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**Front cover photo: Raymond Hoser.**

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## **Record clutch sizes and record body sizes for Copperheads (*Austrelaps*, Worrell, 1963) (Serpentes: Elapidae).**

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### **ABSTRACT**

After breeding in captivity both highland and lowland Copperheads (Genus *Austrelaps* Worrell, 1963) more than 12 times over a period spanning nearly 50 years, only twice has this author ever had more than 20 young born from a single female. This paper reports on two record-sized clutches of young from two captive female Lowland Copperheads *Austrelaps superbus* (Günther, 1858) in early 2019, numbering 27 and 35 young. Two over-sized wild caught male Copperheads measuring a total of exactly 135 cm are also reported as is the sex ratio of Copperheads caught in "call outs" by the Melbourne Snake Catcher.

**Keywords:** Snakes; captive breeding; Copperhead; Melbourne; Victoria; New South Wales; *Austrelaps*; *superbus*; *ramsayi*; live young; Australia; oversize; sex ratio; record clutch sizes; snake catcher.

### **INTRODUCTION**

I (Raymond Hoser) kept and bred Highlands Copperheads *Austrelaps ramsayi* (Krefft, 1864) when living in Lane Cove, New South Wales, Australia, getting litters of 13 and 14 young from two large females that originated within 10 km of Oberon, New South Wales. The three relevant snakes were captured in the wild in January 1974 at a time when it was legal to do so and they both produced litters in March 1976 having mated with a wild-caught in the autumn of 1975. Over the previous two years they had been kept in a particularly cold basement area, which was a modified under home garage.

In the period to 1983, I also became aware of several other cases of wild-caught *A. ramsayi* specimens giving birth and without exception all broods of young were in the range 8-17. Detailed scientific records were kept at the time, but were seized in an illegal armed raid by the New South Wales National Parks and Wildlife Service (NPWS), organised by John (Jack) Rex Giles working at NPWS at the time in mid 1983. In spite of an order the material be returned, it was not.

In the period 2003 to 2019, I have kept and bred Lowlands Copperheads *Austrelaps superbus* (Günther, 1858) from the Melbourne region, when living at Park Orchards, Melbourne, Victoria, including multi-generation snakes more than 10 times. These are ones that have been bred, raised and bred again.

I have also been able to view more than 10 freshly killed gravid Lowlands Copperheads, obtained in my role as the Melbourne Snake Catcher (see Australian Registered Trademark Number: 1436529, "Snake Catcher"). Unfortunately as the Melbourne Snake Catcher, it is not uncommon for me to be called to catch fatally injured snakes or deal with snakes that are simply dead on arrival due to circumstances beyond my control.

Well preserved and freshly killed snake specimens have been lodged at the National Museum of Victoria to allow others to use the specimens for scientific research, while those too decomposed to be useful have simply been discarded.

Until 2019, without exception, none have ever given birth to

more than 20 young at a time or had a number in excess of that within them. The most common number of young for Lowlands Copperheads around Melbourne is 8 at a time.

A clutch size under that number is virtually unheard of, although I do recall one freshly killed snake carrying just five young.

Clutch sizes above 8 snakes, are not particularly rare, but in my experience with Melbourne area snakes, this occurs less than 50 percent of the time.

They are also more likely in particularly large snakes, where numbers between 10 and 20 young are reasonably common.

In writing the preceding, I note that most female Lowland Copperheads in the Melbourne region are significantly smaller than males. Non-growing adult females average about 90 cm (total length) and males 100 cm, but within these numbers is hidden the fact that males are significantly more thick-set and robust in build than females and of about 2-3 times the weight in the normal non-growing adult state, even when of similar length. Snakes, including Lowlands Copperheads are bred at our facility to ensure we maintain a stock of healthy snakes for our Reptile Shows in Melbourne, Australia as well as to supply other wildlife demonstrators across Australia, to supply zoos and also for private hobbyist keepers. We have never sold any reptiles, preferring to give away all offspring. This paper summarizes the results of the 2018 / 2019 breeding of the Lowlands Copperheads.

### **MATERIALS AND METHODS**

The Lowlands Copperheads are kept at the facility here as detailed in Hoser (2009).

To breed the snakes, they are cooled over winter as brutally as we reasonably can. In the context of the Copperheads, this means their cage heating is literally switched off for as long as possible over the cooler months to enable sperm production, but notably the main mating season is in autumn and after the main summer heat. This is a period of relatively cool nights and warm days, meaning that planning to breed Copperheads (all species)

is effectively a two season job, in that cooling over one winter, will result in breeding after the next winter (see Hoser 2018). In March 2018 I artificially inseminated 5 female Lowlands Copperheads at our breeding facility using the method detailed in Hoser (2008) as outlined for this species in Hoser (2018). Semen was obtained from two captive born males and inseminated into five captive born females. All five snakes ultimately produced young including one (first of season) which produced 27 live young on 5 January 2019. The date of birth would have been ahead of wild counterparts in Victoria due to the fact that hibernation for the relevant snakes at our facility ended in August 2018, by way of us manually increasing the cage temperatures, whereas cold outside weather would have kept wild counterparts less active for some weeks after this time. At our facility, due to difficulties in keeping temperatures low in the winter, we are sometimes forced to end hibernation early in order to feed the snakes and prevent dangerous weight loss. The snakes are held in a room and not outdoors and at an average temperature of 15-20 deg C. versus 10-15 deg. C. or less likely for snakes outside in a hibernation spot in the wild, our snakes do noticeably lose condition over winter (when not being fed) whereas colder wild counterparts do not suffer the same loss of condition or at anything like the same rate. Further accelerating the potential loss of condition of our snakes is the use of some for live reptile shows and displays, although these are usually the bigger more robust male copperheads for which condition loss is not a limiting factor in determining timing of ending of hibernation. For some years we have held ten or more adult Copperheads and so invariably have more snakes than we need in terms of taking specimens to our reptile shows.

## RESULTS

As mentioned already one female gave birth to a litter of 27 healthy live young on 5 January 2019. Two others gave birth to 8 young and another gave birth to 13 young. Significantly a very large 105 cm long (total length) and very thick and robust female gave birth to an unprecedented 35 live young all in perfect health (no unfertilized eggs, slugs or dead young) on 24 February 2019.

The female was of a yellowish-orange colour as shown on the front cover of this journal, being the said snake. She was inseminated from a black male with a red belly, this being one of the more common colour configurations in this species. The black phase is often described as "charcoal" and most accurately describes it. Young were born of all common colour forms, including black with red belly, black with white belly, red, yellow and orange and all were particularly large and robust like the female. The male from where the semen came from was of average size and build for a male.

I note here that Copperheads (of all Australian species) come in three main colours, being black (charcoal), red and yellow and combinations thereof. Each of these appear to be controlled by single alleles for each colour.

In terms of the female snakes at our facility, all are kept on their own (one per cage) and the design of the cages does not allow young snakes to escape the cage (or enter from elsewhere), meaning that counting young was a simple process. It was done by removing all newborn snakes from their cage.

On 16 February 2019, as the Melbourne Snake Catcher I was called to remove a snake from 1 Fairway Court, Rowville, Victoria. The snake was a large heavily built male Lowlands Copperhead (charcoal with red belly), measured at exactly 135 cm long (= four and half feet in length).

This is the largest of several hundred copperheads caught by myself as the Melbourne Snake Catcher over some decades. The snake was photographed in a box next to a ruler to confirm the size and bulk of the snake.

A male Highlands Copperhead of the same length (135 cm) also measured, of the yellow colour phase was caught by myself 10 km east of Oberon, New South Wales in 1977, being the largest of over 100 of that species I have caught and/or seen.

On 4 October 2017 I caught an adult female Lowlands Copperhead measuring exactly 110 cm at the Peninsula Kingswood Golf Club, Dingley, Victoria, this probably being the largest and most heavily built female Copperhead I have ever caught.

I should note that unmeasured large copperheads do appear significantly longer and thicker than they actually are, leading to easy over-estimation of size of unmeasured snakes. By way of example a relatively uncommon 120 cm long male Copperhead has a similar appearance to a 180 cm Red-bellied Black Snake *Pseudechis porphyriacus* (Shaw, 1794).

Anecdotal reports of larger Copperheads (i.e. over 135 cm long), especially from Tasmania are common among herpetologists. However there is little doubt that at least some of these claims are exaggerations. It would be helpful if herpetologists collecting or sighting particularly large specimens use some means of verification of their claims. However in Australia at the moment, the law forbids anyone from "interfering with wildlife", which is defined as any native vertebrate, meaning that useful citizen science is effectively outlawed.

While permits to trap or interfere with wildlife are obtainable, this is usually only for a limited number of people such as university based academics and well-known scientists, meaning that pretty much everyone else in Australia is legally at risk and may be jailed, should they "interfere with wildlife" in any way. See Hoser (1989, 1991, 1993 and 1996 for detail).

In terms of colouration of Copperheads and size, there appears to be no obvious correlation between colour and size (i.e. red, black, yellow or whatever), with oversized animals being of any given colour. On a year-round basis, the sex ratio of Copperheads caught by way of "call out" to homes and businesses around Melbourne is 10 males for four females.

The greatest number of Copperheads caught in "call outs" are in the months of February and March which is clearly mating season for the species, although there is a lesser spike in the period end August to October as well.

If non-adult snakes were removed from the sample, the ratio would skew even more heavily towards the males.

## CONCLUSIONS

While I cannot claim that there are no cases of Copperheads (genus *Austrelaps*) giving birth to more than 35 young in history, there is certainly no such case in the published scientific record. Hence the publication of this paper. Same applies for a lower number of 27 young from an Australian Copperhead (*Austrelaps*) of any species as also happened at our facility in 2009.

Put another way, if a random person told me that they had possessed a Copperhead that gave birth to 35 young in a single litter, until 2019, I would have replied that such an event would be impossible.

In terms of size, any claim of Copperheads over 120 cm (= 4 foot) is generally not believed by myself in the absence of a body.

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**CONFLICTS OF INTEREST - NONE.**

**Asiatic Waterside Skinks, *Tropidophorus* Duméril and Bibron, 1839. A long overdue break up of the archaic genus *sensu-lato*, resulting in a total of eight genera, three resurrected from synonymy, four named for the first time and the additional descriptions of three new species.**

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### ABSTRACT

Asiatic Waterside Skinks, *Tropidophorus* Duméril and Bibron, 1839 as recognized by herpetologists in year 2019 are a broadly monophyletic group, but including several divergent lineages of deep antiquity. As numerous molecular studies have confirmed these relevant groups all diverged at least 10-15 MYA or similar (e.g. Honda *et al.* 2006, Pui *et al.* 2017, Pyron *et al.* 2013), it is appropriate that all be recognized as separate genera.

To that effect, this paper does just that. In assigning formal names to each divergent group of species, three names are resurrected from synonymy and four new genera are created in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Another divergent lineage is also formally named as a subgenus.

Three divergent species within the assemblage are also formally named for the first time.

**Keywords:** Taxonomy; reptilia; squamata; nomenclature; Lizards; Asia; Skink; *Tropidophorus*; *Norbea*; *Aspris*; *Enoplosaurus*; *Amphixestus*; new genus: *Greersaurus*; *Barnettsaurus*; *Kerryleewennigea*; *Coggersaurus*; new subgenus; *Paragreerscincus*; new species; *joeymontebelloi*; *peterkraussi*; *russellgranti*.

### INTRODUCTION

Asiatic Waterside Skinks, *Tropidophorus* Duméril and Bibron, 1839 are a well-known group of lizards found mainly in south-east Asia.

As recognized by herpetologists in year 2019 they are a broadly monophyletic group.

However, within this assemblage are several divergent lineages of deep antiquity.

As numerous molecular studies have confirmed these relevant groups all diverged at least 10-15 MYA or similar (e.g. Honda *et al.* 2006, Pui *et al.* 2017, Pyron *et al.* 2013), it is appropriate that all be recognized as separate genera.

To that effect, this paper does just that. In assigning formal names to each divergent group of species, three names are resurrected from synonymy and four new genera are created in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Another divergent lineage is also formally named as a subgenus.

Three divergent species within the assemblage are also formally named for the first time.

### MATERIALS, METHODS AND RESULTS

These are inferred in both the abstract and introduction, but as a matter of trite I spell them out in a little more explicit detail.

The available literature was examined relevant to the genus *Tropidophorus* Duméril and Bibron, 1839 and other phylogenetically close taxa.

Additional to this has been inspection of specimens as required and possible in order to ascertain the classification of the genera or species within the genera, both as defined or including unnamed taxa when they are evident.

Available information in the form of photos of specimens with good available locality data and other information was also utilized in this study.

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in breach of undertakings to the court (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper, even though it would be clearly improved if I took some further years to get further data,

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

This comment is made noting the extensive increase in human population in the relevant region and the general environmental destruction across the planet as documented by Hoser (1991), including low density areas without a large permanent human population.

I also note the abysmal environmental record of various National, State and Local governments in the relevant region over the past 200 years as detailed by Hoser (1989, 1991, 1993, 1996 and 2010) in the face of ongoing threats as diverse as introduced species, habitat destruction and modification,

introduced pathogens and other factors and combinations thereof.

It is also noteworthy that I cannot guarantee another illegal armed raid on our facility, involving theft of materials and data again at some unspecified date in the future. Therefore it is important that the taxonomy of this group be largely resolved herein, rather than be potentially delayed indefinitely and with the negative conservation outcomes this is likely to entail.

Published literature relevant to the taxonomy and nomenclature adopted within this paper includes the following: Annandale (1912), Auliya (2006), Barbour (1912, 1921), Beukema (2011), Binaday *et al.* (2017), Blyth (1854), Bobrov and Semenov (2008), Boettger (1886), Boulenger (1887, 1890, 1895), Bourret (1939), Brown and Alcalá (1980), Brygoo (1985), Chan-ard *et al.* (2015), Chuaynkern *et al.* (2005, 2014a, 2014b), Cox *et al.* (1998), Dan and Hillenius (1966), Das *et al.* (2009), Das (2004, 2010), de Rooij (1915), Duméril and Bibron (1839), Ebenhard and Sjögren (1984), Fei *et al.* (2010), Ferner *et al.* (2000), Fischer (1884), Gaulke (2011, 2012), Gawor *et al.* (2016), Gojo-Cruz and Afuang (2018), Goldberg (2017), Gray (1845), Greer and Biswas (2004), Guo and Deng (2010), Günther (1861a, 1861b, 1864, 1873), Harbig (2000), Hartmann (2012), Hartmann *et al.* (2009), Hecht *et al.* (2013), Heidrich (2007), Hikida and Ota (1994), Hikida *et al.* (2002, 2003), Iskandar and Erdelen (2006), Jestrzanski *et al.* (2013), Klemmer and Gaulke (1993), Koch (2011, 2012), Lalremsanga *et al.* (2010), Lenz (2012), Lidth De Juede (1905), Loveridge (1945), Malkmus (1991), Malkmus *et al.* (2002), Manthey (1983), Manthey and Grossmann (1997), Mathew (2006), Mittleman (1952), Nabhitabhata *et al.* (2000), Ngilangil (2016), Ngo *et al.* (2000), Nguyen *et al.* (2009, 2010a, 2010b, 2010c, 2018), Ota *et al.* (1991), Pauwels *et al.* (2000), Peters (1871), Pianka and Vitt (2003), Pui and Das (2017), Pui *et al.* (2017), Pyron *et al.* (2013), Rao *et al.* (2011), Ride *et al.* (1999), Sanguila *et al.* (2016), Sauvage (1879), Smith (1919, 1923, 1935), Stejneger (1910), Stuart *et al.* (2006, 2010), Stuebing *et al.* (1999), Supsup *et al.* (2016), Sy and Parcon (2014), Tan (1993), Taylor (1915, 1922a, 1922b, 1963), Theobald (1868), Venugopal (2010), Waiprom *et al.* (2013), Wanger (2011), Welch *et al.* (1990), Wen (1992), Werning (2006), Wu (2015), Zhang *et al.* (2012), Zhao and Adler (1993), Ziegler *et al.* (2005, 2006a, 2006b, 2007, 2015) and sources cited therein.

In terms of the species descriptions, all three newly named taxa have until now been regarded as populations of previously described species.

As far as I am aware, no one has until now speculated that any may be distinct at the species level.

However each are significantly divergent from the type forms, each are allopatric in distribution and the relevant taxa are also long separated by wide zones of unsuitable habitat where they clearly do not occur. The age of these biogeographical barriers in their present form is measured in the millions of years meaning that in each case the relevant taxa have diverged sufficiently to be regarded as full species.

In the case of the putative species *Tropidophorus cocincinensis* Duméril and Bibron, 1839, it appears that there may be two separate species.

Based on the original description of Duméril and Bibron, 1839, giving a collection locality of "Cochinchine" at page 558, it appears that the population from Ban Cup, Huong Hoa District, Quang Tri Province, Vietnam is of an undescribed form, worthy of formal recognition at least at the subspecies level.

The morphologically similar species *Tropidophorus microlepis* Günther, 1861 occurs in two distinct separate populations and these are geographically separated and morphologically divergent, so the unnamed Eastern form is herein formally named as a new species.

The species *Aspris berdmorei* Blyth, 1853, of the resurrected genus *Aspris* Blyth, 1853, is in effect split four ways. *A. berdmorei* Blyth, 1853 and the three other species treated as

conspecific with it until now are defined by having an entire fronto-nasal, versus divided in the closely related *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. berdmorei* until now are separated from each other in the descriptions of the two hitherto unnamed forms below and a third available name is resurrected from synonymy.

All are morphologically distinct and geographically separated by wide areas of apparently unsuitable habitat of some antiquity and so I mention again that I had no hesitation at all in formally naming them as new species.

#### SOME KEY POINTS ON THE TAXONOMIC DECISIONS MADE HEREIN

While the genus or species descriptions below, effectively summarize the results of the audit of *Tropidophorus* Duméril and Bibron, 1839 *sensu lato*, it is important that relevant considerations in terms of most of the decisions is spelt out first. Divergent, newly named and resurrected from synonymy genera can be seen appropriately placed in the published molecular phylogenies of Honda *et al.* 2006, Pui *et al.* 2017 and Pyron *et al.* 2013, where the relevant species groups are listed as "*Tropidophorus*".

The divergent species or groups simply match the new genus level entities.

Within *Tropidophorus sensu lato*, the various species groups are divided in line with the formal descriptions below and the result is self evident.

In terms of the following descriptions the following points should be noted:

- 1/ All descriptions of specimens in terms of form and colour relate to normal adult specimens of typical form for each taxon unless otherwise stated and with original tails.
- 2/ Spellings of names assigned to genera or species should not be altered in any way unless mandated by the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) or superseding nomenclatural rules.
- 3/ In the unlikely event a first reviser seeks to merge any genera or species formally named herein, the name to be used is that of the first name used in terms of page priority, also as listed in the abstract keywords.
- 4/ There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

#### GENUS *TROPIDOPHORUS* DUMÉRIL AND BIBRON, 1839

**Type species:** *Tropidophorus cocincinensis* Duméril and Bibron, 1839.

**Diagnosis:** Morphologically the genus *Tropidophorus* Duméril and Bibron, 1839 *sensu lato*, is diagnosed by several characteristics, such as exposure of the superficial tympanum and presence of a single scale at the corner of the eyelid (Greer 1970, Hikida *et al.* 2002, Greer and Biswas 2004).

The relevant species are further diagnosed and separated from other genera by the following: Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed and scaly. Nostril pierced in a single nasal; no supranasals; prefrontals well developed; frontoparietal present, single or double interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellae interiorly.

The genus *Tropidophorus* as herein defined (*sensu stricto*), type species *Tropidophorus cocincinensis* Duméril and Bibron, 1839., is further separated from the other seven genera (formerly treated as being within *Tropidophorus* by the following suite of characters: Some or all of the lateral scale-rows directed obliquely. Two frontoparietals. Two or three large preanals (not one only). Upper head-shields rugose or striated. Dorsal scales strongly keeled, ending in a point; subdigital lamellae smooth.

The three relevant species are separated as follows:

- 1/ Frontal and fronto-nasal entire, fifth supralabial largest, two pre-anal shields, *T. cocincinensis* Duméril and Bibron, 1839, or:

2/ Three preanal shields, dorsal pattern including faded dark and light brown markings and with two rows of dark mid-dorsal flecks running down the body, *T. microlepis* Günther, 1861, or:

3/ Three preanal shields without two rows of dark mid-dorsal flecks running down the body, but instead an obvious dorsal pattern consisting of semi-distinct irregularly shaped yellow crossbands on a chocolate brown background *T. joeymontebelloi* sp. nov.

The genus *Enoplosaurus* Sauvage, 1879, type species *Enoplosaurus insignis* Sauvage, 1879, better known as a junior synonym of *Tropidophorus grayi* Günther 1861, is herein resurrected from the synonymy of *Tropidophorus*.

The relevant species in the genus *Enoplosaurus* are separated from *Tropidophorus* and the other six genera by the following suite of characters: These being as for *Tropidophorus* as defined above, save for dorsal scales that are not only strongly keeled but also spinose, ventrals usually keeled as well and keeled subdigital lamellae (versus smooth in *Tropidophorus*).

The genus *Aspris* Blyth, 1853, type species *Aspris berdmorei* Blyth, 1853, is also resurrected from the synonymy of *Tropidophorus*. The genus is separated from *Tropidophorus* as defined above and the other six genera herein split from *Tropidophorus*, by the unique combination of lateral scales directed straight backwards and smooth head shields. *A. berdmorei* Blyth, 1853 and the three other species treated as conspecific with it until now are defined by having an entire fronto-nasal, versus divided in *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. berdmorei* until now are separated from each other as follows.

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels and two loreal shields, one behind the other.

*Aspris peterkraussi* sp. nov. has 36-40 mid-body rows and two loreal shields, one behind the other.

*Aspris russellgranti* sp. nov. has 32-38 mid-body rows and three loreal shields, the anterior one being divided horizontally.

*Aspris yunnanensis* Boulenger, 1887 has 34 mid-body rows, no dorsal keels of any sort and two loreal shields, one behind the other.

The genus *Norbea* Gray, 1845, type species *Norbea brookei* Gray, 1845 is also resurrected from the synonymy of *Tropidophorus*. The genus name *Amphixestus* Peters, 1871 is also placed within the synonymy of *Norbea*, having a type species of *Amphixestus beccarii* Peters, 1871, being within the same clade of closely related species.

*Norbea* is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of two frontoparietals and a single large preanal.

The genus *Greersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by one or other of the following three suites of characters:

1/ Lateral scales directed straight backwards and head shields feebly rugose, *G. robinsoni* (Smith, 1919), or:

2/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal and fronto-nasal divided *G. thai* (Smith, 1919), or:

3/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal entire, fronto-nasal divided, *G. sinicus* (Boettger, 1886), *G. guangxiensis* (Wen, 1992) (subgenus *Paragreerscincus* subgen. nov.).

The genus *Barnettsaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of keeled dorsal scales and four supraoculars, treated herein as monotypic for *B. micropus* (Lidth De Juede, 1905). Otherwise *Barnettsaurus* gen. nov. is most similar to *Norbea*.

The genus *Kerryleewennigea* gen. nov. is separated from

*Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the following unique suite of characters: Some or all of the lateral scale-rows directed obliquely, two pre-anal shields, frontal and fronto-nasal entire (not divided), fourth (not fifth) supralabial largest.

The genus *Coggersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of smooth head scales (not striated) a completed supraciliary row along the entire length of lateral edge of supraoculars (versus incomplete) and one or other of the following four suites of characters:

1/ Frontonasal undivided; Midbody scales in 22-24 rows; 9-10 scale rows at position of 10th subcaudal, *C. noggei* (Ziegler, Thanh and Thanh, 2005), or:

2/ Frontonasal undivided; midbody scales in 28-32 rows; 11-15 scale rows at position of tenth subcaudal; vertebral scale rows two times broader than neighboring scales, *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002), or:

3/ Frontonasal undivided; prefrontals small, widely separated from each other; nuchals 1-4; supralabials 6; supraciliaries 7-8; midbody scale rows 30-32; dorsal and lateral scales smooth; paravertebral scales 60-69, not widened; ventral scales 56-66; scale rows at position of tenth subcaudal 17-18; medial subcaudals divided from first to fifth, remaining ones approximately 1.5 times wider than neighboring scales *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010), or:

4/ Frontonasal divided; midbody scales in 34 rows *C. matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

**Distribution:** Vietnam, Thailand, Cambodia, Laos.

**Content:** *Tropidophorus cocincinensis* Duméril and Bibron, 1839 (type species), *T. joeymontebelloi* sp. nov.; *T. microlepis* Günther, 1861

#### GENUS ENOPLOSAURUS SAUVAGE, 1879

**Type species:** *Enoplosaurus insignis* Sauvage, 1879 (better known as a junior synonym of *Tropidophorus grayi* Günther 1861).

**Diagnosis:** See within the diagnosis for *Tropidophorus* in this paper.

**Distribution:** Philippines and Sulawesi.

**Content:** *Enoplosaurus grayi* (Günther, 1861) (type species); *E. baconi* (Hikida, Riyanto and Ota, 2003).

#### GENUS ASPRIS BLYTH, 1853

**Type species:** *Aspris berdmorei* Blyth, 1853.

**Diagnosis:** See within the diagnosis for *Tropidophorus* in this paper.

**Distribution:** Thailand, Laos, China, Vietnam.

**Content:** *Aspris berdmorei* Blyth, 1853 (type species); *A. laotus* (Smith, 1923); *A. peterkraussi* sp. nov.; *A. russellgranti* sp. nov.; *A. yunnanensis* Boulenger, 1887.

#### GENUS NORBEA GRAY, 1845.

**Type species:** *Norbea brookei* Gray, 1845.

**Diagnosis:** See within the diagnosis for *Tropidophorus* in this paper.

**Distribution:** Borneo and Philippines.

**Content:** *Norbea brookei* Gray, 1845 (type species); *N. beccarii* (Peters, 1871); *N. davaoensis* (Bacon, 1980); *N. iniquus* (Lidth De Juede, 1905); *N. misaminus* (Stejneger, 1908); *N. mocquardii* (Boulenger, 1895); *N. partelloi* (Stejneger, 1910); *N. perplexus* (Barbour, 1921); *N. sebi* (Pui, Karin, Bauer and Das, 2017).

#### GENUS GREERSAURUS GEN. NOV.

**LSID** urn:lsid:zoobank.org:act:3583E7E7-62BB-41EE-B282-F11E9EBE9725

**Type species:** *Tropidophorus robinsoni* Smith, 1919.

**Diagnosis:** Morphologically the genus *Tropidophorus* Duméril

and Bibron, 1839 *sensu lato*, is diagnosed by several characteristics, such as exposure of the superficial tympanum and presence of a single scale at the corner of the eyelid (Greer 1970, Hikida *et al.* 2002, Greer and Biswas 2004).

The relevant species are further diagnosed and separated from other genera by the following: Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed and scaly. Nostril pierced in a single nasal; no supranasals; prefrontals well developed; frontoparietal present, single or double interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellae interiorly.

The genus *Tropidophorus* as herein defined (*sensu stricto*), type species *Tropidophorus cocincinensis* Duméril and Bibron, 1839., is further separated from the other seven genera (formerly treated as being within *Tropidophorus* by the following suite of characters: Some or all of the lateral scale-rows directed obliquely. Two frontoparietals. Two or three large preanals (not one only). Upper head-shields rugose or striated. Dorsal scales strongly keeled, ending in a point; subdigital lamellae smooth.

The three relevant species are separated as follows:

- 1/ Frontal and fronto-nasal entire, fifth supralabial largest, two pre-anal shields, *T. cocincinensis* Duméril and Bibron, 1839, or:
- 2/ Three preanal shields, dorsal pattern including faded dark and light brown markings and with two rows of dark mid-dorsal flecks running down the body, *T. microlepis* Günther, 1861, or:
- 3/ Three preanal shields without two rows of dark mid-dorsal flecks running down the body, but instead an obvious dorsal pattern consisting of semi-distinct irregularly shaped yellow crossbands on a chocolate brown background *T. joeymontebelloi* sp. nov..

The genus *Enoplosaurus* Sauvage, 1879, type species *Enoplosaurus insignis* Sauvage, 1879, better known as a junior synonym of *Tropidophorus grayi* Günther 1861, is herein resurrected from the synonymy of *Tropidophorus*.

The relevant species in the genus *Enoplosaurus* are separated from *Tropidophorus* and the other six genera by the following suite of characters: These being as for *Tropidophorus* as defined above, save for dorsal scales that are not only strongly keeled but also spinose, ventrals usually keeled as well and keeled subdigital lamellae (versus smooth in *Tropidophorus*).

The genus *Aspris* Blyth, 1853, type species *Aspris berdmorei* Blyth, 1853, is also resurrected from the synonymy of *Tropidophorus*. The genus is separated from *Tropidophorus* as defined above and the other six genera herein split from *Tropidophorus*, by the unique combination of lateral scales directed straight backwards and smooth head shields. *A. berdmorei* Blyth, 1853 and the three other species treated as conspecific with it until now are defined by having an entire fronto-nasal, versus divided in *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. berdmorei* until now are separated from each other as follows.

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels and two loreal shields, one behind the other.

*Aspris peterkraussi* sp. nov. has 36-40 mid-body rows and two loreal shields, one behind the other.

*Aspris russellgranti* sp. nov. has 32-38 mid-body rows and three loreal shields, the anterior one being divided horizontally.

*Aspris yunnanensis* Boulenger, 1887 has 34 mid-body rows, no dorsal keels of any sort and two loreal shields, one behind the other.

The genus *Norbea* Gray, 1845, type species *Norbea brookei* Gray, 1845 is also resurrected from the synonymy of *Tropidophorus*. The genus name *Amphixestus* Peters, 1871 is also placed within the synonymy of *Norbea*, having a type species of *Amphixestus beccarii* Peters, 1871, being within the same clade of closely related species.

*Norbea* is separated from *Tropidophorus* as defined above and

the other six genera formerly treated as within *Tropidophorus* by the presence of two frontoparietals and a single large preanal.

The genus *Greersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by one or other of the following three suites of characters:

1/ Lateral scales directed straight backwards and head shields feebly rugose, *G. robinsoni* (Smith, 1919), or:

2/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal and fronto-nasal divided *G. thai* (Smith, 1919), or:

3/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal entire, fronto-nasal divided, *G. sinicus* (Boettger, 1886), *G. quangxiensis* (Wen, 1992) (subgenus *Paragreerscincus* subgen. nov.).

The genus *Barnettsaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of keeled dorsal scales and four supraoculars, treated herein as monotypic for *B. micropus* (Lidith De Juede, 1905). Otherwise *Barnettsaurus* gen. nov. is most similar to *Norbea*.

The genus *Kerryleewennigea* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the following unique suite of characters: Some or all of the lateral scale-rows directed obliquely, two pre-anal shields, frontal and fronto-nasal entire (not divided), fourth (not fifth) supralabial largest.

The genus *Coggersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of smooth head scales (not striated) a completed supraciliary row along the entire length of lateral edge of supraoculars (versus incomplete) and one or other of the following four suites of characters:

1/ Frontonasal undivided; Midbody scales in 22-24 rows; 9-10 scale rows at position of 10th subcaudal, *C. noggei* (Ziegler, Thanh and Thanh, 2005), or:

2/ Frontonasal undivided; midbody scales in 28-32 rows; 11-15 scale rows at position of tenth subcaudal; vertebral scale rows two times broader than neighboring scales, *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002), or:

3/ Frontonasal undivided; prefrontals small, widely separated from each other; nuchals 1-4; supralabials 6; supraciliaries 7-8; midbody scale rows 30-32; dorsal and lateral scales smooth; paravertebral scales 60-69, not widened; ventral scales 56-66; scale rows at position of tenth subcaudal 17-18; medial subcaudals divided from first to fifth, remaining ones approximately 1.5 times wider than neighboring scales *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010), or:

4/ Frontonasal divided; midbody scales in 34 rows *C. matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

**Distribution:** Thailand, Myanmar (nominated subgenus) and China (Guangxi, Guangdong, Hong Kong), Vietnam (for *Paragreerscincus* subgen. nov.).

**Etymology:** Named in honour of Allen E. Greer, former curator of herpetology at the Australian Museum in Sydney, New South Wales, Australia, now of Mudgee, New South Wales, Australia, in recognition of his immense contributions to herpetology worldwide. "Saurus" is Latin for lizard.

**Content:** *Greersaurus robinsoni* (Smith, 1919) (type species); *G. quangxiensis* (Wen, 1992); *G. sinicus* (Boettger, 1886); *G. thai* (Smith, 1919).

**SUBGENUS PARAGREERSAURUS SUBGEN. NOV.**

**LSID** urn:lsid:zoobank.org:act:51BF36F8-8530-4468-A062-27E24DB06FDD

**Type species:** *Tropidophorus sinicus* Boettger, 1886.

**Diagnosis:** Morphologically the genus *Tropidophorus* Duméril



and Bibron, 1839 *sensu lato*, is diagnosed by several characteristics, such as exposure of the superficial tympanum and presence of a single scale at the corner of the eyelid (Greer 1970, Hikida *et al.* 2002, Greer and Biswas 2004).

The relevant species are further diagnosed and separated from other genera by the following: Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed and scaly. Nostril pierced in a single nasal; no supranasals; prefrontals well developed; frontoparietal present, single or double interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellae interiorly.

The genus *Tropidophorus* as herein defined (*sensu stricto*), type species *Tropidophorus coccinensis* Duméril and Bibron, 1839., is further separated from the other seven genera (formerly treated as being within *Tropidophorus* by the following suite of characters: Some or all of the lateral scale-rows directed obliquely. Two frontoparietals. Two or three large preanals (not one only). Upper head-shields rugose or striated. Dorsal scales strongly keeled, ending in a point; subdigital lamellae smooth.

The three relevant species are separated as follows:

- 1/ Frontal and fronto-nasal entire, fifth supralabial largest, two pre-anal shields, *T. coccinensis* Duméril and Bibron, 1839, or:
- 2/ Three preanal shields, dorsal pattern including faded dark and light brown markings and with two rows of dark mid-dorsal flecks running down the body, *T. microlepis* Günther, 1861, or:
- 3/ Three preanal shields without two rows of dark mid-dorsal flecks running down the body, but instead an obvious dorsal pattern consisting of semi-distinct irregularly shaped yellow crossbands on a chocolate brown background *T. joeymontebelloi* sp. nov..

The genus *Enoplosaurus* Sauvage, 1879, type species *Enoplosaurus insignis* Sauvage, 1879, better known as a junior synonym of *Tropidophorus grayi* Günther 1861, is herein resurrected from the synonymy of *Tropidophorus*.

The relevant species in the genus *Enoplosaurus* are separated from *Tropidophorus* and the other six genera by the following suite of characters: These being as for *Tropidophorus* as defined above, save for dorsal scales that are not only strongly keeled but also spinose, ventrals usually keeled as well and keeled subdigital lamellae (versus smooth in *Tropidophorus*).

The genus *Aspris* Blyth, 1853, type species *Aspris bermorei* Blyth, 1853, is also resurrected from the synonymy of *Tropidophorus*. The genus is separated from *Tropidophorus* as defined above and the other six genera herein split from *Tropidophorus*, by the unique combination of lateral scales directed straight backwards and smooth head shields. *A. bermorei* Blyth, 1853 and the three other species treated as conspecific with it until now are defined by having an entire fronto-nasal, versus divided in *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. bermorei* until now are separated from each other as follows.

*Aspris bermorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels and two loreal shields, one behind the other.

*Aspris peterkraussi* sp. nov. has 36-40 mid-body rows and two loreal shields, one behind the other.

*Aspris russellgranti* sp. nov. has 32-38 mid-body rows and three loreal shields, the anterior one being divided horizontally.

*Aspris yunnanensis* Boulenger, 1887 has 34 mid-body rows, no dorsal keels of any sort and two loreal shields, one behind the other.

The genus *Norbea* Gray, 1845, type species *Norbea brookei* Gray, 1845 is also resurrected from the synonymy of *Tropidophorus*. The genus name *Amphixestus* Peters, 1871 is also placed within the synonymy of *Norbea*, having a type species of *Amphixestus beccarii* Peters, 1871, being within the same clade of closely related species.

*Norbea* is separated from *Tropidophorus* as defined above and

the other six genera formerly treated as within *Tropidophorus* by the presence of two frontoparietals and a single large preanal.

