tubercles. In males there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, commencing on the upper parotoid gland and extending to near the rear leg. The pigment on either side of this fold is chocolate brown, with the raised blunt tubercles being reddish brown, but not particularly well defined in terms of colour.

A thin, well-defined white or yellow vertebral line runs from the tip of the snout to about level with the front limbs, at which point it terminates. Anterior of snout is mainly grey.

*U. margweeksae* sp. nov. is readily separated from

*U. lithomoda* by having a dorsum that is more-or-less smooth but with scattered and relatively pointed tubercles across the dorsum, these becoming tiny on the upper flanks. Where in male *U. lithomoda* there is a thick and prominent broken white fold of skin demarcating the dorsum and the upper flank, this is reduced so as to be barely discernable. The reduction is both in the fold itself (no longer as an obvious fold) and in colouration in that there is a slight lightening of the zone to yellowish (rather than a well defined colour change), but not in any way as a distinctive white and broken line at the top of the flank as seen in *U. lithomoda*. Some of the scattered tubercles on the dorsum of *U. margweeksae sp. nov.* are brightly and distinctly orange-tipped, which is not seen in *U. lithomoda*.

The subspecies *U. margweeksae maximus subsp. nov.* occurring only on Groote Eylandt, is readily separated from *U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.* by being the only taxon in the complex which has significant amounts of dark peppering and pigment on the ventral surfaces.

The average snout-vent length (body length) of male *U. margweeksae maximus subsp. nov.* is relatively huge, being 24.6 mm (N=10), versus a range of 19.0-21.9 mm for all other species and subspecies in the complex (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*) (N=92) (Davies 1987), making this a distinctively large taxon in the complex. Females are also relatively larger in *U. margweeksae maximus subsp. nov.* as compared to in the other species (*U. margweeksae sp. nov.*, *U. lithomoda* and *U. grantturneri sp. nov.*).

*U. grantturneri sp. nov.* comes across as a distinctively whiteish coloured frog.

The base colour of the dorsum is whitish, yellow, creamy or beige overlaid with a fairly distinctive randomised pattern of dark orange-brown blotches and spots. In addition to this there are scattered orange tipped tubercles mainly on the dorsum and with other tiny ones on the upper flanks.

Like in *U. lithomoda*, there is a thick, sometimes broken fold of skin along the upper flank, but because it is surrounded by similarly coloured yellow, cream or beige skin, it is not seen as an obvious fold line as in *U. lithomoda*, where the whitish line is sharply demarcated from the adjoining chocolate-brown skin. The dorsum of *U. grantturneri sp. nov.* is heavily covered with blunt warts, being not as densely packed as seen in *U. lithomoda*, but more so than seen in *U. margweeksae sp. nov.*

*U. margweeksae sp. nov.* has a bluish-grey iris, versus reddish brown in the other two species.

*U. lithomoda* has mainly reddish-brown flanks.

*U. margweeksae sp. nov.* has mainly greyish flanks.

*U. grantturneri sp. nov.* has mainly whitish flanks.

Premetamorphosing tadpoles of *U. lithomoda* when

viewed from above are a dull greyish background colour, with indistinct darker grey mottling on the body and a slight darkening at the end of the tail. The muscle tissue of the tail is lightly peppered black top and bottom consistently along the length.

At the same stage and view *U. margweeksae sp. nov.* tadpoles are yellowish in colour with well-defined areas of black pigment. The tip of the snout has a distinctive short yellow/white bar extending to between the nostrils, the same bar being barely distinct in *U. lithomoda* at the stage. The tail tip is heavily pigmented black. The muscle tissue of the tail is heavily peppered black top and bottom consistently along the length.

At the same stage and view *U. grantturneri sp. nov.* tadpoles are generally a light grey colour when viewed from above and with only limited, but distinct, dark blackish flecks or markings, although like in *U. margweeksae sp. nov.* the darker markings or flecks are strongly contrasting. The tip of the tail is heavily pigmented black in similar manner to *U. margweeksae sp. nov.*, however in contrast to both *U. lithomoda* and *U. margweeksae sp. nov.* the muscle tissue of the tail is characterised with scattered large black spots, as opposed to a consistent and continuous blackening of the upper surface.

*U. lithomoda* in life is depicted in Anstis (2013) on page 727 at top left, top right and middle right, Tyler, Smith and Johnstone (1994) on plate 20, at top, and online at:

<https://www.flickr.com/photos/23031163@N03/8486378849/>

*U. margweeksae sp. nov.* is depicted in life in Anstis (2013) on pages 727 bottom right and 728 top left, Cogger (2014) on page 125, bottom right and online at:

<https://www.flickr.com/photos/ryanfrancis/32451097512/>

and

<https://www.flickr.com/photos/58349528@N02/49485781717/>

*U. grantturneri sp. nov.* is depicted in life online at:

<https://www.flickr.com/photos/14807473@N08/32481012315/>

and

<https://www.flickr.com/photos/euprepiosaur/6835095601/>

*U. lithomoda*, *U. margweeksae sp. nov.* (including the single subspecies), and *U. grantturneri sp. nov.* are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Large parotoid glands usually tending to be creamish or cream on the upper surfaces; venter is cream, except for a blackish rim below the lower jaw; ventral surface is slightly to coarsely granular; belly and abdomen pale with at most some sparsely

scattered stippling of darker pigment; inner thigh is orange (*U. lithomoda* and *U. grantturneri* sp. nov.) or pinkish (*U. margweeksae* sp. nov.). Toes without fringes and without or at most a trace of basal webbing; Maxillary teeth absent. Internarial distance is less than eye-naris distance. Outer metatarsal tubercle is larger than the inner, with both being small but conspicuous;

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. grantturneri* sp. nov. appears to be confined to the eastern edge of the Gulf of Carpentaria and the drier, mainly western parts of Cape York Peninsula, Queensland.

**Etymology:** *U. grantturneri* sp. nov. is named in honour of Grant Turner of Innisfail, North Queensland, Australia, formerly of Bundoora, Victoria, Australia, in recognition of a lifetime of significant contributions to herpetology in Australia, through numerous major scientific works and also recognizing his invaluable (always unpaid and difficult for him) assistances to myself, Rob Valentic and other herpetologists in numerous extremely intensive and demanding fieldwork projects across Victoria in the late 1980's and 1990's.

**UPEROLEIA (PROHARTIA) MINIMA DISPAR SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:FEA212C1-EE72-41ED-8CB0-4A27BAAAAB12**

**Holotype:** A preserved male specimen (snout-vent 26 mm, weight 1.3 grams) at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R169936 collected from the Wunaamin Miliwundi Ranges, which prior to 2020 were known as the King Leopold Ranges, Western Australia, Australia, Latitude -17.4943 S., Longitude 125.7537 E. This government-owned facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Western Australian Museum, Perth, Western Australia, Australia, specimen numbers R169934 and R169935 collected from the Wunaamin Miliwundi Ranges, which prior to 2020 were known as the King Leopold Ranges, Western Australia, Australia, Latitude 17.4943 S., Longitude 125.7537 E.

**Diagnosis:** *U. minima dispar* subsp. nov. is similar in most respects to nominate *U. minima* with a type locality of the Mitchell Plateau Region of the North-east Kimberley, Western Australia, but separated from that taxon by having a dorsum and upper flanks that are dark brown, heavily infused with a leaden grey colour and with closely scattered light brown tubercles of varying size, versus a similar colouration, but with minimal grey infusion and generally lighter all over the dorsum. Fingers of *U. minima dispar* subsp. nov. are mainly dark in colour on top versus mainly light (yellowish blotches or wash) in nominate *U. minima minima*.

Both forms of *U. minima* are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Internarial distance less than eye-naris distance. No maxillary teeth. Toes without fringing or web. Two large metatarsal tubercles. Dorsum is generally drab in colour with little evidence of formation of colour pattern save for numerous small, irregularly shaped and poorly defined darker blotches across the dorsum. The dorsum and upper flanks are covered in closely scattered light brown tubercles of varying size. Bright red patches in the groin and behind the knee. Venter whitish, but suffused with grey on the throat, chest and lower flanks. Skin is moderately granular on the belly. Moderate-sized parotoid glands. Average adult size is about 20-26 mm (snout-vent).

Frogs in the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985, are separated from all other Myobatrachidae frogs by the following suite of characters: Tongue is small oval and free at the rear; prominent parotoid glands; bright red or orange spots in the groin and back of the knee; there is often a pale, white, yellow or brown patch on the upper arm before it joins the body; maxillary teeth may be present or absent; frontoparietal foramen may be present or absent; prevomer is much reduced or absent; vomerine teeth are small or absent; pupil rhomboidal; tympanum is hidden; terminal phlanges are simple and tips of digits not dilated; inner and outer metatarsal tubercles are more or less equally developed.

**Distribution:** *U. minima dispar* subsp. nov. is known only from the area of the type locality being the Wunaamin Miliwundi Ranges, which prior to 2020 were known as the King Leopold Ranges, Western Australia, Australia, Latitude 17.4943 S., Longitude 125.7537 E.

**Etymology:** In Latin “*dispar*” means different, referring to the subtle differences between the two **UPEROLEIA (PROHARTIA) GEDYEI SP. NOV.**

**LSIDurn:lsid:zoobank.org:act:3F6A45E8-C7F1-4EB6-849F-313BB8CC5690**

**Holotype:** A preserved specimen (whole animal, cleaned and stained in ethanol) at the Museum of

Comparative Zoology at Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ Herp A-106605, collected from near Morehead, Western Province, Papua New Guinea, Latitude -8.7137 S., Longitude 141.6416 E. This facility allows access to its holdings.

**Diagnosis:** The species *Uperoleia gedyei* sp. nov. only presently known from southern Papua New Guinea near the Irian Jaya border is similar in most respects to *U. mimula* Davies, McDonald and Corben, 1986, type locality of Lakefield Ranger Station, far north Queensland, which it would otherwise be identified as and has been to date (e.g. Davies 1987, Cogger 2014).

It is readily distinguished from that species, *U. mimula* from the eastern side of Cape York in far north Queensland, being found from Torres Strait to at least as far south as the Paluma Range and potentially south as far as Mackay and the new species *U. rossignolii* sp. nov., previously treated as a population of *U. mimula*, currently only known from Townsville Town Common, Townsville, by the presence of extremely prominent and raised inguinal and femoral patches, which are not seen in either species or for that matter in the morphologically similar species *U. lithomoda* Tyler, Davies and Martin, 1981, *U. grantturneri* sp. nov. and *U. margweeksae* sp. nov. (including subspecies).

