

Three new species of frog in the genus *Limnodynastes* Fitzinger, 1843 from east Australia, two new *Platyplectron* Peters, 1863 species from east Australia and three new species of *Ranaster* Macleay, 1878 from north Australia.

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ABSTRACT

The Australasian frog genus *Limnodynastes* Fitzinger, 1843 as understood by most herpetologists in year 2020 is formally divided three ways using existing available names for each genus based on previously published phylogenies for the assemblage.

Three new species of frog in the genus *Limnodynastes* Fitzinger, 1843 from east Australia, are formally named for the first time. They are in the *Limnodynastes peronii* (Duméril and Bibron, 1841) species group and herein named *L. alexanteneri* sp. nov. and *L. cameronganti* sp. nov., as well as a north Queensland population of the putative species *L. tasmaniensis* herein named *L. shanescarffi* sp. nov..

Two new species of frog in the genus *Platyplectron* Peters, 1863, in a species group currently assigned by most publishing authors into the genus *Limnodynastes* Fitzinger, 1843 from Eastern Australia are formally identified and named for the first time.

One had been confused with the species *Platyplectron terraereginae* (Fry, 1915), better known as "*Limnodynastes terraereginae* Fry, 1915" from far north Queensland and this taxon is formally named *Platyplectron gerrymarantellii* sp. nov.. The second is a population until now treated as *P. dumerillii* (Peters, 1863) from the New England Tableland Region of New South Wales, herein formally named as *Platyplectron timjamesi* sp. nov..

Two other species also formally named for the first time were until now treated as populations of the species *Ranaster lignarius* (Tyler, Martin and Davis, 1979) comb. nov. a taxon originally placed in a monotypic genus *Megistolotis* Tyler, Martin and Davis, 1979, erected at the time the species was formally named. More recently this putative species has been placed in the genus *Limnodynastes*, but the first available name for the relevant species group is in fact *Ranaster* Macleay, 1878.

Those species are formally named *R. scottijamesi* sp. nov. and *R. henrywajswelneri* sp. nov..

The diagnosis of these species is also supported by molecular data as cited within this paper, in particular the work of Schauble *et al.* (2000).

A third new species of *Ranaster* from eastern Queensland is also formally named *R. snakemansboggensis* sp. nov.

Keywords: Taxonomy; amphibia; nomenclature; Frog; Australia; Queensland; Northern Territory; Arnhem Land, Western Australia; Kimberley Division; New South Wales; Victoria; *Platyplectron*; *Limnodynastes*; *Ranaster*; *peronii*; *tasmaniensis*; *affinis*; *terraereginae*; *dumerillii*; *lignarius*; Alex Antenor; Cameron Gant; Gerry Marantelli; Scotty James; Tim James; Raymond Hoser; Henry Wajswelner; new species; *alexanteneri*; *cameronganti*; *shanescarffi*; *gerrymarantellii*; *timjamesi*; *snakemansboggensis*; *henrywajswelneri*; *scottijamesi*; new subspecies; *divergens*.

INTRODUCTION

The Australasian frogs of the genus *Limnodynastes* Fitzinger, 1843, as recognized by most publishing herpetologists in year 2020 (*sensu* Cogger 2014) are abundant where they occur and generally well-known to Australian herpetologists.

Molecular studies including that of Roberts and Maxon (1986), Schauble *et al.* (2000) or more recently Pyron and Wiens (2011) p. 563, support a three-way split of the genus into three well-defined and divergent species groups based on timelines of divergence as seen on page 565 of Roberts and Maxon (1986).

I support this contention and herein resurrect the available names as listed by Cogger *et al.* (1983).

The type group *Limnodynastes* is the species similar to the type species *Cystignathus peronii* Duméril and Bibron, 1841 (now known as *Limnodynastes peronii*).

The species *L. peronii* is also clearly a composite species consisting of at least four distinct forms, with names available for the two northern forms if they are recognized as separate species as done herein. They are *L. peronii* from the Sydney region and nearby parts of New South Wales to north-east Victoria and *L. lineatus* De Vis 1884 generally found along the Queensland coast. *L. krefftii* Günther, 1863 is a synonym of *L. peronii*.

The original description of *L. peronii* by Duméril and Bibron in 1841 matches that of the specimen depicted in Hoser (1989) on page 27 (middle photo).

Two morphologically distinct and geographically disjunct species from Victoria are formally named for the first time as *L. alexanteneri* sp. nov. from Melbourne and parts east of there including the Latrobe Valley and South Gippsland and *L. cameronganti* sp. nov. from south-west Victoria and immediately adjacent parts of south-east South Australia.

For the so-called *dorsalis* (Gray, 1841) group, including "*L. terraereginae*", *Platylepton gerrymarantellii* sp. nov. and *Platylepton timjamesi* sp. nov. first formally named and described within this paper, the name *Platylepton* (Peters, 1863) is available, with the type species of *L. dumerilii* Peters, 1863. Hence all species from *Limnodynastes* within this species group are herein transferred to the genus *Platylepton*.

In the event a revising author concludes that *Platylepton* is in fact a mis-spelling of *Platyleptum* Günther, 1863, now attributed to a different group of frogs (type species being *P. marmoratum* Günther, 1863), the first available name for the relevant group of frogs would be *Heliorana* Steindachner, 1867. The type species for *Heliorana* is *H. grayi* Steindachner, 1867, being treated by many as a junior synonym of *P. dumerilii* (Peters, 1863), but herein as a separate full species.

In terms of my use of *Platylepton* herein, I rely on the relevant comments on page 17 of Cogger *et al.* (1983) who also refer to the name as a valid name, in their case confirming the name as being originally identified as *subgen. nov.*

Based on the phylogeny of Schauble *et al.* (2000), *P. grayi* from the Sydney region in New South Wales is in fact more closely related to *P. terraereginae* and *P. gerrymarantellii* sp. nov. than *P. dumerilii*.

For the species originally described as *Ranaster convexiusculus* Macleay, 1878, currently widely known as *Limnodynastes convexiusculus* (Macleay, 1878), the originally designated genus name is available for this and closely allied species.

Within the genus *Ranaster*, three new species are formally named for the first time in this paper, being one previously confused with the species originally described as *Limnodynastes salmini* Steindachner, 1867, and two geographically disjunct species, until now treated as populations of the species originally described as *Megistolotis lignarius* Tyler, Martin and Davis, 1979.

If full genus status is not recognized by later authors for these preceding species groups, the relevant and very distinctively different species groups should all be formally recognized at the subgenus level. Placing all in a single genus *Limnodynastes* as seen for example in Cogger (2014) or more recently Eipper and Rowland (2018), without reference to the genus-level groupings within, or even by way of identifying species groups, hides the important groupings and relationships within this assemblage of

species.

The relevant species within each species group are separated from one another by the Key in Cogger (2014) at page 46 for all relevant species (not including those formally named herein, which would key as the most similar identified species instead), and notably is excluding those species in the genera *Platylepton* Günther, 1863 and *Rotundishius* Hoser, 2016, as defined by Hoser (2016), noting these species have been placed by other authors in the genus *Limnodynastes*, including Cogger *et al.* (1983).

The taxonomy that follows in this paper recognizes the following species groups including the following content of species, which also reflects the molecular results of Roberts and Maxon (1986) and Schauble *et al.* (2000).

Genus *Limnodynastes* Fitzinger, 1843.

Limnodynastes peronii (Duméril and Bibron, 1841) (type species); *L. affinis* Günther, 1863; *L. alexanteneri* sp. nov.; *L. cameronganti* sp. nov.; *L. depressus* Tyler, 1976; *L. fletcheri* Boulenger, 1888; *L. lineatus* De Vis, 1884, *L. shanescarffii* sp. nov. and *L. tasmaniensis* Günther, 1858.

Genus *Platylepton* (Peters, 1863).

Platylepton dumerilii (Peters, 1863) (type species); *P. dorsalis* (Gray, 1841); *P. gerrymarantellii* sp. nov. (this paper); *P. grayi* (Steindachner, 1867); *P. insularis* (Parker, 1940); *P. interioris* (Fry, 1913); *P. terraereginae* (Fry, 1915) and *P. timjamesi* sp. nov. (this paper).

Genus *Ranaster* Macleay, 1877.

Ranaster convexiusculus Macleay, 1877 (type species); *R. henrywajswelneri* sp. nov. (this paper);

R. lignarius (Tyler, Martin and Davis, 1979) (*comb. nov.*) (including subspecies *R. lignarius divergens* subsp. nov.); *R. snakemansboggensis* sp. nov. (this paper); *R. salmini* (Steindachner, 1867) and *R. scottijamesi* sp. nov. (this paper).

The species *P. interioris* (Fry, 1913) is only tentatively recognized herein on the basis it appears to be morphologically distinct and reproductively isolated from the others, even though it has been shown by Schauble *et al.* (2000) to be genetically similar to *P. dumerilii*.

MATERIALS, METHODS AND RESULTS

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

An audit of relevant species in the genus *Limnodynastes* Fitzinger, 1843 *sensu lato* confirmed the preceding generic level assignment of species.