The genus *Greersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by one or other of the following three suites of characters:

1/ Lateral scales directed straight backwards and head shields feebly rugose, *G. robinsoni* (Smith, 1919), or:

2/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal and fronto-nasal divided *G. thai* (Smith, 1919), or:

3/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal entire, fronto-nasal divided, *G. sinicus* (Boettger, 1886), *G. guangxiensis* (Wen, 1992) (subgenus *Paragreerscincus* subgen. nov.).

The genus *Barnettsaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of keeled dorsal scales and four supraoculars, treated herein as monotypic for *B. micropus* (Lidth De Juede, 1905). Otherwise *Barnettsaurus* gen. nov. is most similar to *Norbea*.

The genus *Kerryleewennigea* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the following unique suite of characters: Some or all of the lateral scale-rows directed obliquely, two pre-anal shields, frontal and fronto-nasal entire (not divided), fourth (not fifth) supralabial largest.

The genus *Coggersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of smooth head scales (not striated) a completed supraciliary row along the entire length of lateral edge of supraoculars (versus incomplete) and one or other of the following four suites of characters:

1/ Frontonasal undivided; Midbody scales in 22-24 rows; 9-10 scale rows at position of 10th subcaudal, *C. noggei* (Ziegler, Thanh and Thanh, 2005), or:

2/ Frontonasal undivided; midbody scales in 28-32 rows; 11-15 scale rows at position of tenth subcaudal; vertebral scale rows two times broader than neighboring scales, *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002), or:

3/ Frontonasal undivided; prefrontals small, widely separated from each other; nuchals 1-4; supralabials 6; supraciliaries 7-8; midbody scale rows 30-32; dorsal and lateral scales smooth; paravertebral scales 60-69, not widened; ventral scales 56-66; scale rows at position of tenth subcaudal 17-18; medial subcaudals divided from first to fifth, remaining ones approximately 1.5 times wider than neighboring scales *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010), or:

4/ Frontonasal divided; midbody scales in 34 rows *C. matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

**Distribution:** Thailand, Myanmar (for the nominate subgenus *Greersaurus* subgen. nov. by default) and China (Guangxi, Guangdong, Hong Kong), Vietnam (for *Paragreerscincus* subgen. nov.).

**Etymology:** The prefix "*para*", means not quite, in reflection of these taxa being not quite the same as those of the nominate subgenus (etymology above).

**Content:** *Greersaurus* (*paragreersaurus*) *sinicus* (Boettger, 1886) (type species); *G. (paragreersaurus) guangxiensis* (Wen, 1992).

#### GENUS BARNETTSAURUS GEN. NOV.

**LSID** urn:lsid:zoobank.org:act:10C1E88C-8B44-49D3-9D07-F107B0E3393D

**Type species:** *Tropidophorus micropus* Lidth De Juede, 1905.

**Diagnosis:** Morphologically the genus *Tropidophorus* Duméril and Bibron, 1839 *sensu lato*, is diagnosed by several

characteristics, such as exposure of the superficial tympanum and presence of a single scale at the corner of the eyelid (Greer 1970, Hikida *et al.* 2002, Greer and Biswas 2004).

The relevant species are further diagnosed and separated from other genera by the following: Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed and scaly. Nostril pierced in a single nasal; no supranasals; prefrontals well developed; frontoparietal present, single or double interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellae interiorly.

The genus *Tropidophorus* as herein defined (*sensu stricto*), type species *Tropidophorus cocincinensis* Duméril and Bibron, 1839, is further separated from the other seven genera (formerly treated as being within *Tropidophorus* by the following suite of characters: Some or all of the lateral scale-rows directed obliquely. Two frontoparietals. Two or three large preanals (not one only). Upper head-shields rugose or striated. Dorsal scales strongly keeled, ending in a point; subdigital lamellae smooth.

The three relevant species are separated as follows:

- 1/ Frontal and fronto-nasal entire, fifth supralabial largest, two pre-anal shields, *T. cocincinensis* Duméril and Bibron, 1839, or:
- 2/ Three preanal shields, dorsal pattern including faded dark and light brown markings and with two rows of dark mid-dorsal flecks running down the body, *T. microlepis* Günther, 1861, or:
- 3/ Three preanal shields without two rows of dark mid-dorsal flecks running down the body, but instead an obvious dorsal pattern consisting of semi-distinct irregularly shaped yellow crossbands on a chocolate brown background *T. joeymontebelloi* sp. nov.

The genus *Enoplosaurus* Sauvage, 1879, type species *Enoplosaurus insignis* Sauvage, 1879, better known as a junior synonym of *Tropidophorus grayi* Günther 1861, is herein resurrected from the synonymy of *Tropidophorus*.

The relevant species in the genus *Enoplosaurus* are separated from *Tropidophorus* and the other six genera by the following suite of characters: These being as for *Tropidophorus* as defined above, save for dorsal scales that are not only strongly keeled but also spinose, ventrals usually keeled as well and keeled subdigital lamellae (versus smooth in *Tropidophorus*).

The genus *Aspris* Blyth, 1853, type species *Aspris berdmorei* Blyth, 1853, is also resurrected from the synonymy of *Tropidophorus*. The genus is separated from *Tropidophorus* as defined above and the other six genera herein split from *Tropidophorus*, by the unique combination of lateral scales directed straight backwards and smooth head shields. *A. berdmorei* Blyth, 1853 and the three other species treated as conspecific with it until now are defined by having an entire fronto-nasal, versus divided in *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. berdmorei* until now are separated from each other as follows.

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels and two loreal shields, one behind the other.

*Aspris peterkraussi* sp. nov. has 36-40 mid-body rows and two loreal shields, one behind the other.

*Aspris russellgranti* sp. nov. has 32-38 mid-body rows and three loreal shields, the anterior one being divided horizontally.

*Aspris yunnanensis* Boulenger, 1887 has 34 mid-body rows, no dorsal keels of any sort and two loreal shields, one behind the other.

The genus *Norbea* Gray, 1845, type species *Norbea brookei* Gray, 1845 is also resurrected from the synonymy of *Tropidophorus*. The genus name *Amphixestus* Peters, 1871 is also placed within the synonymy of *Norbea*, having a type species of *Amphixestus beccarii* Peters, 1871, being within the same clade of closely related species.

*Norbea* is separated from *Tropidophorus* as defined above and

the other six genera formerly treated as within *Tropidophorus* by the presence of two frontoparietals and a single large preanal.

The genus *Greersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by one or other of the following three suites of characters:

- 1/ Lateral scales directed straight backwards and head shields feebly rugose, *G. robinsoni* (Smith, 1919), or:
- 2/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal and fronto-nasal divided *G. thai* (Smith, 1919), or:
- 3/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal entire, fronto-nasal divided, *G. sinicus* (Boettger, 1886), *G. guangxiensis* (Wen, 1992) (subgenus *Paragreerscincus* subgen. nov.).

The genus *Barnettsaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of keeled dorsal scales and four supraoculars, treated herein as monotypic for *B. micropus* (Lidth De Juede, 1905). Otherwise *Barnettsaurus* gen. nov. is most similar to *Norbea*.

The genus *Kerryleewennigee* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the following unique suite of characters: Some or all of the lateral scale-rows directed obliquely, two pre-anal shields, frontal and fronto-nasal entire (not divided), fourth (not fifth) supralabial largest.

The genus *Coggersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of smooth head scales (not striated) a completed supraciliary row along the entire length of lateral edge of supraoculars (versus incomplete) and one or other of the following four suites of characters:

- 1/ Frontonasal undivided; Midbody scales in 22-24 rows; 9-10 scale rows at position of 10th subcaudal, *C. noggei* (Ziegler, Thanh and Thanh, 2005), or:
- 2/ Frontonasal undivided; midbody scales in 28-32 rows; 11-15 scale rows at position of tenth subcaudal; vertebral scale rows two times broader than neighboring scales, *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002), or:
- 3/ Frontonasal undivided; prefrontals small, widely separated from each other; nuchals 1-4; supralabials 6; supraciliaries 7-8; midbody scale rows 30-32; dorsal and lateral scales smooth; paravertebral scales 60-69, not widened; ventral scales 56-66; scale rows at position of tenth subcaudal 17-18; medial subcaudals divided from first to fifth, remaining ones approximately 1.5 times wider than neighboring scales *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010), or:
- 4/ Frontonasal divided; midbody scales in 34 rows *C. matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

**Distribution:** Borneo.

**Etymology:** Named in honour of Brian Barnett of Ardeer, Victoria, Australia, former president of the Victorian Herpetological Society Incorporated in recognition of a lifetime's contributions to herpetology as outlined in Hoser (1996). "Saurus" is Latin for lizard.

**Content:** *Barnettsaurus micropus* (Lidth De Juede, 1905) treated herein as monotypic.

**GENUS KERRYLEEWENNIGEE GEN. NOV.**

**LSID urn:lsid:zoobank.org:act:1D22518B-148E-4001-8BEB-0178390237E6**

**Type species:** *Tropidophorus hainanus* Smith, 1923.

**Diagnosis:** Morphologically the genus *Tropidophorus* Duméril and Bibron, 1839 *sensu lato*, is diagnosed by several characteristics, such as exposure of the superficial tympanum and presence of a single scale at the corner of the eyelid (Greer

1970, Hikida *et al.* 2002, Greer and Biswas 2004).

The relevant species are further diagnosed and separated from other genera by the following: Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed and scaly. Nostril pierced in a single nasal; no supranasals; prefrontals well developed; frontoparietal present, single or double interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellae anteriorly.

The genus *Tropidophorus* as herein defined (*sensu stricto*), type species *Tropidophorus cocincinensis* Duméril and Bibron, 1839, is further separated from the other seven genera (formerly treated as being within *Tropidophorus* by the following suite of characters: Some or all of the lateral scale-rows directed obliquely. Two frontoparietals. Two or three large preanals (not one only). Upper head-shields rugose or striated. Dorsal scales strongly keeled, ending in a point; subdigital lamellae smooth.

The three relevant species are separated as follows:

- 1/ Frontal and fronto-nasal entire, fifth supralabial largest, two pre-anal shields, *T. cocincinensis* Duméril and Bibron, 1839, or:
- 2/ Three preanal shields, dorsal pattern including faded dark and light brown markings and with two rows of dark mid-dorsal flecks running down the body, *T. microlepis* Günther, 1861, or:
- 3/ Three preanal shields without two rows of dark mid-dorsal flecks running down the body, but instead an obvious dorsal pattern consisting of semi-distinct irregularly shaped yellow crossbands on a chocolate brown background *T. joeymontebelloi* sp. nov.

The genus *Enoplosaurus* Sauvage, 1879, type species *Enoplosaurus insignis* Sauvage, 1879, better known as a junior synonym of *Tropidophorus grayi* Günther 1861, is herein resurrected from the synonymy of *Tropidophorus*.

The relevant species in the genus *Enoplosaurus* are separated from *Tropidophorus* and the other six genera by the following suite of characters: These being as for *Tropidophorus* as defined above, save for dorsal scales that are not only strongly keeled but also spinose, ventrals usually keeled as well and keeled subdigital lamellae (versus smooth in *Tropidophorus*).

The genus *Aspris* Blyth, 1853, type species *Aspris berdmorei* Blyth, 1853, is also resurrected from the synonymy of *Tropidophorus*. The genus is separated from *Tropidophorus* as defined above and the other six genera herein split from *Tropidophorus*, by the unique combination of lateral scales directed straight backwards and smooth head shields. *A. berdmorei* Blyth, 1853 and the three other species treated as conspecific with it until now are defined by having an entire fronto-nasal, versus divided in *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. berdmorei* until now are separated from each other as follows.

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels and two loreal shields, one behind the other.

*Aspris peterkraussi* sp. nov. has 36-40 mid-body rows and two loreal shields, one behind the other.

*Aspris russellgranti* sp. nov. has 32-38 mid-body rows and three loreal shields, the anterior one being divided horizontally.

*Aspris yunnanensis* Boulenger, 1887 has 34 mid-body rows, no dorsal keels of any sort and two loreal shields, one behind the other.

The genus *Norbea* Gray, 1845, type species *Norbea brookei* Gray, 1845 is also resurrected from the synonymy of *Tropidophorus*. The genus name *Amphixestus* Peters, 1871 is also placed within the synonymy of *Norbea*, having a type species of *Amphixestus beccarii* Peters, 1871, being within the same clade of closely related species.

*Norbea* is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of two frontoparietals and a single large preanal.

The genus *Greersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by one or other of the following three suites of characters:

- 1/ Lateral scales directed straight backwards and head shields feebly rugose, *G. robinsoni* (Smith, 1919), or:
- 2/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal and fronto-nasal divided *G. thai* (Smith, 1919), or:
- 3/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal entire, fronto-nasal divided, *G. sinicus* (Boettger, 1886), *G. guangxiensis* (Wen, 1992) (subgenus *Paragreerscincus* subgen. nov.).

The genus *Barnettsaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of keeled dorsal scales and four supraoculars, treated herein as monotypic for *B. micropus* (Lidith De Juede, 1905). Otherwise *Barnettsaurus* gen. nov. is most similar to *Norbea*.

The genus *Kerryleewennigea* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the following unique suite of characters: Some or all of the lateral scale-rows directed obliquely, two pre-anal shields, frontal and fronto-nasal entire (not divided), fourth (not fifth) supralabial largest.

The genus *Coggersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of smooth head scales (not striated) a completed supracliliary row along the entire length of lateral edge of supraoculars (versus incomplete) and one or other of the following four suites of characters:

- 1/ Frontonasal undivided; Midbody scales in 22-24 rows; 9-10 scale rows at position of 10th subcaudal, *C. noggei* (Ziegler, Thanh and Thanh, 2005), or:
- 2/ Frontonasal undivided; midbody scales in 28-32 rows; 11-15 scale rows at position of tenth subcaudal; vertebral scale rows two times broader than neighboring scales, *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002), or:
- 3/ Frontonasal undivided; prefrontals small, widely separated from each other; nuchals 1-4; supralabials 6; supracliliaries 7-8; midbody scale rows 30-32; dorsal and lateral scales smooth; paravertebral scales 60-69, not widened; ventral scales 56-66; scale rows at position of tenth subcaudal 17-18; medial subcaudals divided from first to fifth, remaining ones approximately 1.5 times wider than neighboring scales *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010), or:

4/ Frontonasal divided; midbody scales in 34 rows *C. matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

**Distribution:** China, Vietnam, Thailand, Bangladesh, India.

**Etymology:** Named in honour of Kerry Lee Wennig of Geelong, Victoria, Australia for her contributions to exposing organised crime as outlined in pages 366-372 of Hoser (1999).

**Content:** *Kerryleewennigea hainanus* (Smith, 1923) (type species); *K. assamensis* (Annandale, 1912); *K. baviensis* (Bourret, 1939); *K. hangnam* (Chuaynkern, Nabhitabhata, Inthara, Kamsook and Somsri, 2005); *K. murphyi* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

#### GENUS COGGERSAURUS GEN. NOV.

**LSID urn:lsid:zoobank.org:act:C7289577-E7D0-4AF3-815B-A42C1D5C5A29**

**Type species:** *Tropidophorus matsuii* Hikida, Orlov, Nabhitabhata and Ota, 2002.

**Diagnosis:** Morphologically the genus *Tropidophorus* Duméril and Bibron, 1839 *sensu lato*, is diagnosed by several characteristics, such as exposure of the superficial tympanum and presence of a single scale at the corner of the eyelid (Greer

1970, Hikida *et al.* 2002, Greer and Biswas 2004).

The relevant species are further diagnosed and separated from other genera by the following: Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed and scaly. Nostril pierced in a single nasal; no supranasals; prefrontals well developed; frontoparietal present, single or double interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellae anteriorly.

The genus *Tropidophorus* as herein defined (*sensu stricto*), type species *Tropidophorus cocincinensis* Duméril and Bibron, 1839, is further separated from the other seven genera (formerly treated as being within *Tropidophorus*) by the following suite of characters: Some or all of the lateral scale-rows directed obliquely. Two frontoparietals. Two or three large preanals (not one only). Upper head-shields rugose or striated. Dorsal scales strongly keeled, ending in a point; subdigital lamellae smooth.

The three relevant species are separated as follows:

- 1/ Frontal and fronto-nasal entire, fifth supralabial largest, two pre-anal shields, *T. cocincinensis* Duméril and Bibron, 1839, or:
- 2/ Three preanal shields, dorsal pattern including faded dark and light brown markings and with two rows of dark mid-dorsal flecks running down the body, *T. microlepis* Günther, 1861, or:
- 3/ Three preanal shields without two rows of dark mid-dorsal flecks running down the body, but instead an obvious dorsal pattern consisting of semi-distinct irregularly shaped yellow crossbands on a chocolate brown background *T. joeymontebelloi* sp. nov.

The genus *Enoplosaurus* Sauvage, 1879, type species *Enoplosaurus insignis* Sauvage, 1879, better known as a junior synonym of *Tropidophorus grayi* Günther 1861, is herein resurrected from the synonymy of *Tropidophorus*.

The relevant species in the genus *Enoplosaurus* are separated from *Tropidophorus* and the other six genera by the following suite of characters: These being as for *Tropidophorus* as defined above, save for dorsal scales that are not only strongly keeled but also spinose, ventrals usually keeled as well and keeled subdigital lamellae (versus smooth in *Tropidophorus*).

The genus *Aspris* Blyth, 1853, type species *Aspris berdmorei* Blyth, 1853, is also resurrected from the synonymy of *Tropidophorus*. The genus is separated from *Tropidophorus* as defined above and the other six genera herein split from *Tropidophorus*, by the unique combination of lateral scales directed straight backwards and smooth head shields. *A. berdmorei* Blyth, 1853 and the three other species treated as conspecific with it until now are defined by having an entire fronto-nasal, versus divided in *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. berdmorei* until now are separated from each other as follows.

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels and two loreal shields, one behind the other.

*Aspris peterkraussi* sp. nov. has 36-40 mid-body rows and two loreal shields, one behind the other.

*Aspris russellgranti* sp. nov. has 32-38 mid-body rows and three loreal shields, the anterior one being divided horizontally.

*Aspris yunnanensis* Boulenger, 1887 has 34 mid-body rows, no dorsal keels of any sort and two loreal shields, one behind the other.

The genus *Norbea* Gray, 1845, type species *Norbea brookei* Gray, 1845 is also resurrected from the synonymy of *Tropidophorus*. The genus name *Amphixestus* Peters, 1871 is also placed within the synonymy of *Norbea*, having a type species of *Amphixestus beccarii* Peters, 1871, being within the same clade of closely related species.

*Norbea* is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of two frontoparietals and a single large preanal.

The genus *Greersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by one or other of the following three suites of characters:

- 1/ Lateral scales directed straight backwards and head shields feebly rugose, *G. robinsoni* (Smith, 1919), or:
- 2/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal and fronto-nasal divided *G. thai* (Smith, 1919), or:
- 3/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal entire, fronto-nasal divided, *G. sinicus* (Boettger, 1886), *G. guangxiensis* (Wen, 1992) (subgenus *Paragreerscincus* subgen. nov.).

The genus *Barnettsaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of keeled dorsal scales and four supraoculars, treated herein as monotypic for *B. micropus* (Lidith De Juede, 1905). Otherwise *Barnettsaurus* gen. nov. is most similar to *Norbea*.

The genus *Kerryleewennigea* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the following unique suite of characters: Some or all of the lateral scale-rows directed obliquely, two pre-anal shields, frontal and fronto-nasal entire (not divided), fourth (not fifth) supralabial largest.

The genus *Coggersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of smooth head scales (not striated) a completed supraciliary row along the entire length of lateral edge of supraoculars (versus incomplete) and one or other of the following four suites of characters:

- 1/ Frontonasal undivided; Midbody scales in 22-24 rows; 9-10 scale rows at position of 10th subcaudal, *C. noggei* (Ziegler, Thanh and Thanh, 2005), or:
- 2/ Frontonasal undivided; midbody scales in 28-32 rows; 11-15 scale rows at position of tenth subcaudal; vertebral scale rows two times broader than neighboring scales, *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002), or:
- 3/ Frontonasal undivided; prefrontals small, widely separated from each other; nuchals 1-4; supralabials 6; supraciliaries 7-8; midbody scale rows 30-32; dorsal and lateral scales smooth; paravertebral scales 60-69, not widened; ventral scales 56-66; scale rows at position of tenth subcaudal 17-18; medial subcaudals divided from first to fifth, remaining ones approximately 1.5 times wider than neighboring scales *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010), or:
- 4/ Frontonasal divided; midbody scales in 34 rows *C. matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

**Distribution:** Vietnam, Thailand.

**Etymology:** Named in honour of Harold (Hal) Cogger, former curator of herpetology and Deputy Director of the Australian Museum in Sydney, New South Wales, Australia and past commissioner of the International Commission for Zoological Nomenclature (ICZN) in recognition for his services to herpetology spanning a lifetime. "*Saurus*" is Latin for lizard.

**Content:** *Coggersaurus matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002) (type species); *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010); *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002); *Tropidophorus noggei* (Ziegler, Thanh and Thanh, 2005).

**SPECIES TROPIDOPHORUS JOEYMONTEBELLOI SP. NOV.**  
**LSID** urn:lsid:zoobank.org:act:6A249AEE-61CB-46F8-A50F-7E5EEA9056E5

**Holotype:** A preserved specimen at the Field Museum of Natural History, Chicago, Illinois, USA, specimen number FMNH Amphibians and Reptiles 262170, from Lam Dong, Vietnam.

**Paratypes:** Two preserved specimens at the Field Museum of Natural History, Chicago, Illinois, USA, specimen number FMNH Amphibians and Reptiles 262169 and 262171, from Lam Dong, Vietnam.

**Diagnosis:** Until now *Tropidophorus joeymontebelloi* sp. nov. has been treated as an eastern population of *T. microlepis* Günther, 1861. All three species in the genus *Tropidophorus* Günther, 1861 as defined in this paper are readily separated from one another by the following three unique suites of characters.

- 1/ Frontal and fronto-nasal entire, fifth supralabial largest, two pre-anal shields, *T. cocincinensis* Duméril and Bibron, 1839, or:
- 2/ Three preanal shields, dorsal pattern including faded dark and light brown markings and with two rows of dark mid-dorsal flecks running down the body, *T. microlepis* Günther, 1861, or:
- 3/ Three preanal shields without two rows of dark mid-dorsal flecks running down the body, but instead an obvious dorsal pattern consisting of semi-distinct irregularly shaped yellow crossbands on a chocolate brown background *T. joeymontebelloi* sp. nov.

Morphologically the genus *Tropidophorus* Duméril and Bibron, 1839 *sensu lato*, is diagnosed by several characteristics, such as exposure of the superficial tympanum and presence of a single scale at the corner of the eyelid (Greer 1970, Hikida *et al.* 2002, Greer and Biswas 2004).

The relevant species are further diagnosed and separated from other genera by the following: Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed and scaly. Nostril pierced in a single nasal; no supranasals; prefrontals well developed; frontoparietal present, single or double interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellae anteriorly.

The genus *Tropidophorus* as herein defined (*sensu stricto*), type species *Tropidophorus cocincinensis* Duméril and Bibron, 1839, is further separated from the other seven genera (formerly treated as being within *Tropidophorus* by the following suite of characters: Some or all of the lateral scale-rows directed obliquely. Two frontoparietals. Two or three large preanals (not one only). Upper head-shields rugose or striated. Dorsal scales strongly keeled, ending in a point; subdigital lamellae smooth.

The genus *Enoplosaurus* Sauvage, 1879, type species *Enoplosaurus insignis* Sauvage, 1879, better known as a junior synonym of *Tropidophorus grayi* Günther 1861, is herein resurrected from the synonymy of *Tropidophorus*.

The relevant species in the genus *Enoplosaurus* are separated from *Tropidophorus* and the other six genera by the following suite of characters: These being as for *Tropidophorus* as defined above, save for dorsal scales that are not only strongly keeled but also spinose, ventrals usually keeled as well and keeled subdigital lamellae (versus smooth in *Tropidophorus*).

The genus *Aspris* Blyth, 1853, type species *Aspris berdmorei* Blyth, 1853, is also resurrected from the synonymy of *Tropidophorus*. The genus is separated from *Tropidophorus* as defined above and the other six genera herein split from *Tropidophorus*, by the unique combination of lateral scales directed straight backwards and smooth head shields. *A. berdmorei* Blyth, 1853 and the three other species treated as conspecific with it until now are defined by having an entire fronto-nasal, versus divided in *A. laotus* (Smith, 1923).

The four species treated as being conspecific with *A. berdmorei* until now are separated from each other as follows.

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels and two loreal shields, one behind the other.

*Aspris peterkraussi* sp. nov. has 36-40 mid-body rows and two loreal shields, one behind the other.

*Aspris russellgranti* sp. nov. has 32-38 mid-body rows and three loreal shields, the anterior one being divided horizontally.

*Aspris yunnanensis* Boulenger, 1887 has 34 mid-body rows, no dorsal keels of any sort and two loreal shields, one behind the other.

The genus *Norbea* Gray, 1845, type species *Norbea brookei* Gray, 1845 is also resurrected from the synonymy of *Tropidophorus*. The genus name *Amphixestus* Peters, 1871 is also placed within the synonymy of *Norbea*, having a type species of *Amphixestus beccarii* Peters, 1871, being within the same clade of closely related species.

*Norbea* is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of two frontoparietals and a single large preanal.

The genus *Greersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by one or other of the following three suites of characters:

- 1/ Lateral scales directed straight backwards and head shields feebly rugose, *G. robinsoni* (Smith, 1919), or:
- 2/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal and fronto-nasal divided *G. thai* (Smith, 1919), or:
- 3/ Some or all of the lateral scale rows directed obliquely, two preanal shields, frontal entire, fronto-nasal divided, *G. sinicus* (Boettger, 1886), *G. guangxiensis* (Wen, 1992) (subgenus *Paragreerscincus* subgen. nov.).

The genus *Barnettsaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of keeled dorsal scales and four supraoculars, treated herein as monotypic for *B. micropus* (Lidth De Juede, 1905). Otherwise *Barnettsaurus* gen. nov. is most similar to *Norbea*.

The genus *Kerryleewennigea* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the following unique suite of characters: Some or all of the lateral scale-rows directed obliquely, two pre-anal shields, frontal and fronto-nasal entire (not divided), fourth (not fifth) supralabial largest.

The genus *Coggersaurus* gen. nov. is separated from *Tropidophorus* as defined above and the other six genera formerly treated as within *Tropidophorus* by the presence of smooth head scales (not striated) a completed supracliliary row along the entire length of lateral edge of supraoculars (versus incomplete) and one or other of the following four suites of characters:

- 1/ Frontonasal undivided; Midbody scales in 22-24 rows; 9-10 scale rows at position of 10th subcaudal, *C. noggei* (Ziegler, Thanh and Thanh, 2005), or:
- 2/ Frontonasal undivided; midbody scales in 28-32 rows; 11-15 scale rows at position of tenth subcaudal; vertebral scale rows two times broader than neighboring scales, *C. latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002), or:
- 3/ Frontonasal undivided; prefrontals small, widely separated from each other; nuchals 1-4; supralabials 6; supracliliaries 7-8; midbody scale rows 30-32; dorsal and lateral scales smooth; paravertebral scales 60-69, not widened; ventral scales 56-66; scale rows at position of tenth subcaudal 17-18; medial subcaudals divided from first to fifth, remaining ones approximately 1.5 times wider than neighboring scales *C. boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010), or:
- 4/ Frontonasal divided; midbody scales in 34 rows *C. matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002).

**Distribution:** Mainly southern Vietnam, in the hills north of Ho Chi Minh City, with outlier populations in nearby Cambodia and Laos, east of the relatively flat Mekong River region.

**Etymology:** Named in honour of Joey Montebello of Chirnside Park, Victoria, Australia, a well-known snake breeder, specializing in pythons in recognition for his efforts in conservation and education in relation to Australian snakes.

**SPECIES ASPRIS PETERKRAUSSI SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:66A33376-F669-47D4-87C4-B75F8A0356DF

**Holotype:** A preserved specimen at the California Academy of Sciences in San Francisco, California, USA, specimen number CAS HERP 210182, collected at the Alaungdaw Kathapa National Park, Sunthaiik Chaung (tributary to Hkaungdin Chaung), Sagaing Division, Myanmar (Burma), Latitude 22.18 N, Longitude 94.24 E. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the California Academy of Sciences in San Francisco, California, USA, specimen number CAS HERP 210236 collected at the Alaungdaw Kathapa National Park, Sunthaiik Chaung (tributary to Hkaungdin Chaung), Sagaing Division, Myanmar (Burma), Latitude 22.18 N, Longitude 94.24 E.

**Diagnosis:** Until now the species *Aspris peterkraussi sp. nov.* from the mountainous region in West Burma and *A. russellgranti sp. nov.* from the mountainous region in North Thailand have been treated as populations of the species *A. berdmorei* Blyth, 1853. Both would identify as that species using the relevant key in Smith (1923) at page 773.

The species *Aspris yunnanensis* Boulenger, 1887 is similar in form to *A. berdmorei* and has been treated as synonymous to it by many authors. However it is clearly sufficiently different to be recognized as a separate species and so is included in the genus-wide diagnosis for each species herein in order to separate them all from one another as part of this diagnosis.

The five relevant species are readily separated from one another as follows, each having one of the following five unique combinations of characters:

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels, single fronto-nasal and two loreal shields, one behind the other.

*A. peterkraussi sp. nov.* has 36-40 mid-body rows, single fronto-nasal and two loreal shields, one behind the other.

*A. russellgranti sp. nov.* has 32-38 mid-body rows, single fronto-nasal and three loreal shields, the anterior one being divided horizontally.

*A. yunnanensis* (Boulenger, 1887) has 34 mid-body rows, no dorsal keels of any sort, single fronto-nasal and two loreal shields, one behind the other.

*A. laotus* (Smith, 1923) is separated from the four preceding species by having a divided fronto-nasal, versus single in the other four species.

**Distribution:** Found in the mountainous region and nearby areas to the North-west of Myanmar (Burma), centred on the Chin Hills.

**Etymology:** Named in honour of Peter Krauss of north Queensland, Australia, a well-known snake breeder, specializing in pythons in recognition for his efforts in conservation and education in relation to Australian snakes.

**SPECIES ASPRIS RUSSELLGRANTI SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:0089FF4D-F50D-4109-86A6-09F8974C895A

**Holotype:** A preserved specimen at the Field Museum of Natural History, Chicago, Illinois, USA, specimen number FMNH Amphibians and Reptiles 197801, collected at Chiang Mai, Thailand. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ Herp R-39324 collected at Chiang Mai, Thailand.

**Diagnosis:** Until now the species *Aspris russellgranti sp. nov.* from the mountainous region in North Thailand and *A. peterkraussi sp. nov.* from the mountainous region in West Burma have been treated as populations of the species *A. berdmorei* Blyth, 1853. Both would identify as that species using the relevant key in Smith (1923) at page 773.

The species *Aspris yunnanensis* Boulenger, 1887 is similar in form to *A. berdmorei* and has been treated as synonymous to it by many authors. However it is clearly sufficiently different to be recognized as a separate species and so is included in the genus-wide diagnosis for each species herein in order to separate them all from one another as part of this diagnosis.

The five relevant species are readily separated from one another as follows, each having one of the following five unique combinations of characters:

*Aspris berdmorei* Blyth, 1853 has 32-34 mid-body rows, slight to significant dorsal keels, single fronto-nasal and two loreal shields, one behind the other.

*A. peterkraussi sp. nov.* has 36-40 mid-body rows, single fronto-nasal and two loreal shields, one behind the other.

*A. russellgranti sp. nov.* has 32-38 mid-body rows, single fronto-nasal and three loreal shields, the anterior one being divided horizontally.

*A. yunnanensis* (Boulenger, 1887) has 34 mid-body rows, no dorsal keels of any sort, single fronto-nasal and two loreal shields, one behind the other.

*A. laotus* (Smith, 1923) is separated from the four preceding species by having a divided fronto-nasal, versus single in the other four species.

**Distribution:** The Mountainous region in the north-west of Thailand, centred on the area around Chiang Mai.

**Etymology:** Named in honour of Russell Grant of Launching Place, Victoria, Australia, a well-known snake breeder, specializing in pythons in recognition for his efforts in conservation and education in relation to Australian snakes.

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**TROPIDOPHORUS SENSU LATO****GENUS AND SPECIES LIST****Genus *Tropidophorus* Duméril and Bibron, 1839***Tropidophorus cocincinensis* Duméril and Bibron, 1839 (type species)*Tropidophorus joeymontebelloi* sp. nov.*Tropidophorus microlepis* Günther, 1861**Genus: *Enoplosaurus* Sauvage, 1879***Enoplosaurus grayi* (Günther, 1861)*Enoplosaurus baconi* (Hikida, Riyanto and Ota, 2003)**Genus *Aspris* Blyth, 1853***Aspris berdmorei* Blyth, 1853 (type species)*Aspris laotus* (Smith, 1923)*Aspris peterkraussi* sp. nov.*Aspris russellgranti* sp. nov.**Genus *Norbea* Gray***Norbea brookei* Gray, 1845 (type species)*Norbea beccarii* (Peters, 1871)*Norbea davaoensis* (Bacon, 1980)*Norbea iniquus* (Lidth De Juede, 1905)*Norbea misaminius* (Stejneger, 1908)*Norbea mocquardii* (Boulenger, 1895)*Norbea partelloi* (Stejneger, 1910)*Norbea perplexus* (Barbour, 1921)*Norbea sebi* (Pui, Karin, Bauer and Das, 2017)**Genus *Greersaurus* gen. nov.***Greersaurus robinsoni* (Smith, 1919)*Greersaurus thai* (Smith, 1919)**Subgenus *Paragreerscincus* subgen. nov.***Greersaurus (Paragreerscincus) sinicus* (Boettger, 1886) (type species)*Greersaurus (Paragreerscincus) guangxiensis* (Wen, 1992)**Genus *Barnettsaurus* gen. nov.***Barnettsaurus micropus* (Lidth De Juede, 1905) (monotypic)**Genus *Kerryleewennigea* gen. nov.***Kerryleewennigea hainanus* (Smith, 1923) (type species)*Kerryleewennigea assamensis* (Annandale, 1912)*Kerryleewennigea hangnam* (Chuaynkern, Nabhitabhata, Inthara, Kamsook and Somsri, 2005)*Kerryleewennigea baviensis* (Bouret, 1939)*Kerryleewennigea murphyi* (Hikida, Orlov, Nabhitabhata and Ota, 2002)**Genus *Coggersaurus* gen. nov.***Coggersaurus matsuii* (Hikida, Orlov, Nabhitabhata and Ota, 2002) (type species)*Coggersaurus noggei* (Ziegler, Thanh and Thanh, 2005)*Coggersaurus latiscutatus* (Hikida, Orlov, Nabhitabhata and Ota, 2002)*Coggersaurus boehmei* (Nguyen, Nguyen, Schmitz, Orlov and Ziegler, 2010)

**Further dismemberment of the pan-continental Lizard genus *Scincella* Mittleman, 1950 with the creation of four new genera to accommodate divergent species and the formal descriptions of six new species.**

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**ABSTRACT**

The genus *Scincella* Mittleman, 1950 as currently recognized has been shown in numerous studies to be paraphyletic. Since the creation of the genus, some divergent species have been split off into separate genera (e.g. *Kaestlea* Eremchenko and Das, 2004 and *Asymblepharus* Eremchenko and Szczerbak, 1980) or transferred to others.

Continuing with this dismemberment of the genus, this paper relies on both morphological and molecular evidence to further refine the genus-level classification of *Scincella sensu lato*.

Four new genera for Asiatic species are formally erected according to the rules of the International *Code of Zoological Nomenclature* (Ride *et al.* 1999) as well as two subgenera within one of the new genera.

Six obviously unnamed species are also formally named in this paper, so that their conservation and management can be properly implemented and before any species runs the increased risk of becoming extinct through indifference both by the scientific community and regulatory authorities who depend on them.

Included in this group are two species within the genus *Asymblepharus*.

Four other species from Taiwan and a nearby island, until now treated as various other species of "*Scincella*" are formally named for the first time.

**Keywords:** Taxonomy; Nomenclature; Skinks; Lizards; Asia; *Scincella*; *Asymblepharus*; *sikimmensis*; *ladacensis*; *boettgeri*; *formosensis*; New genus; *Asiascincella*; *Ferescincella*; *Quaziscincella*; *Divergesaurus*; new subgenus; *Ovipascincella*; *Sinoscincella*; new species; *insignipicturaconlus*; *ventrealbis*; *flavolateralis*; *yonagunijimaensis*; *aurisovalibus*; *lateralibusdorsoclavo*.