*U. rossignolii* sp. nov. is separated from each of *U. mimula* and *U. gedyei* sp. nov. by having coarsely granular ventral skin, versus only slightly granular in the other two species, as well as a unique crescentric indentation on the anterior edge of the nasals not seen in either of the other two species. The frontoparietal fontanelle is poorly exposed in *U. rossignolii* sp. nov. versus moderately to well exposed in both *U. mimula* and *U. gedyei* sp. nov..

*U. rossignolii* sp. nov. is depicted in life, showing diagnostic characters online at:

<https://www.flickr.com/photos/euprepiosaur/6955419823/>

and

<https://www.flickr.com/photos/euprepiosaur/8516088374/>

and:

<https://www.flickr.com/photos/euprepiosaur/8514973181/>

All of *U. mimula*, *U. gedyei* sp. nov. and *U. rossignolii* sp. nov. are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Outer metatarsal tubercle is large, raised and conspicuous and inner one also well developed. Internarial distance is less than the eye-naris distance. No maxillary teeth. Toes fringed and with a small amount of basal webbing. Dorsal body pattern usually not well developed, but generally drab and consisting of a light background

overlaid with scattered darker blotches or spots.

Paler blotches or spots are on the parotoid glands, which are smaller in size than some other members of the genus. Dorsum is more-or-less smooth with numerous moderately spaced, moderately sized tubercles, with relatively indistinct, but lighter tips. Reddish-orange patches in the groin and behind each knee. Cream or dirty white below, in turn peppered with dark grey or brown. Venter, smooth or slightly granular, except in *U. rossignolii* sp. nov. where it is coarsely granular.

**Distribution:** *Uperoleia gedyei* sp. nov. is only known from the type locality and environs, being near Morehead, Western Province, Papua New Guinea, Latitude -8.7137 S., Longitude 141.6416 E.

**Diagnosis:** The species *Uperoleia gedyei* sp. nov. is named in honour of Andrew Gedye of Bentley Park, a suburb of Cairns, North Queensland, Australia, formerly of Cheltenham, Victoria, Australia, a well known breeder of rare and threatened species of snakes, in recognition of contributions to herpetology in Australia spanning some decades. He has also conducted herpetological fieldwork in Papua New Guinea in recent years.

**UPEROLEIA (PROHARTIA) ROSSIGNOLII SP. NOV.**

**LSID**Durn:lsid:zoobank.org:act:FB296CE3-258B-4229-A60D-E0F31CBFA9A

**Holotype:** A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R29628 collected from Townsville Town Common, Townsville, Queensland, Australia. This government-owned facility allows access to its holdings.

**Paratypes:** 12 preserved specimens at the South Australian Museum, Adelaide, South Australia, Australia, specimen numbers R29629-R29640 collected from Townsville Town Common, Townsville, Queensland, Australia.

**Diagnosis:** *Uperoleia rossignolii* sp. nov. and *U. gedyei* sp. nov. have both until now been treated as aberrant populations at the southern and northern extremities of the known range of the putative species *U. mimula* Davies, McDonald and Corben, 1986, type locality of Lakefield Ranger Station, far north Queensland.

The species *Uperoleia gedyei* sp. nov. only presently known from southern Papua New Guinea near the Irian Jaya border is similar in most respects to *U. mimula* which it would otherwise be identified as and has been to date (e.g. Davies 1987, Cogger 2014). It is readily distinguished from that species, *U. mimula* from the eastern side of Cape York in far north Queensland, being found from Torres Strait to at least as far south as the Paluma Range and potentially south as far as Mackay and the new species *U. rossignolii* sp. nov., previously treated as a population of *U. mimula*, currently only known from



Townsville Common, by the presence of extremely prominent and raised inguinal and femoral patches, which are not seen in either species or for that matter in the morphologically similar species *U. lithomoda* Tyler, Davies and Martin, 1981, *U. grantturneri* sp. nov. and *U. margweksae* sp. nov. (including subspecies).

*U. rossignolii* sp. nov. is separated from each of *U. mimula* and *U. gedyei* sp. nov. by having coarsely granular ventral skin, versus only slightly granular in the other two species, as well as a unique crescentric indentation on the anterior edge of the nasals not seen in either of the other two species. The frontoparietal fontanelle is poorly exposed in *U. rossignolii* sp. nov. versus moderately to well exposed in both *U. mimula* and *U. gedyei* sp. nov.. *U. rossignolii* sp. nov. is depicted in life, showing diagnostic characters online at:

<https://www.flickr.com/photos/euprepiosaur/6955419823/>

and

<https://www.flickr.com/photos/euprepiosaur/8516088374/>

and:

<https://www.flickr.com/photos/euprepiosaur/8514973181/>

All of *U. mimula*, *U. gedyei* sp. nov. and *U. rossignolii* sp. nov. are readily separated from all other species within the genera *Uperoleia* Gray, 1841 and *Hosmeria* Wells and Wellington, 1985 by the following suite of characters: Outer metatarsal tubercle is large, raised and conspicuous and inner one also well developed. Internarial distance is less than the eye-naris distance. No maxillary teeth. Toes fringed and with a small amount of basal webbing. Dorsal body pattern usually not well developed, but generally drab and consisting of a light background overlaid with scattered darker blotches or spots. Paler blotches or spots are on the parotoid glands, which are smaller in size than some other members of the genus. Dorsum is more-or-less smooth with numerous moderately spaced, moderately sized tubercles, with relatively indistinct, but lighter tips. Reddish-orange patches in the groin and behind each knee. Cream or dirty white below, in turn peppered with dark grey or brown. Venter, smooth or slightly granular, except in *U. rossignolii* sp. nov. where it is coarsely granular.

**Distribution:** *Uperoleia rossignolii* sp. nov. is only currently known from the type locality being the Townsville Town Common, Townsville, Queensland, Australia.

**Etymology:** *Uperoleia rossignolii* sp. nov. is named in honour of Federico Rossignoli of Hurtbridge, Victoria, Australia, previously of North Ringwood, Victoria, Australia, in recognition of his services to herpetology and wildlife conservation spanning some decades.

**MIXOPHYES (QUASIMIXOPHYES) HOSERAE JACKYAE SUBSP. NOV.**

**LSIDurn:lsid:zoobank.org:act:0FFABA9C-5F7F-433A-A21F-EC900C65115C**

**Holotype:** A preserved male specimen at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen number D43725, collected from 46.7 km North of Cann River, East Gippsland, Victoria, Australia. Latitude -37.3 S., Longitude 149.18 S. This facility allows access to its holdings.

**Paratypes:** Five preserved specimens at the National Museum of Victoria, Melbourne, Victoria, Australia, specimen numbers D43726, D43729, D43742, D43743 and D43744 all from roughly 47 km North of Cann River, East Gippsland, Victoria, Australia. Latitude -37.3 S., Longitude 149.18 S.

**Diagnosis:** Until 2020 *Mixophyes (Quasimixophyes) hoserae* Hoser, 2020 had been treated as a southern population of the well-known species *M. (Quasimixophyes) balbus* Straughan, 1968.

All three species in the subgenus *Quasimixophyes* Hoser, 2020 are separated from the nominate subgenus of *Mixophyes* Günther, 1864 by having a grey (not whitish) upper lip and areas of darker pigment being prominent on the upper lip, versus a pale creamy-white upper lip without obvious darker blotches in *Mixophyes*.

The subgenus *Feremixophyes* Hoser, 2020 is readily separated from the other two subgenera within *Mixophyes* Günther, 1864, namely *Mixophyes* and *Quasimixophyes* Hoser, 2020 by the following two characters: The length of the inner metatarsal tubercle is approximately half the length of the first toe versus nearly equal to the length in the other two subgenera and the webbing between the toes extends to the second most distal joint of the fourth toe. The web extends to the third most distal joint of the fourth toe in the other two subgenera and to the terminal disc of the fourth toe in *Oxyslop gen. nov.*

*Feremixophyes* Hoser, 2020 can be separated from *Paramixophyes* Hoser, 2016 by having a few or no scattered dark spots on the side versus a broad zone of numerous dark spots on the side.

*Feremixophyes* can also be distinguished from *Oxyslop* Hoser, 2020 by the absence of an uninterrupted narrow vertebral stripe extending from between the eyes to just above the vent.

Within *Quasimixophyes* Hoser, 2020 the species *M. (Quasimixophyes) fleayi* Corben and Ingram, 1987 is separated from the other two species *M.*

*(Quasimixophyes) balbus* Straughan, 1968 and *M. (Quasimixophyes) hoserae* Hoser, 2020 by having well-defined dark cross bands on the limbs, which also widen posteriorly to form dark triangles that are visible from below, as well as an evenly spaced series of conspicuous black spots or blotches on the side, versus ill-defined cross bands on the forelimbs and only moderately well-defined on the upper hind

limbs in the other two species and dark spots or blotches on the side being either infrequent and irregular (in *M. balbus* Straughan, 1968) or absent (in *M. hoserae* Hoser, 2020).

*M. balbus* is further separated from *M. hoserae* by having a broad, irregular, or broken band or patches forming a band, running down the middle of the back. This is not the case for *M. hoserae*.

The subspecies *M. hoserae jackyae subsp. nov.* is found south of Ulladulla, along the coast and nearby ranges of New South Wales, Australia to just south of the Victorian border in East Gippsland, whereas the allopatric nominate subspecies *M. hoserae hoserae* Hoser, 2020 is found north of the Kangaroo Valley.

*M. hoserae jackyae subsp. nov.* is separated from nominate *M. hoserae hoserae* by having a noticeably thickened black bar anterior to and posterior to the eye, running along the upper margin from behind the nostril, over the eye, the top of the ear and posterior to it. The same bar is noticeably thinner in both *M. hoserae hoserae* and *M. balbus*.

The darker banding on the upper surfaces of the forearms is wider than the lighter interspaces, in contrast to both *M. hoserae hoserae* and *M. balbus*, where the lighter interspaces are wider. This banding also extends all the way across the top of the forearm in *M. hoserae jackyae sp. nov.* as opposed to not doing so in both *M. hoserae hoserae* and *M. balbus*.

Adult *M. hoserae jackyae subsp. nov.* is a distinctively pinkish brown coloured frog on the dorsum, with underparts whitish with a slight pinkish tinge. The upper lip beneath the eye is heavily darkened, with dark blackish pigment, dark peppering or both.