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

The final results of this audit found that the species originally described as *L. peronii* is clearly a composite species consisting of at least four distinct forms worthy of species recognition.

Names are available for the two northern forms if they are recognized as separate species as done herein, these are *L. peronii* from the Sydney region and nearby parts of New South Wales to north-east Victoria and *L. lineatus* De Vis 1884 generally found along the Queensland coast.

L. krefftii Günther, 1863 is a synonym of *L. peronii*.

Two morphologically distinct and geographically disjunct species from Victoria are formally named for the first time as *L. alexanteneri* sp. nov. from Melbourne and parts east of there including the Latrobe Valley and South Gippsland, being a belt of generally cooler and wetter terrain to the dry zone barriers to the species north, west and east of where they occur (and are usually replaced by *L. tasmaniensis* Günther, 1858) and *L. cameronganti* sp. nov. from south-west Victoria and immediately adjacent parts of south-east South Australia, which is also constrained in distribution by similar factors (i.e. surrounding dry zones or Bass Strait).

A distinctive north Queensland population of the putative species *L. tasmaniensis* Günther, 1858 is herein formally named *L. shanescarffi* sp. nov..

The audit found that the current classification of the so-called *dorsalis* (Gray, 1841) group including various species and subspecies to be not in accordance with either morphological or genetic evidence.

Hence an effective rewrite of the taxonomy of that species group herein.

To that extent, some forms of *P. dumerilii* Peters, 1863 treated as subspecies by authors in recent times (e.g. Eipper and Rowland, 2018) have been synonymized with *P. dumerilii* Peters, 1863, while others have been treated as full species. No subspecies are recognized herein for the species *P. dumerilii* and the list for the group is given already in this paper. In summary, *P. insularis* (Parker, 1940) and *P. grayi* (Steindachner, 1867) are recognized as full species, while *P. dumerilii fryi* Martin, 1972 is relegated to synonymy of *P. dumerilii*.

A new species, *Platyplectron timjamesi* sp. nov. is formally described and named, having previously been treated as a New England (New South Wales) population of *P. dumerilii*.

Limnodynastes terraereginae Fry, 1915 is in fact two separate and well-defined species and one was until now not formally identified or named. Molecular evidence of Schauble *et al.* (2000) supports this contention.

In 1978 when hitch-hiking back to my home in Sydney after a reptile collecting trip at in far north Queensland, I asked the car driver to stop on the side of the road to let me open my bowels to pass a faeces. This was just south of Rockhampton, Queensland. I jumped a fence and stood at a swamp, or bog, as they are sometimes called and relieved myself, by doing what Australians call "a bog".

I then lifted a large log half in the water at the water's edge. The frog I caught was what I then regarded as an unusually coloured *Limnodynastes salmini* Steindachner, 1867, having distinctive yellow-coloured stripes and markings on the upper body, as opposed to the salmon colouration of *L. salmini*. This location became known as the Snakeman's bog, in reflection of both the bog habitat and the bog (feces) done by myself at the same location.

I was familiar with the species *L. salmini*, having caught large numbers of them at a swamp between Nevertire and Nyngan to the north side of the highway in August 1976.

Investigations over the following 40 years, including a field trip to the relevant area in central eastern Queensland in July and August 2019 confirmed that these so-called *L. salmini* from east-flowing drainage basins in coastal and near-coastal parts of Queensland are in fact a morphologically divergent species separate from the *L. salmini*, found in association with the south-west flowing Darling River system.

A review of relevant literature, including the molecular evidence of Schauble *et al.* (2000) further corroborated the view that the two relevant forms are sufficiently divergent as to be recognized as different species.

The original description of *L. salmini* by Steindachner in 1867 is clearly of the form from west draining rivers (because he even refers to the red on the frog, not present in eastern specimens), making the eastern form until now an unnamed species. It is herein formally named *Limnodynastes snakemansbogensis* sp. nov..

The species originally described as *Megistolotis lignarius* Tyler, Martin and Davis, 1979 is in fact a complex of three species with two until now unnamed.

Molecular evidence of Schauble *et al.* (2000) also supports this contention.

Anstis (2013) contends that there are two species under the existing putative species label *Ranaster lignarius* (Tyler, Martin and Davis, 1979). She divides the species primarily on the basis of colouration, the nominate form being of a distinctive reddish-orange dorsal base colour and different pattern to the other alleged

form with a greyish dorsal base colour.

However the distribution of the three main populations tells a different story.

The nominate form is in the east Kimberley of Western Australia and this wholly divides the other two populations to the west and the east. These are found in suitable escarpment habitat in the West and North Kimberley (one form) and the other superficially morphologically similar form is found in ArnhemLand, Northern Territory.

Whether the ancestors of the extant species diverged, east to west, vice-versa or even from the central population zone doesn't alter the fact that the likelihood of the outlier populations being more closely related to one another than the central one is almost non-existent.

Furthermore inspection of numerous specimens of the two greyish populations also yields consistent morphological differences that confirm that while superficially similar, they are not conspecific and that at least some of the similarities between them is due to convergence, as opposed to a particularly close relationship.

DISCUSSION OF RESULTS IN MORE DETAIL AND FORMAL DESCRIPTIONS

An illegal armed raid and theft of materials on 17 Aug 2011 effectively stopped the publication of a variant of this paper being published back then and a significant amount of materials taken in that raid was not returned. This was in spite of court orders telling the relevant State Wildlife officers to do so (Court of Appeal 2014, Victorian Civil and Administrative Tribunal 2015).

Rather than run the risk of species becoming threatened or extinct due to non-recognition of them as shown in Hoser (2019a, 2019b), I have instead opted to publish this paper in its current form, even though a significant amount of further data was intended to be published and is not.

Naming of taxa is perhaps the most important step in their ultimate preservation and it is with this motivation in mind (protection of biodiversity) that I have chosen to publish this paper.

Until now, no new (and generally recognized) species within the so-called *P. dorsalis* (Gray, 1841) group have been formally named for more than 100 years (since 1915 to be exact) and all are similar in morphology and habit. Molecular studies (e.g. Schauble *et al.* (2000) and Pyron and Weins, (2011)) have shown all species to be closely related, even though they have a distribution spanning the length and width of continental Australia including the tip of Cape York in far north Queensland and far south-west Western Australia (as seen in Cogger 2014 (pages 47 and 53) and relevant pages of Eipper and Rowland 2018).

In terms of the putative species *L. peronii* (Duméril and Bibron, 1841), the two southern species formally named in this paper, previously treated as *L. peronii*, besides being geographically disjunct are also readily morphologically distinguishable and diagnosable as seen in the descriptions that follow.

A similar situation is seen in for the currently unnamed population of the putative species *L. tasmaniensis* Günther, 1858 from north Queensland, herein formally named *L. shanescarffi* sp. nov..

L. salmini Steindachner, 1867 is in fact two species, being a coastal and an inland form which are morphologically and genetically diagnosable, as demonstrated by Schauble *et al.* (2000). As mentioned already it is the coastal form which until now was unnamed.

Of the formally described and named species in the genus *Platyplectron*, one in particular, currently known by most authors as "*Limnodynastes terraereginae* Fry, 1915" is recognized to be highly variable in colour (Eipper and Rowland, 2018), although until now, no author anywhere has ever mooted that there may be more than one species involved (see for example Wells and Wellington, 1985, Cogger *et al.* 1983, Cogger, 2014 or Eipper and Rowland, 2018). Inspection of live specimens across the putative range of this species, this being north eastern New South Wales to far north-east Queensland, by myself over more than four decades alerted me to obvious differences between the regional populations.

These morphological and colouration differences are consistent

and coincide with biogeographical barriers and absence of collected specimens in museums in relevant intervening areas, leading to the inescapable conclusion that more than one species is involved.

Each population are clearly evolving independently of one another. This is particularly the case for populations in far north-east Queensland, which are by the far the most distinctive and also broken into more than one subgroup.

The populations from northern New South Wales and nearby south-east Queensland until now treated as being putative *P. terraereginae* are in many respects morphologically more similar to the species *P. grayi* (Steindachner, 1867), as currently known, rather than the nominate type form of *P. terraereginae*, which in fact has a type locality of Somerset, Cape York, Queensland, Australia.

It is prudent to compare images of both forms as seen on page 53 of Cogger (2014) (*P. gerrymarantellii* sp. nov. identified as *P. terraereginae*) and page 394 of Anstis (2013) (*P. grayi*).

The populations from northern New South Wales and nearby south-east Queensland of putative *P. terraereginae* is sufficiently diagnosably distinct from both other relevant (preceding named) species to warrant being formally named for the first time as a new species as done within this paper as *P. gerrymarantellii* sp. nov.. The newly named species *P. timjamesi* sp. nov., while clearly a member of the *P. dumerilii* species complex, was shown by Schauble *et al.* (2000) to be more divergent from nominate *P. dumerilii* than all of *P. interioris* (Fry, 1913) and *P. insularis* (Parker, 1940) and so I had no hesitation in naming this form as a new species as opposed to subspecies.