**INTRODUCTION**

The small skink lizards of the genus *Scincella* Mittleman, 1950 as currently recognized in 2019 are familiar to herpetologists in Asia and North America, where they are common.

The taxonomy of the group at both genus and species level is in flux and notwithstanding this paper, are likely to remain so for some time.

As recognized by herpetologists in year 2019 they are a broadly monophyletic group. This remains the case even after several genera have been split off from the group and other species transferred out to other already named genera.

By ways of example *Kaestlea* Eremchenko and Das, 2004 and *Asymblepharus* Eremchenko and Szczerbak, 1980 are both composed wholly of species formerly placed within *Scincella*.

Another genus, *Paralipinia* Darevsky and Orlov, 1997, monotypic for the species *Paralipinia rara* Darevsky and Orlov, 1997 has since been subject of contention among taxonomists.

*Paralipinia*, originally separated from *Scincella* by having double

rows of subdigital lamellae on basal fingers and toes, was synonymized with *Scincella* by Greer and Shea (2003) based on the secondary temporal scale overlap pattern (lower scale overlapping upper one). Nguyen *et al.* (2010) rejected that contention and considered *Paralipinia* as a valid genus, which is the position I also take here, not that this particular opinion has any material relevance to the taxonomic acts in this paper, other than to place that species outside of the other genera being discussed in this paper.

Within the assemblage currently known as *Scincella* are several divergent lineages of deep antiquity.

As numerous molecular and morphological studies have confirmed these taxa as divergent (e.g. Ouboter 1986, Pyron *et al.* 2013), this paper takes the logical step of assigning them to relevant genera, four of which are formally named for the first time.

These are created in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.*

1999).

I mention that the genus *Livorimica* Ermchenko, 2003, based on a species described as "*Livorimica bacboensis* Ermchenko, 2003" was synonymized with *Sphenomorphus* (*sensu lato*) by Nguyen *et al.* 2011 based on the diagnostic features of *Livorimica* shared with members of *Sphenomorphus* (e.g., *S. buenloicus* Darevsky *et al.*, 1983, *S. cryptotis* Darevsky *et al.* 2004, *S. incognitus* (Thompson, 1912), *S. indicus* Schmidt, 1928, *S. mimicus* Taylor, 1962 and *S. tonkinensis* Nguyen *et al.* 2011): supranasals absent; lower eyelids scaly; nuchals oriented flush with parietals; scales on dorsal surface of base of digit IV in three rows; medial preloacals enlarged, inner scales overlapping outer scales; and palm with tubercles. Furthermore, the six supralabials of *L. bacboensis* also occur in *Sphenomorphus bukitchensis* Grismer, 2007 and *S. butleri* (Boulenger, 1912).

Therefore that name does not apply to Asiatic species within *Scincella sensu lato*.

*Scincella* is herein confined to the remaining North American species, including the type species for the genus.

The list of recognized species within *Scincella* as of 2019 following the publication of this paper is therefore as follows:

*Scincella lateralis* (Say, 1822) (type species); *S. assata* (Cope, 1864); *S. caudaequinae* (Smith, 1951); *S. cherriei* (Cope, 1893); *S. forbesorum* (Taylor, 1937); *S. gemmingeri* (Cope, 1864); *S. incerta* (Stuart, 1940); *S. kikaapoa* (García-Vázquez, Canseco-Márquez and Nieto-Montes de Oca, 2010); *S. silvicola* (Taylor, 1937).

Existing genera composed of species formerly within *Scincella*, such as *Kaestlea* Ermchenko and Das, 2004 or *Asymblepharus* Ermchenko and Szczerbak, 1980 are not dealt with in this paper or the descriptions below, save for when relevant to the treatment herein (e.g. for the formal descriptions of *Asymblepharus aurisovalbus* sp. nov. and *A. lateralisdorsoclavo* sp. nov. in this paper).

As already inferred, some obvious unnamed species are also formally named for the first time in this paper so that they can be properly managed and conserved in the future.

Included herein are three species from Taiwan and another from the nearby island of Yonagunijima, Yaeyama Islands, Japan, all recently confused with other taxa as identified in the relevant descriptions.

#### MATERIALS, METHODS AND RESULTS

These are inferred in both the abstract and introduction, but as a matter of trite I spell them out in a little more explicit detail.

The available literature was examined relevant to the genus *Scincella sensu lato* and other phylogenetically close taxa.

Additional to this has been inspection of specimens as required and possible in order to ascertain the classification of the genera or species within the genera, both as defined or including unnamed taxa when they are evident.

Available information in the form of photos of specimens with good available locality data and other information was also utilized in this study.

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in breach of undertakings to the court (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper, even though it would be clearly improved if I took some further years to get further data,

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

This comment is made noting the extensive increase in human population in the relevant region and the general environmental destruction across the planet as documented by Hoser (1991), including low density areas without a large permanent human

population.

I also note the abysmal environmental record of various National, State and Local governments in the relevant region over the past 200 years as detailed by Hoser (1989, 1991, 1993, 1996 and 2010, 2019a, 2019b) in the face of ongoing threats as diverse as introduced species, habitat destruction and modification, introduced pathogens and other factors and combinations thereof.

It is also noteworthy that I cannot guarantee another illegal armed raid on our facility, involving theft of materials and data again at some unspecified date in the future. Therefore it is important that the taxonomy of this group be largely resolved herein, rather than be potentially delayed indefinitely and with the negative conservation outcomes this is likely to entail.

Published literature relevant to the taxonomy and nomenclature adopted within this paper includes the following: Barbour (1912, 1927), Bartlett and Bartlett (1999), Bedriaga (1909), Bobrov and Semenov (2008), Blyth (1853), Bocourt (1878), Boulenger (1887a, 1887b, 1888, 1890, 1893), Bourret (1937), Campbell (1998), Chen *et al.* (2001a, 2001b), Cochran (1927, 1941), Cope (1864, 1875, 1893), Cox *et al.* (1998), Darevsky and Orlov (1997), Darevsky and Van Sang (1983), Darevsky *et al.* (1986, 2004), Elpatjevsky (1901), Ermchenko (2003), Ermchenko and Das (2004), Ermchenko and Szczerbak (1986), Ermchenko (1980, 1983), Fawcett and Smith (1971), García-Vázquez and Fera-Ortiz (2006a, 2006b), García-Vázquez *et al.* (2010), Gonzalez *et al.* (2005), Goris and Maeda (2004), Gray (1838), Greer (1974), Greer and Shea (2003), Günther (1864, 1888, 1896), Guo *et al.* (1999), Hu and Djao (1966), Kashchenko (1909), Kastle *et al.* (2013), Köhler (2000, 2008), Koizumi *et al.* (2014), Kolbintzev *et al.* (2000), Lee (1996, 2000), Linkem *et al.* (2011), Mittleman (1950, 1952), Myers and Donnelly (1991), Neang *et al.* (2018), Nguyen *et al.* (2009), Nguyen *et al.* (2010, 2011), Nikolsky (1902), Ouboter (1986), Pylon *et al.* (2013), Ride *et al.* (1999), Savage (2002), Say (1822), Schmidt (1925, 1927), Shea and Greer (2002), Shreve (1940), Sindaco and Jeremcenko (2008), Smith (1939, 1941, 1946, 1951), Smith and Taylor (1950), Smith (1916), Steindachner (1867), Stejneger (1907, 1925), Stuart and Emmett (2006), Stuart (1940, 1948), Szczerbak (2003), Taylor (1937, 1956, 1963), Taylor and Elbel (1958), Van Denburgh (1912a, 1912b), Vedmederya *et al.* (2009), Venugopal (2010), Whiting *et al.* (2003), Zhao and Adler (1993), Zhao and Huang (1982), Ziegler *et al.* (2006) and sources cited therein.

In terms of the following descriptions the following points should be noted:

- 1/ All descriptions of specimens in terms of form and colour relate to normal adult specimens of typical form with original tails for each taxon unless otherwise stated.
- 2/ Spellings of names assigned to genera or species should not be altered in any way unless mandated by the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) or superseding nomenclatural rules.
- 3/ In the unlikely event a first reviser seeks to merge any genera or species formally named herein, the name to be used is that of the first name used in terms of page priority, also as listed in the abstract keywords.
- 4/ There is no conflict of interest in terms of this paper or the conclusions arrived at herein.

#### GENUS ASIASCINCELLA GEN. NOV.

LSID urn:lsid:zoobank.org:act:A5AFF47F-1874-4BC3-BB91-B0F418B6542B

**Type species:** *Tiliqua reevesii* Gray, 1838, now known widely as *Scincella reevesii* (Gray, 1838).

**Diagnosis:** Species within the genus *Asiascincella* gen. nov. would until now have been diagnosed as being within *Scincella* Mittleman, 1950 as defined by Ouboter (1986) on pages 10 and 11.

The genus *Scincella* (*sensu lato* and including both *Asiascincella* gen. nov. and *Ferescincella* gen. nov.) can be

diagnosed by the following combination of characters: (1) body size medium (SVL usually < 65 mm); (2) alpha palate (Greer, 1974) with nine premaxillary teeth; (3) long, thin postorbital bone usually present; and (4) with a transparent window in a movable lower eyelid. Transparent window may be lacking in southern north American populations of *S. cheerei* (1893) (taken from Linkem, Diesmos and Brown, 2011).

*Scincella* species (*sensu lato* and including both *Asiascincella gen. nov.* and *Ferescincella gen. nov.*) are further characterized by their small size, elongated body, short limbs, relatively long tail, smooth subcycloid scales (most species), small oblong head with transparent disc in a movable lower eyelid, absence of supranasals, pentadactyl hindlimbs, one row of basal subdigital lamellae (most species), median preanals overlapping lateral ones, four or more scales bordering the parietals between the upper secondary temporals, and lower secondary temporal overlapping the upper one (diagnosis follows Greer and Shea, 2003; Lim, 1998; Nguyen *et al.* 2010a, 2010b, 2010c). Furthermore, the genus *Scincella* is differentiated from closely related *Sphenomorphus* Fitzinger by the presence of a transparent window in the lower eyelid as opposed to lower eyelid covered with polygonal scales in *Sphenomorphus (sensu lato)* (Greer, 1974; Nguyen *et al.* 2010a) (taken from Neang *et al.* 2018).

*Asiascincella gen. nov.* are however separated from all other *Scincella sensu lato* (including *Ferescincella gen. nov.*) by the following unique combination of characters: Upper postocular wide; hindlegs moderately sized or short (x ratio S-V length/length hindlegs 2.8 or more); transparent disc moderately sized or small (x ratio S-V length/length transparent disc more than 51.5); lateral dark band distinctly broken up by whitish spots; usually more than 30 scales around midbody (exceptionally 29); large number of ciliars (x between  $10.7 \pm 1.5$  and  $12.2 \pm 1.6$ ). Species within the nominate subgenus *Asiascincella subgen. nov.* the live bearers in the genus are separated from the egg-layers in subgenera *Sinoscincella subgen. nov.* and *Ovipascincella subgen. nov.* by the following unique suite of characters: Prefrontals forming a suture; always some scales between the fifth supralabial and the granules of the lower eyelid; usually the eye is visible through the supraoculars as a dark area; black spots on the back often concentrated in the vertebral region; body somewhat elongated; head rather small (x ratio S-V length/head width  $7.9 \pm 0.7$ ); enlarged dorsal scales.

The diagnosis for the subgenus *Sinoscincella subgen. nov.* is as for the genus *Asiascincella gen. nov.* (this paper) but separated from other species in that genus (the other two subgenera) by the unique combination of: Prefrontals usually separated or just meeting in a point; rarely scales between the fifth supralabial and the granules of the lower eyelid; eye not visible through the supraoculars; black spots on the back usually not concentrated in the vertebral region, versus:

Prefrontals forming a suture; always some scales between the fifth supralabial and the granules of the lower eyelid; usually the eye is visible through the supraoculars as a dark area; black spots on the back often concentrated in the vertebral region (in the nominate subgenus of *Asiascincella gen. nov.* and *Ovipascincella subgen. nov.*).

The genus *Scincella* is in turn separated from the genus *Ferescincella gen. nov.* by having a larger number of supraciliaries (7-8 against 5-6 in *Ferescincella gen. nov.*) and a larger number of subdigital lamellae under the fourth toe (14-16 (x = 15.2) against 10-17 (x = 13.3) in *Ferescincella gen. nov.*). Ear is very large in *Scincella* as opposed to that in *Ferescincella gen. nov.* (x ratio S-V length/width ear:  $41.0 \pm 6.2$  in *Scincella*; versus  $54.3 \pm 10.8$  in *Ferescincella gen. nov.*). In *Scincella* there are no scales between the fifth supralabial and the granules of the lower eyelid; in *Ferescincella gen. nov.* these scales are present in all but aberrant specimens.

**Distribution:** Indochina and immediately adjacent areas.

**Etymology:** Named in reflection of a closely related genus from

North America and where this group comes from.

**Content:** *Asiascincella reevesii* (Gray, 1838) (type species); *A. doriae* (Boulenger, 1887)

*A. huanrenensis* (Zhao and Huang, 1982); *A. kohtaensis* (Cochran, 1927); *A. melanosticta* (Boulenger, 1887), *A. nigrofasciata* (Neang, Chan and Poyarkov, 2018); *A. ochracea* (Bourret, 1937); *A. rupicola* (Smith, 1916); *A. rufocaudata* (Darevsky and Nguyen Van Sang, 1983).

**SUBGENUS OVIPASCINCELLA SUBGEN. NOV.**

**LSID** urn:lsid:zoobank.org:act:D7A2AA86-6DB8-4244-AB6F-3B231C2DC306

**Type species:** *Lygosoma melanostictum* Boulenger, 1887.

**Diagnosis:** Species within the genus *Asiascincella gen. nov.* would until now have been diagnosed as being within *Scincella* Mittleman, 1950 as defined by Ouboter (1986) on pages 10 and 11.

The genus *Scincella (sensu lato)* and including both *Asiascincella gen. nov.* and *Ferescincella gen. nov.* can be diagnosed by the following combination of characters: (1) body size medium (SVL usually < 65 mm); (2) alpha palate (Greer, 1974) with nine premaxillary teeth; (3) long, thin postorbital bone usually present; and (4) with a transparent window in a movable lower eyelid. Transparent window may be lacking in southern north American populations of *S. cheerei* (1893) (taken from Linkem, Diesmos and Brown, 2011).

*Scincella* species (*sensu lato* and including both *Asiascincella gen. nov.* and *Ferescincella gen. nov.*) are further characterized by their small size, elongated body, short limbs, relatively long tail, smooth subcycloid scales (most species), small oblong head with transparent disc in a movable lower eyelid, absence of supranasals, pentadactyl hindlimbs, one row of basal subdigital lamellae (most species), median preanals overlapping lateral ones, four or more scales bordering the parietals between the upper secondary temporals, and lower secondary temporal overlapping the upper one (diagnosis follows Greer and Shea, 2003; Lim, 1998; Nguyen *et al.* 2010a, 2010b, 2010c). Furthermore, the genus *Scincella* is differentiated from closely related *Sphenomorphus* Fitzinger by the presence of a transparent window in the lower eyelid as opposed to lower eyelid covered with polygonal scales in *Sphenomorphus (sensu lato)* (Greer, 1974; Nguyen *et al.* 2010a) (taken from Neang *et al.* 2018).

*Asiascincella gen. nov.* are however separated from all other *Scincella sensu lato* (including *Ferescincella gen. nov.*) by the following unique combination of characters: Upper postocular wide; hindlegs moderately sized or short (x ratio S-V length/length hindlegs 2.8 or more); transparent disc moderately sized or small (x ratio S-V length/length transparent disc more than 51.5); lateral dark band distinctly broken up by whitish spots; usually more than 30 scales around midbody (exceptionally 29); large number of ciliars (x between  $10.7 \pm 1.5$  and  $12.2 \pm 1.6$ ).

Species within the nominate subgenus *Asiascincella subgen. nov.* the live bearers in the genus are separated from the egg-layers in subgenera *Sinoscincella subgen. nov.* and *Ovipascincella subgen. nov.* by the following unique suite of characters: Prefrontals forming a suture; always some scales between the fifth supralabial and the granules of the lower eyelid; usually the eye is visible through the supraoculars as a dark area; black spots on the back often concentrated in the vertebral region; body somewhat elongated; head rather small (x ratio S-V length/head width  $7.9 \pm 0.7$ ); enlarged dorsal scales.

The diagnosis for the subgenus *Sinoscincella subgen. nov.* is as for the genus *Asiascincella gen. nov.* (this paper) but separated from other species in that genus (the other two subgenera) by the unique combination of: Prefrontals usually separated or just meeting in a point; rarely scales between the fifth supralabial and the granules of the lower eyelid; eye not visible through the supraoculars; black spots on the back usually not concentrated in the vertebral region, versus:

Prefrontals forming a suture; always some scales between the fifth supralabial and the granules of the lower eyelid; usually the eye is visible through the supraoculars as a dark area; black spots on the back often concentrated in the vertebral region (in the nominate subgenus of *Asiascincella gen. nov.* and *Ovipascincella subgen. nov.*).

The reverse of the preceding in turn diagnoses *Ovipascincella subgen. nov.* separating it from the other two subgenera.

The genus *Scincella* is in turn separated from the genus *Ferescincella gen. nov.* by having a larger number of supraciliaries (7-8 against 5-6 in *Ferescincella gen. nov.*) and a larger number of subdigital lamellae under the fourth toe (14-16 ( $x = 15.2$ ) against 10-17 ( $x = 13.3$ ) in *Ferescincella gen. nov.*). Ear is very large in *Scincella* as opposed to that in *Ferescincella gen. nov.* ( $x$  ratio S-V length/width ear:  $41.0 \pm 6.2$  in *Scincella*; versus  $54.3 \pm 10.8$  in *Ferescincella gen. nov.*). In *Scincella* there are no scales between the fifth supralabial and the granules of the lower eyelid; in *Ferescincella gen. nov.* these scales are present in all but aberrant specimens.

**Distribution:** Indochina, China, Korea and adjacent islands.

**Etymology:** Named in reflection of the fact that these species are egg layers as opposed to live-bearers in the nominate subgenus.

**Content:** *Asiascincella (Ovipascincella) melanosticta* (Boulenger, 1887) (type species); *A. (Ovipascincella) kohtaoensis* (Cochran, 1927); *A. (Ovipascincella) nigrofasciata* (Neang, Chan and Poyarkov, 2018); *A. (Ovipascincella) rupicola* (Smith, 1916); *A. (Ovipascincella) rufocaudata* (Darevsky and Nguyen Van Sang, 1983).

#### SUBGENUS SINOSCINCELLA SUBGEN. NOV.

**LSID urn:lsid:zoobank.org:act:B208E433-2C8F-4426-81C7-7E1B51A25F36**

**Type species:** *Lygosoma doriae* Boulenger, 1887 now most widely known as *Scincella doriae* (Boulenger, 1887).

**Diagnosis:** This diagnosis for the subgenus *Sinoscincella subgen. nov.* is as for the genus *Asiascincella gen. nov.* (this paper) but separated from other species in that genus by the unique combination of: Prefrontals usually separated or just meeting in a point; rarely scales between the fifth supralabial and the granules of the lower eyelid; eye not visible through the supraoculars; black spots on the back usually not concentrated in the vertebral region, versus:

Prefrontals forming a suture; always some scales between the fifth supralabial and the granules of the lower eyelid; usually the eye is visible through the supraoculars as a dark area; black spots on the back often concentrated in the vertebral region (in the nominate subgenus of *Asiascincella gen. nov.* and *Ovipascincella subgen. nov.*).

The preceding formal description of *Asiascincella gen. nov.* should also be treated as part of this formal description.

**Distribution:** China, Vietnam, Burma (known places).

**Content:** *Asiascincella (Sinoscincella) doriae* Boulenger, 1887 (monotypic).

#### GENUS FERESCINCELLA GEN. NOV.

**LSID urn:lsid:zoobank.org:act:AA5BBEA4-C087-49D7-835F-5817CF5EFDDE**

**Type species:** *Eumeces modestus* Günther, 1864, better known as *Scincella modesta* (Günther, 1864).

**Diagnosis:** Species within the genus *Ferescincella gen. nov.* would until now have been diagnosed as being within *Scincella* Mittleman, 1950 as defined by Ouboter (1986) on pages 10 and 11.

The genus *Scincella (sensu lato)* and including both *Asiascincella gen. nov.* and *Ferescincella gen. nov.* can be diagnosed by the following combinations of characters: (1) Body size medium (SVL usually less than 65 mm); (2) Alpha palate (Greer, 1974) with nine premaxillary teeth; (3) Long, thin postorbital bone usually present; and (4) With a transparent

window in a movable lower eyelid. Transparent window may be lacking in southern North American populations of *S. cheerei* (1893) (taken from Linkem, Diesmos and Brown, 2011).

*Scincella* species (*sensu lato* and including both *Asiascincella gen. nov.* and *Ferescincella gen. nov.*) are further characterized by their small size, elongated body, short limbs, relatively long tail, smooth subcycloid scales (most species), small oblong head with transparent disc in a movable lower eyelid, absence of supranasals, pentadactyl hindlimbs, one row of basal subdigital lamellae (most species), median preanals overlapping lateral ones, four or more scales bordering the parietals between the upper secondary temporals, and lower secondary temporal overlapping the upper one (diagnosis follows Greer and Shea, 2003; Lim, 1998; Nguyen *et al.* 2010a, 2010b, 2010c).

Furthermore, the genus *Scincella* is differentiated from closely related *Sphenomorphus* Fitzinger by the presence of a transparent window in the lower eyelid as opposed to lower eyelid covered with polygonal scales in *Sphenomorphus (sensu lato)* (Greer, 1974; Nguyen *et al.* 2010a) (taken from Neang *et al.* 2018).

*Asiascincella gen. nov.* are however separated from all other *Scincella sensu lato* (including *Ferescincella gen. nov.*) by the following unique combination of characters: Upper postocular wide; hindlegs moderately sized or short ( $x$  ratio S-V length/length hindlegs 2.8 or more); transparent disc moderately sized or small ( $x$  ratio S-V length/length transparent disc more than 51.5); lateral dark band distinctly broken up by whitish spots; usually more than 30 scales around the midbody (exceptionally 29); large number of ciliars ( $x$  between  $10.7 \pm 1.5$  and  $12.2 \pm 1.6$ ).

The genus *Scincella* is in turn separated from the genus *Ferescincella gen. nov.* by having a larger number of supraciliaries (7-8 against 5-6 in *Ferescincella gen. nov.*) and a larger number of subdigital lamellae under the fourth toe (14-16 ( $x = 15.2$ ) against 10-17 ( $x = 13.3$ ) in *Ferescincella gen. nov.*). Ear is very large in *Scincella* as opposed to that in *Ferescincella gen. nov.* ( $x$  ratio S-V length/width ear:  $41.0 \pm 6.2$  in *Scincella*; versus  $54.3 \pm 10.8$  in *Ferescincella gen. nov.*). In *Scincella* there are no scales between the fifth supralabial and the granules of the lower eyelid; in *Ferescincella gen. nov.* these scales are present in all but aberrant specimens.

**Distribution:** Indochina and immediately adjacent areas, including north-east Asia.

**Etymology:** "*Fere*" means "not quite" in Latin and hence the name *Ferescincella* reflects that this genus is not quite "*Scincella*".

**Content:** *Ferescincella modesta* (Günther, 1864) (type species); *F. barboursi* (Stejneger, 1925); *F. boettgeri* (Van Denburgh, 1912); *F. capitanea* (Ouboter, 1986); *F. darevskii* (Nguyen, Ananjeva, Orlov, Ryal'tovsky and Böhme, 2010); *F. devorator* (Darevsky, Orlov and Cuc, 2004); *F. flavolateralis sp. nov.*; *F. formosensis* (Van Denburgh, 1912); *F. insignipicturaconlus sp. nov.*; *F. macrotis* (Steindachner, 1867); *F. monticola* (Schmidt, 1925); *F. potanini* (Günther, 1896); *F. przewalskii* (Bedriaga, 1912); *F. punctatolineata* (Boulenger, 1893); *F. schmidtii* (Barbour, 1927); *F. tavesae* (Smith, 1935); *F. tsinlingensis* (Hu and Zhao, 1966); *F. vandenburghi* (Schmidt, 1927); *F. ventrealbis sp. nov.*; *F. yonaganijimaensis sp. nov.*

#### GENUS QUAZISCINCELLA GEN. NOV.

**LSID urn:lsid:zoobank.org:act:F4A4DF54-2120-4C5C-B7F4-66D9362F769F**

**Type species:** *Lygosoma victorianum* Shreve, 1940.

**Diagnosis:** The genus *Quaziscincella gen. nov.* is readily separated from all other species within *Scincella* Mittleman, 1950 and genera recently associated with it, including those formally named within this paper by the distinctly keeled dorsal scales.

The genus *Quaziscincella gen. nov.* is further diagnosed as follows: A robust lizard with well developed limbs. A small

number of body scales. Dorsal and lateral scales about equal in size. Frontal rather long (x ratio length frontal/length parietals -l- interparietal:  $1.3 \pm 0.1$ ). The number of scales around the eye is normal: supraciliaries 5-7 ( $x = 5.7 \pm 1.1$ ); ciliars 8-10 ( $x = 8.7 \pm 1.1$ ); postoculars + postsuboculars 5-6 ( $x = 5.2 \pm 0.4$ ), of which two are postsuboculars. Upper postocular narrow. Only the fifth supralabial is situated under the eye. Ear round, sometimes bearing a small granule on the anterior margin; tympanum deeply sunk. Three pairs of enlarged nuchals. The number of body scales is small: scale rows between the parietals and the thighs 50-54 ( $x = 52.0 \pm 2.8$ ); gulars + ventrals 53-56 ( $x = 54.4 \pm 2.1$ ); 26 scales around mid-body. Dorsals and laterals about equal in size. Dorsal scales distinctly keeled; in front of the forelegs four longitudinal scale rows with bicarinate scales, between the fore and hindlegs six longitudinal scale rows with tricarinate scales, on the tail the scales become bicarinate again and only four scale rows are keeled. There are 11 subdigital lamellae under the fourth finger and 15 under the fourth toe. Fore and hindlegs well-developed and rather long (x ratio S-V length/length limbs:  $3.7 \pm 0.1$  and  $2.8 \pm 0.1$  for fore and hindlegs resp.). Maximum snout-vent length 57.5 mm.

In preservative the colour dorsally is light brown, with some golden and dark brown spots. Dark brown lateral band dorsally bordered by an indistinct whitish line. On the back, adjacent to this line some dark brown spots. A grey lateral streak on the lower flanks, more distinct and whiter anteriorly. Venter is greyish or whitish (taken from Ouboter 1986).

Ouboter (1986) and Shreve (1940), both noted the affinity of this taxon to what is now known as *Asymblepharus* (*Himablepharus*) *sikkimensis* (Blyth, 1854), however it is sufficiently divergent from both *Asymblepharus* and *Scincella* to warrant being placed in its own genus.

**Distribution:** Known only from the type locality at Mt. Victoria, Pokokku-Chin Hills, Myanmar (Burma).

**Etymology:** "Quazi" means resembles, hence this genus resembles *Scincella* Mittleman, 1950.

**Content:** *Quaziscincella victorianum* (Shreve, 1940).

#### GENUS DIVERGESAUROS GEN. NOV.

**LSID urn:lsid:zoobank.org:act:B40C2DED-2A2D-42B6-B0DD-A9BF9652AEAD**

**Type species:** *Scincella apraefrontalis* Nguyen, Nguyen, Böhme and Ziegler, 2010.

**Diagnosis:** The genus *Divergesaurus* gen. nov. is monotypic for the type species, *D. apraefrontalis* (Nguyen, Nguyen, Böhme and Ziegler, 2010) and hence the species diagnosis for this taxon in the original description also applies to the genus. The taxon is so divergent to other species within *Scincella* Mittleman, 1950 or similar genera such as *Sphenomorphus* Fitzinger, 1843 *sensu lato*, that it must be placed within its own genus.

*Divergesaurus* gen. nov. is readily separated from all other species within *Scincella* by the following unique combination of characters: Small skink (36.1 mm SVL); supranasals absent; prefrontals absent; nuchals two or three pairs; nasal and first supralabial fused; loreal single; supralabials six; infralabials five; lower eyelid with undivided opaque window; external ear openings absent; midbody scales in 18 rows; limbs short, pentadactyl, widely separated when adpressed; subdigital lamellae in one row under the digits, numbering eight on fourth toe; dorsum and tail base bronze brown with some indistinct darker spots in anterior part of each scale; laterals paler with three or four longitudinal dark brown stripes. No species within *Scincella* has 18 midbody rows. All have 20 or more and most species in the range of 24-34, or narrower boundaries in that general range.

Nguyen *et al.* (2010) gives more detail and direct comparisons between this species/genus and all other relevant taxa.

**Distribution:** It is known only from the type locality at Huu Lien Nature Reserve, Huu Lung District, Lang Son Province, Vietnam

(21.40 N, 106.20 E), elevation about 200 m.

**Etymology:** Named in reflection of that fact the genus is a divergent lizard, being divergent from the genus it was originally placed in and for that matter divergent from many people's perception of a lizard.

**Content:** *Divergesaurus apraefrontalis* (Nguyen, Nguyen, Böhme and Ziegler, 2010) (monotypic).

#### FERESCINCELLA INSIGNIPICTURACONLUS SP. NOV.

**LSID urn:lsid:zoobank.org:act:7AAE4432-02D7-4118-9855-257C0534B4F5**

**Holotype:** A preserved specimen at the University of Michigan, Museum of Zoology, USA, Herpetology Collection, specimen number UMMZ Herps 199857 collected from Taipei, Taiwan, Latitude 25.03 N., Longitude 121.56 E. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the Museum of Vertebrate Zoology, UC Berkeley, USA, specimen number MVZ:Herp:23539 collected from Yang-ming-shan, North of Taipei, Taipei County, Taiwan.

**Diagnosis:** Until now the species *Ferescincella insignipicturaconlus* sp. nov. has been treated as a population of *F. formosensis* (Van Denburgh, 1912) or *F. modesta* (Günther, 1864), separated from others in the genus "*Scincella*", using the diagnosis of "*Scincella modesta* (Günther, 1864)" on pages 51-45 in Ouboter (1986).

The species *F. modesta* (Günther, 1864) from mainland China is separated from all the Taiwan and Ryukyus Islands species in the genus by the unique combination of colouration in adults being brown with scattered black spots or flecks on the dorsal surface of the body, a well-defined black dorsolateral stripe on either side, whitish on the lower flanks, heavily peppered to give a greyish colour and an absence of any white line (full, broken, or indistinct) on the lower flank of the body and brown forelimbs with blackish marbling.

The species *F. formosensis* of the type form from the vicinity of Guanqiling, Taiwan on the mid west-coast side of the island, is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being brown with few if any scattered black spots or flecks on the upper body, peppering on the sides of the tail but not top of the tail along the mid-dorsal line (in original tails) a semi-distinct black dorsolateral stripe on either side of the dorsum of somewhat irregular boundaries (at top) and at bottom fading to peppered grey on the lower margin, yellowish on the venter, excluding the head and neck, which is whitish and peppered with grey anteriorly and light brown forelimbs with semi-distinct irregular cross-bands.

The species *F. insignipicturaconlus* sp. nov. from the far north of Taiwan, is unique among Taiwan species in the genus by possessing the following unique suite of colouration in adults being well defined markings on the labials, neck and flanks of the fore-body being a combination of white and blackish brown bars and spots, a greyish brown dorsum on the body with numerous regular black flecks on the entire surface, but fading slightly near the rear legs, the dark dorsolateral lines are thick and well-defined, almost completely black, save for limited white or brown flecks, being of a smooth and regular boundary at the top (as in a smooth line) and at the bottom is bounded by a thin, partly broken line of whitish-yellow. Forelimbs are dark with scattered white flecks. Venter is usually white.

The species *F. ventrealbis* sp. nov. from Miaoli County in western Taiwan and nearby areas is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown with numerous scattered black spots or flecks on the upper body, a thin white line bordering the darker dorsolateral line on the flanks; the dark dorsolateral line itself is heavily peppered with white and bounded at the bottom with a thick white line in turn bounded by darker peppering on a white background that in turn runs into a whitish venter. This means the darker peppering on the lower

margin of the white line above it in turn forms a semi-distinct darkish line on the lower flanks. The labials and face are whitish and devoid of distinct markings save for darker centers of some anterior scales and a few posterior to each eye. Venter is white. All limbs are generally light brown with indistinct darker brown flecks or markings.

The species *F. flavolateralis* sp. nov. from the south of Taiwan is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown dorsally with few if any darker flecks, this including on the head which in line with nominate *F. formosensis* has an immaculate coloured head and neck as well (on the upper surface); the dark dorsolateral line on the upper flanks of this species is weakly defined by comparison with all other species on Taiwan. In this species the upper boundary is an irregular and often broken dark brown line, fading at the lower margin to light brown (this same area being blackish in the other species) and then on the mid flanks to yellow or even whitish yellow, which remains the colour on the venter. Limbs are yellowish or light brown with scattered medium sized brown spots and there are no obvious bars or makings of any sort on the upper or lower labials. The tail (original) is light brown with widely scattered dark flecks.

*F. boettgeri* (Van Denburgh, 1912) from the Ryukyus Islands (Japan), is similar in most respects to *F. ventrealbis* sp. nov. from which it can be differentiated by the fact that the dark line on the upper flanks starts at the snout and runs through the eye and neck to the upper flanks and it is dark and prominent and well-defined along the entire length. By contrast this line only forms behind the ear in *F. ventrealbis* sp. nov.. *F. boettgeri* is further separated from *F. ventrealbis* sp. nov. by having blackish coloured limbs.

The species *F. yonagunijimaensis* sp. nov. from Yonagunijima Island, west Ryukyus Islands (Japan), until now treated as a population of *F. boettgeri* is separated from that species by the fact that in the former the tail (original tails) in adults is a peppered grey-brown on the flanks and orange on the mid-dorsal line, versus generally flecked all over in *F. yonagunijimaensis* sp. nov.. *F. boettgeri* is further separated from *F. yonagunijimaensis* sp. nov. by the significant dark peppering on the head and neck on the dorsal surface.

**Distribution:** *F. insignipicturaconlus* sp. nov. occurs in the far north of Taiwan in the vicinity of Taipei and areas north of there.

**Etymology:** The name *insignipicturaconlus* in Latin means prominent markings on neck, in reflection of the adult colouration of this taxon.

#### **FERESCINCELLA VENTREALBIS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:8B342722-5ABF-4F62-8E2A-29953D4C3040

**Holotype:** A preserved specimen at the Department of Zoology, Kyoto University, Kyoto, Japan, specimen number 36100, collected at Miaoli, Taiwan, Latitude 22.62 N., Longitude 120.71 E.

This facility allows access to its holdings.

**Paratypes:** 38 preserved specimens at the Department of Zoology, Kyoto University, Kyoto, Japan, specimen numbers 36101-2, 36114-6, 37400-17, 37496-7, 37511-24, collected at Miaoli, Taiwan, Latitude, 22.62 N., Longitude 120.71 E.

**Diagnosis:** Until now the species *Ferescincella ventrealbis* sp. nov. has been treated as a population of *F. formosensis* (Van Denburgh, 1912) or *F. modesta* (Günther, 1864), separated from others in the genus "*Scincella*", using the diagnosis of "*Scincella modesta* (Günther, 1864)" on pages 51-45 in Ouboter (1986).

The species *F. modesta* (Günther, 1864) from mainland China is separated from all the Taiwan and Ryukyus Islands species in the genus by the unique combination of colouration in adults being brown with scattered black spots or flecks on the dorsal surface of the body, a well-defined black dorsolateral stripe on either side, whitish on the lower flanks, heavily peppered to give a greyish colour and an absence of any white line (full, broken,

or indistinct) on the lower flank of the body and brown forelimbs with blackish marbling.

The species *F. formosensis* of the type form from the vicinity of Guanziling, Taiwan on the mid west-coast side of the island, is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being brown with few if any scattered black spots or flecks on the upper body, peppering on the sides of the tail but not top of the tail along the mid-dorsal line (in original tails) a semi-distinct black dorsolateral stripe on either side of the dorsum of somewhat irregular boundaries (at top) and at bottom fading to peppered grey on the lower margin, yellowish on the venter, excluding the head and neck, which is whitish and peppered with grey anteriorly and light brown forelimbs with semi-distinct irregular cross-bands.