Lower flanks of *M. hoserae jackyae subsp. nov.* are a whitish pink in colour, versus yellowish in both *M. hoserae hoserae* and *M. balbus*.

Both *M. fleayi* and *M. balbus* have a prominent silvery white to blue crescent on top of the iris, whereas this is either indistinct or absent in *M. hoserae sp. nov.* (both subspecies).

An image of living *M. hoserae* can be found on page 29 of Hoser (1989) in the top image or alternatively in Anstis (2013) on page 425 at top right in amplexus.

An image of living *M. balbus* can be seen in Anstis (2013) on page 425 in the top left image and bottom right image.

Images of living *M. fleayi* in life can be found in Anstis (2013) at page 440 (top three images).

An image of living *M. hoserae jackyae subsp. nov.* can be seen online at:

<https://canberra.naturemapr.org/Species/15417>

**Distribution:** The subspecies *M. hoserae jackyae subsp. nov.* is found south of Ulladulla, along the coast and nearby ranges of New South Wales, Australia to just south of the Victorian border in East Gippsland, whereas the allopatric nominate

subspecies *M. hoserae hoserae* Hoser, 2020 is found north of the Kangaroo Valley.

**Etymology:** Named in honour of my daughter, Jacky Indigo Hoser, who as of late 2020 was aged 19, in recognition of services to wildlife conservation in her first 19 years of life, including assisting in Scientific Research projects in various locations around the world, and educating the public via the Reptile Party and Snake Catcher (TM/R) businesses.

**MYOBATRACHINI TRIBE NOV.**

**LSIDurn:lsid:zoobank.org:act:86EEB328-06CB-4104-978A-A223B88356CE**

**Type genus:** *Myobatrachus* Schlegel, 1850.

**Diagnosis:** Frogs within genera in the tribe Myobatrachini tribe nov. are separated from all other species within the family Myobatrachidae by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval. Maxillary teeth absent. Prevomer is much reduced or absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; no terminal discs on fingers or toes (Genera: *Myobatrachus* Schlegel, 1850; *Bufo* Girard, 1853; *Crottyphryne gen. nov.*; *Kankanophryne* Heyer and Liem, 1976; *Metacrinia* Parker, 1940; *Oxyphryne gen. nov.*; *Pseudophryne* Fitzinger, 1843; *Sloppophryne gen. nov.*), or: as for previous except for the following: Lacking vomerine teeth; maxillary teeth present; a massive pectoral girdle; reduced digits; colourless and translucent skin on the snout tip; no extensive areas of dark pigment on the ventral surface. The skin around the body forms a loose sac which extends to the elbow and knee (Genus: *Arenophryne* Tyler, 1976).

**Distribution:** Most parts of the southern half of mainland Australia and Tasmania, except extremely flat arid zones.

**Content:** *Myobatrachus* Schlegel, 1850 (type genus); *Arenophryne* Tyler, 1976; *Bufo* Girard, 1853; *Crottyphryne gen. nov.*; *Kankanophryne* Heyer and Liem, 1976; *Metacrinia* Parker, 1940; *Oxyphryne gen. nov.*; *Pseudophryne* Fitzinger, 1843; *Sloppophryne gen. nov.*

**OXYPHRYNEINA SUBTRIBE NOV.**

**LSIDurn:lsid:zoobank.org:act:FB3734E1-8F71-4EAA-91EA-6992EF1039F3**

**Type genus:** *Oxyphryne gen. nov.*

**Diagnosis:** Frogs in the subtribe Oxyphryneina subtribe nov. are readily separated from the nominate subtribe Myobatrachina subtribe nov. by having short limbs that are more-or less normal, the adpressed hindlimb reaching the tympanic region or beyond and a smooth ventral surface.

Frogs within genera in the tribe Myobatrachini tribe nov. are separated from all other species within the family Myobatrachidae by the following unique suite of characters: Tongue not adhering to the floor of the

mouth at the rear; tongue is small and/or narrowly oval. Maxillary teeth absent. Prevomer is much reduced or absent; outer metatarsal tubercle if present is much smaller than the inner metatarsal tubercle; no terminal discs on fingers or toes (Genera: *Myobatrachus* Schlegel, 1850; *Bufo* Girard, 1853; *Crottyphryne* gen. nov.; *Kankanophryne* Heyer and Liem, 1976; *Metacrinia* Parker, 1940; *Oxyphryne* gen. nov.; *Pseudophryne* Fitzinger, 1843; *Sloppophryne* gen. nov.), or: as for previous except for the following: Lacking vomerine teeth; maxillary teeth present; a massive pectoral girdle; reduced digits; colourless and translucent skin on the snout tip; no extensive areas of dark pigment on the ventral surface. The skin around the body forms a loose sac which extends to the elbow and knee (Genus: *Arenophryne* Tyler, 1976).

The nominate subtribe *Myobatrachina* subtribe nov. is also formally defined within this diagnosis.

**Distribution:** Most parts of the southern half of mainland Australia and Tasmania, except extremely flat arid zones.

**Content:** *Oxyphryne* gen. nov. (type genus); *Bufo* Girard, 1853; *Crottyphryne* gen. nov.; *Kankanophryne* Heyer and Liem, 1976; *Pseudophryne* Fitzinger, 1843; *Sloppophryne* gen. nov..

#### UPEROLEIAINI TRIBE NOV.

**LSIDurn:lsid:zoobank.org:act:1BEAA6AB-8585-4AD2-97F9-F75E293268D3**

**Type genus:** *Uperoleia* Gray, 1841.

**Diagnosis:** Species within the genera within the tribe *Uperoleiaini* tribe nov. are readily separated from all other species within the family *Myobatrachidae* by the following unique suite of characters:

Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent, and one or other of the following unique suites of characters: 1/ Inner and outer metatarsal tubercles more or less equally developed (subtribe *Uperoleiaina* subtribe nov.), or: 2/ Dermal brood pouches absent. Parotoid glands present and evident externally; no prevomer or vomerine teeth; terminal phlanges pointed, not T-shaped. Tips of fingers and toes lack distinct discs. First finger is normal, or if vestigial, there is no dorsolateral skin fold. No outer metatarsal tubercle. Maxillary teeth present. No loose sac of skin around the body; very dark brown or black above; throat, chest and feet bright orange; belly and undersides of limbs are bright blue, overlain with a blackish reticulum (subtribe *Spicospinaina* subtribe nov.),

**Distribution:** Most parts of mainland Australia.

**Content:** *Uperoleia* Gray, 1841 (type genus); *Hosmeria* Wells and Wellington, 1985; *Spicospina* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997.

#### SPICOSPINAINA SUBTRIBE NOV.

**LSIDurn:lsid:zoobank.org:act:13FF82AF-7BB7-4E5C-9D84-B98C351006B8**

**Type genus:** *Spicospina* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997.

**Frogs in the subtribe** *Spicospinaina* subtribe nov. are readily separated from species within the nominate subtribe *Uperoleiaina* subtribe nov., the only other tribe within *Uperoleiaini* tribe nov. and all other *Myobatrachidae* species by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. Dermal brood pouches absent. Parotoid present and evident externally; no prevomer or vomerine teeth; terminal phlanges pointed, not T-shaped. Tips of fingers and toes lack distinct discs. First finger is normal, or if vestigial, there is no dorsolateral skin fold. No outer metatarsal tubercle. Maxillary teeth present. No loose sac of skin around the body; very dark brown or black above; throat, chest and feet bright orange; belly and undersides of limbs are bright blue, overlain with a blackish reticulum

Species within the subtribe *Uperoleiaina* subtribe nov. are in turn separated from all species within *Uperoleiaini* tribe nov. (only the monotypic species, *Spicospina flammocaerulea* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997) and all other *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. Inner and outer metatarsal tubercles more or less equally developed.

The nominate subtribe *Uperoleiaina* subtribe nov. is also formally defined within this diagnosis.

**Content:** *Spicospina* Roberts, Horwitz, Wardell-Johnson, Maxon and Mahony, 1997 (monotypic).

#### WELLINGTONDELLAINI TRIBE NOV.

**LSIDurn:lsid:zoobank.org:act:171D5B31-A64A-4E37-8DD0-9B6600ABBE98**

**Type genus:** *Wellingtondella* gen. nov.

**Diagnosis:** Species within the tribe *Wellingtondellaini* tribe nov. are readily separated from all other species within the family *Myobatrachidae* by the following unique suite of characters:

Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped, and one or other of the following three suites of characters: 1/ Dermal inguinal brood pouches present in males; first finger vestigial; a faint to conspicuous dermal skin fold that extends back from the supratympanic region, often sharply demarcating

the contrasting dorsal and lateral colours (Genus *Assa* Tyler, 1972), or 2/ No dermal brood pouches present; first finger normal, or if vestigial, there is no dorsolateral skin fold. Vomerine teeth, small but present. Belly smooth (Genera *Wellingtondella* gen. nov., *Geocrinia* Blake, 1973), or 3/ Vomerine teeth present and conspicuous, behind the level of the choanae; Granular belly. Parotoid glands and flank glands are absent or not evident externally. Toes broadly fringed (Genus *Paracrinia* Heyer and Liem, 1976 forming the subtribe *Paracrinia* subtribe nov.).

**Distribution:** Wetter parts of south-east and south-west Australia, extending as far north as south-east Queensland in the east.

**Content:** *Wellingtondella* gen. nov. (type genus); *Geocrinia* Blake, 1973; *Paracrinia* Heyer and Liem, 1976.

#### PARACRINIAINA SUBTRIBE NOV.

**LSIDurn:lsid:zoobank.org:act:DAF69A89-4A03-4247-96B1-3EF4C01EB6D4**

**Type genus:** *Paracrinia* Heyer and Liem, 1976.

**Diagnosis:** Species within the subtribe *Paracrinia* subtribe nov. are separated from all other species within tribe *Wellingtondellaini* tribe nov. and from all other species within the family *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped. Vomerine teeth present and conspicuous, behind the level of the choanae; Granular belly. Parotoid glands and flank glands are absent or not evident externally. Toes broadly fringed (Genus *Paracrinia* Heyer and Liem, 1976 forming the entirety of the subtribe *Paracrinia* subtribe nov.).