While five subspecies of *Platyplectron dumerilii* are recognised by herpetologists as of 2020, being *P. dumerilii dumerilii* in south-eastern South Australia, central and northern Victoria, parts of New South Wales, and in south-east Queensland; *P. dumerilii grayi* (Steindachner, 1867) from the central coast of New South Wales; *P. dumerilii fryi* (Martin, 1972) in the Snowy Mountains; *P. dumerilii insularis* (Parker, 1940) in south east Victoria and Tasmania; and *P. dumerilii variegatus* (Martin, 1972) in south-western Victoria and south-eastern South Australia, the last of these appears to be nothing more than a colour morph of the better-known *P. dumerilii*. *P. interioris* (Fry, 1913) also appears to be nothing more than a large variant of *L. dumerilii*, but is herein tentatively treated as a separate species.

The smooth skinned form known generally is *P. dumerilii grayi* is sufficiently divergent as to be treated as a separate species as is the form formally described in this paper, namely *P. timjamesi* sp. nov., being significantly divergent of all other currently recognized subspecies of *P. dumerilii*. This divergence explains why I have described the taxon as a full species and not a subspecies.

Excluding *P. dumerilii variegatus* discussed above, none of the other recognized subspecies are sufficiently divergent as to warrant full species recognition, but molecular evidence does suggest subspecies designations are appropriate.

Exceptional to this is the relatively smooth-skinned *P. dumerilii grayi* (Steindachner, 1867) as depicted in Anstis (2013) at page 394 at top, which is herein treated as a full species separate to *P. dumerilii* and in fact more closely related to both *P. terraereginae* and the newly named species *P. gerrymarantellii* sp. nov. (previously identified as *P. terraereginae*).

The morphological basis of the division of putative *Ranaster salmini* (Steindachner, 1867) is discussed previously. I also note the biogeographical barrier of the Great Dividing Range coinciding with the molecular basis separating the two forms at the species level. The unnamed eastern form is herein formally named *R. snakemansbogensis* sp. nov..

I note that the exact collection location of the syntypes is not known, but from the original description of Steindachner, translated for me by Roman Hulimka (formerly of Park Orchards, Victoria, now of Bayswater, Victoria), the description (and syntypes themselves) can only match the better-known form from west of the Great Dividing Range.

The species of frog originally described as *Megistolotis lignarius*

Tyler, Martin and Davis, 1979, herein included in the genus *Ranaster* Macleay, 1877 was examined by myself over some decades across the known range for the putative species.

There is zero doubt that this is in fact a complex of at least three very different species with two until now unnamed.

All three are geographically disjunct and separated by well defined and well-known biogeographical barriers in terms of saxicoline species.

All three species are inhabitants of upland sandstone habitats, which is obligatory for them, separated by unsuitable mainly flat lowland areas. The same barriers divided the putative species *Odatia glauerti* (Mertens, 1957) three ways, to include *O. hoseri* Hoser, 2013 and *O. davidhancocki* Hoser, 2018 as detailed in Hoser (2013b) and Hoser (2018), which included a robust body of molecular data to support the three-way species split and had been published following rigorous peer review.

Significantly the three relevant species of putative *Ranaster lignarius* are so different from one another that they can be readily and consistently identified and separated from one another at a glance. The molecular results of Schauble *et al.* (2000) also supports a three way split of this putative species.

The nominate form of *R. lignarius* occurs in the East Kimberley region of Western Australia, generally around the Ord River Basin near Kunanurra. A divergent population found east of the main centre of distribution in the Gregory National Park, Northern Territory, Australia, is herein formally named as a subspecies, *R. lignarius divergens* subsp. nov..

R. henrywajswelneri sp. nov. (this paper) occurs in the west and north Kimberley district of Western Australia, while *R. scottijamesi* sp. nov. (this paper) occurs in the general region of the Arnhem Land escarpment in the Northern Territory, Australia.

INFORMATION RELEVANT TO THE FORMAL DESCRIPTIONS THAT FOLLOW

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

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

In terms of the following formal descriptions, spellings should not be altered in any way for any purpose unless expressly and exclusively called for by the rules governing Zoological Nomenclature as administered by the International Commission of Zoological Nomenclature.

In the unlikely event two newly named taxa are deemed conspecific by a first reviser, then the name to be used and retained is that which first appears in this paper by way of page priority and as listed in the abstract keywords.

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

Material downloaded from the internet and cited anywhere in this paper was downloaded and checked most recently as of 7 February 2020, unless otherwise stated and were accurate in terms of the context cited herein as of that date.

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

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

Each newly named species is readily and consistently separable from their nearest congener and that which until now it has been previously treated as.

Delays in recognition of these species could jeopardise the long-

term survival of these taxa as outlined by Hoser (2019a, 2019b) and sources cited therein.

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

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

LIMNODYNASTES ALEXANTENORI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:6EF83369-0A5D-466F-A267-C8E0767F3186

Holotype: A preserved male specimen at the Museum of Victoria, Melbourne, Victoria, Australia, Herpetology Collection, specimen number D69522 collected 2 KM North of Boolarra, Gippsland, Victoria, Australia, Latitude -38.40 S., Longitude 146.28 E. This facility allows access to its holdings.

Paratypes: 1/ A preserved male specimen at the Museum of Victoria, Melbourne, Victoria, Australia, Herpetology Collection, specimen number D69523 collected 2 KM North of Boolarra, Gippsland, Victoria, Australia, Latitude -38.40 S., Longitude 146.28 E. 2/ A preserved specimen at the Museum of Victoria, Herpetology Collection, specimen number D47705 collected south of Hernes Oak, Latrobe Valley, Gippsland, Victoria, Australia, Latitude -38.22 S., Longitude 146.33 E.

Diagnosis: Until now, all of *Limnodynastes peronii* (Duméril and Bibron, 1841), *L. alexantenori* sp. nov.; *L. cameronganti* sp. nov. and *L. lineatus* De Vis, 1884 have been recognized by publishing herpetologists as simply *L. peronii* (*sensu* Cogger *et al.* 1983). Notwithstanding this, molecular data as published by Schauble *et al.* (2000) indicate at least four species being within the species complex and four forms are readily diagnosable and separable from one another on morphological features. They are also distributionally disjunct.

All four species are separated from all other *Limnodynastes* (*sensu lato*) species (including all species within the genera *Platyplectron* (Peters, 1863) and *Ranaster* Macleay, 1877 by the following unique combination of characters: There is no skin flap or papillae in the anterior corner of the eye; the inter metatarsal tubercle is small to moderate and not shovel-shaped; the metacarpal of the inner finger is much longer than that of the second finger; the toes are free and the snout is pointed and prominent.

Colouration is variable, but invariably brown or grey-brown above with a series of somewhat irregular dark-brown stripes or spots running anterior to posterior and dark irregular spots or mottling on the flanks. Dark dorsal markings may have lighter centres and there is sometimes a vertebral stripe which may be distinct, indistinct and of similar or different colour to other parts of the dorsum. There is a dark band along the snout, continuous behind the eye and running through the tympanum to the base of the forelimb. The band is usually bordered below by a white or yellow glandular fold.

All four species are characterised by two thick and usually irregular blackish stripes running down the spine, from between the eyes to the lower back or pelvic girdle, the stripes being separated by a lighter mid-dorsal line which may be thin or thick, and of variable colour, but invariably lighter in colour than the separated black stripes. Beyond these stripes, the dorsal surface is lighter, before there is another thick and irregular-shaped marking in the form of a stripe on the top of either flank. The flanks themselves are generally light in colouration with scattered bits of dark pigment, peppering or spots.

The limbs have scattered dark spots and irregular cross-bands, which may merge to form irregular stripes along the limb. The venter is generally whitish and often flecked with brown or grey. There is no tibial gland.

Nominate *L. peronii* is of the form seen around Sydney, New South Wales and nearby coastal areas of New South Wales and far north-east Victoria. It is depicted in Hoser (1989) on page 27 (bottom two images) and Cogger (2014) on page 50 (top right). It is separated from the other three species, namely *L. alexantenori* sp. nov., *L. cameronganti* sp. nov. and *L. lineatus*, by the following unique suite of characters: Flesh in the groin and armpits is either white or with only a slight yellowish tinge. Specimens with orange on the back, do not have this pigment bounded by black on the upper flank stripes as seen in *L. salmini* Steindachner, 1867 (a putative species which is in fact two, being a coastal and an inland form which are morphologically and genetically diagnosable). The mid and upper flanks of this species are characterised by having small to medium blackish spots of irregular shape. Limbs are mainly light with scattered irregular spots or blotches of small to medium size, exceptional to this is a series of 3-5 medium sized dark spots on the upper surface of the folded rear leg.

L. peronii is also characterised and separated from all of *L. alexantenori* sp. nov., *L. cameronganti* sp. nov. and *L. lineatus* by having 2-6 scattered dark spots of irregular shape on each of the middle and lower flanks.