The species *F. insignipicturaconlus* sp. nov. from the far north of Taiwan, is unique among Taiwan species in the genus by possessing the following unique suite of colouration in adults being well defined markings on the labials, neck and flanks of the fore-body being a combination of white and blackish brown bars and spots, a greyish brown dorsum on the body with numerous regular black flecks on the entire surface, but fading slightly near the rear legs, the dark dorsolateral lines are thick and well-defined, almost completely black, save for limited white or brown flecks, being of a smooth and regular boundary at the top (as in a smooth line) and at the bottom is bounded by a thin, partly broken line of whitish-yellow. Forelimbs are dark with scattered white flecks. Venter is usually white.

The species *F. ventrealbis* sp. nov. from Miaoli County in western Taiwan and nearby areas is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown with numerous scattered black spots or flecks on the upper body, a thin white line bordering the darker dorsolateral line on the flanks; the dark dorsolateral line itself is heavily peppered with white and bounded at the bottom with a thick white line in turn bounded by darker peppering on a white background that in turn runs into a whitish venter. This means the darker peppering on the lower margin of the white line above it in turn forms a semi-distinct darkish line on the lower flanks.

The labials and face are whitish and devoid of distinct markings save for darker centers of some anterior scales and a few posterior to each eye. Venter is white. All limbs are generally light brown with indistinct darker brown flecks or markings.

The species *F. flavolateralis* sp. nov. from the south of Taiwan is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown dorsally with few if any darker flecks, this including on the head which in line with nominate *F. formosensis* has an immaculate coloured head and neck as well (on the upper surface); the dark dorsolateral line on the upper flanks of this species is weakly defined by comparison with all other species on Taiwan. In this species the upper boundary is an irregular and often broken dark brown line, fading at the lower margin to light brown (this same area being blackish in the other species) and then on the mid flanks to yellow or even whitish yellow, which remains the colour on the venter.

Limbs are yellowish or light brown with scattered medium sized brown spots and there are no obvious bars or makings of any sort on the upper or lower labials. The tail (original) is light brown with widely scattered dark flecks.

*F. boettgeri* (Van Denburgh, 1912) from the Ryukyus Islands (Japan), is similar in most respects to *F. ventrealbis* sp. nov. from which it can be differentiated by the fact that the dark line on the upper flanks starts at the snout and runs through the eye and neck to the upper flanks and it is dark and prominent and well-defined along the entire length. By contrast this line only forms behind the ear in *F. ventrealbis* sp. nov.. *F. boettgeri* is further separated from *F. ventrealbis* sp. nov. by having blackish coloured limbs.

The species *F. yonagunijimaensis* sp. nov. from Yonagunijima

Island, west Ryukyus Islands (Japan), until now treated as a population of *F. boettgeri* is separated from that species by the fact that in the former the tail (original tails) in adults is a peppered grey-brown on the flanks and orange on the mid-dorsal line, versus generally flecked all over in *F. yonagunijimaensis* sp. nov.. *F. boettgeri* is further separated from *F. yonagunijimaensis* sp. nov. by the significant dark peppering on the head and neck on the dorsal surface.

**Distribution:** *F. ventrealbis* sp. nov. is found in Miaoli County in western Taiwan and nearby areas.

**Etymology:** The name *ventrealbis* in Latin means white belly, in reflection of the normal adult colouration of this taxon.

**FERESCINCELLA FLAVOLATERALIS SP. NOV.**

**LSID urn:lsid:zoobank.org:act:88966CC3-D8C8-45B0-BA36-A6E11917575B**

**Holotype:** A preserved specimen at the Department of Zoology, Kyoto University, Kyoto, Japan, specimen number 45074, collected at, Kaohsiung, Taiwan, Latitude 22.63 N., Longitude 120.30 E.

This facility allows access to its holdings.

**Paratypes:** 12 preserved specimens at the Department of Zoology, Kyoto University, Kyoto, Japan, specimen numbers 45075-85 and 46902, collected at Kaohsiung, Taiwan, Latitude 22.63 N., Longitude 120.30 E.

**Diagnosis:** Until now the species *Ferescincella flavolateralis* sp. nov. has been treated as a population of *F. formosensis* (Van Denburgh, 1912) or *F. modesta* (Günther, 1864), separated from others in the genus "*Scincella*", using the diagnosis of "*Scincella modesta* (Günther, 1864)" on pages 51-45 in Ouboter (1986).

The species *F. modesta* (Günther, 1864) from mainland China is separated from all the Taiwan and Ryukyus Islands species in the genus by the unique combination of colouration in adults being brown with scattered black spots or flecks on the dorsal surface of the body, a well-defined black dorsolateral stripe on either side, whitish on the lower flanks, heavily peppered to give a greyish colour and an absence of any white line (full, broken, or indistinct) on the lower flank of the body and brown forelimbs with blackish marbling.

The species *F. formosensis* of the type form from the vicinity of Guanaziling, Taiwan on the mid west-coast side of the island, is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being brown with few if any scattered black spots or flecks on the upper body, peppering on the sides of the tail but not top of the tail along the mid-dorsal line (in original tails) a semi-distinct black dorsolateral stripe on either side of the dorsum of somewhat irregular boundaries (at top) and at bottom fading to peppered grey on the lower margin, yellowish on the venter, excluding the head and neck, which is whitish and peppered with grey anteriorly and light brown forelimbs with semi-distinct irregular cross-bands.

The species *F. insignipicturaconlus* sp. nov. from the far north of Taiwan, is unique among Taiwan species in the genus by possessing the following unique suite of colouration in adults being well defined markings on the labials, neck and flanks of the fore-body being a combination of white and blackish brown bars and spots, a greyish brown dorsum on the body with numerous regular black flecks on the entire surface, but fading slightly near the rear legs, the dark dorsolateral lines are thick and well-defined, almost completely black, save for limited white or brown flecks, being of a smooth and regular boundary at the top (as in a smooth line) and at the bottom is bounded by a thin, partly broken line of whitish-yellow. Forelimbs are dark with scattered white flecks. Venter is usually white.

The species *F. ventrealbis* sp. nov. from Miaoli County in western Taiwan and nearby areas is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown with numerous scattered black spots or flecks on the upper body, a thin white line bordering the darker dorsolateral line on the flanks; the dark

dorsolateral line itself is heavily peppered with white and bounded at the bottom with a thick white line in turn bounded by darker peppering on a white background that in turn runs into a whitish venter. This means the darker peppering on the lower margin of the white line above it in turn forms a semi-distinct darkish line on the lower flanks.

The labials and face are whitish and devoid of distinct markings save for darker centers of some anterior scales and a few posterior to each eye. Venter is white. All limbs are generally light brown with indistinct darker brown flecks or markings.

The species *F. flavolateralis* sp. nov. from the south of Taiwan is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown dorsally with few if any darker flecks, this including on the head which in line with nominate *F. formosensis* has an immaculate coloured head and neck as well (on the upper surface); the dark dorsolateral line on the upper flanks of this species is weakly defined by comparison with all other species on Taiwan. In this species the upper boundary is an irregular and often broken dark brown line, fading at the lower margin to light brown (this same area being blackish in the other species) and then on the mid flanks to yellow or even whitish yellow, which remains the colour on the venter.

Limbs are yellowish or light brown with scattered medium sized brown spots and there are no obvious bars or makings of any sort on the upper or lower labials. The tail (original) is light brown with widely scattered dark flecks.

*F. boettgeri* (Van Denburgh, 1912) from the Ryukyus Islands (Japan), is similar in most respects to *F. ventrealbis* sp. nov. from which it can be differentiated by the fact that the dark line on the upper flanks starts at the snout and runs through the eye and neck to the upper flanks and it is dark and prominent and well-defined along the entire length. By contrast this line only forms behind the ear in *F. ventrealbis* sp. nov.. *F. boettgeri* is further separated from *F. ventrealbis* sp. nov. by having blackish coloured limbs.

The species *F. yonagunijimaensis* sp. nov. from Yonagunijima Island, west Ryukyus Islands (Japan), until now treated as a population of *F. boettgeri* is separated from that species by the fact that in the former the tail (original tails) in adults is a peppered grey-brown on the flanks and orange on the mid-dorsal line, versus generally flecked all over in *F. yonagunijimaensis* sp. nov.. *F. boettgeri* is further separated from *F. yonagunijimaensis* sp. nov. by the significant dark peppering on the head and neck on the dorsal surface.

**Distribution:** *F. flavolateralis* sp. nov. is found in the south of Taiwan around Kaohsiung and nearby areas.

**Etymology:** The name *flavolateralis* in Latin means yellow sides, in reflection of the normal adult colouration of this taxon.

**FERESCINCELLA YONAGUNIJIJAENSIS SP. NOV.**

**LSID urn:lsid:zoobank.org:act:FB304A30-9728-45DA-BB5B-BA74CC295BEC**

**Holotype:** A preserved specimen at the Department of Zoology, Kyoto University, Kyoto, Japan, specimen number 412, collected at, Yonagunijima, Yaeyama Islands, Japan, Latitude 24.46 N., Longitude 122.99 E. This facility allows access to its holdings.

**Paratypes:** 33 preserved specimens at the Department of Zoology, Kyoto University, Kyoto, Japan, specimen numbers 413, 444, 1364-6, 13052-73, 13132-6 and 47494 collected at, Yonagunijima, Yaeyama Islands, Japan, Latitude 24.46 N., Longitude 122.99 E.

**Diagnosis:** Until now the species *Ferescincella yonagunijimaensis* sp. nov. has been treated as a population of *F. boettgeri* (Van Denburgh, 1912), *F. formosensis* (Van Denburgh, 1912) or *F. modesta* (Günther, 1864), separated from others in the genus "*Scincella*", using the diagnosis of "*Scincella modesta* (Günther, 1864)" on pages 51-45 in Ouboter (1986).

The species *F. modesta* (Günther, 1864) from mainland China is separated from all the Taiwan and Ryukyus Islands species in



the genus by the unique combination of colouration in adults being brown with scattered black spots or flecks on the dorsal surface of the body, a well-defined black dorsolateral stripe on either side, whitish on the lower flanks, heavily peppered to give a greyish colour and an absence of any white line (full, broken, or indistinct) on the lower flank of the body and brown forelimbs with blackish marbling.

The species *F. formosensis* of the type form from the vicinity of Guanziling, Taiwan on the mid west-coast side of the island, is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being brown with few if any scattered black spots or flecks on the upper body, peppering on the sides of the tail but not top of the tail along the mid-dorsal line (in original tails) a semi-distinct black dorsolateral stripe on either side of the dorsum of somewhat irregular boundaries (at top) and at bottom fading to peppered grey on the lower margin, yellowish on the venter, excluding the head and neck, which is whitish and peppered with grey anteriorly and light brown forelimbs with semi-distinct irregular cross-bands.

The species *F. insignipicturaconlus* sp. nov. from the far north of Taiwan, is unique among Taiwan species in the genus by possessing the following unique suite of colouration in adults being well defined markings on the labials, neck and flanks of the fore-body being a combination of white and blackish brown bars and spots, a greyish brown dorsum on the body with numerous regular black flecks on the entire surface, but fading slightly near the rear legs, the dark dorsolateral lines are thick and well-defined, almost completely black, save for limited white or brown flecks, being of a smooth and regular boundary at the top (as in a smooth line) and at the bottom is bounded by a thin, partly broken line of whitish-yellow. Forelimbs are dark with scattered white flecks. Venter is usually white.

The species *F. ventrealbis* sp. nov. from Miaoli County in western Taiwan and nearby areas is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown with numerous scattered black spots or flecks on the upper body, a thin white line bordering the darker dorsolateral line on the flanks; the dark dorsolateral line itself is heavily peppered with white and bounded at the bottom with a thick white line in turn bounded by darker peppering on a white background that in turn runs into a whitish venter. This means the darker peppering on the lower margin of the white line above it in turn forms a semi-distinct darkish line on the lower flanks.

The labials and face are whitish and devoid of distinct markings save for darker centers of some anterior scales and a few posterior to each eye. Venter is white. All limbs are generally light brown with indistinct darker brown flecks or markings.

The species *F. flavolateralis* sp. nov. from the south of Taiwan is readily separated from other Taiwan species in the genus by the unique combination of colouration in adults being light brown dorsally with few if any darker flecks, this including on the head which in line with nominate *F. formosensis* has an immaculate coloured head and neck as well (on the upper surface); the dark dorsolateral line on the upper flanks of this species is weakly defined by comparison with all other species on Taiwan. In this species the upper boundary is an irregular and often broken dark brown line, fading at the lower margin to light brown (this same area being blackish in the other species) and then on the mid flanks to yellow or even whitish yellow, which remains the colour on the venter.

Limbs are yellowish or light brown with scattered medium sized brown spots and there are no obvious bars or makings of any sort on the upper or lower labials. The tail (original) is light brown with widely scattered dark flecks.

*F. boettgeri* (Van Denburgh, 1912) from the Ryukyus Islands (Japan), is similar in most respects to *F. ventrealbis* sp. nov. from which it can be differentiated by the fact that the dark line on the upper flanks starts at the snout and runs through the eye and neck to the upper flanks and it is dark and prominent and

well-defined along the entire length. By contrast this line only forms behind the ear in *F. ventrealbis* sp. nov.. *F. boettgeri* is further separated from *F. ventrealbis* sp. nov. by having blackish coloured limbs.

The species *F. yonagunijimaensis* sp. nov. from Yonagunijima Island, west Ryukyus Islands (Japan), until now treated as a population of *F. boettgeri* is separated from that species by the fact that in the former the tail (original tails) in adults is a peppered grey-brown on the flanks and orange on the mid-dorsal line, versus generally flecked all over in *F. yonagunijimaensis* sp. nov.. *F. boettgeri* is further separated from *F. yonagunijimaensis* sp. nov. by the significant dark peppering on the head and neck on the dorsal surface.

**Distribution:** *F. yonagunijimaensis* sp. nov. is known only from the type locality of Yonagunijima, Yaeyama Islands, Japan.

**Etymology:** The name *yonagunijimaensis* reflects the only known location the species occurs or is likely to occur.

**ASYMBLEPHARUS AURISOVALIBUS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:F0BB04A9-94A8-4EA7-AD68-ACDF70B7F8F8

**Holotype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number BMNH 1955.1.13.45-56 collected at Sikha, 26 miles northwest of Pokhara, 8000 ft elevation, Annapurna region, Nepal. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number BMNH 1955.1.13.63-67 collected at Ulleri, 19 miles northwest of Pokhara, 6000-7000 ft elevation, Annapurna region, Nepal.

**Diagnosis:** *Asymblepharus aurisovalibus* sp. nov. has until now been treated as a western population of *Asymblepharus sikimmensis* (Blyth, 1853), as defined by Ouboter (1986) as "*Scincella sikimmensis* (Blyth, 1853)" at pages 24-31 and in the key on pages 14-16.

*A. aurisovalibus* sp. nov. is however readily separated from *A. sikimmensis* by an ear opening that is oval or slit shaped, versus smaller and rounded in shape in *A. sikimmensis*. Midbody scale rows are in excess of 25 in *A. aurisovalibus* sp. nov. versus 25 or less in *A. sikimmensis*.

In both *A. aurisovalibus* sp. nov. and *A. sikimmensis* the dorsum is bronze-brown, usually with some irregularly arranged dark brown to black spots. However in *A. aurisovalibus* sp. nov. these are arranged into an obvious vertebral band.

Both holotype and paratype of this species are held at the Museum of Natural History, UK as "*Scincella himalayana*" as of 2018.

**Distribution:** Known only from the area of the type locality at Annapurna, Nepal.

**Etymology:** The name "*aurisovalibus*" in Latin means oval ear, in reflection of the physical reality of this species having an oval-shaped ear opening.

**ASYMBLEPHARUS LATERALIBUSDORSOCLAVO SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:6151B94C-012D-4143-8C37-5EB9AA12EFCA

**Holotype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number 1896.11.20.1-4 collected at 5000-9000 ft elevation near Gulmerg, Kashmir, India. This facility allows access to its holdings.

**Diagnosis:** *Asymblepharus lateralibusdorsoclavo* sp. nov. has until now been treated as a western population of *Asymblepharus ladacensis himalayana* (Günther, 1864), as defined by Ouboter (1986) as "*Scincella ladacensis himalayana* (Günther, 1864)" at pages 21-24 and in the key on pages 14-16.

*A. lateralibusdorsoclavo* sp. nov. is however readily separated from *A. himalayana* (Günther, 1864) (treated herein as a species separate from *Asymblepharus ladacensis ladacensis* (or simply *A. ladacensis*) as defined by Ouboter 1986), by its distinctive dorsal colouration incorporating a pair of very prominent dorsolateral grey to yellow-golden stripes, which are either

absent or indistinct in *A. ladacensis* and *A. himalayana*.

**Distributon:** Known only from the type locality being in the vicinity of Gulmerg, Kashmir, India.

**Etymology:** The word “*lateralibusdorsoclavo*” in Latin refers to the dorsolateral line seen in this species.

#### CONCLUSION

The taxonomy and nomenclature herein provides a robust framework for further urgent research into the relevant taxa. With the massively increasing human population in the south-east Asian region accompanied by land clearing and other forms of ecosystem destruction, it is important that the skink biodiversity of the region be properly catalogued, named and conserved as soon as possible and before species are lost as documented in the examples of Hoser (2019a, 2019b).

As further evidence becomes available, it is likely that species within the genera subject of this paper may need to be further divided at the genus and subgenus levels and further unrecognized (to date) species will need to be formally named.

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**Six new genera of skinks associated with *Lipinia* Gray, 1845 based on morphological and evolutionary divergence as well as twenty seven previously undiagnosed species within the same assemblage.**

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**ABSTRACT**

An ongoing audit of the genus-level classification of the Lygosominae skinks for the genus *Lipinia* Gray, 1845 and associated species was conducted.

It found that the genus-level classification as used in 2019 did not reflect relationships between species or even morphological similarities between groups.

As a result of these discrepancies, a new classification framework for the relevant species is given here. This includes reassignment of species between genera, including via resurrection of old and available names as well as the formal erection of six new genera in accordance with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) to accommodate divergent taxa.

The new taxonomy and nomenclature is based on peer reviewed scientific evidence. This includes both morphological and molecular evidence as cited and because of this, it is robust and likely to substantively withstand the test of time.

The audit also found significant underestimation of the species-level diversity within these genera and twenty seven of these unnamed taxa are formally named for the first time.

**Keywords:** Taxonomy; nomenclature; sauria; skinks; Lygosominae; Asia; Phillipines; Sundaland; New Guinea; Solomon Islands; Indonesia; *Lygosoma*; *Lipinia*; *Sphenomorphus*; *Lobulia*; *Prasinohaema*; *Papuascincus*; *Aulacoplax*; *Fojia*; *Scincella*; *Cophoscincus*; *Leiopisma*; new genus; *Crottysaurus*; *Retroalbascincus*; *Lateratenebriscincus*; *Pointednasus*; *Variusscincus*; *Crudushaema*; new subgenus: *Viridihaema*; *Macrotympanoscincus*; new species; *aurantiacocauda*; *oliveetfatua*; *crottyi*; *sentaniensis*; *sepikensis*; *albaudere*; *gulagorum*; *tokpisinensis*; *freshsweetpotato*; *acrilineata*; *maculaoccipitalis*; *albavarietata*; *laterafusca*; *effatubrunnea*; *leucolabialis*; *widerecta*; *clavoflavoviridis*; *currearbor*; *flavorecta*; *flavopalpebrae*; *ventriiridescens*; *makiraensis*; *extentadigitus*; *labiamarmorata*; *litoresaurus*; *allengreeri*; *haroldcoggeri*.

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**INTRODUCTION**

An ongoing audit of the genus-level classification of the Lygosominae skinks for the genus *Lipinia* Gray, 1845 and associated species was conducted.

This included a perusal of all relevant scientific literature, specimens as required and the most recent molecular studies relevant to the said species.

The audit found that the genus-level classification as used in early 2019 by most herpetologists did not reflect relationships between species or even morphological similarities between groups.

In spite of the best efforts of many talented herpetologists over the past 200 years, the current taxonomy and nomenclature for the relevant species was best described as "a dog's breakfast".

As a result of these discrepancies, a new classification framework for the relevant species is given here. This includes

reassignment of species between genera as required, including resurrection of old generic names as well as the formal erection of six new genera in accordance with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) to accommodate divergent taxa.

The relevant genera include those distinct groups that cannot realistically be assigned to other genera based on likely divergences of more than 10 MYA.

The new taxonomy and nomenclature is also based on peer reviewed scientific evidence as cited herein. This includes both morphological and molecular evidence as cited and because of this, it is robust and likely to substantively withstand the test of time.

The audit also found significant underestimation of the species-level diversity within these genera and twenty seven of these unnamed taxa are formally named for the first time.

## MATERIALS, METHODS AND RESULTS

These are inferred in both the abstract and introduction, but as a matter of trite I spell them out in a little more explicit detail. The available literature was examined relevant to the genus *Lipinia* Gray, 1845 and associated species including other phylogenetically close taxa.

This included species recently assigned within the putative genera *Lygosoma*; *Lipinia*; *Sphenomorphus*; *Lobulia*; *Prasinohaema*; *Papuascincus*; *Aulacoplax*; *Fojia*; *Cophoscincus*; *Scincella*; *Leiopisma* although I should note that this paper does not deal with all species assigned to some of these genera at various times by various authors.

Additional to this has been inspection of specimens as required and possible in order to ascertain the classification of the genera or species within the genera, both as defined by the original authors or including unnamed taxa when they are evident. Available information in the form of photos of specimens with good available locality data and other information was also utilized in this study.

I also note that, notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned in breach of undertakings to the court (Court of Appeal Victoria 2014 and VCAT 2015), I have made a decision to publish this paper, even though it would be clearly improved if I took some further years to get further data,

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

This comment is made noting the extensive increase in human population in the relevant region and the general environmental destruction across the planet as documented by Hoser (1991), including low density areas without a large permanent human population.

I also note the abysmal environmental record of various National, State and Local governments in the relevant region over the past 200 years as detailed by Hoser (1989, 1991, 1993, 1996 and 2010) in the face of ongoing threats as diverse as introduced species, habitat destruction and modification, hybridisation of naturally allopatric forms arising from translocation of specimens, introduced pathogens and other factors and combinations thereof.

It is also noteworthy that I cannot guarantee another illegal armed raid on our facility, involving theft of materials and data again at some unspecified date in the future. Therefore it is important that the taxonomy of this group be largely resolved herein, rather than be potentially delayed indefinitely and with the negative conservation outcomes this is likely to entail.

Published literature relevant to the taxonomy and nomenclature adopted within this paper includes the following: Adler *et al.* (1995), Allison and Greer (1986), Amante and Eakins (2009), Andersson (1913), Annandale (1905), Archbold (1942), Austin (1995, 1998, 1999), Austin and Jessing (1994), Barbour (1912), Binaday *et al.* (2017), Bobrov (1995), Bobrov and Semenov (2008), Boettger (1896, 1900, 1901), Boulenger (1883, 1884, 1886, 1887, 1890, 1894, 1895a, 1895b, 1897a, 1897b, 1900, 1903, 1914), Brongersma (1942, 1953a, 1953b), Brown *et al.* (1996, 2000), Brown and Alcalá (1956, 1963, 1980), Brown and Fehlmann (1958), Brygoo (1985), Bucklitsch *et al.* (2012), Buden (2015), Buden and Taboroši (2016), Burt and Burt (1932), Charnard *et al.* (2015), Cochran (1930), Couper *et al.* (2006), Cox *et al.* (1998), Crombie and Pregill (1999), Curtis (1973), Daan and Hillenius (1966), Darevsky (1964), Das (1997, 1999, 2004), Das and Austin (2007), Das and Greer (2002), De Jong (1927, 1930), de Rooij (1915), De Vis (1890, 1892), Dryden and Taylor (1969), Duméril and Bibron (1839), Duméril and Duméril (1851), Ferner *et al.* (2000), Fitzinger (1843), Garman (1901), Gaulke (2011), Gray (1845), Gill (1993), Girard (1858), Gojo-Cruz and Afuang

(2018), Goldberg and Grismer (2014), Goldberg and Kraus (2012), Grandison (1972), Gray (1845), Greer (1973, 1974), Greer and Mys (1987), Greer and Simon (1982), Greer *et al.* (2005), Grismer (2011a, 2011b), Grismer and Quah (2019), Grismer *et al.* (2002, 2007, 2008a, 2008b, 2014, 2016), Grossmann (2010), Günther (1873, 1888), Günther (2000), Hagen *et al.* (2012), Hallermann (1998), Hallowell (1860), Hamilton (2008), Hamilton *et al.* (2010), Hartmann *et al.* (2013), Havery *et al.* (2018), Heatwole (1975), Hediger (1934), Hein *et al.* (2001), Hunsaker and Breesse (1967), Ineich (1990, 2009, 2011), Iskandar and Erdelen (2006), Jaques and Robinson (1977), Jestrzemeski *et al.* (2013), Kinghorn (1928), Koch (2011, 2012), Koch *et al.* (2009), Kramer (1979), Kraus (2013), Lagat (2009), Lesson (1826, 1830), Lim and Ng (1999), Linkem *et al.* (2011), Loveridge (1945, 1948), Mahony (2008), Manthey and Grossmann (1997), McCoy (1980, 2006, 2015), Mckeown (1996), McMorris (1970), Mehely (1898), Mertens (1931), Meyer (1874), Mittleman (1952), Morrison (2003), Müller (1894), Mys (1988), Nabhitabhata *et al.* (2000), Neang and Poyarkov (2016), Nguyen *et al.* (2009), Oliver and Shaw (1953), Onn *et al.* (2010), O'Shaughnessy (1873), Oudemans (1894), Parker (1925, 1936, 1940), Pauwels *et al.* (2003), Peters (1966), Peters (1864, 1867, 1871, 1874a, 1874b, 1881, 1878), Peters and Doria (1878), Pyron *et al.* (2013), Reeder (2003), Relox *et al.* (2011), Ride *et al.* (1999), Sanguiola *et al.* (2016), Sauvage (1879), Schmidt (1932), Shea (2007, 2017), Shea and Greer (2002), Shea and Michels (2008), Siler and Brown (2010), Smith (1922, 1935, 1937), Steindachner (1867, 1869), Stejneger (1899), Sternfeld (1918, 1920), Stoliczka (1873), Stuart and Emmett (2006), Stuart *et al.* (2006), Sumarli *et al.* (2015), Supsup *et al.* (2016), Sworder (1933), Tanner (1950, 1951, 1952), Taylor (1917, 1919, 1922, 1944, 1963), Teo and Rajathurai (1997), Teynié *et al.* (2010), Venugopal (2010), Vogt (1912, 1932), Wanger *et al.* (2011), Werner (1899, 1910), Wichmann (1912), Wood *et al.* (2004), Woodruff (1972), Zug (1991), Zug *et al.* (2011, 2012), Zweifel (1972, 1979, 1980) and sources cited therein.

In terms of the genus and species descriptions, all newly named taxa or those resurrected from synonymy have until now (as of 2019) been regarded as populations of previously described genera or species.

As far as I am aware, no one has until now speculated that any may be distinct at the genus or species level or if so, only in an ambivalent way and not going so far as to define them as such. See for example Austin (1999) or Zweifel (1979) for species associated with "*Lipinia noctua* (Lesson, 1830)" as identified by them from the New Guinea/Solomon islands region.

However each genus and species are significantly divergent from the type forms, each are often allopatric in distribution and the relevant taxa are also commonly long separated by wide zones of unsuitable habitat where they clearly do not occur or biogeographical barriers in the form of deep water as shown by publications such as Amante and Eakins (2009). The age of these biogeographical barriers in terms of the relevant reptile genera and/or species in their present form is measured in the millions of years meaning that in each case the relevant taxa have diverged sufficiently to be regarded as full species.

In the case of "*Lipinia noctua* (Lesson, 1830)" the mean sequence divergence between relevant populations was found by Austin (1999) to be 9.7% (mtDNA) or just under 5 MYA, which clearly makes each population distinct at the species level. Hagen *et al.* (2012), found similar divergences for putative species between the same deep water biogeographic barriers in the Solomon Islands.

Hence the formal descriptions below.

### SOME KEY POINTS ON THE TAXONOMIC DECISIONS MADE HEREIN

While the genus or species descriptions below, effectively summarize the results of the audit of *Lipinia* Gray, 1845 *sensu lato* and associated species including other phylogenetically close

taxa, it is important that relevant considerations in terms of most of the decisions is spelt out first.

Divergent, newly named and resurrected from synonymy genera can be seen appropriately placed by way of cross referencing with the published molecular phylogenies of Rodriguez *et al.* (2018), Pyron *et al.* (2013) and others cited above.

The divergent species or groups simply match the new genus level entities.

Within *Lipinia sensu lato*, the various species groups are divided in line with the formal descriptions below and the result is self evident.

All divisions of genera have been made with the benefit of molecular evidence and known divergence times as detailed in the relevant references cited above. At the species level about half of the species named below have also been confirmed as species by molecular evidence published to date.

Those for which molecular evidence is not yet available invariably have been divided across well-known biogeographic barriers affecting a whole suite of similarly constrained species, such barriers including features such as the central New Guinea cordillera or water bodies that have remained covered by oceans at all relevant geological periods.

The relevant taxa are also morphologically divergent as would be expected.

In terms of the following descriptions the following points should be noted:

1/ All descriptions of specimens in terms of form and colour relate to normal adult specimens of typical form and health and with original tails (not regenerated) for each taxon unless otherwise stated.

2/ Spellings of names assigned to genera or species should not be altered in any way unless mandated by the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) or superseding nomenclatural rules.

3/ In the unlikely event a first reviser seeks to merge any genera or species formally named herein, the name to be used is that of the first name used in terms of page priority, also as listed in the abstract keywords in the same order.

4/ Material may be repeated in descriptions in order to comply with the relevant articles of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

5/ A lot of diagnostic material within descriptions has been gleaned from earlier literature (as cited herein) and when appropriate reproduced in similar form (as there is little point in re-inventing what has been done well). But as a warning, it must be noted that the original diagnoses from which these were taken are often incorrect in detail such as scale counts, ranges of them, lamellae counts and so on. These errors have arisen either due to errors made at the time by the original authors (quite common) or alternatively further material being available to me that the earlier authors did not have and which in effect changed the diagnoses required and necessitated new ones to be formulated.

Quite frequently when this should have been done in the past, it has not been, thereby perpetuating errors in the literature over many decades in a few cases even centuries!

Past authors have commonly copied diagnostic material for putative taxa from earlier authors when describing new taxa, even when their new taxa clearly does not conform with the diagnosis they publish their announcement of their findings. In this paper these errors have (as best as humanly possible) been ironed out.

I therefore issue a warning that failure to take into account of the exact diagnostic information in these following descriptions (by not reading them) and/or instead referring to earlier published material on the basis it may be much the same is a potentially hazardous route to take and may lead to perpetuation of past errors still seen in the contemporary literature.

A second potential outcome of failure to properly read the

material herein may be the improper and hasty synonymization of species when they should not be.

The improper synonymisation of valid species by so-called scientists acting in a non-scientific way also has serious wildlife conservation outcomes. This has already caused one or more extinctions in the herpetology space as detailed by Hoser (2019a and 2019b) and is a particular risk in terms of some of the island endemics formally named herein.

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

#### **FORMAL ASSIGNMENT OF A LECTOTYPE FOR THE SPECIES *LYGOSOMA ANOLIS* BOULENGER, 1883. IN ACCORDANCE WITH THE RULES OF THE INTERNATIONAL CODE OF ZOOLOGICAL NOMENCLATURE (RIDE ET AL. 1999).**

The species known until now as *Prasinohaema virens* (Peters, 1881) (originally described as *Lygosoma virens*), is herein treated as a complex of several species, some of which are formally named herein. The synonymised (by most authors since) species *Lygosoma anolis* Boulenger, 1883 is also regarded as a valid taxon and herein resurrected from the synonymy of *P. virens*.

At the time Boulenger formally described the species *P. anolis* (Boulenger, 1883), he relied on two types (syntypes) for his species, being a specimen from the Treasury Islands in the Solomon Islands and another from Santa Anna Island in the Solomon Islands.

As each are herein regarded as being of separate species, it is necessary to make one the type for the species *P. anolis* (Boulenger, 1883), to ensure the clarity of the taxonomic status of each species. This is an express statement of the taxonomic purpose of the designation as per Article 74.7.3 of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

As first reviser (Article 24 or other articles as relevant) and under article 74 (or other relevant articles) of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), I hereby make a lectotype designation for the purpose of clarifying the application of the name to this taxon, and hereby assign the Treasury Island animal as identified in Boulenger's original 1883 description and again in Boulenger (1887) as the Lectotype in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

The preceding species are all herein placed in a new genus namely *Pointednasmus* *gen. nov.* and in turn placed in the newly erected subgenus namely *Viridihaema* *subgen. nov.* also named according to the rules set out in the *International Code of Zoological Nomenclature*.

This lectotype designation is relevant and necessary and should be treated as part of the relevant species descriptions later in this paper.

#### **GENUS *LIPINIA* GRAY, 1845**

**Type species:** *Lygosoma (Leiopisma) pulchellum* Gray, 1845.

**Diagnosis:** Members of the genus *Lipinia* Gray, 1845 are characterized by the following suite of characters: small body size (SVL to 58 mm); lower eyelid with a clear window (except in *Lipinia leptosoma* a species herein transferred out of *Lipinia* and placed within *Aulacoplax* Brown and Fehlmann, 1958); auricular lobules absent; body scales smooth; longitudinal scale rows at mid-body 28; basal subdigital lamellae expanded (slightly in some taxa); postorbital absent; vomers fused; pterygoid teeth absent; dorsal colour pattern typically comprising a pale (rarely dark) mid-dorsal stripe at least anteriorly; visceral fat bodies absent (except in *Lipinia noctua* and associated species herein placed in the genus *Lateratenebriscincus* *gen. nov.*); brood size of two (exceptionally one, as in *Lipinia rouxi* transferred to the genus *Retroalbascincus*) (derived mainly from Das and Greer, 2002).

Species and genera formerly placed in the genus *Lipinia* are separated from *Lipinia* in the descriptions that follow in this

paper.

**Distribution:** *Lipinia* as defined within this paper is herein confined to the Philippines.

**Content:** *Lipinia pulchella* (Gray, 1845) (type species); *L. auriculata* (Taylor, 1917); *L. rabori* (Brown and Alcalá, 1956); *L. semperi* (Peters, 1867); *L. vulcania* Girard, 1858; *L. zamboangensis* (Brown and Alcalá, 1963).

#### GENUS *LOBULIA* GREER 1974

**Type species:** *Lygosoma elegans* Boulenger, 1897.

**Diagnosis:** The genus is herein defined as a member of the *Sphenomorphus* group of lygosominae skinks as defined by Greer (1979) but separated from the other genera by one of the following two unique combinations of characters:

- 1/ Lower eyelid with clear window or perhaps secondary scaly; two or more pairs of enlarged chin shields in medial contact; small lateral chin scales extending forward between enlarged chin scales and infralabials to varying degrees; smooth body scales; plantar surfaces yellow; Post-orbital bone absent; No inguinal fat bodies; ovoviviparous (species until now placed in *Lobulia* Greer, 1974 as defined by Greer and Allison 1986), or:
- 2/ Snout subacuminate or rounded somewhat; prefrontals separated from one another; frontonasal broader than long; supraoculars 4, the foremost 2 in contact with the frontal; frontal as long as, or longer than, the paired frontoparietals and interparietal together; interparietal moderate to large; supraciliaries 6-10 all higher than long; upper labials 7-9; lower labials 6-10; midbody scale rows 38-42; limbs pentadactyle; digits dilated; lamellae under fourth toe transversely enlarged and numbering 15-22; length from snout to forelimb contained one and fifth to one and a third times in the distance between axilla and groin; toes of adpressed hindlimb reach wrist of backward-pressed forelimb, ear opening is oval (some of the species as of 2019 known to be within the genus *Prasinohaema* Greer, 1974, being *P. flavipes* (Parker, 1936), *P. parkeri* (Smith, 1937) or *P. prehensicauda* (Loveridge, 1945) all herein transferred into the genus *Lobulia*).