Species within the subtribe *Wellingtondellaini* subtribe nov. are separated from all other species within the only other subtribe in the tribe, being *Paracrinia* subtribe nov. and from all other species within the family *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped, and one or other of the following two suites of characters: 1/ Dermal inguinal brood pouches present in males; first finger vestigial; a faint to conspicuous dermal skin fold that extends back from the supratympanic region, often sharply demarcating the contrasting dorsal and lateral colours (Genus *Assa* Tyler, 1972), or 2/ No dermal brood pouches present; first finger normal, or if vestigial, there is no dorsolateral skin fold. Vomerine teeth, small but present. Belly smooth

(Genera *Wellingtondella* gen. nov., *Geocrinia* Blake, 1973).

The nominate subtribe *Wellingtondellaini* subtribe nov. is also formally defined within this diagnosis.

**Distribution:** Coastal areas of south-east Australia, extending from south-east of Melbourne, Victoria (The Mornington Peninsula), along the coast and nearby range areas to the lower north coast of New South Wales, north of Newcastle and south of the Queensland border.

**Content:** *Paracrinia* Heyer and Liem, 1976 (herein treated as including at least three species).

#### CRINIINI TRIBE NOV.

**LSIDurn:lsid:zoobank.org:act:EA86A910-CAA8-4A34-BAEB-B1BC7B924176**

**Type genus:** *Crinia* Tschudi, 1838.

**Diagnosis:** Species of frogs within the tribe *Criniini* tribe nov. are readily separated from from all other species within the family *Myobatrachidae* by the following unique suite of characters: Tongue not adhering to the floor of the mouth at the rear; tongue is small and/or narrowly oval; prevomer much reduced or absent; vomerine teeth vestigial or absent. maxillary teeth present; small terminal discs absent; terminal phlanges are pointed, not T-shaped. No vomerine teeth, although sometimes rarely present, but if so, then very inconspicuous and in the form of small clusters or short rows. Tympanum usually hidden or otherwise indistinct. Skin on belly is coarsely granular. Parotoid glands and flank glands are absent or not evident externally. A large frontoparietal foramen in adults. Toes without fringes, or if present only narrow.

The genus *Crinia* Tschudi, 1838 as defined herein includes six well-defined and divergent subgenera, as defined elsewhere in this paper, especially with respect of those newly named ones, that all may ultimately warrant being split into full genera.

**Distribution:** Most of mainland Australia, including Tasmania, except for the most arid regions. Known from southern New Guinea near the closest area to the Cape York Peninsula.

**Content:** *Crinia* Tschudi, 1838 (monotypic as identified herein, but including defined subgenera).

#### REFERENCES CITED

- Agassiz, L. 1846. *Nomenclator Zoologicus Continens Nomina Systematica Generum Animalium tam Viventium quam Fossilium*, . . . Fascicle 12 (Indicem Universalem). Soloduri: Jent et Gassmann.
- Ananjeva, N. B., Borkin, L. J., Darevsky, I. S. and Orlov, N. L. 1988. *Dictionary of Amphibians and Reptiles in Five Languages. Amphibians and Reptiles*. Russky Yazyk Publishers, Moscow, USSR.
- Andersson, L. G. 1916. Results of Dr. E. Mjöberg's Swedish scientific expeditions to Australia 1910-1913. IV. Batrachians. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* 52:1-26.

- Anstis, M. 2010. A comparative study of divergent embryonic and larval development in the Australian frog genus *Geocrinia* (Anura: Myobatrachidae). *Records of the Western Australian Museum* 25:399-440.
- Anstis, M. 2013. *Tadpoles and frogs of Australia*. Reed / New Holland, Sydney, Australia:829 pp.
- Barbour, T. and Loveridge, A. 1929. Typical reptiles and amphibians. *Bulletin of the Museum of Comparative Zoology*. Cambridge, Massachusetts 69:203-360.
- Barendse, W. 1984. Speciation in the genus *Crinia* (Anura: Myobatrachidae) in southern Australia: A phylogenetic analysis of allozyme data supporting endemic speciation in southwestern Australia. *Evolution* 18:1238-1250.
- Barker, J., Grigg, G. C. and Tyler, M. J. 1995. *A Field Guide to Australian Frogs*. Edition 2. Surrey Beatty and Sons, Chipping Norton, Australia.
- Bauer, A. M., Günther, R. and Robeck, H. E. 1996. An annotated type catalogue of the hemisotid, microhylid, myobatrachid, pelobatid and pipid frogs in the Zoological Museum, Berlin (Amphibia: Anura: Hemisotidae, Microhylidae, Myobatrachidae, Pelobatidae and Pipidae). *Mitteilungen aus dem Zoologischen Museum in Berlin* 72:259-275.
- Berger, L., Speare, R. and Hyatt, A. 1999. Chytrid fungi and amphibian declines: overview, implications and future directions. in: Campbell, A. (ed.) *Declines and Disappearances of Australian Frogs*. Environment Australia, Canberra, Australia:23-33. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/frogs.html>.
- Blackwell, J. M. and Bull, C. M. 1978. A narrow hybrid zone between two Western Australian frog species *Ranidella insignifera* and *R. pseudinsignifera*: the extent of introgression. *Heredity* 40:13-25.
- Blake, A. J. D. 1973. Taxonomy and relationships of myobatrachine frogs (Leptodactylidae): a numerical approach. *Australian Journal of Zoology* 21:119-149.
- Bossuyt, F. and Roelants, K. 2009. Anura. pp. 357-364 in Hedges, S. B. and Kumar, S. (eds.), *The Timetree of Life*. Oxford University Press, New York, USA.
- Boulenger, G. A. 1882. *Catalogue of the Batrachia Salientia s. Ecaudata in the Collection of the British Museum*. Second Edition. Taylor and Francis. London, UK.
- Boulenger, G. A. 1885. *Catalogue of the lizards in the British Museum (Natural History)*. Vol. 2, Second edition. London, xiii+497 pp.
- Boulenger, G. A. 1888. Descriptions of two new Australian frogs. *Annals and Magazine of Natural History*, 6(2):142-143.
- Burton, T. C. 2001. Variation in the foot muscles of frogs of the family Myobatrachidae. *Australian Journal of Zoology* 49:539-559.
- Bush, B., Maryan, B., Browne-Cooper, R. and Robinson, D. C. 2010. *A Field Guide to Reptiles and Frogs of the Perth Region*. Second Edition. Western Australian Museum, Perth, Australia.
- Byrne, P. G. and Silla, A. J. 2020. An experimental test of the genetic consequences of population augmentation in an amphibian. *Conservation Science and Practice*. 2020;2:e194. (online) at: <https://doi.org/10.1111/csp2.194>.
- Catullo, R. A. and Scott Keogh, J. 2014. Aridification drove repeated episodes of diversification between Australian biomes: Evidence from a multi-locus phylogeny of Australian toadlets (*Uperoleia*: Myobatrachidae). *Molecular Phylogenetics and Evolution* 79:106-117.
- Catullo, R. A., Doughty, P., Roberts, J. D. and Scott Keogh, J. 2011. Multi-locus phylogeny and taxonomic revision of *Uperoleia* toadlets (Anura: Myobatrachidae) from the western arid zone of Australia, with a description of a new species. *Zootaxa* (PRINO) (online) 2902:1-43.
- Catullo, R. A., Doughty, P. and Keogh, J. S. 2014a. A new frog species (Myobatrachidae: *Uperoleia*) from the northern desert region of Australia, with a redescription of *U. trachyderma*. *Zootaxa* (PRINO) (online) 3753:251-262.
- Catullo, R. A., Lanfear, R., Doughty, P. and Scott Keogh, J. 2014b. The biogeographical boundaries of northern Australia: evidence from ecological niche models and a multi-locus phylogeny of *Uperoleia* toadlets (Anura: Myobatrachidae). *Journal of Biogeography* 41:659-672.
- Clulow, S., Anstis, M., Scott Keogh, J. and Catullo, R. A. 2016. A new species of Australian frog (Myobatrachidae: *Uperoleia*) from the New South Wales mid-north coast sandplains. *Zootaxa* (PRINO) (online) 4184:285-315.
- Cochran, D. M. 1961. *Living Amphibians of the World*. Doubleday and Company, Garden City, New York, USA.
- Cogger, H. G. 1979. Type specimens of reptiles and amphibians in the Australian Museum. *Records of the Australian Museum* 32:164-210.
- Cogger, H. G. 2014. *Reptiles and Amphibians of Australia* (Seventh edition), CSIRO. Sydney, Australia:1064 pp.
- Cogger, H. G., Cameron, E. E. and Cogger, H. M. 1983. *Zoological Catalogue of Australia (1): Amphibia and Reptilia*. AGPS, Canberra, ACT, Australia:313 pp.
- Colefax, A. N. 1956. New information on the Corroboree Frog (*Pseudophryne corroboree* Moore). *Proceedings of the Linnean Society of New South Wales* 80:258-266.
- Condon, H. T. 1941. Further records of lizards and frogs from Kangaroo Island. *Records of the South*