L. lineatus De Vis, 1884 from coastal Queensland is similar in most respects to *L. peronii* but most readily separated from that species by having well-defined light areas within the dark stripe area on the upper flanks, and heavy yellow pigment in groin and back of upper hind limbs. The dark mid-dorsal stripes run to the pelvic girdle, versus not that far in *L. peronii*.

L. lineatus is separated from all of *L. alexantenori* sp. nov., *L. cameronganti* sp. nov. and *L. peronii* by having a well defined row of 5 to 9 large dark spots along each of the lower flanks. *L. lineatus* also has spots and/or peppering merged to form lines running longitudinally down each of the fore and hind limbs.

L. alexantenori sp. nov. are separated from *L. peronii*, *L. lineatus* and *L. cameronganti* sp. nov. by having unpigmented versus pigmented eggs.

L. alexantenori sp. nov. from Melbourne are nearby parts of West Gippsland, including the Latrobe Valley is separated from the other three species *L. peronii*, *L. cameronganti* sp. nov. and *L. lineatus* by the black to dark brown stripe area of the upper flank being noticeably wider and more prominent at the anterior end of the body, than posterior, versus of more-or-less even thickness or prominence along the entire flank in the other three species.

L. alexantenori sp. nov. is also separated from all of *L. peronii*, *L. cameronganti* sp. nov. and *L. lineatus* by having no dark pigment on the middle or lower flanks save for a single large spot on the upper flank just posterior to the forelimb.

L. cameronganti sp. nov., from south-west Victoria and nearby parts of south-east South Australia near the coast is separated from the other three species *L. alexantenori* sp. nov., *L. peronii*, and *L. lineatus* by having an extremely well-defined pattern of longitudinal stripes running down the body, including a well-defined dark stripe along each of the upper flanks and a well-defined large dark blotch forming a stripe on each of the lower flanks, this not being seen in any of the other species. *L. cameronganti* sp. nov. also has a consistently strong and well-defined beige to yellow mid-dorsal stripe running to the rear of the body, being well bounded by the adjoining black stripes, which are also thin and well-defined. The yellow or white mid-dorsal stripe in this species is also thicker than either of the blackish stripes that bound it on the body, which is in stark contrast to the other three species, where the reverse is the case. There is a well-defined dark stripe along the upper surface of the anterior part of each hind limb, but not on the forelimbs (in contrast to *L. lineatus*).

Photos of *L. peronii* in life can be found in Hoser (1989) at page 27 (two bottom images) and Cogger (2014) at page 51 and online at: <https://www.flickr.com/photos/14807473@N08/3558432634/>
Photos of *L. lineatus* in life can be found online at: <https://www.flickr.com/photos/113096834@N02/12051078886/> and <https://www.flickr.com/photos/smacdonald/395057571/in/album-72157594543840677/>

Photos of *L. alexantenori* sp. nov. in life can be found online at: <https://www.flickr.com/photos/craigboase/14068509511/> and

<https://www.flickr.com/photos/gondwanareptileproductions/28732302793/> and

<https://www.flickr.com/photos/160417453@N04/39688090763/>

A photo of *L. cameronganti* sp. nov. in life can be found online at:

<https://www.frogwatchsa.com.au/species/view/21>

Distribution: *L. alexantenori* sp. nov. is restricted to the region bound by the Melbourne CBD in the west, the Great Dividing Range in the north, and east from these points to include the wetter parts of west and central Gippsland in the east, generally in a line from the Latrobe Valley in the north, south to Wilson's Promontary, this being the eastern limit of the range of this species and including the northern suburbs of Melbourne, the entire Yarra Valley and most of the Dandenong Ranges.

Etymology: Named in honour of (originally) Sydney-based herpetologist Alex Antenor in recognition of more than 50 years of contributions to Australian herpetology, including through working in close association with the late Graeme F. Gow who also made significant contributions to Australian herpetology in various roles.

LIMNODYNASTES CAMERONGANTI SP. NOV.

LSID urn:lsid:zoobank.org:act:785A65A0-CA57-4700-B55C-251AB0649276

Holotype: A preserved specimen at the Museum of Victoria, Melbourne, Victoria, Australia, Herpetology Collection, specimen number D25859 collected at Dismal Swamp, near Mount Gambier, South Australia, Australia, Latitude -37.68 S., Longitude 140.72 E. This facility allows access to its holdings.

Paratype: A preserved specimen at the South Australian Museum, Adelaide, South Australia, Australia, Herpetology Collection specimen number: R49328, collected from Tarpeena, South Australia, Australia, Latitude -37.70 S., Longitude 140.80 E.

Diagnosis: Until now, all of *Limnodynastes peronii* (Duméril and Bibron, 1841), *L. alexantenori* sp. nov.; *L. cameronganti* sp. nov. and *L. lineatus* De Vis, 1884 have been recognized by publishing herpetologists as simply *L. peronii* (*sensu* Cogger *et al.* 1983).

Notwithstanding this, molecular data as published by Schauble *et al.* (2000) indicate at least four species being within the species complex and four forms are readily diagnosable and separable from one another on morphological features. They are also distributionally disjunct.

All four species are separated from all other *Limnodynastes* (*sensu lato*) species (including all species within the genera *Platyplectron* (Peters, 1863) and *Ranaster* Macleay, 1877 by the following unique combination of characters: There is no skin flap or papillae in the anterior corner of the eye; the inter metatarsal tubercle is small to moderate and not shovel-shaped; the metacarpal of the inner finger is much longer than that of the second finger; the toes are free and the snout is pointed and prominent.

Colouration is variable, but invariably brown or grey-brown above with a series of somewhat irregular dark-brown stripes or spots running anterior to posterior and dark irregular spots or mottling on the flanks. Dark dorsal markings may have lighter centres and there is sometimes a vertebral stripe which may be distinct, indistinct and of similar or different colour to other parts of the dorsum. There is a dark band along the snout, continuous behind the eye and running through the tympanum to the base of the forelimb. The band is usually bordered below by a white or yellow glandular fold.

All four species are characterised by two thick and usually irregular blackish stripes running down the spine, from between the eyes to the lower back or pelvic girdle, the stripes being separated by a lighter mid-dorsal line which may be thin or thick, and of variable colour, but invariably lighter in colour than the separated black stripes. Beyond these stripes, the dorsal surface is lighter, before there is another thick and irregular-shaped marking in the form of a stripe on the top of either flank. The flanks themselves are generally light in colouration with scattered bits of dark pigment,

peppering or spots.

The limbs have scattered dark spots and irregular cross-bands, which may merge to form irregular stripes along the limb. The venter is generally whiteish and often flecked with brown or grey. There is no tibial gland.

Nominate *L. peronii* is of the form seen around Sydney, New South Wales and nearby coastal areas of New South Wales and far north-east Victoria. It is depicted in Hoser (1989) on page 27 (bottom two images) and Cogger (2014) on page 50 (top right). It is separated from the other three species, namely *L. alexantenori* sp. nov., *L. cameronganti* sp. nov. and *L. lineatus*, by the following unique suite of characters: Flesh in the groin and armpits is either white or with only a slight yellowish tinge. Specimens with orange on the back, do not have this pigment bounded by black on the upper flank stripes as seen in *L. salmini* Steindachner, 1867 (a putative species which is in fact two, being a coastal and an inland form which are morphologically and genetically diagnosable). The mid and upper flanks of this species are characterised by having small to medium blackish spots of irregular shape. Limbs are mainly light with scattered irregular spots or blotches of small to medium size, exceptional to this is a series of 3-5 medium sized dark spots on the upper surface of the folded rear leg.

L. peronii is also characterised and separated from all of *L. alexantenori* sp. nov., *L. cameronganti* sp. nov. and *L. lineatus* by having 2-6 scattered dark spots of irregular shape on each of the middle and lower flanks.

L. lineatus De Vis, 1884 from coastal Queensland is similar in most respects to *L. peronii* but most readily separated from that species by having well-defined light areas within the dark stripe area on the upper flanks, and heavy yellow pigment in groin and back of upper hind limbs. The dark mid-dorsal stripes run to the pelvic girdle, versus not that far in *L. peronii*.

L. lineatus is separated from all of *L. alexantenori* sp. nov., *L. cameronganti* sp. nov. and *L. peronii* by having a well defined row of 5 to 9 large dark spots along each of the lower flanks. *L. lineatus* also has spots and/or peppering merged to form lines running longitudinally down each of the fore and hind limbs.

L. alexantenori sp. nov. are separated from *L. peronii*, *L. lineatus* and *L. cameronganti* sp. nov. by having unpigmented versus pigmented eggs.

L. alexantenori sp. nov. from Melbourne are nearby parts of West Gippsland, including the Latrobe Valley is separated from the other three species *L. peronii*, *L. cameronganti* sp. nov. and *L. lineatus* by the black to dark brown stripe area of the upper flank being noticeably wider and more prominent at the anterior end of the body, than posterior, versus of more-or-less even thickness or prominence along the entire flank in the other three species.

L. alexantenori sp. nov. is also separated from all of *L. peronii*, *L. cameronganti* sp. nov. and *L. lineatus* by having no dark pigment on the middle or lower flanks save for a single large spot on the upper flank just posterior to the forelimb.