Based on the phylogeny of Rodríguez *et al.* (2018) none of the alternative generic names assigned to these two preceding species groups are recognized herein for the said taxa on the basis of the limited divergences between them. For that matter, none are recognized herein even at the subgenus level.

This means *Prasinohaema* Greer, 1974 is synonymised with *Lobulia*. Other species until now placed within the genus *Prasinohaema* have been placed within two newly created genera to reflect their proper phylogenetic affinities as well as morphological divergence.

The two groups of species diagnosed above are each within two clades in the genus, that in effect divides it, but their divergence is not great and therefore I do not in this case recognize subgenera.

**Distribution:** New Guinea, mainly north of the central cordillera.

**Content:** *Lobulia elegans* (Boulenger, 1897) (type species); *L. alpina* Greer, Allison and Cogger, 2005; *L. brongersmai* (Zweifelf, 1972); *L. flavipes* (Parker, 1936); *L. glacialis* Greer, Allison and Cogger, 2005; *L. oliveifata* sp. nov.; *L. parkeri* (Smith, 1937); *L. prehensicauda* (Loveridge, 1945); *L. stellaris* Greer, Allison and Cogger, 2005; *L. subalpina* Greer, Allison and Cogger, 2005.

#### GENUS *FOJIA* GREER AND SIMON, 1982

**Type species:** *Lygosoma elegans* Boulenger, 1897.

**Diagnosis:** The genus *Fojia* Greer and Simon, 1982 is herein defined as a member of the *Sphenomorphus* group of lygosominae skinks as defined by Greer (1979) but expanded from the original concept to include all species placed in the genus *Papuascincus* Allison and Greer, 1986 and a species group from the genus *Lipinia* Gray, 1845 that should be placed with this group instead.

This monophyletic group of species are separated from the other related genera by one of the following three unique combinations of characters:

- 1/ Mature males with extensive patches of yellow sub-dermal glands on the chin, abdomen, femoral area and underside of the base of tail; scales on the lateral and dorso-lateral areas of neck and body tubercular and contrasting sharply with the more normal sized mid-dorsal and ventral scales; all dorsal scales covered with minute granules, each large mid-dorsal scale with a granule-crested ridge concentric to posterior edge of scale; basal half of digits very small. There are ventral glands in adult males and the juxtaposition of the normal sized mid-dorsal scales with the granular lateral scales. There are glandular patches on the chin and undersides of thighs and tail base as well as the abdomen in males; there is a typical instead of a highly fused complement of head scales (the species described as *Fojia bumui* Greer and Simon, 1982 being monotypic for that genus erected by Greer and Simon, 1982); or:

- 2/ Frontoparietals fused; lower eyelid with clear or at least semi-translucent window; basal subdigital lamellae expanded slightly; body scales smooth. Post-orbital bone absent; parietal eye and foramen absent; pterygoid teeth absent; palatal rami of pterygoids with slight post medial processes; intermedium absent. No inguinal fat bodies. Two eggs laid with numerous small pustules distributed evenly over the surface. Sexually dichromatic; ventral abdominal colouration of adult females is pearl to pearl yellow, depending on species and adult males are same as females but noticeably brighter and these colourations are maintained throughout adult life (species until now placed in *Papuascincus* Allison and Greer, 1986 as defined by Greer and Allison 1986), or:

- 3/ Snout pointed; lower eyelid with a transparent disk; earopening roundish, smaller than the eye-opening, no lobules. Nostril in a large nasal; no supranasals; frontonasal more broad than long, in contact with the rostral; prefrontals meeting or separated; frontal small, as long as the frontoparietal, pointed behind, in contact with the two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietal single, about twice as long as the interparietal; parietals in contact; three to five pair of nuchals; four upper labials before the subocular. Body slender, scales smooth; the distance between the tip of the snout and the forelimb is contained one and one fourth in the distance between axilla and groin; 24 mid-body rows, the two vertebral series largest, laterals smallest; preanals strongly enlarged. Tail one and a half times as long as head and body. Limbs strong, the hind limb reaches the elbow; digits slender, fourth toe with 22 smooth lamellae below. Colouration is black above, with five greenish-white longitudinal lines, beginning at the rostral, the middle one ending before the hind limbs; limbs reddish-brown, spotted with black; digits banded with dark; tail red with a regular series of vertical bands on each side. Lower parts greenish-white (the species described as *Lygosoma pulchrum* Boulenger, 1903).

Based on the phylogeny of Rodríguez *et al.* (2018) none of the alternative generic names assigned to these three preceding species groups are recognized herein for the said taxa on the basis of the limited divergences between them. For that matter, none are recognized herein even at the subgenus level. This means *Papuascincus* has herein been synonymised with *Fojia*.

**Distribution:** New Guinea, mainly north of the central cordillera.

**Content:** *Fojia bumui* (Greer and Simon, 1982) (type species); *F. aurantiacocauda* sp. nov.; *F. buergersi* (Vogt, 1932); *F. morokanus* (Parker, 1936); *F. phaeodes* (Vogt, 1932); *F. pulchra* (Boulenger, 1903); *F. stanleyanum* (Boulenger, 1897).

#### GENUS *AULACOPLAX* BROWN AND FEHLMANN, 1958

**Type species:** *Aulacoplax leptosoma* Brown and Fehlmann, 1958.

**Diagnosis:** The single known species within the genus *Aulacoplax leptosoma* Brown and Fehlmann, 1958 has for many years prior to 2019 been regarded as being within the genus *Lipinia* Gray, 1845, since Greer, transferred the species to the genus in 1974.



However the molecular results of Rodriguez *et al.* (2018) confirms that a lot of the morphological similarity with other species placed in the genus *Lipinia* is merely indicative of convergent evolution as opposed to a close relationship.

Their phylogeny placed this taxon well apart from all other species placed within the genera *Lipinia*, *Scincella* and those associated with these and not particularly close to any other species, hence the resurrection of this genus (*Aulacoplax*) herein.

The genus *Aulacoplax* is separated from all other species within *Lipinia* and associated genera by the absence of a lower eyelid with a clear window. The monotypic genus is further characterized by having the following suite of characters: external ear opening present; 22-26 mid-body scale rows; supralabial five in midorbital position; 7-10 lamellae under toe IV and arboreal habits.

*Aulacoplax* is most closely related to a group of skinks improperly placed in the genus *Sphenomorphus* Fitzinger, 1843 found mainly in the Solomon Islands, but sufficiently divergent from them to warrant being placed in a separate genus.

**Distribution:** Palau Island (= Belau Islands).

**Content:** *Aulacoplax leptosoma* Brown and Fehlmann, 1958.

#### GENUS *COPHOSCINCUS* PETERS, 1867

**Type species:** *Cophoscincus quadrivittatum* Peters, 1867

**Diagnosis:** The genus *Cophoscincus* is readily separated from all other similar species and genera in Indonesia, the Philippines, Sundaland (south-east Asia), Solomon Islands and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Body slender and elongated; external ear opening absent or at times just a scaly dimple (for example, see image in Fig 3 in Grismer *et al.* 2014); lower eyelid with a clear spectacle; 18-22 midbody scale rows; 46-50 longitudinal scale rows between parietals and base of tail; 10-19 lamellae under toe four; 6 supralabials; 6-7 infralabials; 64-74 subcaudals; supralabials 4, 5, or both contact the orbit; with or without two enlarged paravertebral scale rows; dorsum yellow brown to dark gray brown with a series of dark or light longitudinal stripes; and/or a series of dark spots arranged in a longitudinal series bilaterally on each outer side of the paravertebral stripes; labials unbarred; venter yellowish or cream, with or without pale gray smudges or other flecks or similar.

**Distribution:** Philippines, Borneo, Sulawesi and immediately adjacent smaller islands.

**Content:** *Cophoscincus quadrivittata* (Peters, 1867); (type species); *C. inexpectata* (Das and Austin, 2007); *C. infralineolata* (Günther, 1873); *C. inconspicua* (Müller, 1894); *C. miangensis* (Werner, 1910); *C. nitens* (Peters, 1871); *C. relicta* (Vinciguerra, 1892); *C. sekayuensis* (Grismer, Ismail, Awang, Rizal and Ahmad, 2014); *C. subvittata* (Günther, 1873); *C. surda* (Boulenger, 1900).

#### GENUS *CROTTYSAURUS* GEN. NOV.

**LSID urn:lsid:zoobank.org:act:94A90201-E41E-4F80-B340-27C6A6292A02**

**Type species:** *Crottysaurus crottyi* sp. nov.

**Diagnosis:** Until now the only described species within this genus as defined herein, was placed in the genus *Sphenomorphus* Fitzinger, 1843, type species *Gongylus* (*Lygosoma*) *melanopogon* Duméril and Bibron, 1839, which is a completely different and distantly related species, separated from this genus.

Relevant species remaining within *Sphenomorphus* are separated from *Crottysaurus* and other species that should not be placed in *Sphenomorphus sensu stricto* by the combination of finely striate dorsal scales, the imbricate scales on the dorsal surface of the pes extending onto the plantar surface between the fourth and fifth digits and three or more supraoculars contacting the frontal. *Sphenomorphus sensu stricto* can be

further differentiated from members of the so called *Sphenomorphus variegatus* (Peters, 1867) group, with all of these character states by the combination of smoothly rounded subdigital lamellae, presence of auricular lobules and the postmental modally only contacting a single infralabial on each side. When present, the black throat is also a useful diagnostic character.

The genus *Crottysaurus* gen. nov. is separated from all other morphologically similar species, including all others within *Sphenomorphus sensu stricto* by the following unique suite of characters: adult snout to vent length 53.2-56.1 mm; tail length 25.8-30mm; prefrontals in contact; lower eyelids scaly; supraciliaries 10-13; supralabials 7, the 4th and 5th located underneath the eye; infralabials 6; primary temporal 1; supraocular 4; parietals in contact posteriorly; mid-body scale rows 32-34; ventral scales 62-66; limbs well-developed, each with 5 digits; subdigital lamellae under fourth toe 17-21; hemipenis bifurcating near the tip. In life specimens have a reddish brown colouration on the dorsum, flanks and tail; scattered, small dark spots or markings on the dorsum; an indistinct and irregular dark stripe from the nostril to the anterior corner of eye (sometimes broken), passing the postocular and temporal region and running along the dorsolateral region to the base of tail; lower flanks, especially in the axillary region reddish-brown, with or without pinkish spotting in the region between posterior axilla and body; scattered tiny but indistinct, elongated light bars along the body and tail flanks; the dorsal surface of limbs with small or large dark blotches or mottling.

The species *Crottysaurus crottyi* sp. nov. is readily separated from the similar *Crottysaurus buenloicus* Darevsky and Nguyen, 1983 (originally described as *Sphenomorphus buenloicus*) by having 10-13 supraciliaries, (versus 9 in *C. buenloicus*); 32-34 mid-body scale rows (versus 30-34 in *C. buenloicus*); and 62-66 ventral scales (versus 55-58 in *C. buenloicus*).

*Crottysaurus crottyi* sp. nov. is further separated from *C. buenloicus* by the presence of prominent black markings on the orange-pink upper labials, versus none in *C. buenloicus* and small white spots arranged into dorsolateral bands on the anterior of the tail on the flanks, versus none in *C. buenloicus*. The lower back of *C. buenloicus* has a marbled appearance not seen in *C. crottyi* sp. nov..

**Distribution:** Known only from Vietnam and Cambodia.

**Etymology:** Named in honour of the author's long deceased pet Great Dane cross Rottweiler Dog, in recognition of his services protecting the research facility of this author for more than ten years in the period from May 1989 to about 2002 (see etymology in Hoser (1998) for *Acanthophs crotalusei* Hoser, 1998, or Hoser (2017) for *Crottysaurus* Hoser, 2017 at page 10). The "saurus" part means lizard in Latin.

#### GENUS *RETROALBASCINCUS* GEN. NOV.

**LSID urn:lsid:zoobank.org:act:5A8A367B-C7AB-4BC3-BE1C-1D8021C687C5**

**Type species:** *Leiopisma rouxi* Hediger, 1934.

**Diagnosis:** The genus *Retroalbascincus* gen. nov. is readily separated from all other similar species and genera in Indonesia, the Philippines, Solomon Islands and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: External ear opening present; 22-28 midbody scale rows; 2-5 pairs of nuchals; 52-60 longitudinal scale rows between parietals and base of tail; seven supralabials, 8-9 supraciliaries; 18-26 lamellae under toe four. Colour is with a dorsum that has a base coloration generally tan to coppery invariably with a mid-dorsal row of light or dark spots forming an interrupted zigzag line or stripe from the occiput to tail base, sometimes bordered by a darker line, and a dark lateral band along the flanks and tail, sometimes with a series of large, semicircular spots or flecks or peppering along its upper border; venter is yellowish or greenish-white in life.

**Distribution:** New Guinea (mainly north of the central cordillera)

and New Ireland.

**Etymology:** “*Retroalbascincus*” in Latin means light coloured back, in reflection of the relevant markings seen on the back of most specimens.

**Content:** *Retroalbascincus rouxi* (Hediger, 1934) (type species); *R. cheesmanae* (Parker, 1940):

*R. nototaenia* (Boulenger, 1914); *R. occidentalis* (Günther, 2000); *R. septentrionalis* (Günther, 2000); *R. venemai* (Brongersma, 1953).

#### GENUS *LATERATENEBRISCINCUS* GEN. NOV.

**LSID urn:lsid:zoobank.org:act:4E054814-F341-4E57-BF78-8204A8698042**

**Type species:** *Lateratenebriscincus acrilineata* sp. nov.

**Diagnosis:** The genus *Lateratenebriscincus* gen. nov. is readily separated from all other similar species and genera in Indonesia, the Philippines, Solomon Islands and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

**Distribution:** From Ternate/Halmahera in the west across the northern half of New Guinea, including the bird's head region in full, and islands to the north and east into the Pacific.

**Etymology:** “*Lateratenebriscincus*” in Latin means dark side skink.

**Content:** *Lateratenebriscincus acrilineata* sp. nov. (type species); *L. albaudere* sp. nov.; *L. albavarietata* sp. nov.; *L. albodorsalis* (Vogt, 1932); *L. aurea* (Meyer, 1874); *L. effatubrunnea* sp. nov.; *L. freshsweetpotato* sp. nov.; *L. gulagorum* sp. nov.; *L. leucolabialis*; *L. laterafusca* sp. nov.; *L. maculaoccipitalis* sp. nov.; *L. miotis* (Boulenger, 1895); *L. noctua* (Lesson, 1830); *L. sentaniensis* sp. nov.; *L. sepikensis* sp. nov.; *L. ternatensis* (Peters and Doria, 1878); *L. tokpisinensis* sp. nov..

#### GENUS *POINTEDNASUS* GEN. NOV.

**LSID urn:lsid:zoobank.org:act:BE79819F-1479-4362-AB66-74DE2E55CE66**

**Type species:** *Pointednasus widerecta* sp. nov.

**Diagnosis:** The genus *Pointednasus* gen. nov. is readily separated from all other similar species and genera in New Guinea and the Solomon Islands, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal as long as broad or more long than broad; digits somewhat dilated.

The nominate subgenus *Pointednasus* subgen. nov. is readily separated from the other subgenus *Viridihaema* subgen. nov. by having the following unique suite of characters:

Four supraoculars; ear opening is large; 22-26 mid-body scale rows; 19 lamellae under the fourth toe; rectilinear black dorsolateral lines converge at the tail base and the tail is golden yellow.

The subgenus *Viridihaema* subgen. nov. is in turn further separated from the nominate subgenus *Pointednasus* subgen. nov. by having five supraoculars; ear-opening is small; 30-38 mid-body scale rows.

**Distribution:** New Guinea (mainly in the north) extending to almost all of the Solomon Islands. The nominate subgenus is confined to New Guinea and immediately adjacent offshore islands, mainly on the northern side of the island, except in the far west and far east.

**Etymology:** “*Pointednasus*” in Latin means pointed nose which is fairly descriptive of the relevant species, in particular the type species.

**Content:** *Pointednasus widerecta* sp. nov. (type species); *P. anolis* (Boulenger, 1883); *P. clavoflavoviridis* sp. nov.; *P. currearbor* sp. nov.; *P. extantadigitus* sp. nov.; *P. flavopalpebrae* sp. nov.; *P. labiamarmorata* sp. nov.; *P. longiceps* (Boulenger, 1895); *P. makiraensis* sp. nov.; *P. flavorecta* sp. nov.; *P. ventriiridescens* sp. nov.; *P. virens* (Peters, 1881).

#### SUBGENUS *IRIDIHAEMA* SUBGEN. NOV.

**LSID urn:lsid:zoobank.org:act:0D11CED0-858E-49C2-97A7-87FA8C968B07**

**Type species:** *Pointednasus (Viridihaema) flavopalpebrae* sp. nov.

**Diagnosis:** The nominate subgenus *Pointednasus* subgen. nov. is readily separated from the only other subgenus *Viridihaema* subgen. nov. by having the following unique suite of characters: Four supraoculars; ear opening is large; 22-26 mid-body scale rows; 19 lamellae under the fourth toe; rectilinear black dorsolateral lines converge at the tail base and the tail is golden yellow.

The subgenus *Viridihaema* subgen. nov. is in turn further separated from the nominate subgenus *Pointednasus* subgen. nov. by having five supraoculars; ear-opening is small; 30-38 mid-body scale rows.

The genus *Pointednasus* gen. nov. is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal as long as broad or more long than broad; digits somewhat dilated.

**Distribution:** *Viridihaema* subgen. nov. is found in New Guinea (mainly in the north) extending to almost all of the Solomon Islands.

The nominate subgenus is confined to New Guinea and immediately adjacent offshore islands, mainly on the northern side of the island, except in the far west and far east.

**Etymology:** “*Viridihaema*” in Latin means green blood, in reflection of this trait in these lizards.

**Content:** *Pointednasus (Viridihaema) flavopalpebrae* sp. nov. (type species); *P. (Viridihaema) anolis* (Boulenger, 1883); *P. (Viridihaema) extantadigitus* sp. nov.; *P. (Viridihaema) labiamarmorata* sp. nov.; *P. (Viridihaema) makiraensis* sp. nov.; *P. (Viridihaema) ventriiridescens* sp. nov.; *P. (Viridihaema) virens* (Peters, 1881).

#### SUBGENUS *POINTEDNASUS* SUBGEN. NOV.

**LSID urn:lsid:zoobank.org:act:BE79819F-1479-4362-AB66-74DE2E55CE66**

**Type species:** *Pointednasus widerecta* sp. nov.

**Diagnosis:** Refer to the diagnosis for the genus *Pointednasus* gen. nov. in this paper.

**Distribution:** The nominate subgenus is confined to New Guinea and immediately adjacent offshore islands, mainly on the northern side of the island, except in the far west and far east.

*Viridihaema* subgen. nov. occurs in New Guinea (mainly in the north) extending to almost all of the Solomon Islands.

**Etymology:** Refer to the etymology for the genus *Pointednasus* gen. nov. in this paper.

**Content:** *Pointednasus widerecta* sp. nov. (type species); *P. clavoflavoviridis* sp. nov.; *P. currearbor* sp. nov.; *P. longiceps* (Boulenger, 1895); *P. flavorecta* sp. nov..

#### GENUS *VARIUSSCINCUS* GEN. NOV.

**LSID urn:lsid:zoobank.org:act:F816AB4F-0D75-4EA1-BC9C-DAED91A14280**

**Type species:** *Lygosoma vittigerum* Boulenger, 1894.

**Diagnosis:** The genus *Variusscincus* gen. nov. is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by one or other of the following two unique character suites:

1/ 28-30 midbody scale rows; there is a small but distinct external ear opening present; 25 lamellae on toe four; a dorsal

pattern comprising dark gray to brown stripes starting above the eye and one pale stripe starting from the tip of the nose. The flanks are dotted with brownish spots. The limbs show brown spots. Dark spots are also visible at the side of the neck.

The snout is obtuse from above but rather pointed at the lateral view. The rostral is wider than long. The prefrontals contact each other medially. The frontal is narrowing posteriorly. Four supraoculars, the first three in contact with frontal. The frontoparietals are in contact with each other, with the frontal, and with supraoculars three and four. The interparietal and parietals are distinct; parietals contact each other posteriorly; 3/4 nuchals. The nasal is in contact with the rostral and the first supralabial; the postnasal and the supranasal are not present; 2/2 loreals; two preoculars; one presubocular; seven supraciliaries; one primary temporal; two secondary temporals; seven supralabials, with numbers five and six below the eye; two postsupralabials; lower eyelid is with a clear window; 7/7 infralabials. The mental is rounded anteriorly, wider than long; the postmental is in contact with

the first infralabial, first pair of chin shields and anterior portion of second infralabial; three pairs of chin shields, first pair in contact medially; second pair separated by one scale, third pair separated by three scales; the chin shields are in contact with the infralabials; 54-56 paravertebral scales, the dorsal scales are larger than the ventral scales; 55-58 ventral scale rows from first gular to anterior margin of preloacals; four preloacals; 15 to 16 subdigital lamellae on fourth finger, 25 subdigital lamellae on fourth toe (nominate subgenus *Variusscincus gen. nov.*), or:

2/ 21-22 midbody scale rows; seven supralabials, fifth upper labial under the orbit. Ear-opening very large, rounded, with a perfectly smooth edge all round; colouration as follows: Head above brown, paler on the snout; three longitudinal white bands along the body, separated by two somewhat broader brown bands; the median dorsal white band becomes obsolete at the root of the tail; labials and sides of head brownish, spotted with white; limbs above with very close longitudinal brown lines, digits powdered with pure white; lower portion of the sides and lower surfaces are a livid flesh colour, tinged with bright orange on the lower belly and on the tail, which is a bright reddish colour.

Body moderately slender. Snout rather attenuated and prolonged. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal in contact with the rostral, posteriorly just touching the frontal; four supraoculars frontoparietal single; interparietal distinct; parietals forming a suture behind the interparietal; four pairs of nuchals; dorsals slightly larger than laterals. A pair of moderately enlarged praeanales. Limbs proportionately developed, with the toes very slender, (subgenus *Macrotympanoscincus subgen. nov.*)

**Distribution:** South-east Asia in the region confined to Sundaland, being the sum of from Vietnam and Burma in the north, through the Nicobar and Andaman Islands in the west, through the Malay Peninsula and including Sumatra and offshore islands to the immediate west and east.

**Etymology:** In Latin "*Variusscincus*" literally means striped skink in reflection of the colouration of the usual specimens.

**Content:** *Variusscincus vittigera* (Boulenger, 1894) (type species); *V. litoresaurus sp. nov.*; *V. microcerum* (Boettger, 1901); *V. pranensis* (Cochran, 1930); *V. macrotympanum* (Stoliczka, 1873).

**SUBGENUS MACROTYPANOSCINCUS SUBGEN. NOV.**

**LSID urn:lsid:zoobank.org:act:0FAA6E23-3E53-4FEF-8B9C-EF09B5F377E4**

**Type species:** *Mococa macrotympanum* Stoliczka, 1873.

**Diagnosis:** The genus *Variusscincus gen. nov.* with two subgenera, is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by one or other of the following unique character suites:

1/ 21-22 midbody scale rows; seven supralabials, fifth upper labial under the orbit. Ear-opening very large, rounded, with a perfectly smooth edge all round.; colouration as follows: Head above brown, paler on the snout; three longitudinal white bands along the body, separated by two somewhat broader brown bands; the median dorsal white band becomes obsolete at the root of the tail; labials and sides of head brownish, spotted with white; limbs above with very close longitudinal brown lines, digits powdered with pure white; lower portion of the sides and lower surfaces are a livid flesh colour, tinged with bright orange on the lower belly and on the tail, which is a bright reddish colour.

Body moderately slender. Snout rather attenuated and prolonged. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal in contact with the rostral, posteriorly just touching the frontal; four supraoculars frontoparietal single; interparietal distinct; parietals forming a suture behind the interparietal; four pairs of nuchals; dorsals slightly larger than laterals. A pair of moderately enlarged praeanales. Limbs proportionately developed, with the toes very slender, (subgenus *Macrotympanoscincus subgen. nov.*) or:

2/ 28-30 midbody scale rows; there is a small but distinct external ear opening present; 25 lamellae on toe four; a dorsal pattern comprising dark gray to brown stripes starting above the eye and one pale stripe starting from the tip of the nose. The flanks are dotted with brownish spots. The limbs show brown spots. Dark spots are also visible at the side of the neck.

The snout is obtuse from above but rather pointed at the lateral view. The rostral is wider than long. The prefrontals contact each other medially. The frontal is narrowing posterior. Four supraoculars, the first three in contact with frontal. The frontoparietals are in contact with each other, with the frontal, and with supraoculars three and four. The interparietal and parietals are distinct; parietals contact each other posteriorly; 3/4 nuchals. The nasal is in contact with the rostral and the first supralabial; the postnasal and the supranasal are not present; 2/2 loreals; two preoculars; one presubocular; seven supraciliaries; one primary temporal; two secondary temporals; seven supralabials, with numbers five and six below the eye; two postsupralabials; lower eyelid is with a clear window;

7/7 infralabials. The mental is rounded anteriorly, wider than long; the postmental is in contact with the first infralabial, first pair of chin shields and anterior portion of second infralabial; three pairs of chin shields, first pair in contact medially; second pair separated by one scale, third pair separated by three scales; the chin shields are in contact with the infralabials; 54-56 paravertebral scales, the dorsal scales are larger than the ventral scales; 55-58 ventral scale rows from first gular to anterior margin of preloacals; four preloacals; 15 to 16 subdigital lamellae on fourth finger, 25 subdigital lamellae on fourth toe (nominate subgenus *Variusscincus gen. nov.*).

**Distribution:** The subgenus subgenus *Macrotympanoscincus subgen. nov.* is confined to the Nicobar and Andaman Islands (India).

**Etymology:** "*Macrotympanoscincus*" in Latin literally means skink with large ear hole.

**Content:** *Variusscincus (Macrotympanoscincus) macrotympanum* (Stoliczka, 1873) (type species); *V. (Macrotympanoscincus) litoresaurus sp. nov.*

**SUBGENUS VARIUSSCINCUS SUBGEN. NOV.**

**LSID urn:lsid:zoobank.org:act:F816AB4F-0D75-4EA1-BC9C-DAED91A14280**

**Type species:** *Lygosoma vittigerum* Boulenger, 1894.

**Diagnosis:** Refer to the description for the genus *Variusscincus gen. nov.* in this paper.

**Distribution:** South-east Asia in the region confined to Sundaland, being the sum of from Vietnam and Burma in the north, excluding the Nicobar and Andaman Islands in the west, but through the Malay Peninsula and including Sumatra and

offshore islands to the immediate west and east.

**Etmology:** See for the genus.

**Content:** *Variusscincus* (*Variusscincus*) *vittigera* (Boulenger, 1894) (type species); *V.* (*Variusscincus*) *microcercum* (Boettger, 1901); *V.* (*Variusscincus*) *pranensis* (Cochran, 1930).

**GENUS CRUDUSHAEMA GEN. NOV.**

**LSID urn:lsid:zoobank.org:act:AA671B4D-A135-4412-9E69-E3D0B13C16C1**

**Type species:** *Crudushaema allengreeri* sp. nov.

**Diagnosis:** The genus *Crudushaema* gen. nov. is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal more broad than long; two frontoparietals; scales smooth with 26 midbody scale rows.

In more detail the genus is diagnosed as follows: Snout short; lower eyelid with a transparent disk; ear opening is very small, smaller than the palpebral disk, no lobules. Nostril in the nasal; no supranasals; frontonasal a little more broad than long, broadly in contact with the rostral and with the frontal, latter almost as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first longest; seven supraciliaries, first largest; frontoparietals nearly twice as large as the interparietal, behind which the parietals are in contact; two or three pair of nuchals; fifth and sixth or sixth and seventh upper labials below the eye. Scales smooth with 26-28 midbody scale rows, dorsals largest; the distance between the tip of the snout and the fore limb is contained nearly one time and a half in that between axilla and groin; preanals enlarged. Tail one and one third the length of head and body. Limbs strong, the hind limb reaches the wrist; digits slender, compressed, fourth toe with 21 lamellae below. Colouration is light brown above with broad dark transverse bands, the first between the eye and the ear, seven, eight or nine on the nape and back, the posterior alternating on both sides; tail with 14 dark bands; limbs and digits banded with dark brown; flanks with short longitudinal blackish lines. Lower parts white (adapted and modified from De Rooij 1915).

**Distribution:** The island of New Guinea, including north and south of the main cordillera and both Papua and West Papua.

**Etmology:** "*Crudushaema*" in Latin means bleeding green blood, in reflection of the relatively unusual property in this genus of possessing green coloured blood.

**Content:** *Crudushaema allengreeri* sp. nov. (type species); *C. semoni* (Oudemans, 1894); *C. haroldcoggeri* sp. nov..

**FOJIA AURANTIACOCAUDA SP. NOV.**

**LSID urn:lsid:zoobank.org:act:53F9108F-442A-4DA6-B6A4-AD84515FC5A8**

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ 49410, collected Aitape, West Sepik Province, Papua New Guinea, Latitude 3.13 S., Longitude 142.35 E. This facility allows access to its holdings.

**Diagnosis:** Until now *Fojia aurantiacocauda* sp. nov. from west of the Adelbert Range in Papua New Guinea and nearby coastal Irian Jaya, Indonesia has been treated as a north-western population of *F. pulchra* (Boulenger, 1903), found south-east of the Huon Peninsula and north of the central cordillera in Papua New Guinea.

The species *F. aurantiacocauda* sp. nov. is however readily separated from *F. pulchra* by having 22 midbody scale rows as opposed to 24 in *F. pulchra* and 22 lamellae under the fourth toe as opposed to 21 in *F. pulchra*.

Both species are separated from all other species in the genera *Fojia* Greer and Simon, 1982 and *Lipinia* Gray, 1845 by the following suite of characters: Frontonasal as broad as long;

supraoculars 4, the two anterior ones in contact with the frontal; frontoparietal single; interparietal moderate; ear opening small; midbody scale rows 22-24; limbs pentadactyle, with fourth toe being distinctly longer than the third; digits not dilated; subdigital lamellae more or less transversely enlarged; lamellae under fourth toe 21-22. Colouration is with a white stripe that commences on the tip of the snout and terminates abruptly at midbody, being bordered by jet black. The white stripe is replaced at mid-body by a broader dark brown stripe derived from the paravertebral stripes. The tail is a brilliant orange colour.

**Distribution:** Lowland areas of Northern New Guinea west of Wewak, Papua New Guinea and East of Barapasi in Irian Jaya, Papua New Guinea and north of the central Highlands.

**Etmology:** In Latin "*aurantiacocauda*" means orange tail, a distinctive trait of this species.

The species known as *Lipinia auriculata* (Taylor, 1917) is a totally different animal and the two names should not be confused. *Lipinia auriculata* comes from the Philippines, not New Guinea, and the species names are sufficiently different to avoid potential confusion, even in the event a later author may seek to place both within an expanded *Lipinia* or other genus.

**LOBULIA OLIVEETFATUA SP. NOV.**

**LSID urn:lsid:zoobank.org:act:CB36C706-895E-4B24-8485-D866483DD5F4**

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ 47054 collected at Mount Wilhelm, at the intersection of Simbu, Jiwaka and Madang provinces in Papua New Guinea, Latitude 5.78 S., Longitude 145.03 E. This facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ 47055 and MCZ 47056 collected at Mount Wilhelm, Papua New Guinea, Latitude 5.78 S., Longitude 145.03 E.

**Diagnosis:** *Lobulia oliveetfatua* sp. nov. has until now been treated as a north-western population of the species *L. flavipes* (Parker, 1936), however it is separated from that taxon by having a small distinct distinct, palpebral disk in the lower eyelid, which is absent in *L. flavipes*.

*L. oliveetfatua* sp. nov. is also separated from *L. flavipes* (Parker, 1936), in that a white temporal bar and lateral flecks seen in *L. flavipes* are absent in *L. oliveetfatua* sp. nov.. *L. flavipes* typically has 36 midbody rows, versus 38-42 in *L. oliveetfatua* sp. nov..

Both *L. flavipes* and *L. oliveetfatua* sp. nov. are further separated from other similar species and diagnosed as follows: Frontonasal broader than long; supraoculars 4, the foremost 2 in contact with the frontal; frontal as long as, or longer than, the frontoparietals and interparietal together; interparietal moderate; supraciliaries 6-10; upper labials 7-8; lower labials 6-10; midbody scale rows 36-42; limbs pentadactyle; digits dilated; lamellae under fourth toe 19-22; length from snout to forelimb contained one and a fifth to one and a third times in the distance between the axilla and groin; toes of adpressed hindlimb reach wrist of the backward-pressed forelimb.

The colour morphs of this taxon broadly correspond to those of "*L. flavipes*" from Kunida, Muller Range of Southern Highlands Province, Papua New Guinea, as depicted by Kraus (2010) at page 32.

**Distribution:** This taxon occurs in the area of Mount Wilhelm, Papua New Guinea and Madang in other nearby mountainous areas to the west, including the Bismarck and Schrader Ranges.

**Etmology:** In Latin "*oliveetfatua*" means "olive snout" in reflection of the colouration of adult specimens of this species, regardless of colour morph or sex.

**CROTTYSAUROS CROTTYI SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:1A0297D8-8277-46BA-982E-64CE911C546A

**Holotype:** A preserved male specimen at the Centre for Biodiversity Conservation, Royal University of Phnom Penh, Confederation of Russia Boulevard, Phnom Penh, Cambodia, specimen number CBC-02769 collected at the Phnom Namlyr Wildlife Sanctuary, located in the eastern plains of Cambodia beside the Vietnamese border in Mondulhiri Province in Cambodia, Latitude 2.19 N., Longitude 107.23 E. This facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Centre for Biodiversity Conservation, Royal University of Phnom Penh, Confederation of Russia Boulevard, Phnom Penh, Cambodia, being a male specimen number CBC-02770 and a female specimen number CBC-02771 collected at the Phnom Namlyr Wildlife Sanctuary (AKA Phnom Namlear Wildlife Sanctuary) located in the eastern plains of Cambodia beside the Vietnamese border in Mondulhiri Province in Cambodia, Latitude 2.19 N., Longitude 107.23 E.

**Diagnosis:** The species *Crottysaurus crottyi sp. nov.* is readily separated from the similar species *Crottysaurus buenloicus* Darevsky and Nguyen, 1983 (originally described as *Sphenomorphus buenloicus*) by having 10-13 supraciliaries, (versus 9 in *C. buenloicus*); 32-34 mid-body scale rows (versus 30-34 in *C. buenloicus*); and 62-66 ventral scales (versus 55-58 in *C. buenloicus*).

*Crottysaurus crottyi sp. nov.* is further separated from *C. buenloicus* by the presence of prominent black markings on the orange-pink upper labials, versus none in *C. buenloicus* and small white spots arranged into dorsolateral bands on the anterior of the tail on the flanks, versus none in *C. buenloicus*. The lower back of *C. buenloicus* has a marbled appearance not seen in *C. crottyi sp. nov.*

*C. crottyi sp. nov.* was reported by Neang and Poyarkov (2016) as a Cambodian population of *C. buenloicus* and identified on the basis of the descriptive information given below.

Until now the only described species within this genus (*Crottysaurus gen. nov.*) as defined herein, (namely *C. buenloicus*) was placed in the genus *Sphenomorphus* Fitzinger, 1843, type species *Gongylus (Lygosoma) melanopogon* Duméril and Bibron, 1839, which is a completely different and distantly related species, separated from this genus.

Relevant species remaining within *Sphenomorphus* are separated from *Crottysaurus* and other species that should not be placed in *Sphenomorphus sensu stricto* by the combination of finely striate dorsal scales, the imbricate scales on the dorsal surface of the pes extending onto the plantar surface between the fourth and fifth digits and three or more supraoculars contacting the frontal. *Sphenomorphus sensu stricto* can be further differentiated from members of the so called *Sphenomorphus variegatus* (Peters, 1867) group, with all of these character states by the combination of smoothly rounded subdigital lamellae, presence of auricular lobules and the postmental modally only contacting a single infralabial on each side.

When present, the black throat is also a useful diagnostic character.