- Australian Museum* 7:111-114.
- Cope, E. D. 1865. Sketch of the primary groups of Batrachia s. Salientia. *Natural History Review*. New Series 5:97-120.
- Cope, E. D. 1866. On the structures and distribution of the genera of the arciferous Anura. *Journal of the Academy of Natural Sciences of Philadelphia*. Series 2(6):7-112.
- Cope, E. D. 1867. On the families of the raniform Anura. *Journal of the Academy of Natural Sciences of Philadelphia*. Series 2(6):189-206.
- Court of Appeal Victoria. 2014. *Hoser v Department of Sustainability and Environment* [2014] VSCA 206 (5 September 2014).
- Coventry, A. J. 1970. Reptile and amphibian type specimens housed in the National Museum of Victoria. *Memoirs of the National Museum of Victoria*. Melbourne 31:115-124.
- Davies, M. M. 1987. *Taxonomy and systematics of the genus Uperoleia Gray (Anura: Leptodactylidae)*. PhD Thesis. Department of Zoology, University of Adelaide, South Australia. Australia:310 pp.
- Davies, M. M. 1989. Rediscovery of *Uperoleia orientalis* (Parker) (Anura: Myobatrachinae). *Transactions of the Royal Society of South Australia* 113:115.
- Davies, M. M. and Littlejohn, M. J. 1986. Frogs of the genus *Uperoleia* Gray (Anura: Leptodactylidae) in south-eastern Australia. *Transactions of the Royal Society of South Australia* 110: 111-143.
- Davies, M. M. and Martin, A. A. 1988. Redefinition of *Uperoleia talpa* Tyler, Davies & Martin, 1981 (Anura: Leptodactylidae: Myobatrachinae). *Transactions of the Royal Society of South Australia* 112:87-89.
- Davies, M. M., Mahony, M. J. and Roberts, J. D. 1985. A new species of *Uperoleia* (Anura: Leptodactylidae) from the Pilbara Region, Western Australia. *Transactions of the Royal Society of South Australia* 109:103-108.
- Davies, M. M., McDonald, K. R. and Corben, C. J. 1986. The genus *Uperoleia* (Anura: Leptodactylidae) in Queensland, Australia. *Proceedings of the Royal Society of Victoria* 98:147-188.
- Davies, M. M., Watson, G. F. and McDonald, K. R. 1992. Redefinition of *Uperoleia littlejohni* Davies, McDonald & Corben (Anura: Leptodactylidae: Myobatrachinae). *Transactions of the Royal Society of South Australia* 116:137-139.
- Davies, M. M., Watson, G. F., McDonald, K. R., Trenerry, M. P. and Werren, G. L. 1993. A new species of *Uperoleia* (Anura: Leptodactylidae: Myobatrachinae) from northeastern Australia. *Memoirs of the Queensland Museum* 33:167-174.
- Donnellan, S. C., Mahony, M. J. and Bertozzi, T. 2012a. A new species of *Pseudophryne* (Anura: Myobatrachidae) from the central Australian ranges. *Zootaxa* (PRINO) (online) 3476:69-85.
- Donnellan, S. C., Anstis, M., Price, A. H. and Wheaton, L. 2012b. A new species of *Crinia* (Anura: Myobatrachidae) from the Flinders Ranges, South Australia. *Zootaxa* (PRINO) (online) 3499:1-26.
- Doughty, P. and Roberts, J. D. 2008. A new species of *Uperoleia* (Anura: Myobatrachidae) from the northwest Kimberley, Western Australia. *Zootaxa* (PRINO) (online) 1939:10-18.
- Doughty, P., Anstis, M. and Price, L. C. 2009. A new species of *Crinia* (Anura: Myobatrachidae) from the high rainfall zone of the northwest Kimberley, Western Australia. *Records of the Western Australian Museum* 25:127-144.
- Driscoll, D. A. 1998. Genetic structure, metapopulation processes and evolution influence the conservation strategies for two endangered frog species. *Biological Conservation* 83(1):43-54.
- Dubois, A., Bauer, A. M., Ceriaco, L. M. P., Dusoulier, F., Fretey, T., Lobl, I., Lorvelec, O., Ohler, A., Stopiglia, R. and Aesch, E. 2019. The Linz Zoocode project: a set of new proposals regarding the terminology, the Principles and Rules of zoological nomenclature. First report of activities (2014-2019). *Bionomina* (online), 17:1-111.
- Duméril, A. M. C. and Bibron, G. 1841. *Erpétologie Générale ou Histoire Naturelle Complète des Reptiles*. Volume 8. Paris: Librairie Encyclopedique de Roret.
- Duméril, A. M. C., Bibron, G., and Duméril, A. H. A. 1854. *Erpétologie Générale ou Histoire Naturelle Complète des Reptiles*. Volume 9. Paris: Librairie Encyclopedique de Roret.
- Edwards, D. L. 2007. *Biogeography and speciation of southwestern Australian frogs*. PhD Thesis, School of Animal Biology, University of Western Australia:222 pp.
- Eipper, S. and Rowland, P. 2018. *A Naturalist's Guide to the Frogs of Australia*. John Beaufoy Publishing, Oxford, UK:176 pp.
- Ellis, R. J., Doughty, P. and Roberts, J. D. 2017. An annotated type catalogue of the frogs (Amphibia: Anura: Limnodynastidae, Myobatrachidae, Pelodyadidae) in the collection of the Western Australian Museum. *Records of the Western Australian Museum* 32:1-28.
- Fitzinger, L. J. F. J. 1843. *Systema Reptilium. Fasciculus Primus*. Wien: Braumüller et Seidel.
- Fletcher, J. J. 1891. Description of a supposed new cystignathoid frog. *Proceedings of the Linnean Society of New South Wales*, 2(6):275-276.
- Fletcher, J. J. 1894. Description of a new cystignathoid frog from New South Wales. *Proceedings of the Linnean Society of New South Wales*, 2(8):522-523.
- Fletcher, J. J. 1898. Contributions to a more exact knowledge of the geographical distribution of Australian Batrachia. No. V. *Proceedings of the*

- Linnean Society of New South Wales, 2(2):660-684.
- Frank, N. and Ramus, E. 1995. *Complete Guide to Scientific and Common Names of Amphibians and Reptiles of the World*. N. G. Publishing Inc., Pottsville, Pennsylvania, USA.
- Frost, D. R., Grant, T., Faivovich, F., Bain, R. H., Haas, A., Haddad, C. F. B., de Sá, R. O., Channing, A., Wilkinson, M., Donnellan, S. C., Raxworthy, C. J., Campbell, J. A., Blotto, B. L., Moler, P. E., Drewes, R. C., Nussbaum, R. A., Lynch, J. D., Green, D. M. and Wheeler, W. C. 2006. The amphibian tree of life. *Bulletin of the American Museum of Natural History* 297:1-370.
- Fletcher, J. J. 1898. Contributions to a more exact knowledge of the geographical distribution of Australian Batrachia. No. V. *Proceedings of the Linnean Society of New South Wales*, 2(12):660-684.
- Girard, C. 1853. Descriptions of new species of reptiles, collected by the U.S. Exploring Expedition, under the command of Capt. Charles Wilkes, U.S.N. Second part: including the species of batrachians, exotic to North America. *Proceedings of the Academy of Natural Sciences of Philadelphia* 6:420-424.
- Girard, C. 1858. *United States Exploring Expedition During the Years 1838, 1839, 1840, 1841, 1842, Under the Command of Charles Wilkes, U.S.N.* Vol. 20 (Herpetology). J. B. Lippincott., Philadelphia, USA.
- Gollmann, G. 1991. Osteological variation in *Geocrinia laevis*, *Geocrinia victoriana*, and their hybrid populations (Amphibia, Anura, Myobatrachinae). *Zeitschrift für Zoologische Systematik und Evolutionsforschung* 29:289-303.
- Gray, J. E. 1835. Untitled. *Proceedings of the Zoological Society of London* 1835:57.
- Gray, J. E. 1841. Description of some new species and four new genera of reptiles from western Australia, discovered by John Gould, Esq.. *Annals and Magazine of Natural History*, 1(7):86-91.
- Gray, J. E. 1845. Appendix. Description of some new Australian animals. Eyre, E. J. ed., *Journals of Expeditions of Discovery into Central Australia and Overland from Adelaide to King George's Sound in the Years 1840-1*. Volume 1: 405-411. T. and W. Boone. London, UK.
- Guibé, J. 1950 (1948). *Catalogue des Types d'Amphibiens du Muséum National d'Histoire Naturelle*. Imprimerie Nationale, Paris, France.
- Günther, A. 1858. *Catalogue of the Batrachia Salienata in the Collection of the British Museum*, London. British Museum, UK:xvi+160 pp.
- Günther, A. C. L. G. 1864. Third contribution to our knowledge of batrachians from Australia. *Proceedings of the Zoological Society of London* 1864:46-49.
- Günther, A. C. L. G. 1867. Additions to the knowledge of Australian reptiles and fishes. *Annals and Magazine of Natural History*, 3(20):45-68.
- Günther, A. C. L. G. 1869 (1868). First account of species of tailless batrachians added to the collection of the British Museum. *Proceedings of the Zoological Society of London* 1868:478-490.
- Harrison, L. 1927. Notes on some Western Australian Frogs, with descriptions of new species. *Records of the Australian Museum* 15:277-287.
- Harrison, P. A. and Littlejohn, M. J. 1985. Diphasy in the advertisement calls of *Geocrinia laevis* (Anura: Leptodactylidae): Vocal responses of males during field playback experiments. *Behavioral Ecology and Sociobiology* 18:67-73.
- Hero, J., Littlejohn, M. and Marantelli, G. 1991. *Frogwatch guide to Victorian Frogs*. Department of Conservation and Environment, Victoria, Australia:108 pp.
- Heyer, W. R. and Liem, D. S. S. 1976. Analysis of the intergeneric relationships of the Australian frog family Myobatrachidae. *Smithsonian Contributions to Zoology* 233:1-29.
- Heyer, W. R., Daugherty, C. H. and Maxson, L. R. 1982. Systematic resolution of the genera of the *Crinia* complex (Amphibia: Anura: Myobatrachidae). *Proceedings of the Biological Society of Washington* 95:423-427.
- Holthius, L. B. 1988. Comments on the proposed suppression for nomenclature of three works by R. W. Wells and C. R. Wellington. (Case 2531: see BZN 44: 116-121; 257-261 and 45: 52-54). (6). *Bulletin of Zoological Nomenclature* 45:151-152.
- Hoser, R. T. 1989. *Australian Reptiles and Frogs*. Pierson and Co., Sydney, NSW, Australia:238 pp.
- Hoser, R. T. 1991. *Endangered Animals of Australia*. Pierson and Co., Mosman, NSW, 240 pp.
- Hoser, R. T. 1993. *Smuggled: The Underground Trade in Australia's Wildlife*. Apollo Publishing, Moss Vale, NSW. 160 pp.
- Hoser, R. T. 1995. Release into hell. *Monitor: Journal of the Victorian Herpetological Society*, 7(2):77-88.
- Hoser, R. T. 1996. *Smuggled-2: Wildlife Trafficking, Crime and Corruption in Australia*. Kotabi Publishing, Doncaster, Victoria, 3108, Australia:280 pp.
- Hoser, R. T. 2007. Wells and Wellington - It's time to bury the hatchet. *Calodema* Supplementary Paper 1:1-9.
- Hoser, R. T. 2009. Creationism and contrived science: A review of recent python systematics papers and the resolution of issues of taxonomy and nomenclature. *Australasian Journal of Herpetology* 2:1-34. (3 February).
- Hoser, R. T. 2012a. Exposing a fraud! *Afronaja* Wallach, Wüster and Broadley 2009, is a junior synonym of *Spracklandus* Hoser 2009! *Australasian Journal of Herpetology* 9 (3 April 2012):1-64.
- Hoser, R. T. 2012b. Robust taxonomy and