L. cameronganti sp. nov., from south-west Victoria and nearby parts of south-east South Australia near the coast is separated from the other three species *L. alexantenori* sp. nov., *L. peronii*, and *L. lineatus* by having an extremely well-defined pattern of longitudinal stripes running down the body, including a well-defined dark stripe along each of the upper flanks and a well-defined large dark blotch forming a stripe on each of the lower flanks, this not being seen in any of the other species. *L. cameronganti* sp. nov. also has a consistently strong and well-defined beige to yellow mid-dorsal stripe running to the rear of the body, being well bounded by the adjoining black stripes, which are also thin and well-defined. The yellow or white mid-dorsal stripe in this species is also thicker than either of the blackish stripes that bound it on the body, which is in stark contrast to the other three species, where the reverse is the case. There is a well-defined dark stripe along the upper surface of the anterior part of each hind limb, but not on the forelimbs (in contrast to *L. lineatus*).

Photos of *L. peronii* in life can be found in Hoser (1989) at page 27 (two bottom images) and Cogger (2014) at page 51 and online at: <https://www.flickr.com/photos/14807473@N08/3558432634/>

Photos of *L. lineatus* in life can be found online at:
<https://www.flickr.com/photos/113096834@N02/12051078886/>
 and

<https://www.flickr.com/photos/smacdonald/395057571/in/album-72157594543840677/>

Photos of *L. alexanteneri* sp. nov. in life can be found online at:
<https://www.flickr.com/photos/craigboase/14068509511/>
 and

<https://www.flickr.com/photos/gondwanareptileproductions/28732302793/>
 and

<https://www.flickr.com/photos/160417453@N04/39688090763/>
 A photo of *L. cameronganti* sp. nov. in life can be found online at:
<https://www.frogwatchsa.com.au/species/view/21>

Distribution: *L. cameronganti* sp. nov. is restricted to the region bound by the Otway Ranges on south-west coast of Victoria through wetter near coastal areas of far south-west Victoria and into nearby parts of far south-east South Australia, north to about Kingston, South Australia.

Etymology: Named in honour of Cameron Gant, Physiotherapist at Mount Hotham, Victoria (2019) in recognition of his many contributions to the welfare and safety of ski and snowboarders at Mount Hotham as well as his secondary role of looking after the welfare of ski lodge patrons during ski seasons in Australia and Japan. Another of his achievements was being photographed doing a large snow jump on a snowboard at a Japanese ski resort while wearing nothing but his jocks (underwear), thereby giving some local women a thrill.

Myself, known as the Snakeman tried to upstage this by skiing completely naked (no underwear) at 92 kph (timed with an ap) down the Saddle Ski run at Whistler Canada in February 2019.

LIMNODYNASTES SHANESCARFFI SP. NOV.

LSID urn:lsid:zoobank.org:act:704E15BE-E3D2-4859-BA80-623801D290F9

Holotype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.148809, collected from Charmillan Creek, 11.6km south of Kennedy Highway at Ravenshoe, via the Tully Falls Rd, Queensland, Australia, Latitude -17.716 S., Longitude 145.516 E.

This facility allows access to its holdings.

Paratypes: 1/ A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J65844, collected from Gunnawarra Rd, North Queensland, Australia, Latitude -18.2153 S., Longitude 145.1336 E.

2/ A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J48949 collected from Blunder Creek, 3km south-east of Woorora Homestead, north Queensland, Australia, Latitude -17.75 S., Longitude 145.4667 E.

3/ A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J65916, collected from Lumholtz National Park, north Queensland, Australia, Latitude 18.2367 S., Longitude 145.4758 E.

Diagnosis: Until now *Limnodynastes shanesearffi* sp. nov. has been treated as a northern population of the widespread species *Limnodynastes tasmaniensis* Günther, 1858. Both would key out as the same species in Cogger (2014). While both species are variable in colour, *L. shanesearffi* sp. nov. is readily separated from *L. tasmaniensis* by the following unique combination of characters in adult frogs: A dorsal colouration incorporating a dominance of dark-greenish-blackish or dark-brownish-blackish spots and blotches (versus obviously green in *L. tasmaniensis*), with dark occupying more than 70% of the upper surface, versus less than 70% in *L. tasmaniensis*; an obvious purple tinge on the lower flanks and inner thighs (versus yellow in *L. tasmaniensis*) and a dark blotch beneath and slightly anterior to the eye of size nearly as large as the eye, versus significantly smaller in size in *L. tasmaniensis*. Male *L. shanesearffi* sp. nov. also have obvious orangeish-red spotting or peppering on the upper body and limbs, which is also present to a lesser extent in most females, this being separate from any vertebral stripe that may or may not be present.

The species *L. affinis* Günther, 1863 was treated by Cogger *et al.* (1983) as being a synonym of *L. tasmaniensis* and has been effectively ignored by all authors since, except for Wells and Wellington (1985), who like Cogger *et al.* (1983), did not provide diagnostic information by which to separate the forms.

Both *L. affinis* and *L. tasmaniensis* are separated from *L. shanesearffi* sp. nov. as defined above. However both *L. affinis* and *L. shanesearffi* sp. nov. are readily separated from *L. tasmaniensis* by the fact that they have a well defined white or yellowish-white stripe running beneath the eye and the ear to the front leg. This is either absent or ill-defined, or not white to creamy-white in *L. tasmaniensis*. This means all three species can be readily separated from one another.

An image of *L. shanesearffi* sp. nov. (including specimens of both sexes) can be found in Vanderduys (2012) on page 90 bottom.

Distribution: *L. shanesearffi* sp. nov. appears to be restricted to north-east Queensland. *L. affinis* is known from north-east New South Wales and nearby parts of southern Queensland, including inland areas. *L. tasmaniensis* appears to be confined to the New South Wales coast south of the Hunter Valley, southern Victoria and nearby areas.

Etymology: 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.

PLATYPLECTRON GERRYMARANTELLII SP. NOV.

LSID urn:lsid:zoobank.org:act:CAADCE7F-BDB1-4C2B-8102-2464A2F930B2

Holotype: A preserved specimen in the Queensland Museum, Brisbane, Australia, Amphibians and Reptiles Collection, Specimen number J12556 collected from Burpengary, Queensland, Australia, Latitude -27.17 S., Longitude 152.97 E. This facility allows access to its holdings.

Paratype: A preserved specimen in the Queensland Museum, Brisbane, Australia, Amphibians and Reptiles Collection, Specimen number J12555 collected from Burpengary, Queensland, Australia, Latitude -27.17 S., Longitude 152.97 E.

Diagnosis: Until now *Platyplectron gerrymarantellii* sp. nov. has been treated as the southern population of *P. terraereginae* (Fry, 1915).

Both species are separated from all other species in the same genus (*Platyplectron*) by having a groin suffused with scarlet (red), inner metatarsal tubercle is large and shovel-shaped and there is no skin flap or papillae in the anterior corner of the eye, this part of the diagnosis being effectively derived from Cogger (2014).

P. gerrymarantellii sp. nov. is however readily separated from *P. terraereginae* by appearance. The flanks, in particular the upper flanks have areas of light pigment formed by peppering. On the upper flanks, it is dark at the top, with lighter peppering increasing to form an indistinct lighter marking or indistinct line on the mid upper flank, being bound by grey below, with mainly yellow peppering or small spots recurring on the lower flanks, beyond a region on the mid-flanks of only grey colouration.

By contrast the flanks of *P. terraereginae* have an obviously marbled appearance. This is created by distinctively bright orange to yellow irregular blobs and blotches along the upper flank and to a lesser extent on the lower flanks on a whitish grey background. The marbled and brilliant appearance of these bright markings, which extend to the limbs and anteriorly to be below the eye in *P. terraereginae* are in stark contrast to *P. gerrymarantellii* sp. nov.. Yellowish markings under the throat are intense in *P. terraereginae* but are dull in *P. gerrymarantellii* sp. nov..

In *P. terraereginae* there is a dark brown to black stripe running on the snout on either side from the nostril to the eye and beneath this is a well defined brown stripe between this and an area of grey on the upper lip, the stripe becoming yellow under the eye and running to near the forelimb. This is not the case in *P. terraereginae*, where the same area of the snout (beneath the upper line) is all greyish (as seen on the upper lip) and at best has some peppering or marbling, which invariably becomes bright orange or yellow marbling from the eye and further posterior.

P. gerrymarantellii sp. nov. has light brown pigment on the iris, versus dark brown in *P. terraereginae*. *P. gerrymarantellii* sp. nov. in life is depicted on page 53 of Cogger (2014) on top of page.

Distribution: *Platyplectron gerrymarantellii* sp. nov. is found in coastal regions and near coastal regions of northern New South Wales north of Coffs Harbour, including west of the Great Dividing Range through south-east Queensland as far north as Gladstone and including nearby parts of the Brigalow Belt west of the Dividing Range. *P. terraereginae* is found generally along the coast from just south of Rockhampton to the northern tip of Cape York in Queensland, Australia.