The genus *Crottysaurus gen. nov.* is separated from all other morphologically similar species, including all others within *Sphenomorphus sensu stricto* by the following unique suite of characters: adult snout to vent length 53.2-56.1 mm; tail length 25.8-30mm; prefrontals in contact; lower eyelids scaly; supraciliaries 10-13; supralabials 7, the 4th and 5th located underneath the eye; infralabials 6; primary temporal 1; supraocular 4; parietals in contact posteriorly; mid-body scale rows 32-34; ventral scales 62-66; limbs well-developed, each with 5 digits; subdigital lamellae under fourth toe 17-21; hemipenis bifurcating near the tip. In life specimens have a reddish brown colouration on the dorsum, flanks, and tail;

scattered, small dark spots or markings on the dorsum; an indistinct and irregular dark stripe from the nostril to the anterior corner of eye (sometimes broken), passing the postocular and temporal region and running along the dorsolateral region to the base of tail; lower flanks, especially in the axillary region reddish-brown, with or without pinkish spotting in the region between posterior axilla and body; scattered tiny but indistinct, elongated light bars along the body and tail flanks; and dorsal surface of limbs with small or large dark blotches or mottling. The two now formally described species of *Crottysaurus gen. nov.* occur in hilly locations separated by a zone of effectively unsuitable habitat confirming the thesis that the two populations are separate and evolving independently, as evidenced by the morphological divergence between the populations.

In terms of the type locality for *Crottysaurus crottyi sp. nov.* Neang and Poyarkov (2016) noted "This area has close affinities to the Annamite Mountains where many new species and herpetofaunal records have recently been documented (Nazarov et al., 2012; Hartmann et al., 2013; Nguyen et al., 2013; Poyarkov et al., 2014, 2015a, 2015b; Rowley et al., 2016)."

**Distribution:** Known only from the type locality in Cambodia.

**Etymology:** Named in honour of the author's long deceased pet Great Dane cross Rottweiler Dog, in recognition of his services protecting the research facility for more than ten years. See also the etymology in Hoser (1998) for *Acanthophs crotalusei* Hoser, 1998.

**LATERATENEBRISCINCUS SENTANIENSIS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:31219F4D-31DD-4ED0-B230-D4E1A8B45A31

**Holotype:** A preserved specimen at the Natural History Museum of Basel in Basel, Switzerland, specimen number NHMB 9297, collected at Lake Sentani, Irian Jaya, Indonesia, Latitude 2.61 S., Longitude 140.52 E. This facility allows access to its holdings.

**Paratypes:** Four preserved specimen at the Natural History Museum of Basel in Basel, Switzerland, specimen numbers NHMB 9294, 9295, 9296 and 9298, collected at Lake Sentani, Irian Jaya, Indonesia, Latitude 2.61 S., Longitude 140.52 E.

**Diagnosis:** This species is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscincus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and ostensibly distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus gen. nov.* with all other species being diagnosed separately and separated from this species in the description below.

The genus *Lateratenebriscincus gen. nov.* is readily separated from all other similar species and genera in Indonesia, the Philippines, Solomon Islands, New Guinea and Pacific regions, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite:

All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

The species originally described as "*Lygosoma vertebrae* Hallowell, 1860", from Hawaii is resurrected from synonymy of *L. noctua* and applies to all populations east of Vanuatu and a population west of there on the Kapingamarangi Atoll (*sensu* Austin 1999), that were hitherto treated as *L. noctua*.

*L. noctua* is herein restricted to the islands of Kosrae and Pohnpei, in the north-east Pacific, with other species occupying other parts of the range for the genus (and species complex).

The species *Euprepes novarae* Steindachner, 1869, from Tahiti is herein treated as a synonym of *L. vertebrale*, following relevant determinations of Zweifel (1979) and Austin (1999) and the evidence provided by each author in their papers.

The species *Leiolepisma rouxi* Hediger, 1934, also synonymised by Zweifel (1979) is resurrected from synonymy with *L. noctua* (see Greer and Mys 1987), and herein placed in a separate genus *Retroalbascincus gen. nov.*

The species *L. albodorsalis* (Vogt, 1932), known only from three specimens all caught in the East Sepik Province of Papua New Guinea is unique in the genus (group of species) in having a clean yellow dorsum without any dark colour or mid dorsal line of any sort and otherwise conforms to the diagnosis for the genus.

The species *L. aurea* (Meyer, 1874) from Yapen Island, Irian Jaya, Indonesia, *L. ternatensis* (Peters and Doria, 1878) type locality Ternate Island in the Moluccas, Indonesia and *L. miotis* (Boulenger, 1895) from Fergusson Island, Milne Bay Province in Papua New Guinea are all resurrected from the synonymy of *L. noctua*, on the basis of morphological divergence and allopatry and treated as occurring only in the areas near their type localities.

The species *Lygosoma (Leiolepisma) subnitens* Boettger, 1896, type locality Astrolabe Bay, Madang Province, Papua New Guinea is herein synonymised with *T. miotis* based on morphological similarities and proximal known distribution, but this synonymisation may be in error and worthy of further investigation. Twelve other newly named species in the genus are as follows:

*L. sentaniensis sp. nov.* from the vicinity of Lake Setani, Irian Jaya, Indonesia.

*L. sepikensis sp. nov.* from the lower Sepik River region of the East Sepik Province, Papua, New Guinea.

*L. albaudere sp. nov.* from Misima island, Milne Bay Province, Papua New Guinea.

*L. gulagorum sp. nov.* from the Admiralty Islands, Manus Province, Papua New Guinea.

*L. tokpisinensis sp. nov.* from East New Britain, New Britain, Papua New Guinea.

*L. freshsweetpotato sp. nov.* from Tabar Island, off mainland New Ireland, New Ireland, Papua New Guinea.

*L. acrilineata sp. nov.* from the southern two thirds of Bougainville, Papua New Guinea.

*L. maculaoccipitalis sp. nov.* from the north-west part of Bougainville, Papua New Guinea.

*L. albavarietata sp. nov.* from Guadalacol Island, Solomon Islands.

*L. laterafusca sp. nov.* from Malaita, Solomon Islands.

*L. etfatubrunnea sp. nov.* from the New Georgia group of islands in the Western Province of the Solomon Islands.

*L. leucolabialis sp. nov.* from the Palau Group of Islands.

All newly named species except for *L. gulagorum sp. nov.*, *L. tokpisinensis sp. nov.*, *L. acrilineata sp. nov.*, the three Solomon Islands species and *L. leucolabialis sp. nov.* from Palau are only known from their type localities.

Excluding *L. albodorsalis* (see above), each of the relevant species in the genus (AKA species complex) are differentiated and separated from one another by the following suites of characters.

*L. noctua* is separated from all other species in the genus by the following unique suite of characters:

23-27 midbody rows, consistently paired frontoparietals, 17 to 25 lamellae under the fourth toe. A dorsal pattern incorporating a mid-dorsal line (stripe) with a generally ill defined boundary and indistinct dark brownish-black markings on a mainly lightish

yellowish-brown to beige background on the rest of the back. The mid dorsal stripe does not fade before the pelvic girdle and the tail is yellowish in colour with a distinctive line of indistinctly shaped blackish triangles running down the anterior end. The upper surfaces of the flanks are black with yellowish flecks, bounded by whitish, which is also the colouration of the lower half of the flanks, which more-or-less appears to be defined by a line, through the near continuous brownish squares above. The snout is peppered brown and the yellow occipital spot is significantly brighter than the mid-dorsal stripe posterior to it. The legs are light, peppered with brown and also with the occasional dark brown blotch. Both upper and lower labials are white with alternating black bars.

The character suites for each of the other species below also separate *L. noctua* from each of them.

*L. ternatensis* is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, consistently paired frontoparietals, 20 to 25 (average 23) lamellae under the fourth toe. The dorsal colouration is very well defined and the vertebral stripe is pale and distinct, with straight edges on the anterior part of the body and it is very well defined to almost the base of the tail. The edges of the stripe are relatively sharply defined and little invaded by dark pigmentation from the paravertebral field. Its borders, especially posteriorly, tend to be somewhat less well defined than those of the vertebral stripe, but it retains its integrity. The paravertebral field is unbroken dark brown in the neck region of all specimens but breaks into large squarish blotches around the midbody. From there to the hind legs, the lateral field, even in the juveniles, is pigmented in large, squarish dark blotches separated by narrow light interspaces. Tail is bright yellow to orange.

*L. aurea* is similar in most respects to *L. ternatensis* (see above) but separated from that species by a different colour configuration. The vertebral stripe is ragged edged, even in the neck region, due to spreading of the irregular blotches of the paravertebral fields. The occipital spot is fairly distinct, yellow and paler than the vertebral stripe. The paravertebral fields are not broken into large, discrete blotches but rather into smaller ones that tend to be joined together. The dorsolateral stripe is distinct to the base of the tail and not sharply defined because of the ragged edges of the adjacent fields. The flanks are dark with occasional light spots. The tail is bronzy orange in colour with orangey spots arranged in rings around the anterior part of the tail. *L. aurea* also has 17 to 22 (average 20) lamellae under the fourth toe, a lower number than seen in *L. ternatensis*.

*L. miotis* is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, consistently single frontoparietal, 17 to 22 (average 20) lamellae under the fourth toe. The dorsal colour pattern may be distinct or indistinct, but invariably includes a pattern of obliquely centred dark triangles running off the mid-dorsal line, which ends on the tail. The anterior dorsal surface of the tail is lighter than the terminal end and the length of the tail is marked with dark flecks or irregularly shaped spots.

*L. sentaniensis sp. nov.* is separated from all other species in the genus by the following unique suite of characters: 23-28 midbody rows, the frontoparietal may be single, partially divided or divided and there are 17 to 22 (average 20) lamellae under the fourth toe. Colouration consists of a very faded dorsum without any obvious colour pattern, save for a thin mid-dorsal stripe largely reduced in intensity by ill-defined side boundaries and peppering of darker pigment, which occupies the rest of the back. Put simply, the striped pattern is suppressed to the point of obscurity. While there are a few dark flecks on the dorsum away from the mid-dorsal stripe region, the general view is of an unmarked dorsum save for the obscured, ill-defined and faded mid-dorsal line. In this species even juveniles show only an indistinct vertebral stripe with edges that fade into the ground color between relatively small, dark markings of the paravertebral fields. The flanks have limited dark pigment with

any pattern or markings obscured and suppressed as on the dorsum. The tail is generally light with an absence of any dark spots or similar on the dorsal surface (including anteriorly) and save for a few indistinct tiny dark flecks is otherwise unmarked. In *L. sentaniensis* sp. nov., the region of the occipital spot seen in other species is merely an area of lightening in the scales, but otherwise indistinct from the surrounding scales.

*L. sepikensis* sp. nov. is separated from all other species in the genus as follows: It is the same in most respects to *L. sentaniensis* sp. nov. as described above including having a colouration that mainly consists of a very faded dorsum without any obvious colour pattern. However within this species the mid-dorsal stripe is wide between the back of the head and anterior to the front legs as well as also being bordered by well-defined irregular-shaped (but squarish) dark patches, almost continuously joined, so that on this part of the lizard, the mid dorsal stripe is well defined. In *L. sentaniensis* sp. nov. on the body, the thin mid-dorsal stripe fades into a dorsum which is peppered and effectively unicolour. By contrast in *L. sepikensis* sp. nov. the body has a thicker mid-dorsal stripe, heavily peppered on the posterior half of the body bordered by heavy dark blotches or small to medium size blotches in two longitudinal rows, in turn bordered by a lighter zone of yellow that is also heavily peppered, giving the dorsal surface of the body a general view of having five indistinct and heavily peppered stripes of alternating beige and brown stripes. The flanks are lined with closely spaced and large indistinct squarish dark blotches. In contrast to *L. sentaniensis* sp. nov. the tail of *L. sepikensis* sp. nov. is heavily marked on the anterior dorsal surface with five or six distinctive dark triangles or triangular-shaped squares with the narrower point (side) being posterior in each, being evenly spaced and surrounded by generally lighter pigment, versus generally unmarked in *L. sentaniensis* sp. nov.. *L. sepikensis* sp. nov. has a well defined bright diamond-shaped occipital spot surrounded by black scales with a sharp well-defined border at the edge of the occipital spot.

Between the populations of *L. sentaniensis* sp. nov. and *L. sepikensis* sp. nov. is a population in the West Sepik region in the vicinity of Aitape, Papua New Guinea which appears in most respects to be similar to *L. gulagorum* and is herein treated as that species in the absence of molecular evidence to the contrary (see comments above).

*L. vertebrale* is separated from all other species in the genus by the following unique suite of characters: It is similar in most respects to *L. sentaniensis* sp. nov., but is separated from that taxon by the following: The mid dorsal stripe is bright and well demarcated dorsally, being bound evenly by brownish pigment. There is limited black speckling at the boundary of the mid dorsal stripe on the body, but otherwise colour pattern on the upper body and flanks is generally suppressed.

In this species the limbs are dark but with obvious white spots, blotches or bands. The tail is light and generally unmarked, although some younger specimens have a tail with ill-defined alternating light bands.

*L. albaudere* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 17 to 26 lamellae under the fourth toe. Colouration is strongly striped. The vertebral stripe is sharp-edged and slightly broader than usual, occupying all but the tips of the paravertebral scale rows. No occipital spot is evident. The paravertebral field, somewhat narrowed by the expansion of the vertebral stripe, is mostly dark. Although somewhat uneven, it is not broken into discrete spots. The dorsolateral stripe is distinct and the dark lateral field has light spots.

*L. gulagorum* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is either single, semi-divided or divided and there are 19 to 23 (average 21) lamellae under the

fourth toe. Colouration is with the vertebral, paravertebral and dorsolateral fields being contrasting dark and light stripes extending to the rear of the body; the stripes on the paravertebral field may occasionally be broken; lateral fields bear only a few tiny light spots and the occipital spot is effectively separated from the stripe posterior to it. The line of yellow on the dorsolateral edge is thick with the upper edge indistinct and the lower edge sharp. It is also bounded sharply on all other sides by a region of thick unbroken black. The occipital spot is also a distinctive diamond shape. The tail is very light all over with limited darker flecks anteriorly.

*L. tokpisinensis* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is either single, semi-divided or divided and there are 18 to 21 (average 20) lamellae under the fourth toe. Colouration is strongly striped extending to the rear of the body. The occipital spot is not completely cut off from the vertebral stripe and may be indistinct but present in old specimens. There is always a distinct, sharp-edged vertebral stripe, bordered by dark pigment that in turn fades in the form of peppering towards the flanks, where the dorsolateral edge forms a very thin and semi-distinct light line (this line is thick in *L. gulagorum* sp. nov.). *L. tokpisinensis* sp. nov. has a tail that is light on the upper surface and with scattered evenly-spaced dark flecks on the flanks.

In colouration *L. tokpisinensis* sp. nov. is almost identical to *L. acrilineata* sp. nov. from the southern two thirds of Bougainville Island, but the two are separated by the fact that the yellow mid dorsal line is narrower than the legs in *L. tokpisinensis* sp. nov., but slightly wider than the legs in *L. acrilineata* sp. nov..

*L. freshsweetpotato* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always semi-divided and there are 24-26 lamellae under the fourth toe. The sympatric morphologically similar species *Retroalbascincus rouxi* (Hediger, 1934), previously synonymised with *L. noctua* by Zweifel (1979), is most easily separated from *L. freshsweetpotato* sp. nov. by having a fully divided frontoparietal and lacking an occipital spot and the dorsum of the head not consisting of strongly contrasting dark and light areas. Colouration in *L. freshsweetpotato* sp. nov. is with an occipital spot and all stripes are well developed in the neck region. The vertebral stripe is distinct to the rump in most specimens except very old ones, where this may fade somewhat posteriorly. Unique to this species is that the vertebral stripe is thick on the neck and front half of the body and then becomes noticeably thinner posteriorly. The tail is generally dark on the anterior dorsal surface, except immediately posterior to the back legs where it is light in colour. The paravertebral field is pale, uniform light brown. The lateral field is continuously dark, sometimes broken by a few tiny spots.

*L. acrilineata* sp. nov. from the southern two thirds of Bougainville Island, is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 20-24 (average 22) lamellae under the fourth toe. The colouration is with the vertebral stripe being distinct to the tail base and edged by a narrow, sharp and well-defined, continuous dark border. The dorsolateral light field is broad and relatively unmarked. The labials have indistinct dark bars or none (versus strongly barred in *L. maculaoccipitalis* sp. nov.). The tail is light in colour with few if any dark flecks and the head is mainly light in colour, especially near the snout. The lateral dark field is continuous and lightly spotted.

*L. acrilineata* sp. nov. has an occipital spot joined by a continuous line to the mid-dorsal line and so is one.

*L. maculaoccipitalis* sp. nov. known only from Kanua in the far north of Bougainville Island, is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 19-22 (average 20.6) lamellae under the fourth toe. The

colouration is with the vertebral stripe not being visible to the pelvic girdle. The edge is not narrow, sharp and well-defined with a continuous dark border. Instead it is poorly defined and the boundary is a combination of dark pigment of irregular shape and light peppering merging into the adjoining light region on the dorsolateral line which in turn is wide, but similarly ill defined due to the extensive peppering on it. This means that the paravertebral fields are broken into irregular spots much broader than the homologous narrow dark line in *L. acrilineata* sp. nov.. The lateral dark field is continuous and lightly spotted. The labials have strong, vertically oriented dark bars in contrast to *L. acrilineata* sp. nov. in which the bars are either absent or very faint.

*L. maculaoccipitalis* sp. nov. has an occipital spot surrounded by blackish pigment and either wholly separate from the mid-dorsal line starting posterior to this or almost separated from the mid-dorsal stripe, except for a tiny sliver of pale joining the two.

*L. albavarietata* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows and the frontoparietal is always divided. The colouration is generally light brown, yellow and beige, with an occipital spot of elongate shape, well defined and surrounded by dark brown to black, joined by a short-narrow point to a thick-well-defined mid-dorsal stripe that runs just past the pelvis, where it abruptly stops and the tail colouration commences.

On either side of the mid-dorsal stripe is a well-defined brown stripe, in turn bound by a thinner but well-defined yellow stripe on the flank side of the dorsal surface. In turn the flanks are blackish on top fading gradually to whitish at the bottom with semi-regularly spaced white dots. The tail is a distinctive light brown in colour with a series of yellow spots, arranged in lines, giving it a slightly banded appearance. Snout and labials are brown and peppered with grey and there is no obvious barred appearance.

Toes are banded black and yellow and the hind legs are brown with dull yellow spots arranged into bands. Forelimbs are brown with irregular spots. A dark blackish brown temporal streak is bounded on top by a rectangular yellow bar, which fades on the neck before reforming into the yellow line that runs down the side of the dorsum on top of the flanks.

*L. laterafusca* sp. nov. is similar in most respects to *L. albavarietata* sp. nov. (see above), but differs from it in that the flanks are generally black on the top two thirds and there are no scattered white dots, save for a small number of larger spots on the upper and lower boundary. There is no distinct boundary between the occipital spot and the mid-dorsal line, both being effectively one in this species, with the mid-dorsal line commencing at the point of the occipital spot. Tail is orange brown with evenly spaced pairs of yellow spots running down the upper surface. Lower labials have an alternating brown and white colouration giving the lower jawline a barred appearance.

*L. etfatubrunnea* sp. nov. is similar in most respects to both *L. laterafusca* sp. nov. and *L. albavarietata* sp. nov. (see above), but is separated from both by the mid-dorsal line being bounded by black and the yellow line on the flank sides of the dorsum is virtually unnoticeable and effectively absent. The upper surface of the anterior forelimbs has white scales or peppering, giving the appearance of a thin irregular white line. Tail is generally unmarked and light yellowish in colour.

*L. leucolabialis* sp. nov. is readily separated from all other species in the group by colouration. It is similar in most respects to *L. noctua* (see above), but separated from that species by having a white snout and upper labials (without barring of any sort); minimal barring on the otherwise whitish lower labials; only dark brown and not black on the upper and lateral surfaces. Occipital spot is bright yellow, wholly surrounded by brown and separated from the mid-dorsal line. Mid-dorsal line ends posterior to the hind legs and the anterior tail has semi-distinct brown triangles on the upper surface while each of the sides of the tail has a semi-distinct brown line running along each side,

this line being formed by dense peppering on an otherwise beige background. The dark brown peppering bordering the mid-dorsal line on the body is broken and irregular meaning that yellow from the mid-dorsal line actually joins that of the yellow stripes on the lateral edge of the dorsal surface. The brown on the upper lateral surfaces is also broken (by white), which fades to a white lower lateral surface and venter.

Austin (1999) found that the seven species defined herein as *L. noctua*, *L. ternatensis*, *L. vertebrale*, *L. miotis*, *L. freshsweetpotato* sp. nov., *L. leucolabialis* sp. nov. and *L. albavarietata* sp. nov. had an average (mean) mtDNA sequence divergence of 9.7 per cent (= to about 5 MYA divergence from one another) effectively confirming the relevant species diagnoses herein. Other species named herein were not tested by Austin (1999), but could reasonably be expected to have similar mtDNA sequence divergences.

A photo of the holotype of *L. sentaniensis* sp. nov. is depicted in Zweifel (1979), Fig 3, A, on page 6.

**Distribution:** *L. sentaniensis* sp. nov. is known only from the type locality of Lake Sentani in Irian Jaya, Indonesia.

**Etymology:** Named in reflection of where the type specimen was caught.

#### **LATERATENEBRISCINCUS SEPIKENSIS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:28B7F0CF-0C0C-40EF-BB4A-3857AF0E755E

**Holotype:** A preserved specimen at the Natural History Museum of Basel in Basel, Switzerland, specimen number NHMB 11642, collected at Kamberamba, lower Sepik River, East Sepik Province, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** Eight preserved specimens at the Natural History Museum of Basel in Basel, Switzerland, specimen numbers NHMB 11643-11650, collected at Kamberamba, lower Sepik River, East Sepik Province, Papua New Guinea.

**Diagnosis:** This species is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscincus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus* gen. nov. with the species *Lateratenebriscincus sepikensis* sp. nov. being diagnosed separately and separated from this species and others in the genus in the description below.

The genus *Lateratenebriscincus* gen. nov. is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

*L. sentaniensis* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-28 midbody rows, the frontoparietal may be single, partially divided or divided and there are 17 to 22 (average 20) lamellae under the fourth toe. Colouration consists of a very faded dorsum without any obvious colour pattern, save for a thin mid-dorsal stripe largely reduced in intensity by ill-defined side boundaries and peppering of darker pigment, which occupies the rest of the back. Put simply, the striped pattern is suppressed to the point of obscurity. While there are a few dark flecks on the dorsum



away from the mid-dorsal stripe region, the general view is of an unmarked dorsum save for the obscured, ill-defined and faded mid-dorsal line. In this species even juveniles show only an indistinct vertebral stripe with edges that fade into the ground color between relatively small, dark markings of the paravertebral fields. The flanks have limited dark pigment with any pattern or markings obscured and suppressed as on the dorsum. The tail is generally light with an absence of any dark spots or similar on the dorsal surface (including anteriorly) and save for a few indistinct tiny dark flecks is otherwise unmarked. In *L. sentaniensis* sp. nov., the region of the occipital spot seen in other species is merely an area of lightening in the scales, but otherwise indistinct from the surrounding scales.

*L. sepikensis* sp. nov. is separated from all other species in the genus as follows: It is the same in most respects to *L. sentaniensis* sp. nov. as described above including having a colouration that mainly consists of a very faded dorsum without any obvious colour pattern. However within this species the mid-dorsal stripe is wide between the back of the head and anterior to the front legs as well as also being bordered by well-defined irregular-shaped (but squarish) dark patches, almost continuously joined, so that on this part of the lizard, the mid-dorsal stripe is well defined. In *L. sentaniensis* sp. nov. on the body, the thin mid-dorsal stripe fades into a dorsum which is peppered and effectively unicolour. By contrast in *L. sepikensis* sp. nov. the body has a thicker mid-dorsal stripe, heavily peppered on the posterior half of the body bordered by heavy dark blotches or small to medium size blotches in two longitudinal rows, in turn bordered by a lighter zone of yellow that is also heavily peppered, giving the dorsal surface of the body a general view of having five indistinct and heavily peppered stripes of alternating beige and brown stripes. The flanks are lined with closely spaced and large indistinct squarish dark blotches. In contrast to *L. sentaniensis* sp. nov. the tail of *L. sepikensis* sp. nov. is heavily marked on the anterior dorsal surface with five or six distinctive dark triangles or triangular-shaped squares with the narrower point (side) being posterior in each, being evenly spaced and surrounded by generally lighter pigment, versus generally unmarked in *L. sentaniensis* sp. nov.. *L. sepikensis* sp. nov. has a well defined bright diamond-shaped occipital spot surrounded by black scales with a sharp well-defined border at the edge of the occipital spot.

Between the populations of *L. sentaniensis* sp. nov. and *L. sepikensis* sp. nov. is a population in the West Sepik region in the vicinity of Aitape, Papua New Guinea which appears in most respects to be similar to nominate *L. gulagorum* sp. nov. and is herein tentatively treated as that species.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis* sp. nov. earlier in this paper and that material should be treated as being a part of this formal description.

A photo of the holotype of *L. sepikensis* sp. nov. is depicted in Zweifel (1979), Fig 3, B, on page 6.

**Distribution:** *L. sepikensis* sp. nov. is known only from the type locality of the lower Sepik River region of the East Sepik Province, Papua, New Guinea.

**Etmology:** Named in reflection of where the type specimen was caught.

**LATERATENEBRISCINCUS ALBAAUDERE SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:15AD8A7F-95FC-4ACF-826F-CE76C0A6B632

**Holotype:** A preserved specimen at the American Museum of Natural History, Manhattan, New York, USA, specimen number AMNH 76825, collected at Misima Island, Milne Bay Province, Papua New Guinea, Latitude 10.67 S., Longitude 152.72 E. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the American Museum of Natural History, Manhattan, New York, USA, specimen number AMNH 76826, collected at Misima Island, Milne Bay Province,

Papua New Guinea, Latitude 10.67 S., Longitude 152.72 E.

**Diagnosis:** *Lateratenebriscus albaudere* sp. nov. is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus* gen. nov. with the species *Lateratenebriscus albaudere* sp. nov. being diagnosed separately and separated from this species and others in the genus in the description below.

The genus *Lateratenebriscincus* gen. nov. is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

*L. albaudere* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 17 to 26 lamellae under the fourth toe. Colouration is strongly striped. The vertebral stripe is sharp-edged and slightly broader than usual, occupying all but the tips of the paravertebral scale rows. No occipital spot is evident. The paravertebral field, somewhat narrowed by the expansion of the vertebral stripe, is mostly dark. Although somewhat uneven, it is not broken into discrete spots. The dorsolateral

stripe is distinct and the dark lateral field has light spots.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis* sp. nov. earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** Known only from the type locality of Misima Island, Milne Bay Province, Papua New Guinea.

**Etmology:** In Latin "*albaudere*" means bold stripe with reference to the mid-dorsal stripe on this species.

**LATERATENEBRISCINCUS GULAGORUM SP. NOV.**

**SID** urn:lsid:zoobank.org:act:AE01B803-8B47-4DAE-9953-E17EC212BBD6

**Holotype:** A preserved specimen at the Natural History Museum of Basel in Basel, Switzerland, specimen number NHMB 11802, collected at Iriu, Manus Island, Manus Province, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ 139524 and 139525, collected at Lorengau, Manus Island, Manus Province, Papua New Guinea.

**Diagnosis:** *Lateratenebriscincus gulagorum* sp. nov. is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830).

In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline Islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus* gen. nov. with *L. gulagorum* sp. nov. being

diagnosed separately and separated from this species in the description below.

The genus *Lateratenebriscincus gen. nov.* is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined (all other species in the genus).

*L. gulagorum sp. nov.* is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is either single, semi-divided or divided and there are 19 to 23 (average 21) lamellae under the fourth toe. Colouration is with the vertebral, paravertebral and dorsolateral fields being contrasting dark and light stripes extending to the rear of the body; the stripes on the paravertebral field may occasionally be broken; lateral fields bear only a few tiny light spots and the occipital spot is bright yellow, a distinctive diamond shape and effectively separated from the stripe posterior to it. The line of yellow on the dorsolateral edge is thick with the upper edge indistinct and the lower edge sharp. It is also bounded sharply on all other sides by a region of thick unbroken black. The tail is very light and yellowish all over with limited darker flecks anteriorly.

A photo of the holotype of *L. gulagorum sp. nov.* is depicted in Zweifel (1979), Fig 4, A, on page 7. Another specimen of the same species is depicted in Zweifel (1979), Fig 4, B, on page 7 from N'Drova Island, Manus Province, Papua New Guinea.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis sp. nov.* earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** Known only from Manus Island and immediately adjacent islets. Specimens from West New Britain are morphologically similar to this taxon and may be of the same species.

**Etymology:** As of 2018, "Google" defined the word "Gulag" as either, "a system of labour camps maintained in the Soviet Union from 1930 to 1955 in which many people died" or as a generic term for much the same thing by defining the word as "a camp in the Gulag system, or any political labour camp". In Australia people refer to so-called "concentration camps" as built and used by Nazi Germany and more recent Australian governments as "Gulags".

This species is therefore named "*gulagorum*" in recognition of the concentration camps maintained on Manus Island between 2001 and 2019 by the imperialist hegemonic Australian government of both Liberal and Labor parties in order to appease widely supported racist groups in Australia and ensure the re-election of the ruling party. The recognition is of the fact that for better or worse, innocent people's lives at the Manus Island concentration camp (called a "Detention Centre" by the Australian government) were lost as a result of the political games played by ruling parties in Australia on Manus Island and it is appropriate that a species name acknowledges the factual historical record for future generations.

**LATERATENEBRISCINCUS TOKPISINENSIS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:E421BA12-6CB8-485B-B80C-2B4FB39864D6

**Holotype:** A preserved specimen at the Natural History Museum of Basel in Basel, Switzerland, specimen number NHMB 11636, collected at Jacquinot Bay, New Britain, East New Britain Province, Papua New Guinea. This facility allows access to its holdings.

**Diagnosis:** *Lateratenebriscus tokpisinensis sp. nov.* is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus gen. nov.* with the species *Lateratenebriscus tokpisinensis sp. nov.* being diagnosed separately and separated from this species and others in the genus in the description below.

The genus *Lateratenebriscincus gen. nov.* is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

*L. tokpisinensis sp. nov.* is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is divided and there are 18 to 21 (average 20) lamellae under the fourth toe. Colouration is strongly striped extending to the rear of the body. The occipital spot is not completely cut off from the vertebral stripe and may be indistinct but present in old specimens. There is always a distinct, sharp-edged vertebral stripe, bordered by dark pigment that in turn fades in the form of peppering towards the flanks, where the dorsolateral edge forms a very thin and semi-distinct light line (this line is thick in *L. gulagorum sp. nov.*). *L. tokpisinensis sp. nov.* has a tail that is light on the upper surface and with scattered evenly-spaced dark flecks on the flanks.

In colouration *L. tokpisinensis sp. nov.* is almost identical to *L. acrilineata sp. nov.* from the southern two thirds of Bougainville Island, but the two are separated by the fact that the yellow mid dorsal line is narrower than the legs in *L. tokpisinensis sp. nov.*, but slightly wider than the legs in *L. acrilineata sp. nov.*

A photo of the holotype of *L. tokpisinensis sp. nov.* is depicted in Zweifel (1979), Fig 6, B, on page 8. Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis sp. nov.* earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** *L. tokpisinensis sp. nov.* is known only from the type locality of East New Britain, Papua New Guinea.

**Etymology:** *Tok Pisin* is the natives name for the island known to most people as "New Britain". The island got its name "New Britain" after Englishman William Dampier, named the island New Britain 1767. Dampier, an ex-pirate later did mercenary work for the British Empire and it is therefore appropriate the species etymology (reflecting where the species is found) reflect a name of more peaceful native peoples who did not go to the opposite side of the planet to rape and pillage.

**LATERATENEBRISCINCUS FRESHWEETPOTATO SP. NOV.**  
**LSID** urn:lsid:zoobank.org:act:DCAE9B6B-D7E6-4885-AE0D-9055114E539E

**Holotype:** A preserved specimen at the Natural History Museum of Basel in Basel, Switzerland, specimen number NHMB 10955, collected at Tabar Island, New Ireland Province, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Natural History Museum of Basel in Basel, Switzerland, specimen numbers NHMB 10953 and 10954, collected at Tabar Island, New Ireland Province, Papua New Guinea.

**Diagnosis:** *Lateratenebriscus freshsweetpotato sp. nov.* is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus gen. nov.* with the species *Lateratenebriscus freshsweetpotato sp. nov.* being diagnosed separately and separated from this species and others in the genus in the description below.

The genus *Lateratenebriscincus gen. nov.* is readily separated from all other similar species and genera in Indonesia, the Philippines, Solomon Islands and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

*L. freshsweetpotato sp. nov.* is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always semi-divided and there are 24-26 lamellae under the fourth toe. The sympatric morphologically similar species *Retroalbascincus rouxi* (Hediger, 1934), previously synonymised with *L. noctua* by Zweifel (1979), is most easily separated from *L. freshsweetpotato sp. nov.* by having a fully divided frontoparietal and lacking an occipital spot and the dorsum of the head not consisting of strongly contrasting dark and light areas (see also comparative photos in both Zweifel (1979) pages 7 and 8, or Austin (1995) at page 294 (Fig 2, A and B). Colouration in *L. freshsweetpotato sp. nov.* is with an occipital spot and all stripes are well developed in the neck region. The vertebral stripe is distinct to the rump in most specimens except very old ones, where this may fade somewhat posteriorly. Unique to this species is that the vertebral stripe is thick on the neck and front half of the body and then becomes noticeably thinner posteriorly. The tail is generally dark on the anterior dorsal surface, except immediately posterior to the back legs where it is light in colour. The paravertebral field is pale, uniform light brown. The lateral field is continuously dark, sometimes broken by a few tiny spots.

A photo of the holotype of *L. freshsweetpotato sp. nov.* is depicted in Zweifel (1979), Fig 4, C, on page 7. Another photo of this species is depicted in Austin (1995) Fig 2, B, on page 294 (at bottom).

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis sp. nov.* earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** Known from the type locality, Tabar Island and nearby parts of New Ireland, New Ireland Province, Papua New Guinea.

**Etymology:** Named in reflection of a common plant crop in the area (sweet potato) and that they are eaten fresh there by natives and that the location is "New Ireland", with the "old Ireland" being famous for its potatoes (unsweetend variety) and not much else.

**LATERATENEBRISCINCUS ACRILINEATA SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:36DEB802-0DB5-46F6-AD5C-E41F2E018271

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge,

Massachusetts, USA, specimen number MCZ 93823, collected at Melilup, Bougainville Province, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** Two preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ 93822 and MCZ 98783, collected at Melilup, Bougainville Province, Papua New Guinea.

**Diagnosis:** *Lateratenebriscus acrilineata sp. nov.* is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus gen. nov.* with the species *Lateratenebriscus acrilineata sp. nov.* being diagnosed separately and separated from this species and others in the genus in the description below.

The genus *Lateratenebriscincus gen. nov.* is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

*L. acrilineata sp. nov.* from the southern two thirds of Bougainville Island, is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 20-24 (average 22) lamellae under the fourth toe. The colouration is with the vertebral stripe being distinct to the tail base and edged by a narrow, sharp and well-defined, continuous dark border. The dorsolateral light field is broad and relatively unmarked. The labials have indistinct dark bars or none (versus strongly barred in *L. maculaoccipitalis sp. nov.*). The tail is light in colour with few if any dark flecks and the head is mainly light in colour, especially near the snout. The lateral dark field is continuous and lightly spotted.

*L. acrilineata sp. nov.* has an occipital spot joined by a continuous line to the mid-dorsal line and so both are in effect, one.

*L. maculaoccipitalis sp. nov.* known only from Kanua in the far north of Bougainville Island, is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 19-22 (average 20.6) lamellae under the fourth toe. The colouration is with the vertebral stripe not being visible to the pelvic girdle. The edge is not narrow, sharp and well-defined with a continuous dark border. Instead it is poorly defined and the boundary is a combination of dark pigment of irregular shape and light peppering merging into the adjoining light region on the dorsolateral line which in turn is wide, but similarly ill defined due to the extensive peppering on it. This means that the paravertebral fields are broken into irregular spots much broader than the homologous narrow dark line in *L. acrilineata sp. nov.*. The lateral dark field is continuous and lightly spotted. The labials have strong, vertically oriented dark bars in contrast to *L. acrilineata sp. nov.* in which the bars are either absent or very faint.

*L. maculaoccipitalis sp. nov.* has an occipital spot surrounded by blackish pigment and either wholly separate from the mid-dorsal line starting posterior to this or almost separated from the mid-

dorsal stripe, except for a tiny sliver of pale joining the two.