- nomenclature based on good science escapes harsh fact-based criticism, but remains unable to escape an attack of lies and deception. *Australasian Journal of Herpetology* 14:37-64.
- Hoser, R. T. 2013. The science of herpetology is built on evidence, ethics, quality publications and strict compliance with the rules of nomenclature. *Australasian Journal of Herpetology* 18:2-79.
- Hoser, R. T. 2015a. Dealing with the "truth haters" ... a summary! Introduction to Issues 25 and 26 of *Australasian Journal of Herpetology*. Including "A timeline of relevant key publishing and other events relevant to Wolfgang Wüster and his gang of thieves." and a "Synonyms list". *Australasian Journal of Herpetology* 25:3-13.
- Hoser, R. T. 2015b. The Wüster gang and their proposed "Taxon Filter": How they are knowingly publishing false information, recklessly engaging in taxonomic vandalism and directly attacking the rules and stability of zoological nomenclature. *Australasian Journal of Herpetology* 25:14-38.
- Hoser, R. T. 2015c. Best Practices in herpetology: Hinrich Kaiser's claims are unsubstantiated. *Australasian Journal of Herpetology* 25:39-52.
- Hoser, R. T. 2015d. PRINO (Peer reviewed in name only) journals: When quality control in scientific publication fails. *Australasian Journal of Herpetology* 26:3-64.
- Hoser, R. T. 2015e. Rhodin *et al.* 2015, Yet more lies, misrepresentations and falsehoods by a band of thieves intent on stealing credit for the scientific works of others. *Australasian Journal of Herpetology* 27:3-36.
- Hoser, R. T. 2015f. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published (Case 3601; see *BZN* 70: 234-237; comments *BZN* 71:30-38, 133-135). (unedited version) *Australasian Journal of Herpetology* 27:37-42.
- Hoser, R. T. 2016a. Two new species of frogs in the genus *Adelotus* Ogilby, 1907 from Queensland Australia (Anura: Limnodynastidae). *Australasian Journal of Herpetology* 33:55-56.
- Hoser, R. T. 2016b. A redefinition of the Australian frog genus *Platyplectrum* Günther, 1863, dividing the genus into two and including the description of two new species from mid Western Australia and far North Queensland. *Australasian Journal of Herpetology* 33:57-59.
- Hoser, R. T. 2016c. New frogs of the genus *Mixophyes* Günther, 1864 from Eastern Queensland, and New South Wales, Australia (Anura: Myobatrachidae). *Australasian Journal of Herpetology* 33:60-64.
- Hoser, R. T. 2017. The inevitable break-up of the Australian legless lizard genera *Delma* Gray, 1831 and *Aprasia* Gray, 1839, formal descriptions of 13 well-defined Pygopodid species, as well as a further improvement in Pygopodid taxonomy and nomenclature. *Australasian Journal of Herpetology* 35:3-32.
- Hoser, R. T. 2018. Six new species of Dwarf Goanna, *Worrellisaurus* Wells and Wellington, 1984 from Australia. *Australasian Journal of Herpetology* 37:24-37.
- Hoser, R. T. 2019a. A new species of *Philocryphus* Fletcher, 1894 (Amphibia: Myobatrachidae) from north-east Victoria and south-east New South Wales. *Australasian Journal of Herpetology* 39:6-8.
- Hoser, R. T. 2019b. 11 new species, 4 new subspecies and a subgenus of Australian Dragon Lizard in the genus *Tympanocryptis* Peters, 1863, with a warning on the conservation status and long-term survival prospects of some newly named taxa. *Australasian Journal of Herpetology* 39:23-52.
- Hoser, R. T. 2019c. Richard Shine *et al.* (1987), Hinrich Kaiser *et al.* (2013), Jane Melville *et al.* (2018 and 2019): Australian Agamids and how rule breakers, liars, thieves, taxonomic vandals and law breaking copyright infringers are causing reptile species to become extinct. *Australasian Journal of Herpetology* 39:53-63.
- Hoser, R. T. 2020a. Three new species of frog in the genus *Limnodynastes* Fitzinger, 1843 from east Australia, two new *Platyplectrum* Peters, 1863 species from east Australia and three new species of *Ranaster* Macleay, 1878 from north Australia. *Australasian Journal of Herpetology* 43:3-14.
- Hoser, R. T. 2020b. The inevitable reassessment of the Australasian frog genera *Mixophyes* Günther, 1864 and *Taudactylus* Straughan and Lee, 1966, resulting in the formal descriptions of two new families, new subfamilies and tribes, three new genera, 2 new subgenera, 1 new species and 2 new subspecies. *Australasian Journal of Herpetology* 43:15-26.
- Hoser, R. T. 2020c. For the first time ever! An overdue review and reclassification of the Australasian Tree Frogs (Amphibia: Anura: Pelodyadidae), 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.
- Hoser, R. T. 2020d. A new species of the Australian Bandy Bandy *Vermicella* Gray, 1841 (Serpentes: Elapidae) from north-west Australia. *Australasian Journal of Herpetology* 47:39-41.
- Hoser, R. T. 2020e. Four new species of frog in the genus *Assa* from eastern Australia. *Australasian Journal of Herpetology* 47:57-63.
- Hoser, R. T. 2020f. A new species of Tree Frog in the



- genus *Shireenhoserhylea* Hoser, 2020 from north Queensland, Australia. *Australasian Journal of Herpetology* 49:7-8.
- Howitt, A. W., Lucas, A. H. S. and Dendy, A. 1891. A visit to Lake Nigothoruk and the Mount Wellington District, Gippsland. *Victorian Naturalist*. Melbourne 8:17-40.
- Ingram, G. J. and Corben, C. J. 1975. A new species of *Kyarranus* (Anura: Leptodactylidae) from Queensland, Australia. *Memoirs of the Queensland Museum* 17:335-339.
- Ingram, G. J. and Corben, C. J. 1994. Two new species of broodfrogs (*Pseudophryne*) from Queensland. *Memoirs of the Queensland Museum* 37:267-272.
- Ingram, G. J., Nattrass, A. E. O. and Czechura, G. V. 1993. Common names for Queensland frogs. *Memoirs of the Queensland Museum* 33:221-224.
- International Commission of Zoological Nomenclature (ICZN) 1991. Decision of the Commission: Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 48(4):337-338.
- Iverson, J. B., Thomson, S. A. and Georges, A. 2001. Validity of taxonomic changes for turtles proposed by Wells and Wellington. *Journal of Herpetology* 35:361-368.
- Kaiser, H. 2012a. SPAM email sent out to numerous recipients on 5 June 2012.
- Kaiser, H. 2012b. Point of view. Hate article sent as attachment with SPAM email sent out on 5 June 2012.
- Kaiser, H. 2013. The Taxon Filter, a novel mechanism designed to facilitate the relationship between taxonomy and nomenclature, vis-à-vis the utility of the Code's Article 81 (the Commission's plenary power). *Bulletin of Zoological Nomenclature* 70(4) December 2013:293-302.
- Kaiser, H. 2014a. Comments on *Spracklandus* Hoser, 2009 (Reptilia, Serpentes, ELAPIDAE): request for confirmation of the availability of the generic name and for the nomenclatural validation of the journal in which it was published. *Bulletin of Zoological Nomenclature*, 71(1):30-35.
- Kaiser H. 2014b. Best Practices in Herpetological Taxonomy: Errata and Addenda. *Herpetological Review*, 45(2):257-268.
- Kaiser, H., Crother, B. L., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When supported by a body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.
- Keferstein, W. M. 1867. Über einige neue oder seltene Batrachier aus Australien und dem tropischen Amerika. *Nachrichten von der Georg-Augusts-Universität und der Königl. Gesellschaft der Wissenschaften zu Göttingen* 18:342-361.
- Keferstein, W. 1868. Ueber die Batrachier Australiens. *Archiv für Naturgeschichte*, 34(1):251-290.
- Kluge, A. G. 1976. Phylogenetic relationships in the lizard family Pygopodidae: an evaluation of theory, methods and data. *Miscellaneous Publications, Museum of Zoology, University of Michigan* (152):1-72.
- Knowles, R., Mahony, M. J., Armstrong, J. and Donnellan, S. C. 2004. Systematics of the sphagnum frogs of the genus *Philoria* (Anura: Myobatrachidae) in eastern Australia, with the description of two new species. *Records of the Australian Museum* 56:57-74.
- Lawrence, J. P., Mahony, M. and Noonan, B. P. 2018. Differential responses of avian and mammalian predators to phenotypic variation in Australian Brood Frogs. *PLoS ONE* 13(4): e0195446. (online) at: <https://doi.org/10.1371/journal.pone.0195446>
- Liem, D. S. S. and Ingram, G. J. 1977. Two new species of frogs (Anura: Myobatrachidae, Pelodyadidae) from Queensland and New South Wales. *Victorian Naturalist*. Melbourne 94:255-262.
- Linnaeus, C. 1758. *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I.* Editio decima, reformata. Laurentii Salvii, Holmiae. 10th Edition:824 pp.
- Littlejohn, M. J. 1957. A new species of frog of the genus *Crinia*. *Western Australian Naturalist* 6:18-23.
- Littlejohn, M. J. 1958. A new species of frog of the genus *Crinia Tschudi* from South Eastern Australia. *Proceedings of the Linnean Society of New South Wales* 83:222-226.
- Littlejohn, M. J. 2008. Geographic variation in the advertisement call of *Crinia signifera* (Anura : Myobatrachidae) on Kangaroo Island and across southern south-eastern Australia. *Australian Journal of Zoology* 56:223-232.
- Littlejohn, M. J. and Martin, A. A. 1964. The *Crinia laevis* complex (Anura: Leptodactylidae) in south-eastern Australia. *Australian Journal of Zoology* 12:70-83.
- Littlejohn, M. J. and Martin, A. A. 1965. A new species of *Crinia* (Anura: Leptodactylidae) from South Australia. *Copeia* 1965:319-324.
- Loveridge, A. 1933a. Four new crinine frogs from Australia. *Occasional Papers of the Boston Society of Natural History* 8:55-60.
- Loveridge, A. 1933b. A new genus and three new species of crinine frogs from Australia. *Occasional Papers of the Boston Society of Natural History* 8:89-94.