Etymology: Named in honour of Gerry Marantelli a frog expert, originally based in Melbourne, Victoria, Australia, but since travelled elsewhere to live, in recognition of his many contributions to herpetology at several levels and numerous roles, in particular with respect of frogs and their captive breeding, including practical programs for the conservation of threatened species.

When he discontinued his employment at Melbourne Zoo (Zoos Victoria) he commented that he found it untenable that he could masquerade as working for "captive breeding recovery programmes" that had as their principal aim to not breed the relevant species.

The perverse logic behind this was to ensure that the Melbourne Zoo maintained their monopoly and commercial self-interest in being the only facility with the species. By ensuring other zoos and potential keepers and breeders did not possess relevant rare and endangered species, Melbourne Zoo was able to maintain a monopoly position in being the only people to get favourable media for trying to save the species and to sell rights associated with them, be it admissions through their front gate, or for photos for books, for which they would seek large sums of cash in "royalties" and prominent "acknowledgements" in the relevant works.

Notable among these captive breeding recovery programs designed to ensure a Zoos Victoria monopoly on species by avoiding breeding too many of them were the Leadbeater's Possums *Gymnoblepius leadbeateri* McCoy, 1867 and the Baw Baw Frog *Philoria frosti* Spencer, 1901 programs.

See for example the webpages at:

<https://www.zoo.org.au/fighting-extinction/local-threatened-species/baw-baw-frog/>

or

<https://www.zoo.org.au/fighting-extinction/local-threatened-species/leadbeaters-possum-lowland-population/>

both of which have an identical sales pitch and which importantly are little more than clever sales pitches to gain paying customers at the zoo and to solicit donations for their business from duped well meaning conservation minded people. Each page begs readers to help "By visiting our zoos ... Donate if you can."

Using Search Engine Optimisation (also known as SEO), Zoos Victoria have ensured that their fundraising pages come on top of Google searches for the relevant search terms "Leadbeater's Possums" and "Baw Baw Frog" to ensure that they get the money from swindled donors and this money does not go to anyone they perceive as competition in the wildlife business, including privately owned wildlife shelters and hands on animal rescue organisations.

PLATYPLECTRON TIMJAMESI SP. NOV.

LSID urn:lsid:zoobank.org:act:1D691F16-71FB-4102-9D4F-738E9B8EEFCC

Holotype: A preserved female specimen at the South Australian Museum, Adelaide, South Australia, Australia, specimen number R34733 collected from Llangothlin, New South Wales, Australia, Latitude -30.13 S., Longitude 151.68 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.50036 collected at 24 miles south-east of Glen Innes at Fowlers Creek, New South Wales, Australia, Latitude -29.9044 S., Longitude 151.97527 E.

Diagnosis: *P. timjamesi* sp. nov. has until now been regarded as a population of *P. dumerilii* Peters, 1863, including at the subspecies level as defined by Eipper and Rowland (2018).

Eipper and Rowland (2018) provide diagnostic information separating all recognized subspecies of *P. dumerilii* as recognized by them.

The type form of *P. dumerilii* with type locality of near Gawler, South Australia is found in south-east Australia, but not including the New England region of New South Wales and immediately adjacent elevated regions north of there in Queensland, where it is replaced by *P. timjamesi* sp. nov.

The putative species *P. interioris* Fry, 1913, which genetically is virtually indistinguishable from nominate *P. dumerilii* is separated from that species (*P. dumerilii*), *P. grayi* (Steindachner, 1867) and *P. timjamesi* sp. nov. by having a brilliant deep yellow colour on the belly and lower flanks invariably with yellow flecks, spots or these merged to form irregular blotches, sometimes with greyish-white peppering on the flanks and on the belly itself with only a few yellow spots or none at all, versus a belly that may be creamy yellow to white or whitish-grey, with distinct black or grey mottling or reticulations.

P. timjamesi sp. nov. is readily separated from both *P. grayi* and *P. dumerilii* (all subspecies), by having light brown pigment in the iris of the eye, versus bright reddish-orange in *P. grayi* or dark brown to orangeish-red in *P. dumerilii* (all subspecies).

Both *P. grayi* and *P. dumerilii* (all subspecies) have a well defined black or blackish line starting from the rear of the eye, angled downwards through the ear, before narrowing at a triangular angle. By contrast such a black or blackish line is entirely absent, or if present is effectively indistinct and very hard to see. In effect where this stripe would be, the colouration is either the same as the dorsum or similar, but potentially marginally darker, but not in any way demarcated by a line.

The dorsum of *P. timjamesi* sp. nov. is effectively unmarked, versus always well marked in some way in all subspecies of *P. dumerilii* and *P. grayi*.

The dorsum of *P. timjamesi* sp. nov. generally lacks markings and even on the flanks, any markings or pattern is greatly reduced as to be generally indistinct.

P. timjamesi sp. nov. is further separated from all subspecies of *P. dumerilii* and *P. grayi* by having large and prominent swellings on upper dorsal surface of the upper hind limbs. These swellings are reduced or absent in all subspecies of *P. dumerilii* and *P. grayi*.

The snout is generally unmarked in *P. timjamesi* sp. nov., whereas it has at least some markings in all subspecies of *P. dumerilii* and *P. grayi*. *P. timjamesi* sp. nov. in life is depicted in Cogger (2014) at page 48, top left image.

Distribution: *P. timjamesi* sp. nov. is restricted to the higher areas of the New England region of New South Wales and adjacent parts of southern Queensland.

Etymology: Named in honour of Tim James, brother of world famous Australian snowboard champion Scotty James, both of Warrandyte, Victoria, Australia in recognition of their contributions to the outdoor sport of snowboarding. In this case the name is recognizing Tim James, not Scotty. While Scotty James is known for winning the halfpipe at various winter sports contests and as the flag bearer for Australia at the 2018 Winter Olympics, where he won a bronze medal in halfpipe, it is Tim James who does a lot of the filming of Scotty James and bringing his exciting achievements to a global audience. Besides their sporting achievements, both men are amazing human beings willing to lend a hand to help others around them.

RANASTER SNAKEMANSBOGENSIS SP. NOV.

LSID urn:lsid:zoobank.org:act:B8406264-A843-47E6-98FC-3270EA62607F

Holotype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J85079 collected at Yaamba, Queensland, Australia, Latitude -23.0464 S., Longitude 150.3197 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Queensland Museum, Brisbane, Queensland, Australia, specimen number J68801 collected at 20 km south of Marlborough, Queensland, Australia, Latitude -22.9989 S., Longitude 149.8725 E.

Diagnosis: *Ranaster snakemansbogensis* sp. nov. has until now been treated as a population of *R. salmini* (Steindachner, 1867), known in most texts under the genus *Limnodynastes* Fitzinger, 1843, (e.g. Cogger, 2014, Eipper and Rowland, 2018).

R. snakemansbogensis sp. nov. and *R. salmini* and other closely related species are sufficiently divergent from the type species group of *Limnodynastes* Fitzinger, 1843 (type species *Cystignathus peronii* Duméril and Bibron, 1841) to be placed in a separate genus. The name *Ranaster* Macleay, 1877 is available for this assemblage and is therefore used, as this is the procedure set out in the *International Code of Zoological Nomenclature* (Ride et al. 1999). The decree of the Wüster gang of thieves, Kaiser et al. (2013) calls for names such as *Ranaster* to be overwritten as it was coined without peer review and was not coined by a member of their group.

However as the original publication formally naming *Ranaster* was an ICZN compliant and scientific publication for the permanent record, the demands of Kaiser et al. (2013) are formally ignored.

R. snakemansbogensis sp. nov. and *R. salmini* are readily separated from all other species in the genera *Ranaster*, *Limnodynastes* and *Platyplectron* Peters, 1863 by the following suite of characters: There is no skin flap or papillae in the anterior corner of the eye; the inner metatarsal is small to moderate (not large), and not shovel shaped; the metacarpal of inner finger is equal to, or slightly longer or shorter than that of the second finger (but definitely not much longer than the second finger); there is a pale glandular fold or ridge from below the eye to the base of the forelimb; the first finger is longer than the second (as opposed to being equal to or shorter than) and there is a single metatarsal tubercle.

Adult *R. snakemansbogensis* sp. nov. are similar in most respects to *R. salmini*, but are readily separated by colouration. The red or salmon stripes running from either side from above the shoulder to the groin, vertebral stripe from middle of back to vent of same colour (sometimes running the full length of the body) and other orange markings or flushes on the body and limbs as seen in *R. salmini* are instead a washed out light yellow colour in *R. snakemansbogensis* sp. nov., which may have a slight orange tinge, but not the brilliant orange, pink or red as seen in *R. salmini*. Importantly these differences are obvious in live specimens.

R. snakemansbogensis sp. nov. has mainly dark pigment on the upper labial area, versus mainly light in *R. salmini*.

R. salmini in life is depicted in Vanderduys 2012 at p. 89 bottom, or Anstis (2013) at p. 413 (both sexes), or Clyne (1969) at p. 57 (top).