*L. tokpisinensis* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is either single, semi-divided or divided and there are 18 to 21 (average 20) lamellae under the fourth toe. Colouration is strongly striped extending to the rear of the body. The occipital spot is not completely cut off from the vertebral stripe and may be indistinct but present in old specimens. There is always a distinct, sharp-edged vertebral stripe, bordered by dark pigment that in turn fades in the form of peppering towards the flanks, where the dorsolateral edge forms a very thin and semi-distinct light line (this line is thick in *L. gulagorum* sp. nov.). *L. tokpisinensis* sp. nov. has a tail that is light on the upper surface and with scattered evenly-spaced dark flecks on the flanks.

In colouration *L. tokpisinensis* sp. nov. is almost identical to *L. acrilineata* sp. nov. from the southern two thirds of Bougainville Island, but the two are separated by the fact that the yellow mid dorsal line is narrower than the legs in *L. tokpisinensis* sp. nov., but slightly wider than the legs in *L. acrilineata* sp. nov..

A photo of the holotype of *L. acrilineata* sp. nov. is depicted in Zweifel (1979), Fig 6, C, on page 8.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis* sp. nov. earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** *L. acrilineata* sp. nov. occurs on the southern two thirds of Bougainville Island. The allopatric *L. maculaoccipitalis* sp. nov. is known only from Kanua in the far north of Bougainville Island.

**Etymology:** In Latin “*acrilineata*” means sharp line in reflection of the sharp mid-dorsal line in this species.

**LATERATENEBRISCINCUS MACULAOCCIPITALIS SP. NOV.**

**LSID urn:lsid:zoobank.org:act:062C5838-04E2-4245-BADC-D93883A1CF44**

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ 76273, collected at Kunua, Bougainville Province, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** Twelve preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ 67750, 67751, 72534, 76004-76008, 76271, 76272, 76921 and 76922 collected at Kunua and vicinity, Bougainville Province, Papua New Guinea.

**Diagnosis:** *Lateratenebriscus maculaoccipitalis* sp. nov. is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscus* gen. nov. with the species *Lateratenebriscus maculaoccipitalis* sp. nov. being diagnosed separately and separated from this species and others in the genus in the description below.

The genus *Lateratenebriscus* gen. nov. is readily separated from all other similar species and genera in Indonesia, the Phillipines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite:

All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague

or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

*L. acrilineata* sp. nov. from the southern two thirds of Bougainville Island, is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 20-24 (average 22) lamellae under the fourth toe. The colouration is with the vertebral stripe being distinct to the tail base and edged by a narrow, sharp and well-defined, continuous dark border. The dorsolateral light field is broad and relatively unmarked. The labials have indistinct dark bars or none (versus strongly barred in *L. maculaoccipitalis* sp. nov.). The tail is light in colour with few if any dark flecks and the head is mainly light in colour, especially near the snout. The lateral dark field is continuous and lightly spotted.

*L. acrilineata* sp. nov. has an occipital spot joined by a continuous line to the mid-dorsal line and so is one.

*L. maculaoccipitalis* sp. nov. known only from Kanua and immediate vicinity in the far north of Bougainville Island, is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is always divided and there are 19-22 (average 20.6) lamellae under the fourth toe. The colouration is with the vertebral stripe not being visible to the pelvic girdle. The edge is not narrow, sharp and well-defined with a continuous dark border. Instead it is poorly defined and the boundary is a combination of dark pigment of irregular shape and light peppering merging into the adjoining light region on the dorsolateral line which in turn is wide, but similarly ill defined due to the extensive peppering on it. This means that the paravertebral fields are broken into irregular spots much broader than the homologous narrow dark line in *L. acrilineata* sp. nov.. The lateral dark field is continuous and lightly spotted. The labials have strong, vertically oriented dark bars in contrast to *L. acrilineata* sp. nov. in which the bars are either absent or very faint.

*L. maculaoccipitalis* sp. nov. has an occipital spot surrounded by blackish pigment and either wholly separate from the mid-dorsal line starting posterior to this or almost separated from the mid-dorsal stripe, except for a tiny sliver of pale joining the two.

*L. tokpisinensis* sp. nov. is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows, the frontoparietal is either single, semi-divided or divided and there are 18 to 21 (average 20) lamellae under the fourth toe. Colouration is strongly striped extending to the rear of the body. The occipital spot is not completely cut off from the vertebral stripe and may be indistinct but present in old specimens. There is always a distinct, sharp-edged vertebral stripe, bordered by dark pigment that in turn fades in the form of peppering towards the flanks, where the dorsolateral edge forms a very thin and semi-distinct light line (this line is thick in *L. gulagorum* sp. nov.). *L. tokpisinensis* sp. nov. has a tail that is light on the upper surface and with scattered evenly-spaced dark flecks on the flanks.

In colouration *L. tokpisinensis* sp. nov. is almost identical to *L. acrilineata* sp. nov. from the southern two thirds of Bougainville Island, but the two are separated by the fact that the yellow mid dorsal line is narrower than the legs in *L. tokpisinensis* sp. nov., but slightly wider than the legs in *L. acrilineata* sp. nov..

A photo of the holotype of *L. maculaoccipitalis* sp. nov. is depicted in Zweifel (1979), Fig 6, D, on page 8.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis* sp. nov. earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** *L. acrilineata* sp. nov. occurs on the southern two thirds of Bougainville Island. The allopatric *L. maculaoccipitalis* sp. nov. is known only from Kanua and vicinity in the far north of Bougainville Island.

**Etymology:** In Latin “*maculaoccipitalis*” means occipital spot in reflection of this diagnostic trait in this species.

**LATERATENEBRISCINCUS ALBAVARIETATA SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:BD418963-DB22-4F0A-86DA-815A30D13CF2

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, Specimen number Herp R-113355 collected at Mbahi, Guadalcanal Island, Solomon Islands, Latitude 9.30 S., Longitude 159.6 E. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the California Academy of Sciences, San Francisco, California, USA, specimen number CAS HERP 72177 collected from Guadalcanal Island, Solomon Islands, Latitude 9.65 S., Longitude 160.20 E.

**Diagnosis:** *L. albavarietata sp. nov.* is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows and the frontoparietal is always divided. The colouration is generally light brown, yellow and beige, with an occipital spot of elongate shape, well defined and surrounded by dark brown to black, joined by a short-narrow point to a thick-well-defined mid-dorsal stripe that runs just past the pelvis, where it abruptly stops and the tail colouration commences.

On either side of the mid-dorsal stripe is a well-defined brown stripe, in turn bound by a thinner but well-defined yellow stripe on the flank side of the dorsal surface. In turn the flanks are blackish on top fading gradually to whitish at the bottom with semi-regularly spaced white dots. The tail is a distinctive light brown in colour with a series of yellow spots, arranged in lines, giving it a slightly banded appearance. Snout and labials are brown and peppered with grey and there is no obvious barred appearance.

Toes are banded black and yellow and the hind legs are brown with dull yellow spots arranged into bands. Forelimbs are brown with irregular spots. A dark blackish brown temporal streak is bounded on top by a rectangular yellow bar, which fades on the neck before reforming into the yellow line that runs down the side of the dorsum on top of the flanks.

*L. laterafusca sp. nov.* from Malaita Island and San Cristobal in the Solomon Islands is similar in most respects to *L. albavarietata sp. nov.* (see above), but differs from it in that the flanks are generally black on the top two thirds and there are no scattered white dots, save for a small number of larger spots on the upper and lower boundary. There is no distinct boundary between the occipital spot and the mid-dorsal line, both being effectively one in this species, with the mid-dorsal line commencing at the point of the occipital spot. Tail is orange brown with evenly spaced pairs of yellow spots running down the upper surface. Lower labials have an alternating brown and white colouration giving the lower jawline a barred appearance.

*L. efatubrunnea sp. nov.* from the New Georgia group of islands in the Solomon Islands, is similar in most respects to both *L. laterafusca sp. nov.* and *L. albavarietata sp. nov.* (see above), but is separated from both by the mid-dorsal line being bounded by black and the yellow line on the flank sides of the dorsum is virtually unnoticeable and effectively absent. The upper surface of the anterior forelimbs has white scales or peppering, giving the appearance of a thin irregular white line. Tail is generally unmarked and light yellowish in colour.

*L. albavarietata sp. nov.* is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscincus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus gen. nov.* with all other species being

diagnosed separately and separated from this species in the description below.

The genus *Lateratenebriscincus gen. nov.* is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albdorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis sp. nov.* earlier in this paper and that material should be treated as being a part of this formal description.

*L. albavarietata sp. nov.* in life is depicted in Plate 68 (bottom) of McCoy (2006).

**Distribution:** *L. albavarietata sp. nov.* occurs on Guadalcanal Island, Solomon Islands.

**Etymology:** In Latin “*albavarietata*” means white spots with reference to white dots on the upper flanks of the body.

**LATERATENEBRISCINCUS LATERAFUSCA SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:30DDB5AD-ABCB-4D19-A6ED-2CCCF10C9812

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, Specimen number MCZ Herp R-113348 collected at Auki, Malaita Island, Solomon Islands. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, Specimen number MCZ Herp R-113349 collected at Auki, Malaita Island, Solomon Islands.

**Diagnosis:** *L. albavarietata sp. nov.* from Guadalcanal Island, Solomon Islands is separated from all other species in the genus by the following unique suite of characters: 23-27 midbody rows and the frontoparietal is always divided. The colouration is generally light brown, yellow and beige, with an occipital spot of elongate shape, well defined and surrounded by dark brown to black, joined by a short-narrow point to a thick-well-defined mid-dorsal stripe that runs just past the pelvis, where it abruptly stops and the tail colouration commences.

On either side of the mid-dorsal stripe is a well-defined brown stripe, in turn bound by a thinner but well-defined yellow stripe on the flank side of the dorsal surface. In turn the flanks are blackish on top fading gradually to whitish at the bottom with semi-regularly spaced white dots. The tail is a distinctive light brown in colour with a series of yellow spots, arranged in lines, giving it a slightly banded appearance. Snout and labials are brown and peppered with grey and there is no obvious barred appearance.

Toes are banded black and yellow and the hind legs are brown with dull yellow spots arranged into bands. Forelimbs are brown with irregular spots. A dark blackish brown temporal streak is bounded on top by a rectangular yellow bar, which fades on the neck before reforming into the yellow line that runs down the side of the dorsum on top of the flanks.

*L. laterafusca sp. nov.* from Malaita Island and San Cristobal in the Solomon Islands is similar in most respects to *L. albavarietata sp. nov.* (see above), but differs from it in that the flanks are generally black on the top two thirds and there are no scattered white dots, save for a small number of larger spots on the upper and lower boundary. There is no distinct boundary between the occipital spot and the mid-dorsal line, both being effectively one in this species, with the mid-dorsal line commencing at the point of the occipital spot. Tail is orange brown with evenly spaced pairs of yellow spots running down the

upper surface. Lower labials have an alternating brown and white colouration giving the lower jawline a barred appearance.

*L. effatubrunnea* sp. nov. from the New Georgia group of islands in the Solomon Islands, is similar in most respects to both *L. laterafusca* sp. nov. and *L. albavarietata* sp. nov. (see above), but is separated from both by the mid-dorsal line being bounded by black and the yellow line on the flank sides of the dorsum is virtually unnoticeable and effectively absent. The upper surface of the anterior forelimbs has white scales or peppering, giving the appearance of a thin irregular white line. Tail is generally unmarked and light yellowish in colour.

*L. laterafusca* sp. nov. is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscincus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus* gen. nov. with all other species being diagnosed separately and separated from this species in the description below.

The genus *Lateratenebriscincus* gen. nov. is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis* sp. nov. earlier in this paper and that material should be treated as being a part of this formal description.

*L. albavarietata* sp. nov. is depicted in life in McCoy (1980) Plate 17, third down on left.

**Distribution:** *L. laterafusca* sp. nov. occurs on Malaita Island and San Cristobal in the Solomon Islands as well as nearby islets.

**Etymology:** In Latin "*laterafusca*" refers to the dark sides of this species, as in dark upper flanks that are blackish in colouration.

**LATERATENEBRISCINCUS ETFATUBRUNNEA SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:AE912E8C-2C8D-4F1B-8384-E2C4EFAC7E35

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, Specimen number MCZ Herp R-113358 collected at Lambete, New Georgia Island, Western Province, Solomon Islands, Latitude 8.31 S., Longitude 157.27 E.. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, Specimen number MCZ Herp R-14664 collected at Rubiana (= Roviana Island), in the New Georgia Group of Islands, Western Province, Solomon Islands.

**Diagnosis:** *L. albavarietata* sp. nov. from Guadalcanal Island, Solomon Islands is separated from all other species in the genus by the following unique suite of characters:

23-27 midbody rows and the frontoparietal is always divided. The colouration is generally light brown, yellow and beige, with an occipital spot of elongate shape, well defined and surrounded by dark brown to black, joined by a short-narrow point to a thick-well-defined mid-dorsal stripe that runs just past the pelvis, where it abruptly stops and the tail colouration commences.

On either side of the mid-dorsal stripe is a well-defined brown

stripe, in turn bound by a thinner but well-defined yellow stripe on the flank side of the dorsal surface. In turn the flanks are blackish on top fading gradually to whitish at the bottom with semi-regularly spaced white dots. The tail is a distinctive light brown in colour with a series of yellow spots, arranged in lines, giving it a slightly banded appearance. Snout and labials are brown and peppered with grey and there is no obvious barred appearance.

Toes are banded black and yellow and the hind legs are brown with dull yellow spots arranged into bands. Forelimbs are brown with irregular spots. A dark blackish brown temporal streak is bounded on top by a rectangular yellow bar, which fades on the neck before reforming into the yellow line that runs down the side of the dorsum on top of the flanks.

*L. laterafusca* sp. nov. from Malaita Island and San Cristobal in the Solomon Islands is similar in most respects to *L. albavarietata* sp. nov. (see above), but differs from it in that the flanks are generally black on the top two thirds and there are no scattered white dots, save for a small number of larger spots on the upper and lower boundary. There is no distinct boundary between the occipital spot and the mid-dorsal line, both being effectively one in this species, with the mid-dorsal line commencing at the point of the occipital spot. Tail is orange brown with evenly spaced pairs of yellow spots running down the upper surface. Lower labials have an alternating brown and white colouration giving the lower jawline a barred appearance.

*L. effatubrunnea* sp. nov. from the New Georgia group of islands in the Solomon Islands, is similar in most respects to both *L. laterafusca* sp. nov. and *L. albavarietata* sp. nov. (see above), but is separated from both by the mid-dorsal line being bounded by black and the yellow line on the flank sides of the dorsum is virtually unnoticeable and effectively absent. The upper surface of the anterior forelimbs has white scales or peppering, giving the appearance of a thin irregular white line.

Tail is generally unmarked and light yellowish in colour.

*L. effatubrunnea* sp. nov. is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscincus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus* gen. nov. with all other species being diagnosed separately and separated from this species in the description below.

The genus *Lateratenebriscincus* gen. nov. is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis* sp. nov. earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** *L. effatubrunnea* sp. nov. occurs in the New Georgia group of islands in the Solomon Islands as well as nearby islets.

**Etymology:** In Latin "*effatubrunnea*" refers to the brown snout of this species.

**LATERATENEBRISCINCUS LEUCOLABIALIS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:38BB88EB-7B0B-4375-9323-BFA7FCEC7196

**Holotype:** A preserved specimen at the Bernice P. Bishop Museum, Honolulu, Hawaii, USA, specimen number: Herp-BPBM 13078 collected from Airai, which is about 1 km by road north-west from Airai Harbor, Babeldaob Island, Palau, Latitude 7.36 N., Longitude 134.56 E. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the United States National Museum (now National Museum of Natural History; Smithsonian Institution; Washington, DC), USA, Specimen number USNM Amphibians and Reptiles 495133, collected at Melekeok, main jetty (Ngeremecheluch), Melekeok State, Babeldaob Island, Palau, Latitude 7.48 N., Longitude 134.63 E.

**Diagnosis:** The species *Lateratenebriscus leucolabialis sp. nov.* is one of twelve species formally named within this paper, formerly treated as allopatric populations of the widespread species *Lateratenebriscincus noctua* (Lesson, 1830), known in most texts as *Lipinia noctua* (Lesson, 1830). In spite of the division herein, it is likely further species within the complex remain to be formally identified and named.

The putative species *Lateratenebriscus noctua* (Lesson, 1830) with a type locality of Kosrae in the Caroline islands and distributed widely in the Pacific is diagnosed as for the genus *Lateratenebriscincus gen. nov.* with all other species being diagnosed separately and separated from this species in the description below.

The genus *Lateratenebriscincus gen. nov.* is readily separated from all other similar species and genera in Indonesia, the Philippines and New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: All limbs are pentadactyle; frontonasal is as long as broad or more long than broad. Digits are not dilated; fourth toe longer than third; 22-26 mid-body scale rows; 19-28 lamellae under the fourth toe, dorsum pale yellow (*L. albodorsalis* (Vogt, 1932) only), or with a light mid-dorsal line of some form, even if vague or ill defined and in turn with a darker stripe bounding this or a dark upper lateral stripe on either side, again sometimes ill defined.

The species originally described as "*Lygosoma vertebrale* Hallowell, 1860", from Hawaii is resurrected from synonymy of *L. noctua* and applies to all populations east of Vanuatu and a population west of there on the Kapingamarangi Atoll (*sensu* Austin 1999).

The species *Euprepes Novarae* Steindachner, 1869, from Tahiti is herein treated as a synonym of *L. vertebrale*, following relevant determinations of Zweifel (1979) and Austin (1999).

The species *Leiolepisma rouxi* Hediger, 1934, also synonymised by Zweifel (1979) is resurrected from synonymy with *L. noctua* and herein placed in a separate genus *Retroalbascincus gen. nov.*

The species *L. albodorsalis* (Vogt, 1932), known only from three specimens all caught in the East Sepik Province of Papua New Guinea is unique in the genus (group of species) in having a clean yellow dorsum without any dark colour or mid dorsal line of any sort and otherwise conforms to the diagnosis for the genus.

The species *L. aurea* (Meyer, 1874) from Yapen Island, Irian Jaya, Indonesia, *L. ternatensis* (Peters and Doria, 1878) type locality Ternate Island in the Moluccas, Indonesia and *L. miotis* (Boulenger, 1895) from Fergusson Island, Milne Bay Province in Papua New Guinea are all resurrected from the synonymy of *L. noctua*, on the basis of morphological divergence and allopatry. The species *Lygosoma (Leiolepisma) subnitens* Boettger, 1896, type locality Astrolabe Bay, Madang Province, Papua New Guinea is herein synonymised with *T. miotis* based on morphological similarities and proximal known distribution.

Excluding *L. albodorsalis* (see above), the relevant species in the genus (AKA species complex) are differentiated and separated from one another by the following suites of

characters.

*L. noctua* is separated from all other species in the genus by the following unique suite of characters:

23-27 midbody rows, consistently paired frontoparietals, 17 to 25 lamellae under the fourth toe. A dorsal pattern incorporating a mid-dorsal line (stripe) with a generally ill defined boundary and indistinct dark brownish-black markings on a mainly lightish yellowish-brown to beige background on the rest of the back. The mid dorsal stripe does not fade before the pelvic girdle and the tail is yellowish in colour with a distinctive line of indistinctly shaped blackish triangles running down the anterior end. The upper surfaces of the flanks are black with yellowish flecks, bounded by whitish, which is also the colouration of the lower half of the flanks, which more-or-less appears to be defined by a line, through the near continuous brownish squares above. The snout is peppered brown and the yellow occipital spot is significantly brighter than the mid-dorsal stripe posterior to it. The legs are light, peppered with brown and also with the occasional dark brown blotch. Both upper and lower labials are white with alternating black bars.

*L. leucolabialis sp. nov.* is readily separated from all other species in the group by colouration. It is similar in most respects to *L. noctua* (see above), but separated from that species by having a white snout and upper labials (without barring of any sort); minimal barring on the otherwise whitish lower labials; only dark brown and not black on the upper and lateral surfaces. Occipital spot is bright yellow, wholly surrounded by brown and separated from the mid-dorsal line. Mid-dorsal line ends posterior to the hind legs and the anterior tail has semi-distinct brown triangles on the upper surface while each of the sides of the tail has a semi-distinct brown line running along each side, this line being formed by dense peppering on an otherwise beige background. The dark brown peppering bordering the mid-dorsal line on the body is broken and irregular meaning that yellow from the mid-dorsal line actually joins that of the yellow stripes on the lateral edge of the dorsal surface. The brown on the upper lateral surfaces is also broken (by white), which fades to a white lower lateral surface and venter.

Separation of all species within this genus is done in detail in the formal description for *L. sentaniensis sp. nov.* earlier in this paper and that material should be treated as being a part of this formal description.

**Distribution:** *L. leucolabialis sp. nov.* is known only from the Palau group of islands.

**Etymology:** In Latin "*leucolabialis*" refers to the white coloured upper labial scales on this species.

**POINTEDNASUS (POINTEDNASUS) WIDIRECTA SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:2868BFDD-8D37-4EB8-A7F5-1F918A3B381E

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, Specimen number MCZ 48584 collected at Aitape, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** Four preserved specimens at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen numbers MCZ 48585-8 collected at Aitape, Papua New Guinea.

**Diagnosis:** The species *Pointednassus clavoflavoviridis sp. nov.* from the vicinity of Guisko, Morobe, Papua New Guinea, the species *P. widerecta sp. nov.* from north west Papua New Guinea (west of the Sepik River) and nearby coastal Irian Jaya, the species *P. currearbor sp. nov.* from Irian Jaya south of the central cordillera and the species *P. flavorecta sp. nov.* from Misima Island, Milne Bay Province, Papua New Guinea would until now have been identified as (mainly) western populations of *P. longiceps* (Boulenger, 1895), type locality of Trobriand Islands, Papua New Guinea.

However both *P. widerecta sp. nov.* and *P. clavoflavoviridis sp.*

*nov.* can be separated from *P. longiceps* by colouration. *P. widerecta sp. nov.* and *P. clavoflavoviridis sp. nov.* in adults has the dorsal colouration of the head being sooty with a pale yellowish green stripe continued on back as a

vertebral stripe flanked with olive brown, the olive brown stripes converging posteriorly and becoming reddish brown; anteriorly they are edged by a black line, below which is a bronze dorso-lateral band

with an olive area below fading into the pale, metallic gold belly; limbs are dappled with light brown and black; tail is orange bronze above and pale dull orange below. Lower parts and upper lip white, with greenish-golden gloss. By contrast *P. longiceps* is similar to the preceding, but with the beginning of the pale yellowish green stripe at the anterior end being indistinct and the tail is yellowish-gold.

*P. clavoflavoviridis sp. nov.* is separated from both *P. longiceps* and *P. widerecta sp. nov.* by having 22-24 midbody rows, versus 26 in the other two species.

The species *P. currearbor sp. nov.* from south of the main Cordillera in West Papua is similar in most respects to *P. widerecta sp. nov.* and *P. clavoflavoviridis sp. nov.* (see above) but differs from those two species in that the markings on the limbs are indistinct and the tail is very pale to whitish under the medial line. *P. currearbor sp. nov.* also has 24 midbody rows.

*Pointednasus flavorecta sp. nov.* is similar in most respects to *P. longiceps* and is separated from all other species (above) on the same basis. *P. flavorecta sp. nov.* is however separated from *P. longiceps* by the fact that the stripe commencing at the anterior end is yellowish in colour and not yellowish green, or if green is present, it is extremely faint.

The five species *Pointednasus widerecta sp. nov.*, *P. clavoflavoviridis sp. nov.*, *P. flavorecta sp. nov.*, *P. longiceps* and *P. currearbor sp. nov.* are further diagnosed as follows: Head two and a half times as long as broad; snout very long and pointed, depressed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more long than broad, forming a broad straight suture with the rostral; prefrontals in contact; frontal small, as long as the frontoparietals and interparietal together, acutely pointed behind, in contact with the two anterior supraoculars; four supraoculars, first large; seven supraciliaries; frontoparietals almost as large as the interparietal; parietals in contact; three pair of nuchals; five upper labials before the subocular. Scales smooth with 22-26 midbody rows, dorsals largest, laterals smallest; the distance between the tip of the snout and fore limb almost equals that between axilla and groin; preanals enlarged. Tail about as long as the head and body. Limbs strong, the hind limb reaches the wrist; digits depressed at the base, compressed distally, third and fourth equal, fourth toe with about 19 smooth lamellae below.

**Distribution:** The species *Pointednasus widerecta sp. nov.* is known from north west Papua New Guinea and nearby coastal Irian Jaya in the region near the Torricelli Alexander Mountains in Papua New Guinea (West Sepik Province), west to the area of Penguungan Van Rees in Irian Jaya.

**Etymology:** In Latin "*widerecta*" means wide line, in reflection of the broad wide line running down the middle of the back of the species.

**POINTEDNASUS (POINTEDNASUS) CLAVOFLAVOVIRIDIS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:BE26FD2B-5B6B-4BE0-9F04-02612ACBB9B3

**Holotype:** A preserved specimen at the United States National Museum (now National Museum of Natural History; Smithsonian Institution; Washington, DC), USA, Specimen number USNM 19356 collected at Gusiko, Morobe, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** Five preserved specimens at the United States National Museum (now National Museum of Natural History;

Smithsonian Institution; Washington, DC), USA, Specimen numbers USNM 119357, 119358, 119359, 119362 and 119363 collected at Gusiko, Morobe, Papua New Guinea.

**Diagnosis:** The species *Pointednasus clavoflavoviridis sp. nov.* from the vicinity of Guisko, Morobe, Papua New Guinea, the species *P. widerecta sp. nov.* from north west Papua New Guinea (west of the Sepik River) and nearby coastal Irian Jaya, the species *P. currearbor sp. nov.* from Irian Jaya south of the central cordillera and the species *P. flavorecta sp. nov.* from Misima Island, Milne Bay Province, Papua New Guinea would until now have been identified as (mainly) western populations of *P. longiceps* (Boulenger, 1895), type locality of Trobriand Islands, Papua New Guinea.

However both *P. widerecta sp. nov.* and *P. clavoflavoviridis sp. nov.* can be separated from *P. longiceps* by colouration. *P. widerecta sp. nov.* and *P. clavoflavoviridis sp. nov.* in adults has the dorsal colouration of the head being sooty with a pale yellowish green stripe continued on back as a

vertebral stripe flanked with olive brown, the olive brown stripes converging posteriorly and becoming reddish brown, anteriorly they are edged by a black line, below which is a bronze dorso-lateral band

with an olive area below fading into the pale, metallic gold belly; limbs are dappled with light brown and black; tail is orange bronze above and pale dull orange below. Lower parts and upper lip white, with greenish-golden gloss. By contrast *P. longiceps* is similar to the preceding, but with the beginning of the pale yellowish green stripe at the anterior end being indistinct and the tail is yellowish-gold.

*P. clavoflavoviridis sp. nov.* is separated from both *P. longiceps* and *P. widerecta sp. nov.* by having 22-24 midbody rows, versus 26 in the other two species.

The species *P. currearbor sp. nov.* from south of the main Cordillera in West Papua is similar in most respects to *P. widerecta sp. nov.* and *P. clavoflavoviridis sp. nov.* (see above) but differs from those two species in that the markings on the limbs are indistinct and the tail is very pale to whitish under the medial line. *P. currearbor sp. nov.* also has 24 midbody rows.

*Pointednasus flavorecta sp. nov.* is similar in most respects to *P. longiceps* and is separated from all other species (above) on the same basis. *P. flavorecta sp. nov.* is however separated from *P. longiceps* by the fact that the stripe commencing at the anterior end is yellowish in colour and not yellowish green, or if green is present, it is extremely faint.

The five species *Pointednasus widerecta sp. nov.*, *P. clavoflavoviridis sp. nov.*, *P. flavorecta sp. nov.*, *P. longiceps* and *P. currearbor sp. nov.* are further diagnosed as follows: Head two and a half times as long as broad; snout very long and pointed, depressed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more long than broad, forming a broad straight suture with the rostral; prefrontals in contact; frontal small, as long as the frontoparietals and interparietal together, acutely pointed behind, in contact with the two anterior supraoculars; four supraoculars, first large; seven supraciliaries; frontoparietals almost as large as the interparietal; parietals in contact; three pair of nuchals; five upper labials before the subocular. Scales smooth with 22-26 midbody rows, dorsals largest, laterals smallest; the distance between the tip of the snout and fore limb almost equals that between axilla and groin; preanals enlarged. Tail about as long as head and body. Limbs strong, the hind limb reaches the wrist; digits depressed at the base, compressed distally, third and fourth equal, fourth toe with about 19 smooth lamellae below.

**Distribution:** The species *D. clavoflavoviridis sp. nov.* is only known from the vicinity of Guisko, Morobe, Papua New Guinea. Species from between Morobe (the town) and the Sepik River previously assigned to *P. longiceps* are probably of this species.

**Etymology:** In Latin "*clavoflavoviridis*" means wide green line, in



reflection of the broad wide greenish line running down the middle of the back of the species.

**POINTEDNASUS (POINTEDNASUS) CURREARBOR SP. NOV.**  
**LSID urn:lsid:zoobank.org:act:FBB93D2C-6029-46CE-AAE9-5ACE0347FB85**

**Holotype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number 1913.11.1.55 collected from the Stekwa River, Irian Jaya, Indonesia.

This facility allows access to its holdings.

**Diagnosis:** The species *Pointednasus clavofflavoviridis sp. nov.* from the vicinity of Guisko, Morobe, Papua New Guinea, the species *P. widerecta sp. nov.* from north west Papua New Guinea (west of the Sepik River) and nearby coastal Irian Jaya, the species *P. currearbor sp. nov.* from Irian Jaya south of the central cordillera and the species *P. flavorecta sp. nov.* from Misima Island, Milne Bay Province, Papua New Guinea would until now have been identified as (mainly) western populations of *P. longiceps* (Boulenger, 1895), type locality of Trobriand Islands, Papua New Guinea.

However both *P. widerecta sp. nov.* and *P. clavofflavoviridis sp. nov.* can be separated from *P. longiceps* by colouration. *P. widerecta sp. nov.* and *P. clavofflavoviridis sp. nov.* in adults has the dorsal colouration of the head being sooty with a pale yellowish green stripe continued on back as a

vertebral stripe flanked with olive brown, the olive brown stripes converging posteriorly and becoming reddish brown, anteriorly they are edged by a black line, below which is a bronze dorso-lateral band

with an olive area below fading into the pale, metallic gold belly; limbs are dappled with light brown and black; tail is orange bronze above and pale dull orange below. Lower parts and upper lip white, with greenish-golden gloss. By contrast *P. longiceps* is similar to the preceding, but with the beginning of the pale yellowish green stripe at the anterior end being indistinct and the tail is yellowish-gold.

*P. clavofflavoviridis sp. nov.* is separated from both *P. longiceps* and *P. widerecta sp. nov.* by having 22-24 midbody rows, versus 26 in the other two species.

The species *P. currearbor sp. nov.* from south of the main Cordillera in West Papua is similar in most respects to *P. widerecta sp. nov.* and *P. clavofflavoviridis sp. nov.* (see above) but differs from those two species in that the markings on the limbs are indistinct and the tail is very pale to whitish under the medial line. *P. currearbor sp. nov.* also has 24 midbody rows.

*Pointednasus flavorecta sp. nov.* is similar in most respects to *P. longiceps* and is separated from all other species (above) on the same basis. *P. flavorecta sp. nov.* is however separated from *P. longiceps* by the fact that the stripe commencing at the anterior end is yellowish in colour and not yellowish green, or if green is present, it is extremely faint.

The five species *Pointednasus widerecta sp. nov.*, *P. clavofflavoviridis sp. nov.*, *P. flavorecta sp. nov.*, *P. longiceps* and *P. currearbor sp. nov.* are further diagnosed as follows: Head two and a half times as long as broad; snout very long and pointed, depressed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more long than broad, forming a broad straight suture with the rostral; prefrontals in contact; frontal small, as long as the frontoparietals and interparietal together, acutely pointed behind, in contact with the two anterior supraoculars; four supraoculars, first large; seven supraciliaries; frontoparietals almost as large as the interparietal; parietals in contact; three pair of nuchals; five upper labials before the subocular. Scales smooth with 22-26 midbody rows, dorsals largest, laterals smallest; the distance between the tip of the snout and fore limb almost equals that between axilla and groin; preanals enlarged. Tail about as long as head and body. Limbs strong, the hind limb reaches the wrist; digits depressed at the base, compressed distally, third and fourth equal, fourth

toe with about 19 smooth lamellae below.

**Distribution:** The species *P. currearbor sp. nov.* is only known from the type locality and nearby areas south of the central cordillera of New Guinea in Irian Jaya.

**Etymology:** In Latin "*currearbor*" means runs on tree, in reflection of the habit of this species when it is usually encountered.

**POINTEDNASUS (POINTEDNASUS) FLAVORECTA SP. NOV.**  
**LSID urn:lsid:zoobank.org:act:68112154-DC28-4460-8B94-3E49D3FFBEEE**

**Holotype:** A preserved specimen at the American Museum of Natural History, Manhattan, New York City, USA, specimen number AMNH 76827 collected from Misima Island, Milne Bay Province, Papua New Guinea. This facility allows access to its holdings.

**Diagnosis:** The species *Pointednasus clavofflavoviridis sp. nov.* from the vicinity of Guisko, Morobe, Papua New Guinea, the species *P. widerecta sp. nov.* from north west Papua New Guinea (west of the Sepik River) and nearby coastal Irian Jaya, the species *P. currearbor sp. nov.* from Irian Jaya south of the central cordillera and the species *P. flavorecta sp. nov.* from Misima Island, Milne Bay Province, Papua New Guinea would until now have been identified as (mainly) western populations of *P. longiceps* (Boulenger, 1895), type locality of Trobriand Islands, Papua New Guinea.

However both *P. widerecta sp. nov.* and *P. clavofflavoviridis sp. nov.* can be separated from *P. longiceps* by colouration. *P. widerecta sp. nov.* and *P. clavofflavoviridis sp. nov.* in adults has the dorsal colouration of the head being sooty with a pale yellowish green stripe continued on back as a

vertebral stripe flanked with olive brown, the olive brown stripes converging posteriorly and becoming reddish brown, anteriorly they are edged by a black line, below which is a bronze dorso-lateral band

with an olive area below fading into the pale, metallic gold belly; limbs are dappled with light brown and black; tail is orange bronze above and pale dull orange below. Lower parts and upper lip white, with greenish-golden gloss. By contrast *P. longiceps* is similar to the preceding, but with the beginning of the pale yellowish green stripe at the anterior end being indistinct and the tail is yellowish-gold.

*P. clavofflavoviridis sp. nov.* is separated from both *P. longiceps* and *P. widerecta sp. nov.* by having 22-24 midbody rows, versus 26 in the other two species.

The species *P. currearbor sp. nov.* from south of the main Cordillera in West Papua is similar in most respects to *P. widerecta sp. nov.* and *P. clavofflavoviridis sp. nov.* (see above) but differs from those two species in that the markings on the limbs are indistinct and the tail is very pale to whitish under the medial line. *P. currearbor sp. nov.* also has 24 midbody rows.

*Pointednasus flavorecta sp. nov.* is similar in most respects to *P. longiceps* and is separated from all other species (above) on the same basis. *P. flavorecta sp. nov.* is however separated from *P. longiceps* by the fact that the stripe commencing at the anterior end is yellowish in colour and not yellowish green, or if green is present, it is extremely faint.

The five species *Pointednasus widerecta sp. nov.*, *P. clavofflavoviridis sp. nov.*, *P. flavorecta sp. nov.*, *P. longiceps* and *P. currearbor sp. nov.* are further diagnosed as follows: Head two and a half times as long as broad; snout very long and pointed, depressed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules.

Nostril in the nasal; no supranasals; frontonasal more long than broad, forming a broad straight suture with the rostral; prefrontals in contact; frontal small, as long as the frontoparietals and interparietal together, acutely pointed behind, in contact with the two anterior supraoculars; four supraoculars, first large; seven supraciliaries; frontoparietals almost as large as the interparietal; parietals in contact; three pair of nuchals;

five upper labials before the subocular. Scales smooth with 22-26 midbody rows, dorsals largest, laterals smallest; the distance between the tip of the snout and fore limb almost equals that between axilla and groin; preanals enlarged. Tail about as long as head and body. Limbs strong, the hind limb reaches the wrist; digits depressed at the base, compressed distally, third and fourth equal, fourth toe with about 19 smooth lamellae below.