- Loveridge, A. 1934. Tasmanian Amphibia in the Museum of Comparative Zoology, Cambridge, Massachusetts. *Papers and Proceedings of the Royal Society of Tasmania* 1933:57-64.
- Loveridge, A. 1935. Australian Amphibia in the Museum of Comparative Zoology, Cambridge, Massachusetts. *Bulletin of the Museum of Comparative Zoology*. Cambridge, Massachusetts 78:11-60.
- Lucas, A. H. S. 1892. Note on the distribution of Victorian batrachians, with descriptions of two new species. *Proceedings of the Royal Society of Victoria* 4:61-64.
- Lütken, C. F. 1864. (1863). Nogle ny Krybyr og Padder. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn*, Serie 2, 4:292-311.
- Lynch, J. D. 1971. Evolutionary relationships, osteology, and zoogeography of leptodactylid frogs. *Miscellaneous Publication. Museum of Natural History, University of Kansas* 53:1-238.
- Main, A. R. 1957. Studies in Australian Amphibia. I. The genus *Crinia* Tschudi in South-Western Australia and some species from South-Eastern Australia. *Australian Journal of Zoology* 5:30-55.
- Main, A. R. 1963. A new species of *Crinia* (Anura: Leptodactylidae) from National Park, Nornalup. *Western Australian Naturalist* 8:143-144.
- Main, A. R. 1964. A new species of *Pseudophryne* (Anura: Leptodactylidae) from north-western Australia. *Western Australian Naturalist* 9:66-72.
- Main, A. R. 1965. *Frogs of Southern Western Australia*. Western Australian Naturalist's Club, Perth, Australia.
- Main, A. R. and Storr, G. M. 1966. Range extensions and notes on the biology of frogs from the Pilbara region, Western Australia. *Western Australian Naturalist* 10:53-61.
- Malnate, E. V. 1971. A catalog of primary types in the herpetological collections of the Academy of Natural Sciences, Philadelphia (ANSP). *Proceedings of the Academy of Natural Sciences of Philadelphia* 123:345-375.
- Martin, A. A. and Littlejohn, M. J. 1982. *Tasmanian Amphibians*. University of Tasmania, Hobart, Tasmania, Australia.
- Martin, A. A., Tyler, M. J. and Davies, M. M. 1980. A new species of *Ranidella* (Anura: Leptodactylidae) from northwestern Australia. *Copeia* 1980:93-99.
- Maryan, B., Oliver, P. M., Fitch, A. J. and O'Connell, M. 2014. Molecular and morphological assessment of *Varanus pilbarensis* (Squamata: Varanidae), with a description of a new species from the southern Pilbara, Western Australia. *Zootaxa* (PRINO) (online) 3768(2):139-158.
- Menzies, J. I. 2006. *The Frogs of New Guinea and the Solomon Islands*. Pensoft, Moscow, Russia.
- Moore, J. A. 1953. A new species of *Pseudophryne* from Victoria. *Proceedings of the Linnean Society of New South Wales* 78:179.
- Moore, J. A. 1954. Geographic and genetic isolation in Australian Amphibia. *American Naturalist* 88:65-74.
- Moore, J. A. 1958. A new genus and species of leptodactylid frog from Australia. *American Museum Novitates* 1919:1-7.
- Moore, J. A. 1961. The frogs of eastern New South Wales. *Bulletin of the American Museum of Natural History*, 121(3):149-386, pls. 27-46.
- Morgan, M. J., Hunter, D., Pietsch, R., Osborne, W. S. and Keogh, J. S. 2008a. Assessment of genetic diversity in the critically endangered Australian corroboree frogs, *Pseudophryne corroboree* and *Pseudophryne pengilleyi*, identifies four evolutionarily significant units for conservation. *Molecular Ecology* 17:3448-3463.
- Morgan, M. J., Byrne, P. G., Hayes, C. M. and Keogh, J. S. 2008b. Microsatellite markers in the endangered Australian northern corroboree frog, *Pseudophryne pengilleyi* (Anura: Myobatrachidae) and amplification in other *Pseudophryne* species. *Conservation Genetics* 9:1315-1317.
- Nieden, F. 1923. Anura I. Subordo Aglossa und Phaneroglossa, Sectio 1. Arcifera. *Das Tierreich* 46:xxii+584.
- Odendaal, F. J. and Bull, C. M. 1982. A parapatric boundary between *Ranidella signifera* and *R. riparia* (Anura: Leptodactylidae) in South Australia. *Australian Journal of Zoology* 30:49-57.
- Odendaal, F. J., Bull, C. M. and Adams, M. 1983. Genetic divergence between two morphologically similar *Ranidella* species (Anura: Leptodactylidae). *Copeia* 1983:275-279.
- Osborne, W. S., Zentelis, R. A. and Lau, M. W. -n. 1996. Geographical variation in Corroboree Frogs, *Pseudophryne corroboree* Moore (Anura: Myobatrachidae): a reappraisal supports recognition of *P. pengilleyi* Wells & Wellington. *Australian Journal of Zoology* 44:569-587.
- Parker, H. W. 1940. The Australasian frogs of the family Leptodactylidae. *Novitates Zoologicae*. Tring 42: 1-106.
- Parker, W. K. 1881. On the structure and development of the skull in the Batrachia: Part III. *Philosophical Transactions of the Royal Society of London* 3:1-266.
- Péron, F. 1807. *Voyage de Decouvertes aux Terres Australes, executé par ordre de sa majeste l'Empereur et Roi, sur les Corvettes la Geographe, la Naturaliste et la Goulette le Casuarina, pendant les annees 1800, 1801, 1803 et 1804*. Volume 1. Imprimerie imperial, Paris, France.
- Perry, C. R. 2004. *Phylogenetic Analysis of the Australian Genus Pseudophryne (Myobatrachidae)*

- Using Morphological Characters*. MSc Thesis, Department of Biological Sciences, East Tennessee State University, USA. 59 pp.
- Peters, W. C. H. 1863. Eine Übersicht der von Hrn. Richard Schomburgk an das zoologische Museum eingesandten Amphibien, aus Buchsfelde bei Adelaide in Südastralien. *Monatsberichte der Königlich Preussische Akademie des Wissenschaften zu Berlin* 1863:228-236.
- Pyron, R. A. and Wiens, J. J. 2011. A large-scale phylogeny of Amphibia including over 2800 species, and a revised classification of advanced frogs, salamanders, and caecilians. *Molecular Phylogenetics and Evolution* 61:543-583.
- Read, K., Keogh, J. S., Scott, I. A., Roberts, J. D. and Doughty, P. 2001. Molecular phylogeny of the Australian frog genera *Crinia*, *Geocrinia*, and allied taxa (Anura: Myobatrachidae). *Molecular Phylogenetics and Evolution* 21:294-308.
- Reynolds, S. J. 2007. Some common names for top end frogs. *Northern Territory Naturalist* 19:60-68.
- Ride, W. D. L. (ed.) et al. (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature*. The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").
- Roberts, J. D. 2010. Natural hybrid between the frogs *Crinia pseudinsignifera* and *Crinia subinsignifera* (Myobatrachidae) from southwestern Australia defined by allozyme phenotype and call. *Journal of Herpetology* 44:654-657.
- Roberts, J. D. and Maxson, L. R. 1989. A molecular perspective on relationships of Australian *Pseudophryne* (Anura: Myobatrachidae). *Systematic Zoology* 38:154-165.
- Roberts, J. D., Wardell-Johnson, G. and Barendse, W. 1990. Extended descriptions of *Geocrinia vitellina* and *Geocrinia alba* (Anura: Myobatrachidae) from south-western Australia, with comments on the status of *G. lutea*. *Records of the Western Australian Museum* 14:427-437.
- Rounsevell, D. E., Ziegeler, D., Brown, P. B., Davies, M. M. and Littlejohn, M. J. 1994. A new genus and species of frog (Anura: Leptodactylidae: Myobatrachinae) from southern Tasmania. *Transactions of the Royal Society of South Australia* 118:171-185.
- Saunders, S. 2019. Morrison and Shorten's Big Australia: The overpopulation problem. News article published 17 April 2019 and downloaded from <https://independentaustralia.net/politics/politics-display/morrison-and-shortens-big-australia-the-overpopulation-problem,12584>
- Shea, G. M. 1987. Comment on the proposed suppression for nomenclatural purposes of three works by Richard W. Wells and C. Ross Wellington. (Case 2531, see BZN 44: 116-121). *Bulletin of Zoological Nomenclature* 44(4):257-261.
- Shea, G. M. 1988. Nomenclatural notes on two frogs from south-eastern Australia. *Victorian Naturalist*. Melbourne 105:152-153.
- Shea, G. M. 2005. The type locality of the sphagnum frog *Philoria loveridgei* (Anura: Myobatrachidae). *Memoirs of the Queensland Museum* 51:524.
- Shea, G. M. and Kraus, F. 2007. A list of herpetological type specimens in the collections of the Papua New Guinea National Museum and Art Gallery and University of Papua New Guinea. *Zootaxa* (PRINO) (online) 1514:37-60.
- Shea, G. M. and Rowley, J. J. L. 2018. Resolution of the types and type localities of some early nominal species of the Australian myobatrachid frog genus *Pseudophryne* Fitzinger, 1843. *Zootaxa* (PRINO) (online) 4407(1):051-064.
- Shea, G. M. and Sadlier, R. A. 1999. A catalogue of the non-fossil amphibian and reptiles type specimens in the collection of the Australian Museum; types currently, previously and purportedly present. *Technical Reports of the Australian Museum* 15:1-91.
- Shine, R. (As President, Australian Society of Herpetologists). 1987. Case 2531. Three works by Richard W. Wells and C. Ross Wellington: proposed suppression for nomenclatural purposes. *Bulletin of Zoological Nomenclature* 44:116-121.
- Spencer, B. 1901. Two new species of frogs from Victoria. *Proceedings of the Royal Society of Victoria* 13:176-178.
- Stauber, A. 1999. Geographic variation in *Pseudophryne australis*: morphological and genetic differences. BSc (Honours) Thesis, University of Technology, Sydney, Australia.
- Stauber, A. G. 2006. Habitat requirements and habitat use of the Red-crowned toadlet *Pseudophryne australis* and the Giant Burrowing frog *Heleioporus australiacus* in the Sydney basin. PhD Thesis, Department of Environmental Sciences, University of Technology, Sydney, Australia:263 pp.
- Steindachner, F. 1867. *Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859 unter den Befehlen des Commodore B. von Wüllerstorff-Urbair. Zoologischer Theil. 1. Amphibien*. Wien: K. K. Hof- und Staatsdruckerei.
- Storr, G. M. 1967. The genus *Vermicella* (Serpentes: Elapidae) in Western Australia and the Northern Territory. *Journal of the Royal Society of Western Australia* 50:80-92.
- Storr, G. M. 1980. The monitor lizards (genus *Varanus* Merrem, 1820) of Western Australia. *Records of the Western Australian Museum* 8(2):237-293.
- Straughan, I. R. and Main, A. R. 1966. Speciation and polymorphism in the genus *Crinia* Tschudi