R. snakemansbogensis sp. nov. in life can be found online at:

<https://www.flickr.com/photos/smacdonald/362303412/>

and

<https://www.flickr.com/photos/toddburrows/6435136841/>

and

<https://www.flickr.com/photos/toddburrows/6435134219/>

Distribution: *R. snakemansbogensis* sp. nov. occurs in habitat associated with drainages flowing east of the Great Dividing Range, generally north of Hervey Bay and south of Mackay, in central, eastern Queensland, Australia, centred on the Fitzroy River system. *R. salmini* is found generally west of the Great Dividing Range, from central Eastern Queensland, throughout the Darling River basin into central New South Wales and including the Macquarie and Bogan River Drainages.

Etymology: Named in reflection of the location where the species was first discovered by this author, which is in the region of the type locality for the holotype. It was a swamp, or bog, where I had to drop a feces in eastern Queensland, Australia, being a location otherwise known as Snakeman's Bog!

In training for a future Coronavirus pandemic, there was no toilet paper available, so I had to use leaves to wipe my bottom.

RANASTER HENRYWAJSWELNERI SP. NOV.

LSID urn:lsid:zoobank.org:act:FCFB9407-7E5C-4944-B941-957730BF7823

Holotype: A preserved specimen at the Western Australian Museum, Perth, Western Australia, Australia, specimen number R67477 collected at Beverley Springs Station, Western Australia,

Australia, Latitude -16.7167 S., Longitude 125.4667 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 R97978 collected at Mount Hart, Western Australia, Australia, Latitude -16.9167 S., Longitude 125.0667 E.

Diagnosis: *Ranaster henrywajswelneri* sp. nov. and *R. scottijamesi* sp. nov. have until now been treated as populations of the species *R. lignarius* (Tyler, Martin and Davis, 1979) (*comb. nov.*), originally formally named *Megistolotis lignarius*, Tyler, Martin and Davis, 1979, with a type locality of 6.5 km north of Lake Argyle Tourist Village, Western Australia, Australia. Most recent texts, including Anstis (2013), Cogger (2014) and Eipper and Rowland (2018) have placed the putative species in the genus *Limnodynastes* Fitzinger, 1843.

However morphologically and phylogenetically, the best generic placement for the relevant species is in fact within the genus *Ranaster* Macleay, 1877, type species *R. convexusculus* Macleay, 1877.

R. lignarius, *R. henrywajswelneri* sp. nov. and *R. scottijamesi* sp. nov., treated in Anstis (2013), Cogger (2014) and Eipper and Rowland (2018) as a single putative species, can be separated from all other species in the genera *Ranaster*, *Limnodynastes* and *Platyplectron*, Peters, 1863 by having a distinct skin flap with papillae in the anterior corner of the eye. A detailed description of the three species (treated as one) can be found in Cogger (2014), Anstis (2013) or the description of Tyler, Martin and Anstis (1979).

There are three main geographically disjunct populations and forms, these being one centred on the Arnhemland escarpment, the nominate form in the East Kimberley, centred on the Ord River drainage and a third form in the West Kimberley.

R. scottijamesi sp. nov. from the Arnhemland escarpment and nearby areas is separated from both *R. lignarius* and *R. henrywajswelneri* sp. nov. by having a brownish or greyish dorsal colouration without distinctive markings and contrasting lighter areas being of a marbled appearance. These marbled markings, or spots or flecks are also on the flanks and limbs.

R. lignarius is readily separated from *R. scottijamesi* sp. nov. and *R. henrywajswelneri* sp. nov. by having a yellowish background colour on the dorsum punctuated with well defined medium-sized reddish-orange spots, the same colouration continuing on the limbs, but not the lower flanks, with the arrangement of markings on the limbs, not being in obvious spots as for the dorsal surface. The mid and lower flanks of *R. lignarius* are light as opposed to dark in *R. scottijamesi* sp. nov..

R. henrywajswelneri sp. nov. is readily separated from *R. scottijamesi* sp. nov. and *R. lignarius* by having a creamish background on the dorsum with fairly distinct darker purplish-brown markings including one or more large and irregular shaped spots or blotches, usually seen on the upper or mid back. In terms of colouration both *R. henrywajswelneri* sp. nov. and *R. scottijamesi* sp. nov. are similar, but the two can be readily separated by the fact that *R. henrywajswelneri* sp. nov. has weakly marked or defined pattern on the dorsal surfaces of the hind limbs, versus well marked and a well defined pattern of light blotches on a dark surface in *R. scottijamesi* sp. nov..

R. lignarius divergens subsp. nov. from the Gregory National Park, in north-west Northern Territory, Australia is similar in most respects to *R. lignarius* in colouration, as in having a yellowish background colour on the dorsum, but unlike the nominate subspecies, the darker dorsal markings do not show as well defined spots, but instead have a more-or-less marbled appearance, but unlike that seen in *R. scottijamesi* sp. nov. the demarcation between light and dark is well defined.

R. lignarius divergens subsp. nov. is further separated from the nominate subspecies of *R. lignarius* by having small yellow spots on purplish forelimbs, versus large irregular yellow blotches of irregular shape and similar markings, including large spots on the forelimbs.

R. lignarius in life is depicted in Anstis (2013) on page 406, top right and page 407, bottom right and Eipper and Rowland (2018) on page 32 at bottom.

R. scottijamesi sp. nov. in life is depicted in Cogger (2014) on page 50 at top left, Eipper and Rowland (2018) on page 32 at top and in Anstis (2013), on page 406 second down on right.

An image of *R. henrywajswelneri* sp. nov. in life can be found online at:

<https://www.mediastorehouse.com/australian-views/animals/frogs/woodworker-frog-limnodynastes-lignarius-10848498.html>

Distribution: *R. henrywajswelneri* sp. nov. is confined to the West Kimberley region of Western Australia, Australia.

R. scottijamesi sp. nov. is confined to Arnhemland and nearby hilly parts of the Northern Territory.

R. lignarius (of the nominate subspecies) is confined to the East Kimberley region, centred on the Ord River basin.

The subspecies *R. lignarius divergens* subsp. nov. is found in the Gregory National Park, north-west Northern Territory, Australia.

Etymology: Named in honour of Henry Wajswelner, Physiotherapist at Mount Hotham, Victoria Australia (2019), normally resident at Carlton, Victoria in recognition of his many contributions to the welfare and safety of ski and snowboarders at Mount Hotham, including at very strange hours of the day and night, as well as services to physiotherapy in general in Australia.

RANASTER SCOTTIJAMESI SP. NOV.

LSID urn:lsid:zoobank.org:act:49724BC4-1161-445E-99CF-275612376D13

Holotype: A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen number R.31044 collected at Remusatia Gorge, Mount Brockman, Northern Territory, Australia, Latitude -12.75 S., Longitude 132.93 E. This government-owned facility allows access to its holdings. The same specimen is listed as a paratype for the species *R. lignarius*, (holotype specimen from Western Australia) but it is herein treated as a separate taxon.

Paratype: A preserved specimen at the Australian Museum, Sydney, New South Wales, Australia, specimen number R.97512 collected at Jabiluka Project Area, Northern Territory, Australia, Latitude -12.533 S., Longitude 132.916 E.

Diagnosis: *Ranaster scottijamesi* sp. nov. and *R. henrywajswelneri* sp. nov. have until now been treated as populations of the species *R. lignarius* (Tyler, Martin and Davis, 1979) (*comb. nov.*), originally formally named *Megistolotis lignarius*, Tyler, Martin and Davis, 1979, with a type locality of 6.5 km north of Lake Argyle Tourist Village, Western Australia, Australia.

Most recent texts, including Anstis (2013), Cogger (2014) and Eipper and Rowland (2018) have placed the putative species in the genus *Limnodynastes* Fitzinger, 1843.

However morphologically and phylogenetically, the best generic placement for the relevant species is in fact within the genus *Ranaster* Macleay, 1877, type species *R. convexiusculus* Macleay, 1877.

R. lignarius, *R. henrywajswelneri* sp. nov. and *R. scottijamesi* sp. nov., treated in Anstis (2013), Cogger (2014) and Eipper and Rowland (2018) as a single putative species, can be separated from all other species in the genera *Ranaster*, *Limnodynastes* and *Platyplectron*, Peters, 1863 by having a distinct skin flap with papillae in the anterior corner of the eye. A detailed description of the three species (treated as one) can be found in Cogger (2014), Anstis (2013) or the original description of Tyler, Martin and Anstis (1979). There are three main geographically disjunct populations and forms, these being one centred on the Arnhemland escarpment, the nominate form in the East Kimberley, centred on the Ord River drainage and a third form in the West Kimberley.

R. scottijamesi sp. nov. from the Arnhemland escarpment and nearby areas is separated from both *R. lignarius* and *R. henrywajswelneri* sp. nov. by having a brownish or greyish dorsal colouration without distinctive markings and contrasting lighter areas being of a marbled appearance. These marbled markings, or spots or flecks are also on the flanks and limbs.

R. lignarius is readily separated from *R. scottijamesi* sp. nov. and *R. henrywajswelneri* sp. nov. by having a yellowish background colour on the dorsum punctuated with well defined medium-sized

reddish-orange spots, the same colouration continuing on the limbs, but not the lower flanks, with the arrangement of markings on the limbs, not being in obvious spots as for the dorsal surface. The mid and lower flanks of *R. lignarius* are light as opposed to dark in *R. scottijamesi* sp. nov..

R. henrywajswelneri sp. nov. is readily separated from *R. scottijamesi* sp. nov. and *R. lignarius* by having a creamish background on the dorsum with fairly distinct darker purplish-brown markings including one or more large and irregular shaped spots or blotches, usually seen on the upper or mid back. In terms of colouration both *R. henrywajswelneri* sp. nov. and *R. scottijamesi* sp. nov. are similar, but the two can be readily separated by the fact that *R. henrywajswelneri* sp. nov. has weakly marked or defined pattern on the dorsal surfaces of the hind limbs, versus well marked and a well defined pattern of light blotches on a dark surface in *R. scottijamesi* sp. nov..

R. lignarius divergens subsp. nov. from the Gregory National Park, in north-west Northern Territory, Australia is similar in most respects to *R. lignarius* in colouration, as in having a yellowish background colour on the dorsum, but unlike the nominate subspecies, the darker dorsal markings do not show as well defined spots, but instead have a more-or-less marbled appearance, but unlike that seen in *R. scottijamesi* sp. nov. the demarcation between light and dark is well defined.

R. lignarius divergens subsp. nov. is further separated from the nominate subspecies of *R. lignarius* by having small yellow spots on purplish forelimbs, versus large irregular yellow blotches of irregular shape and similar markings, including large spots on the forelimbs.

R. lignarius in life is depicted in Anstis (2013) on page 406, top right and page 407, bottom right and Eipper and Rowland (2018) on page 32 at bottom.

R. scottijamesi sp. nov. in life is depicted in Cogger (2014) on page 50 at top left, Eipper and Rowland (2018) on page 32 at top and in Anstis (2013), on page 406 second down on right.

An image of *R. henrywajswelneri* sp. nov. in life can be found online at: <https://www.mediastorehouse.com/australian-views/animals/frogs/woodworker-frog-limnodynastes-lignarius-10848498.html>

Distribution: *R. scottijamesi* sp. nov. is confined to Arnhemland and nearby hilly parts of the Northern Territory.

R. henrywajswelneri sp. nov. is confined to the West Kimberley region of Western Australia, Australia.

R. lignarius (of the nominate subspecies) is confined to the East Kimberley region, centred on the Ord River basin.

The subspecies *R. lignarius divergens* subsp. nov. is found in the Gregory National Park, north-west Northern Territory, Australia.

Etymology: Named in honour of Scotty James of Warrandyte, Victoria, Australia, in recognition for his services for snowboarding worldwide. He was the flag bearer for Australia at the 2018 Winter Olympics, where he won a bronze medal in halfpipe. He has won numerous titles since and has inspired countless young people to get out of their homes and to enjoy the outdoor environment in sport, which in turn encourages people to want to do what is needed to preserve and enhance the world's natural assets.

RANASTER LIGNARIUS DIVERGENS SUBSP. NOV.

LSID urn:lsid:zoobank.org:act:0D46468E-C03C-4C58-889C-1CC76DF3353E

Holotype: A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen number R25944 collected at Jasper Gorge, Gregory National Park, Northern Territory, Australia, Latitude -16.03 S., Longitude 130.739 E. This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Museum and Art Gallery of the Northern Territory, Darwin, Northern Territory, Australia, specimen number R23873, collected at the Matt Wilson Escarpment, Gregory National Park, Northern Territory, Australia, Latitude -15.458 S., Longitude 131.253 E.

Diagnosis: *Ranaster scottijamesi* sp. nov. and *R. henrywajswelneri* sp. nov. have until now been treated as

populations of the species *R. lignarius* (Tyler, Martin and Davis, 1979) (*comb. nov.*), originally formally named *Megistolotis lignarius*, Tyler, Martin and Davis, 1979, with a type locality of 6.5 km north of Lake Argyle Tourist Village, Western Australia, Australia.

Most recent texts, including Anstis (2013), Cogger (2014) and Eipper and Rowland (2018) have placed the putative species in the genus *Limnodynastes* Fitzinger, 1843.

However morphologically and phylogenetically, the best generic placement for the relevant species is in fact within the genus *Ranaster* Macleay, 1877, type species *R. convexiusculus* Macleay, 1877.

R. lignarius, *R. henrywajswelneri* sp. nov. and *R. scottijamesi* sp. nov., treated in Anstis (2013), Cogger (2014) and Eipper and Rowland (2018) as a single putative species, can be separated from all other species in the genera *Ranaster*, *Limnodynastes* and *Platyplectron*, Peters, 1863 by having a distinct skin flap with papillae in the anterior corner of the eye. A detailed description of the three species (treated as one) can be found in Cogger (2014), Anstis (2013) or the original description of Tyler, Martin and Anstis (1979).

There are three main geographically disjunct populations and forms, these being one centred on the Arnhemland escarpment, the nominate form in the East Kimberley, centred on the Ord River drainage and a third form in the West Kimberley.

R. scottijamesi sp. nov. from the Arnhemland escarpment and nearby areas is separated from both *R. lignarius* and *R. henrywajswelneri* sp. nov. by having a brownish or greyish dorsal colouration without distinctive markings and contrasting lighter areas being of a marbled appearance. These marbled markings, or spots or flecks are also on the flanks and limbs.

R. lignarius is readily separated from *R. scottijamesi* sp. nov. and *R. henrywajswelneri* sp. nov. by having a yellowish background colour on the dorsum punctuated with well defined medium-sized reddish-orange spots, the same colouration continuing on the limbs, but not the lower flanks, with the arrangement of markings on the limbs, not being in obvious spots as for the dorsal surface. The mid and lower flanks of *R. lignarius* are light as opposed to dark in *R. scottijamesi* sp. nov..

R. henrywajswelneri sp. nov. is readily separated from *R. scottijamesi* sp. nov. and *R. lignarius* by having a creamish background on the dorsum with fairly distinct darker purplish-brown markings including one or more large and irregular shaped spots or blotches, usually seen on the upper or mid back. In terms of colouration both *R. henrywajswelneri* sp. nov. and *R. scottijamesi* sp. nov. are similar, but the two can be readily separated by the fact that *R. henrywajswelneri* sp. nov. has weakly marked or defined pattern on the dorsal surfaces of the hind limbs, versus well marked and a well defined pattern of light blotches on a dark surface in *R. scottijamesi* sp. nov..

R. lignarius divergens subsp. nov. from the Gregory National Park, in north-west Northern Territory, Australia is similar in most respects to *R. lignarius* in colouration, as in having a yellowish background colour on the dorsum, but unlike the nominate subspecies, the darker dorsal markings do not show as well defined spots across the entire dorsum, but instead have a more-or-less marbled appearance, but unlike that marbled appearance seen in *R. scottijamesi* sp. nov. the demarcation between light and dark in this subspecies is well defined.

R. lignarius divergens subsp. nov. is further separated from the nominate subspecies of *R. lignarius* by having small yellow spots on purplish forelimbs, versus large irregular yellow blotches of irregular shape and similar markings, including large spots on the forelimbs.

R. lignarius in life is depicted in Anstis (2013) on page 406, top right and page 407, bottom right and Eipper and Rowland (2018) on page 32 at bottom.

R. scottijamesi sp. nov. in life is depicted in Cogger (2014) on page 50 at top left, Eipper and Rowland (2018) on page 32 at top and in Anstis (2013), on page 406 second down on right.

An image of *R. henrywajswelneri* sp. nov. in life can be found

online at: <https://www.mediastorehouse.com/australian-views/animals/frogs/woodworker-frog-limnodynastes-lignarius-10848498.html>

Distribution: *R. scottijamesi* sp. nov. is confined to Arnhemland and nearby hilly parts of the Northern Territory.

R. henrywajswelneri sp. nov. is confined to the West Kimberley region of Western Australia, Australia.

R. lignarius (of the nominate subspecies) is confined to the East Kimberley region, centred on the Ord River basin.

The subspecies *R. lignarius divergens* subsp. nov. is found in the Gregory National Park, north-west Northern Territory, Australia.

Etymology: Named in reflection of the fact that this form is divergent from the nominate subspecies in terms of morphology, distribution and historical divergence.

CONSERVATION THREATS TO THE RELEVANT SPECIES

There are no known significant immediate conservation threats to any species discussed within this paper.

However, if the Australian government persists with its "Big Australia Policy", (see for example Saunders 2019 or Zaczek 2019), that being a long-term aim to increase the human population in Australia to over 100 million people by year 2150 (from the present 25 million as of 2019), all sorts of unforeseen threats to the survival of these species may emerge.

Due to unforeseen potential threats I recommend further research to identify likely potential threats including arising from land clearing for homes or farming activities, changed vegetation regimes, introduced pests and potential pathogens, including those introduced via the legal importation of non-native amphibians by government-owned zoos.

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