- (Anura, Leptodactylidae) in Queensland. *Proceedings of the Royal Society of Queensland* 78:11-78.
- Stuart, S. N., Hoffmann, M., Chanson, J., Cox, N., Berridge, R., Ramani, P. and Young, B. (eds.). 2008. *Threatened Amphibians of the World*. Barcelona, Spain; International Union for the Conservation of Nature (IUCN), Gland, Switzerland; Conservation International, Arlington, Virginia, U.S.A.: Lynx Editions.
- Symula, R., Scott Keogh, J. and Cannatella, D. C. 2008. Ancient phylogeographic divergence in southeastern Australia among populations of the widespread common froglet, *Crinia signifera*. *Molecular Phylogenetics and Evolution* 47:569-580.
- Thompson, M. B. 1981. The systematic status of the genus *Australocrinia* Heyer & Liem (Anura: Leptodactylidae). *Australian Journal of Zoology* 29:93-102.
- Thumm, K. and Mahony, M. 2002. Evidence for continuous iteroparity in a temperate zone frog, the red-crowned toadlet, *Pseudophryne australis* (Anura: Myobatrachidae). *Australian Journal of Zoology* 50:151-167.
- Tiedemann, F. and Grillitsch, H. 2000 (1999). Ergänzungen zu den Katalogen der Typusexemplare der Herpetologischen Sammlung des Naturhistorischen Museums in Wien. *Herpetozoa*. Wien 12:147-156.
- Tschudi, J. J. von. 1838. *Classification der Batrachier mit Berücksichtigung der fossilen Thiere dieser Abtheilung der Reptilien*. Neuchâtel: Petitpierre.
- Tyler, M. J. 1976. Vertebrate type-specimens in the South Australian Museum. 2. Amphibians. *Records of the South Australian Museum* 17:177-180.
- Tyler, M. J. 1978. *Amphibians of South Australia*. Australian Government Printer, Adelaide, Australia.
- Tyler, M. J. 1985. Nomenclature of the Australian herpetofauna; anarchy rules O.K.. *Herpetological Review* 16:69.
- Tyler, M. J. 1988. Comments on the proposed suppression for nomenclature of three works by R. W. Wells and C. R. Wellington. (Case 2531: see BZN 44: 116-121; 257-261 and 45: 52-54). (7). *Bulletin of Zoological Nomenclature* 45:152.
- Tyler, M. J. 1992. *Encyclopedia of Australian Animals: Frogs*. The Australian Museum / National Photographic Index of Wildlife. Angus and Robertson, Pymble, NSW, Australia:109 pp.
- Tyler, M. J. and Davies, M. M. 1980. Systematic studies of *Kankanophryne* Heyer & Liem (Anura: Leptodactylidae). *Transactions of the Royal Society of South Australia* 104:17-20.
- Tyler, M. J. and Davies, M. M. 1984. *Uperoleia* Gray (Anura: Leptodactylidae) in New Guinea. *Transactions of the Royal Society of South Australia* 108:123-125.
- Tyler, M. J. and Doughty, P. 2009. *Field Guide to Frogs of Western Australia*. Fourth Edition. Western Australian Museum, Perth, Australia.
- Tyler, M. J. and Knight, F. 2009. *Field Guide to the Frogs of Australia*. CSIRO Publishing, Collingwood, Victoria, Australia.
- Tyler, M. J. and Parker, F. 1974. New species of hylid and leptodactylid frogs from southern New Guinea. *Transactions of the Royal Society of South Australia* 98:71-77.
- Tyler, M. J., Davies, M. M. and Martin, A. A. 1981a. Australian frogs of the leptodactylid genus *Uperoleia* Gray. *Australian Journal of Zoology*, Supplemental Series 29(79):1-64.
- Tyler, M. J., Davies, M. M. and Martin, A. A. 1981b. New and rediscovered species of frogs from the Derby-Broome area of Western Australia. *Records of the Western Australian Museum* 9:147-172.
- Tyler, M. J., Davies, M. M. and Martin, A. A. 1981c. Frog fauna of the Northern Territory: new distributional records and the description of a new species. *Transactions of the Royal Society of South Australia* 105:149-154.
- Tyler, M. J., Davies, M. M. and Martin, A. A. 1983. The frog fauna of the Barkly Tableland, Northern Territory. *Transactions of the Royal Society of South Australia* 107:237-242.
- Tyler, M. J., Smith, L. A. and Johnstone, R. E. 1994. *Frogs of Western Australia*. Western Australian Museum, Perth, Western Australia, Australia:187 pp.
- Vanderduys, E. 2012. *Field Guide to the Frogs of Queensland*. CSIRO, Collingwood, Victoria, Australia:192 pp.
- Victorian Civil and Administrative Tribunal (VCAT). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015, judgment and transcript).
- Waite, E. R. 1929. *The Reptiles and Amphibians of South Australia*. Handbooks of the Flora and Fauna of Australia. Government Printer, Adelaide, South Australia, Australia.
- Walker, S. J. and Goonan, P. M. 2000. Re-evaluation of the distribution of *Geocrinia laevis* (Anura: Leptodactylidae) in South Australia. *Transactions of the Royal Society of South Australia* 124:135-139.
- Wardell-Johnson, G. and Roberts, J. D. 1989. *Endangered!*. Landscape. Perth 5:17.
- Wells, R. W. and Wellington, C. R. 1984. A synopsis of the class Reptilia in Australia. *Australian Journal of Herpetology* 1(3-4):73-129.
- Wells, R. W. and Wellington, C. R. 1985. A classification of the Amphibia and Reptilia of Australia. *Australian Journal of Herpetology Supplementary Series* 1:1-61.
- Wells, R. W. and Wellington, C. R. 1989. A checklist of the Amphibians and Reptiles known from the Cumberland Plain Region, Sydney Basin, New South Wales Australia. *Australian Herpetologist*, 506, 1-34.

Werner, F. 1914. Amphibia. Michaelsen, W. and Hartmeyer, R. (eds.), *Die Fauna Südwest-Australiens, Ergebnisse der Hamburger südwest-australischen Forschungsreise 1905*. Volume 4, Part 10: 403-426. Jena, Gustav Fischer.

Wüster, W. 2020. Hate post on ICZN List server posted on 6 May 2020 at 7:44 AM UK time.

Young, J. E., Tyler, M. J. and Kent, S. A. 2005. Diminutive new species of *Uperoleia* Grey (Anura: Myobatrachidae) from the vicinity of Darwin, Northern Territory, Australia. *Journal of Herpetology* 39:603-

609.

Zaczek, Z. 2019. Former PM Kevin Rudd says Australia should drastically increase its population to 50 MILLION to make sure nation can defend itself in the face of threats from China. *Daily Mail* (Australia) (27 November), published online at: <https://www.dailymail.co.uk/news/article-7729689/Kevin-Rudd-says-Australia-increase-population-50-MILLION-defend-China.html>

**CONFLICTS OF INTEREST**  
None.

*Crinia signifera* from Kooweerup, Victoria.



Hoser 2020 - Australasian Journal of Herpetology 50-51:1-128.

*Australasian Journal of Herpetology*

Publishes original research in printed form in relation to reptiles, other fauna and related matters in a peer reviewed journal for permanent public scientific record, and has a global audience.

Full details at: <http://www.herp.net>

Online journals (this issue) appear a month after hard copy publication. Minimum print run of first printings is always at least fifty hard copies.

**Proudly Supported by Snakebusters:  
Australia's best reptiles.**

Snakebusters are Australia's only hands-on reptiles shows that let people hold the animals.



Relevant trademarks registered

**TAX INVOICE**  
 Kwik Kopy Printing Box Hill  
 3/1031 Whitehorse Road  
 Box Hill VIC 3128  
 t: 039 899 0833 | f: 039 899 0536  
 ABN: 65 740 679 782

**CONTACT**  
 Australasian Journal of Herpetology

**RECEIVED BY:**  
 Terms: **Please refer to trade account, E. & O. and made within 7 days of receipt of goods**

**CUSTOMER:** Australasian Journal of Herp  
**INVOICE No.:** 29182  
**INVOICE Tot.:** \$664.99  
 Something for everyone.

**INVOICE DETAILS**  
**No.29182**  
 Issue Date: 02/10/2020

**INVOICE DETAILS**  
 Issue Date: 03/08/2020

QUANTITY	DESCRIPTION	VALUE	Ex. GST
50	Australasian Journal of Herpetology Issue 49 - 64 page document printed black and white on 128gsm gloss and 250gsm gloss cover in colour	\$302.27	
50	Australasian Journal of Herpetology Issue 50 - 64 page document printed black and white on 128gsm gloss and 250gsm gloss cover in colour	\$302.27	
		<b>\$604.54</b>	
		<b>\$60.45</b>	
		<b>\$664.99</b>	

**REMITTANCE ADVICE: RETURN WITH PAYMENT**  
 Suachess Pty Ltd | Bank: Westpac | BSB: 033 172 | Acc: 334 219  
 Method: VISA MASTERCARD CASH  
 Amount: \$  
 Card No.:  
 Name:  
 Date:  
 Expires:  
 CCV:  
 \*See terms of trading for conditions of payment by other methods

**AMOUNT DUE \$664.99**

# ***Australasian Journal of Herpetology***

ISSN 1836-5698 (Print)  
ISSN 1836-5779 (Online)

Hoser, R. T. 2020. 3 new tribes, 3 new subtribes, 5 new genera, 3 new subgenera, 39 new species and 11 new subspecies of mainly small ground-dwelling frogs from Australia. *Australasian Journal of Herpetology* 50-51:1-128.

**ISSUE 51, PUBLISHED 10 OCTOBER 2020**

Covers: Issue 50: *Crinia signifera* from Kooweerup, Victoria.  
Covers: Issue 51: *Crinia parainsignifera* from Kangaroo Ground, Victoria.  
Photos of frogs and habitat by Author, Raymond Hoser.

# ***Australasian Journal of Herpetology***

Hoser, R. T. 2020. 3 new tribes, 3 new subtribes, 5 new genera, 3 new subgenera, 39 new species and 11 new subspecies of mainly small ground-dwelling frogs from Australia. *Australasian Journal of Herpetology* 50-51:1-128.



ISSN 1836-5698 (Print)  
ISSN 1836-5779 (Online)

**ISSUE 51, PUBLISHED 10 OCTOBER 2020**