**Distribution:** Known only from the type locality of Misima Island, Milne Bay Province, Papua New Guinea.

**Etymology:** In Latin "*flavorecta*" means yellow line.

**POINTEDNASUS (VIRIDIHAEMA) FLAVOPALPEBRAE SP. NOV.**

**LSID urn:lsid:zoobank.org:act:D03781CF-786C-4A6F-856E-80C52397397C**

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA specimen number MCZ 48579 collected from Aitape, West Sepik Province, Papua New Guinea. This facility allows access to its holdings.

**Diagnosis:** This species has until now been treated by most authors as a population of *P. virens* (Peters, 1881), until now placed in the genus *Prasinochaema* Greer, 1974.

This taxon and all related species has been placed in a separate and new genus *Pointednasus gen. nov.* to better reflect the morphological and genetic origins of the group of species.

Within this genus, the species *P. virens* as presently recognized has been placed within the subgenus *Viridihaema subgen. nov.* This subgenus would be monotypic if the species *P. virens* as presently recognized were to continue to be treated as a single species. However, putative *P. virens* as recognized here is herein treated as a complex of species, some of which are named herein.

*P. virens* (Peters, 1881) is herein restricted to the nominate form from south-east Papua New Guinea from the Milne Bay province and nearby islands including the Trobriand Islands, and adjacent parts of the Northern Province.

*P. anolis* (Boulenger, 1883) is herein restricted to the Treasury Islands, in the Solomon Islands in the region south of the Shortland Islands.

The diagnosis for the subgenus *Viridihaema subgen. nov.* applies to all species until now treated as *P. virens* and the following diagnoses differences between the relevant species described herein.

*P. virens* (Peters, 1881) is diagnosed and separated from relevant similar species by having 30 midbody rows, three or four anterior supraoculars in contact with the frontal, frontoparietal

paired and 13 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces greenish brown above (not pinkish), scales sometimes etched with brown; head with four greyish spots: on the frontal, on the supraocular regions and on the interparietal and part of the parietals; digits banded with dark. Lower surfaces whitish; subdigital lamellae dark brown.

*P. ventriiridescens sp. nov.* from Morobe Province in Papua New Guinea is readily separated from relevant similar species by 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, an undivided frontoparietal and a colouration that is on the dorsal surface olive tinged with bronze; eyelids edged with yellow; lips green; neck and flanks flecked with light green; bronze brown especially strong on the posterior portion of body; legs olive mottled with green.

Below, the chin and throat are tinged with pale yellowish green; belly slightly iridescent greenish white, the lower flanks mottled with brown; legs and tail a dull yellowish green darker than the belly.

Alternatively, some specimens also have the parietal and temporal areas suffused with reddish brown; bodies bright olive green; chin and throat green; bellies bright yellow.

*P. flavopalpebrae sp. nov.* from west of the Sepik River in northern Papua New Guinea is similar in most respects to *P. ventriiridescens sp. nov.* (see above) including by having 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, and an undivided frontoparietal, but is separated from that species by having an obviously semi-divided frontoparietal.

At the time Boulenger formally described the species *P. anolis* Boulenger, 1883, he relied on two types (syntypes) for his species, being a specimen from the Treasury Islands in the Solomon Islands and another from Santa Anna Island in the Solomon Islands.

As each are herein regarded as being of separate species, as first reviser, I herein assign the Treasury Island animal as identified in Boulenger's original 1883 description and again in Boulenger (1887) as the Lectotype in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) to stabilize the identity of the relevant species.

*P. anolis* (Boulenger, 1883) is diagnosed and separated from relevant similar species by having 38 midbody rows, eight or nine upper labials, sixth or seventh entering the orbit. 16-18 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces uniform pale olive, with a pinkish tinge or pinkish brown, the head being darker and more olive; limbs pinkish; lower surfaces white.

*P. makiraensis sp. nov.* from San Cristobal and offshore islets in the Solomon Islands is similar in most respects to *P. anolis* (see above) but is separated from *P. anolis* by having 7, 8 or 9 upper labials, 36-38 midbody scale rows, dark etching on the scales of the crown and a blue tinge present on the lower flanks.

*P. extentadigitus sp. nov.* from from Guadalacol, Solomon Islands is similar in most respects to *P. anolis* and *P. makiraensis sp. nov.* (see above) and *P. labiamarmorata sp. nov.* (see below) but separated from all three by having 33 midbody scale rows and 14-18 lamellae on the expanded part of the fourth toe, well-defined dark edges on the scales of the dorsum and dark etching on the scales of the crown.

*P. labiamarmorata sp. nov.* from the New Georgia group of islands is similar to all of *P. extentadigitus sp. nov.*, *P. anolis* and *P. makiraensis sp. nov.* but separated from all three by having 34-38 midbody scale rows, small white spots on the sides of the neck as well as distinctive white spots in a row on each side of the base of the tail and an obvious whitish marbling on the labials.

The subgenus *Viridihaema subgen. nov.* is separated from the nominate subgenus *Pointednasus subgen. nov.* by having five supraoculars; ear-opening is small; 30-38 mid-body scale rows. The nominate subgenus *Pointednasus subgen. nov.* is readily separated from the other subgenus *Viridihaema subgen. nov.* by having the following unique suite of characters: Four supraoculars; ear opening is large; 22-26 mid-body scale rows; 19 lamellae under the fourth toe; rectilinear black dorsolateral lines converge at the tail base and the tail is golden yellow.

The genus *Pointednasus gen. nov.* is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite:

Limbs pentadactyle; frontonasal as long as broad or more long than broad; digits somewhat dilated.

**Distribution:** *P. flavopalpebrae sp. nov.* is known only from the vicinity of the type locality at Aitape, West Sepik Province, Papua New Guinea.

**Etymology:** "*flavopalpebrae*" in Latin means yellow eyelid in reflection of a colour trait of the species.

**POINTEDNASUS (VIRIDIHAEMA) VENTRIIRIDESCENS SP. NOV.**

**LSID urn:lsid:zoobank.org:act:5417710F-CEC8-4DF2-9413-CAFCC9230E8C**

**Holotype:** A preserved specimen at the United States National Museum (now National Museum of Natural History);

Smithsonian Institution, Washington, DC, USA specimen number 119335 collected at Gusiko, Morobe Province, Papua New Guinea. This facility allows access to its holdings.

**Paratypes:** 19 preserved specimens at the United States National Museum (now National Museum of Natural History); Smithsonian Institution; Washington, DC, USA specimen numbers 119336-54 collected at Gusiko, Morobe Province, Papua New Guinea.

**Diagnosis:** This species has until now been treated by most authors as a population of *P. virens* (Peters, 1881), until now placed in the genus *Prasinohaema* Greer, 1974.

This taxon and all related species has been placed in a separate and new genus *Pointednasus* gen. nov. to better reflect the morphological and genetic origins of the group of species.

Within this genus, the species *P. virens* as presently recognized has been placed within the subgenus *Viridihaema* subgen. nov. This subgenus would be monotypic if the species *P. virens* as presently recognized were to continue to be treated as a single species. However, putative *P. virens* as recognized here is herein treated as a complex of species, some of which are named herein.

*P. virens* (Peters, 1881) is herein restricted to the nominate form from south-east Papua New Guinea from the Milne Bay province and nearby islands including the Trobriand Islands, and adjacent parts of the Northern Province.

*P. anolis* (Boulenger, 1883) is herein restricted to the Treasury Islands, in the Solomon Islands in the region south of the Shortland Islands.

The diagnosis for the subgenus *Viridihaema* subgen. nov. applies to all species until now treated as *P. virens* and the following diagnoses differences between the relevant species described herein.

*P. virens* (Peters, 1881) is diagnosed and separated from relevant similar species by having 30 midbody rows, three or four anterior supraoculars in contact with the frontal, frontoparietal

paired and 13 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces greenish brown above (not pinkish), scales sometimes etched with brown; head with four greyish spots: on the frontal, on the supraocular regions and on the interparietal and part of the parietals; digits banded with dark. Lower surfaces whitish; subdigital lamellae dark brown.

*P. ventriiridescens* sp. nov. from Morobe Province in Papua New Guinea is readily separated from relevant similar species by 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, an undivided frontoparietal and a colouration that is on the dorsal surface olive tinged with bronze; eyelids edged with yellow; lips green; neck and flanks flecked with light green; bronze brown especially strong on the posterior portion of body; legs olive mottled with green. Below, the chin and throat are tinged with pale yellowish green; belly slightly iridescent greenish white, the lower flanks mottled with brown; legs and tail a dull yellowish green darker than the belly. Alternatively, some specimens also have the parietal and temporal areas suffused with reddish brown; bodies bright olive green; chin and throat green; bellies bright yellow.

*P. flavopalpebrae* sp. nov. from west of the Sepik River in northern Papua New Guinea is similar in most respects to *P. ventriiridescens* sp. nov. (see above) including by having 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, and an undivided frontoparietal, but is separated from that species by having an obviously semi-divided frontoparietal.

At the time Boulenger formally described the species *P. anolis* Boulenger, 1883, he relied on two types (syntypes) for his species, being a specimen from the Treasury Islands in the Solomon Islands and another from Santa Anna Island in the Solomon Islands.

As each are herein regarded as being of separate species, I as first reviser, herein assign the Treasury Island animal as

identified in Boulenger's original 1883 description and again in Boulenger (1887) as the Lectotype in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), to stabilize the taxonomy and nomenclature of the relevant species.

*P. anolis* (Boulenger, 1883) is diagnosed and separated from relevant similar species by having 38 midbody rows, eight or nine upper labials, sixth or seventh entering the orbit. 16-18 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces uniform pale olive, with a pinkish tinge or pinkish brown, the head being darker and more olive; limbs pinkish; lower surfaces white.

*P. makiraensis* sp. nov. from San Cristobal and offshore islets in the Solomon Islands is similar in most respects to *P. anolis* (see above) but is separated from *P. anolis* by having 7, 8 or 9 upper labials, 36-38 midbody scale rows, dark etching on the scales of the crown and a blue tinge present on the lower flanks.

*P. extentadigitus* sp. nov. from from Guadanacol, Solomon Islands is similar in most respects to *P. anolis* and *P. makiraensis* sp. nov. (see above) and *P. labiamarmorata* sp. nov. (see below) but separated from all three by having 33 midbody scale rows and 14-18 lamellae on the expanded part of the fourth toe, well-defined dark edges on the scales of the dorsum and dark etching on the scales of the crown.

*P. labiamarmorata* sp. nov. from the New Georgia group of islands is similar to all of *P. extentadigitus* sp. nov., *P. anolis* and *P. makiraensis* sp. nov. but separated from all three by having 34-38 midbody scale rows, small white spots on the sides of the neck as well as distinctive white spots in a row on each side of the base of the tail and an obvious whitish marbling on the labials.

The subgenus *Viridihaema* subgen. nov. is separated from the nominate subgenus *Pointednasus* subgen. nov. by having five supraoculars; ear-opening is small; 30-38 mid-body scale rows.

The nominate subgenus *Pointednasus* subgen. nov. is readily separated from the other subgenus *Viridihaema* subgen. nov. by having the following unique suite of characters: Four supraoculars; ear opening is large; 22-26 mid-body scale rows; 19 lamellae under the fourth toe; rectilinear black dorsolateral lines converge at the tail base and the tail is golden yellow.

The genus *Pointednasus* gen. nov. is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal as long as broad or more long than broad; digits somewhat dilated.

**Distribution:** *P. ventriiridescens* sp. nov. is known only from the vicinity of the type locality at Gusiko, Morobe Province, Papua New Guinea.

**Etymology:** "ventriiridescens" in Latin means iridescent belly.

**POINTEDNASUS (VIRIDIHAEMA) MAKIRAENSIS SP. NOV.**

**LSID urn:lsid:zoobank.org:act:FF43E9D8-0674-4589-9C66-9C4BDF4341A3**

**Holotype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number 1961.1945 collected at Bulimaterava, San Cristobal, Solomon Islands. This facility allows access to its holdings.

**Paratypes:** 1/ A preserved specimen at the Museum of Natural History, London, UK, specimen number 1973.283, collected at 7 miles South of Wainoni, San Cristobal, Solomon Islands.

2/ A preserved specimen at the Museum of Natural History, London, UK, specimen number 1946.8.17.52 collected at Santa Anna Island, Solomon Islands.

**Diagnosis:** This species has until now been treated by most authors as a population of *P. virens* (Peters, 1881), until now placed in the genus *Prasinohaema* Greer, 1974.

This taxon and all related species has been placed in a separate and new genus *Pointednasus* gen. nov. to better reflect the morphological and genetic origins of the group of species.

Within this genus, the species *P. virens* as presently recognized has been placed within the subgenus *Viridihaema subgen. nov.* This subgenus would be monotypic if the species *P. virens* as presently recognized were to continue to be treated as a single species. However, putative *P. virens* as recognized here is herein treated as a complex of species, some of which are named herein.

*P. virens* (Peters, 1881) is herein restricted to the nominate form from south-east Papua New Guinea from the Milne Bay province and nearby islands including the Trobriand Islands, and adjacent parts of the Northern Province.

*P. anolis* (Boulenger, 1883) is herein restricted to the Treasury Islands, in the Solomon Islands in the region south of the Shortland Islands.

The diagnosis for the subgenus *Viridihaema subgen. nov.* applies to all species until now treated as *P. virens* and the following diagnoses differences between the relevant species described herein.

*P. virens* (Peters, 1881) is diagnosed and separated from relevant similar species by having 30 midbody rows, three or four anterior supraoculars in contact with the frontal, frontoparietal

paired and 13 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces greenish brown above (not pinkish), scales sometimes etched with brown; head with four greyish spots: on the frontal, on the supraocular regions and on the interparietal and part of the parietals; digits banded with dark. Lower surfaces whitish; subdigital lamellae dark brown.

*P. ventriiidescens sp. nov.* from Morobe Province in Papua New Guinea is readily separated from relevant similar species by 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, an undivided frontoparietal and a colouration that is on the dorsal surface olive tinged with bronze; eyelids edged with yellow; lips green; neck and flanks flecked with light green; bronze brown especially strong on the posterior portion of body; legs olive mottled with green. Below, the chin and throat are tinged with pale yellowish green; belly slightly iridescent greenish white, the lower flanks mottled with brown; legs and tail a dull yellowish green darker than the belly. Alternatively, some specimens also have the parietal and temporal areas suffused with reddish brown; bodies bright olive green; chin and throat green; bellies bright yellow.

*P. flavopalpebrae sp. nov.* from west of the Sepik River in northern Papua New Guinea is similar in most respects to *P. ventriiidescens sp. nov.* (see above) including by having 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, and an undivided frontoparietal, but is separated from that species by having an obviously semi-divided frontoparietal.

At the time Boulenger formally described the species *P. anolis* Boulenger, 1883, he relied on two types (syntypes) for his species, being a specimen from the Treasury Islands in the Solomon Islands and another from Santa Anna Island in the Solomon Islands.

As each are herein regarded as being of separate species, I as first reviser herein assign the Treasury Island animal as identified in Boulenger's original 1883 description and again in Boulenger (1887) as the Lectotype in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999), to stabilize the taxonomy and nomenclature of the relevant species.

*P. anolis* (Boulenger, 1883) is diagnosed and separated from relevant similar species by having 38 midbody rows, eight or nine upper labials, sixth or seventh entering the orbit. 16-18 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces uniform pale olive, with a pinkish tinge or pinkish brown, the head being darker and more olive; limbs pinkish; lower surfaces white.

*P. makiraensis sp. nov.* from San Cristobal and offshore islets in the Solomon Islands is similar in most respects to *P. anolis* (see

above) but is separated from *P. anolis* by having 7, 8 or 9 upper labials, 36-38 midbody scale rows, dark etching on the scales of the crown and a blue tinge present on the lower flanks.

*P. extentadigitus sp. nov.* from from Guadalcanal, Solomon Islands is similar in most respects to *P. anolis* and *P. makiraensis sp. nov.* (see above) and *P. labiamarmorata sp. nov.* (see below) but separated from all three by having 33 midbody scale rows and 14-18 lamellae on the expanded part of the fourth toe, well-defined dark edges on the scales of the dorsum and dark etching on the scales of the crown.

*P. labiamarmorata sp. nov.* from the New Georgia group of islands is similar to all of *P. extentadigitus sp. nov.*, *P. anolis* and *P. makiraensis sp. nov.* but separated from all three by having 34-38 midbody scale rows, small white spots on the sides of the neck as well as distinctive white spots in a row on each side of the base of the tail and an obvious whitish marbling on the labials.

The subgenus *Viridihaema subgen. nov.* is separated from the nominate subgenus *Pointednasus subgen. nov.* by having five supraoculars; ear-opening is small; 30-38 mid-body scale rows.

The nominate subgenus *Pointednasus subgen. nov.* is readily separated from the other subgenus *Viridihaema subgen. nov.* by having the following unique suite of characters: Four supraoculars; ear opening is large; 22-26 mid-body scale rows; 19 lamellae under the fourth toe; rectilinear black dorsolateral lines converge at the tail base and the tail is golden yellow.

The genus *Pointednasus gen. nov.* is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal as long as broad or more long than broad; digits somewhat dilated.

**Distribution:** *P. makiraensis sp. nov.* is known only from the vicinity of San Cristobal Island and adjacent islets in the Solomon Islands.

**Etymology:** Named in reflection of from where the species occurs in the Solomon Islands.

**POINTEDNASUS (VIRIDIHAEMA) EXTENTADIGITUS SP. NOV.**  
**LSID urn:lsid:zoobank.org:act:1FCBC960-7488-42C4-BA8D-37C4726480FB**

**Holotype:** A preserved specimen at the Brigham Young University Museum, Provo, Utah, USA, Natural History Collection (reptiles) specimen number: BYU 7268 collected from Guadalcanal, Solomon Islands. This facility allows access to its holdings.

**Paratypes:** 1/ Five preserved specimens at the Brigham Young University Museum, Provo, Utah, USA, Natural History Collection (reptiles) specimen numbers BYU 6964, 7075, 7252, 7264 and 7765 collected from Guadalcanal, Solomon Islands.

2/ A preserved specimen at the Museum of Natural History, London, UK, specimen number 1961.1947 collected at Gonapau, Guadalcanal, Solomon Islands. Solomon Islands. This facility allows access to its holdings.

3/ A preserved specimen at the Museum of Natural History, London, UK, specimen number 1973.295-296 collected at Mount Gallego, Guadalcanal, Solomon Islands.

4/ A preserved specimen at the Museum of Natural History, London, UK, specimen number 1961.1946 collected at Rua Vatu, Guadalcanal, Solomon Islands.

**Diagnosis:** This species has until now been treated by most authors as a population of *P. virens* (Peters, 1881), until now placed in the genus *Prasinohaema* Greer, 1974.

This taxon and all related species has been placed in a separate and new genus *Pointednasus gen. nov.* to better reflect the morphological and genetic origins of the group of species.

Within this genus, the species *P. virens* as presently recognized has been placed within the subgenus *Viridihaema subgen. nov.* This subgenus would be monotypic if the species *P. virens* as presently recognized were to continue to be treated as a single

species. However, putative *P. virens* as recognized here is herein treated as a complex of species, some of which are named herein.

*P. virens* (Peters, 1881) is herein restricted to the nominate form from south-east Papua New Guinea from the Milne Bay province and nearby islands including the Trobriand Islands, and adjacent parts of the Northern Province.

*P. anolis* (Boulenger, 1883) is herein restricted to the Treasury Islands, in the Solomon Islands in the region south of the Shortland Islands.

The diagnosis for the subgenus *Viridihaema subgen. nov.* applies to all species until now treated as *P. virens* and the following diagnoses differences between the relevant species described herein.

*P. virens* (Peters, 1881) is diagnosed and separated from relevant similar species by having 30 midbody rows, three or four anterior supraoculars in contact with the frontal, frontoparietal

paired and 13 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces greenish brown above (not pinkish), scales sometimes etched with brown; head with four greyish spots: on the frontal, on the supraocular regions and on the interparietal and part of the parietals; digits banded with dark. Lower surfaces whitish; subdigital lamellae dark brown.

*P. ventriiridescens sp. nov.* from Morobe Province in Papua New Guinea is readily separated from relevant similar species by 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, an undivided frontoparietal and a colouration that is on the dorsal surface olive tinged with bronze; eyelids edged with yellow; lips green; neck and flanks flecked with light green; bronze brown especially strong on the posterior portion of body; legs olive mottled with green. Below, the chin and throat are tinged with pale yellowish green; belly slightly iridescent greenish white, the lower flanks mottled with brown; legs and tail a dull yellowish green darker than the belly. Alternatively, some specimens also have the parietal and temporal areas suffused with reddish brown; bodies bright olive green; chin and throat green; bellies bright yellow.

*P. flavopalpebrae sp. nov.* from west of the Sepik River in northern Papua New Guinea is similar in most respects to *P. ventriiridescens sp. nov.* (see above) including by having 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, and an undivided frontoparietal, but is separated from that species by having an obviously semi-divided frontoparietal.

At the time Boulenger formally described the species *P. anolis* Boulenger, 1883, he relied on two types (syntypes) for his species, being a specimen from the Treasury Islands in the Solomon Islands and another from Santa Anna Island in the Solomon Islands.

As each are herein regarded as being of separate species, I, as first reviser, herein assign the Treasury Island animal as identified in Boulenger's original 1883 description and again in Boulenger (1887) as the Lectotype in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride et al. 1999), to stabilize the taxonomy and nomenclature of the relevant species.

*P. anolis* (Boulenger, 1883) is diagnosed and separated from relevant similar species by having 38 midbody rows, eight or nine upper labials, sixth or seventh entering the orbit. 16-18 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces uniform pale olive, with a pinkish tinge or pinkish brown, the head being darker and more olive; limbs pinkish; lower surfaces white.

*P. makiraensis sp. nov.* from San Cristobal and offshore islets in the Solomon Islands is similar in most respects to *P. anolis* (see above) but is separated from *P. anolis* by having 7, 8 or 9 upper labials, 36-38 midbody scale rows, dark etching on the scales of the crown and a blue tinge present on the lower flanks.

*P. extentadigitus sp. nov.* from from Guadanacol, Solomon

Islands is similar in most respects to *P. anolis* and *P. makiraensis sp. nov.* (see above) and *P. labiamarmorata sp. nov.* (see below) but separated from all three by having 33 midbody scale rows and 14-18 lamellae on the expanded part of the fourth toe, well-defined dark edges on the scales of the dorsum and dark etching on the scales of the crown.

*P. labiamarmorata sp. nov.* from the New Georgia group of islands is similar to all of *P. extentadigitus sp. nov.*, *P. anolis* and *P. makiraensis sp. nov.* but separated from all three by having 34-38 midbody scale rows, small white spots on the sides of the neck as well as distinctive white spots in a row on each side of the base of the tail and an obvious whitish marbling on the labials.

The subgenus *Viridihaema subgen. nov.* is separated from the nominate subgenus *Pointednasus subgen. nov.* by having five supraoculars; ear-opening is small; 30-38 mid-body scale rows. The nominate subgenus *Pointednasus subgen. nov.* is readily separated from the other subgenus *Viridihaema subgen. nov.* by having the following unique suite of characters: Four supraoculars; ear opening is large; 22-26 mid-body scale rows; 19 lamellae under the fourth toe; rectilinear black dorsolateral lines converge at the tail base and the tail is golden yellow.

The genus *Pointednasus gen. nov.* is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal as long as broad or more long than broad; digits somewhat dilated.

**Distribution:** *P. extentadigitus sp. nov.* is known only from Guadanacol Island in the Solomon Islands.

**Etymology:** "*extentadigitus*" in Latin means elongated fingers.

**POINTEDNASUS (VIRIDIHAEMA) LABIAMARMORATA SP. NOV.**

**LSID urn:lsid:zoobank.org:act:7C34B794-2C1B-4190-BDC9-27733F0E5897**

**Holotype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number

1973.294 collected at Kolombangara Base Camp, New Georgia Group, Solomon Islands. This facility allows access to its holdings.

**Paratype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number

1973.297 collected at Kolombangara Base Camp, New Georgia Group, Solomon Islands.

**Diagnosis:** This species has until now been treated by most authors as a population of *P. virens* (Peters, 1881), until now placed in the genus *Prasinohaema* Greer, 1974.

This taxon and all related species has been placed in a separate and new genus *Pointednasus gen. nov.* to better reflect the morphological and genetic origins of the group of species. Within this genus, the species *P. virens* as presently recognized has been placed within the subgenus *Viridihaema subgen. nov.*. This subgenus would be monotypic if the species *P. virens* as presently recognized were to continue to be treated as a single species. However, putative *P. virens* as recognized here is herein treated as a complex of species, some of which are named herein.

*P. virens* (Peters, 1881) is herein restricted to the nominate form from south-east Papua New Guinea from the Milne Bay province and nearby islands including the Trobriand Islands, and adjacent parts of the Northern Province.

*P. anolis* (Boulenger, 1883) is herein restricted to the Treasury Islands, in the Solomon Islands in the region south of the Shortland Islands.

The diagnosis for the subgenus *Viridihaema subgen. nov.* applies to all species until now treated as *P. virens* and the following diagnoses differences between the relevant species described herein.

*P. virens* (Peters, 1881) is diagnosed and separated from

relevant similar species by having 30 midbody rows, three or four anterior supraoculars in contact with the frontal, frontoparietal

paired and 13 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces greenish brown above (not pinkish), scales sometimes etched with brown; head with four greyish spots: on the frontal, on the supraocular regions and on the interparietal and part of the parietals; digits banded with dark. Lower surfaces whitish; subdigital lamellae dark brown.

*P. ventriiridescens* sp. nov. from Morobe Province in Papua New Guinea is readily separated from relevant similar species by 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, an undivided frontoparietal and a colouration that is on the dorsal surface olive tinged with bronze; eyelids edged with yellow; lips green; neck and flanks flecked with light green; bronze brown especially strong on the posterior portion of body; legs olive mottled with green. Below, the chin and throat are tinged with pale yellowish green; belly slightly iridescent greenish white, the lower flanks mottled with brown; legs and tail a dull yellowish green darker than the belly. Alternatively, some specimens also have the parietal and temporal areas suffused with reddish brown; bodies bright olive green; chin and throat green; bellies bright yellow.

*P. flavopalpebrae* sp. nov. from west of the Sepik River in northern Papua New Guinea is similar in most respects to *P. ventriiridescens* sp. nov. (see above) including by having 32-34 midbody rows, 14-15 lamellae under the dilated part of the fourth toe, and an undivided frontoparietal, but is separated from that species by having an obviously semi-divided frontoparietal.

At the time Boulenger formally described the species *P. anolis* Boulenger, 1883, he relied on two types (syntypes) for his species, being a specimen from the Treasury Islands in the Solomon Islands and another from Santa Anna Island in the Solomon Islands.

As each are herein regarded as being of separate species, I, as first reviser, herein assign the Treasury Island animal as identified in Boulenger's original 1883 description and again in Boulenger (1887) as the Lectotype in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride et al. 1999), to stabilize the taxonomy and nomenclature of the relevant species.

*P. anolis* (Boulenger, 1883) is diagnosed and separated from relevant similar species by having 38 midbody rows, eight or nine upper labials, sixth or seventh entering the orbit. 16-18 lamellae under the dilated part of the fourth toe and a colouration with upper surfaces uniform pale olive, with a pinkish tinge or pinkish brown, the head being darker and more olive; limbs pinkish; lower surfaces white.

*P. makiraensis* sp. nov. from San Cristobal and offshore islets in the Solomon Islands is similar in most respects to *P. anolis* (see above) but is separated from *P. anolis* by having 7, 8 or 9 upper labials, 36-38 midbody scale rows, dark etching on the scales of the crown and a blue tinge present on the lower flanks.

*P. extentadigitus* sp. nov. from from Guadanacol, Solomon Islands is similar in most respects to *P. anolis* and *P. makiraensis* sp. nov. (see above) and *P. labiamarmorata* sp. nov. (see below) but separated from all three by having 33 midbody scale rows and 14-18 lamellae on the expanded part of the fourth toe, well-defined dark edges on the scales of the dorsum and dark etching on the scales of the crown.

*P. labiamarmorata* sp. nov. from the New Georgia group of islands is similar to all of *P. extentadigitus* sp. nov., *P. anolis* and *P. makiraensis* sp. nov. but separated from all three by having 34-38 midbody scale rows, small white spots on the sides of the neck as well as distinctive white spots in a row on each side of the base of the tail and an obvious whitish marbling on the labials.

The subgenus *Viridihaema* subgen. nov. is separated from the nominate subgenus *Pointednasus* subgen. nov. by having five

supraoculars; ear-opening is small; 30-38 mid-body scale rows. The nominate subgenus *Pointednasus* subgen. nov. is readily separated from the other subgenus *Viridihaema* subgen. nov. by having the following unique suite of characters: Four supraoculars; ear opening is large; 22-26 mid-body scale rows; 19 lamellae under the fourth toe; rectilinear black dorsolateral lines converge at the tail base and the tail is golden yellow.

The genus *Pointednasus* gen. nov. is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal as long as broad or more long than broad; digits somewhat dilated.

**Distribution:** *P. labiamarmorata* sp. nov. is known only from the New Georgia group of islands in the Solomon Islands.

**Etymology:** "*labiamarmorata*" in Latin means marbled lips.

**VARIUSSCINCUS (MACROTYPANOSCINCUS)  
LITORESAURUS SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:F2C9A325-EDE2-4796-9CA8-50C8318FD01C

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ R-1 76760 from Pulo Ulan, Little Nicobar, India, Latitude 07.03 N., Longitude 93.35 E. This facility allows access to its holdings.

**Diagnosis:** Until now the species *V. litoresaurus* sp. nov. from the Nicobar Islands has been treated as a southern population of *V. macrotympanum* (Stoliczka, 1873) from the Andaman Islands, currently known as *Lipinia macrotympanum* (Stoliczka, 1873).

The holotype specimen of this species at MCZ and a second specimen of this species was described in detail by Das (1997) as was the original type specimen of *Mocooa macrotympanum* Stoliczka, 1873 in the same paper and therefore does not need to be substantively repeated here, especially as the paper of Das (1997) is freely available online.

*V. litoresaurus* sp. nov. would identify as *V. macrotympanum*, but is readily separated from that species by having 16-17 lamellae under the fourth toe, versus 15 in *V. macrotympanum*, 21-22 midbody scale rows, versus 22 in *V. macrotympanum* and an unpatterned cream belly, versus flesh coloured, tinged with orange in *V. macrotympanum*.

The two species are found on islands separated by a wide deep sea channel that remained submerged during recent glacial maxima and so it is self-evident that the two morphologically divergent populations must be separate, albeit sister, species, which as a pair comprise the entirety of their subgenus.

The two species in the subgenus *Macrotympanoscincus* subgen. nov. are defined as follows:

21-22 midbody scale rows; seven supralabials, fifth upper labial under the orbit. Ear-opening very large, rounded, with a perfectly smooth edge all round.; colouration as follows: Head above brown, paler on the snout; three longitudinal white bands along the body, separated by two somewhat broader brown bands; the median dorsal white band becomes obsolete at the root of the tail; labials and sides of head brownish, spotted with white; limbs above with very close longitudinal brown lines, digits powdered with pure white; lower portion of the sides and lower surfaces are a livid flesh colour, tinged with bright orange on the lower belly and on the tail, which is a bright reddish colour.

Body moderately slender. Snout rather attenuated and prolonged. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal in contact with the rostral, posteriorly just touching the frontal; four supraoculars frontoparietal single; interparietal distinct; parietals forming a suture behind the interparietal; four pairs of nuchals; dorsals slightly larger than laterals. A pair of moderately enlarged praeanales.

Limbs proportionately developed, with the toes very slender.

**Distribution:** Known only from the type locality of Pulo Ulan, Little Nicobar, India.

**Etymology:** In Latin "*litorosaurus*" means "beach lizard" in reflection of where the holotype was found active.

**CRUDUSHAEMA ALLENGREERI SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:4BB2384E-5DE5-4A9A-928F-388F17599C5B

**Holotype:** A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ 48580 collected from Aitape, Papua New Guinea. This facility allows access to its holdings.

**Diagnosis:** Until now, both *Crudushaema allengreeri* sp. nov. from north-west Papua west of the Sepik River, in the vicinity of the Prince Alexander Mountains and *Crudushaema haroldcoggeri* sp. nov. from the Stekwa River region in south-west Irian Jaya, Indonesia, south of the central cordillera have been treated as western populations of *Crudushaema semoni* (Oudemans, 1894), originally described as "*Lygosoma semoni* Oudemans, 1894" and most recently placed in the genus *Prasinochaema* Greer, 1974.

All three species form the entirety of the genus *Crudushaema* gen. nov.

*Crudushaema allengreeri* sp. nov. and *C. haroldcoggeri* sp. nov. are readily separated from *C. semoni* by the presence of 28 midbody rows, versus 26 in *C. semoni*.

*Crudushaema allengreeri* sp. nov. is separated from both *C. haroldcoggeri* sp. nov. and *C. semoni* by the fifth and sixth upper labials below the eye, versus sixth and seventh in the other two species.

*Crudushaema allengreeri* sp. nov. is further separated from the other two species by the fact that toes of the addressed hind limb just meet the finger tips (not wrist); and there are nine (not 7 or 8) dark transverse bands on the nape and back.

*C. haroldcoggeri* sp. nov. is separated from both *C. allengreeri* sp. nov. and *C. semoni* by having 7 dark transverse bands on the nape and back versus 8 or 9 in the other two species.

The genus *Crudushaema* gen. nov. is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal more broad than long; two frontoparietals; scales smooth with 26 midbody scale rows.

In more detail the genus is diagnosed as follows: Snout short; lower eyelid with a transparent disk; ear opening is very small, smaller than the palpebral disk, no lobules. Nostril in the nasal; no supranasals; frontonasal a little more broad than long, broadly in contact with the rostral and with the frontal, latter almost as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first longest; seven supraciliaries, first largest; frontoparietals nearly twice as large as the interparietal, behind which the parietals are in contact; two or three pair of nuchals; fifth and sixth or sixth and seventh upper labials below the eye. Scales smooth with 26-28 midbody scale rows, dorsals largest; the distance between the tip of the snout and the fore limb is contained nearly one time and a half in that between axilla and groin; preanals enlarged. Tail one and one third times the length of head and body. Limbs strong, the hind limb reaches the wrist; digits slender, compressed; fourth toe with 21 lamellae below.

Colouration is light brown above with broad dark transverse bands, the first between the eye and the ear, seven, eight or nine on the nape and back, the posterior alternating on both sides; tail with 14 dark bands; limbs and digits banded with dark brown; flanks with short longitudinal blackish lines. Lower parts white (adapted and modified from De Rooij 1915).

**Distribution:** Known only from the type locality Aitape, Papua New Guinea.

**Etymology:** Named in honour of Allen E. Greer for services to

herpetology and nomenclature spanning some decades, including in his role as reptile curator at the Australian Museum in Sydney, NSW, Australia. He now (as of 2019) lives at Mudgee in New South Wales, Australia.

**CRUDUSHAEMA HAROLDCOGGERI SP. NOV.**

**LSID** urn:lsid:zoobank.org:act:4F2B5491-591D-43A6-8B38-B9758D2F5C7A

**Holotype:** A preserved specimen at the Museum of Natural History, London, UK, specimen number BMNH 1913.11.1.56 collected from Stekwa River Irian Jaya, Indonesia. This facility allows access to its holdings.

**Diagnosis:** Until now, both *Crudushaema haroldcoggeri* sp. nov. from the Stekwa River region in south-west Irian Jaya, Indonesia, south of the central cordillera and *Crudushaema allengreeri* sp. nov. from north-west Papua west of the Sepik River, in the vicinity of the Prince Alexander Mountains, have been treated as western populations of *Crudushaema semoni* (Oudemans, 1894), originally described as "*Lygosoma semoni* Oudemans, 1894" and most recently placed in the genus *Prasinochaema* Greer, 1974.

All three species form the entirety of the genus *Crudushaema* gen. nov.

*Crudushaema allengreeri* sp. nov. and *C. haroldcoggeri* sp. nov. are readily separated from *C. semoni* by the presence of 28 midbody rows, versus 26 in *C. semoni*.

*Crudushaema allengreeri* sp. nov. is separated from both *C. haroldcoggeri* sp. nov. and *C. semoni* by the fifth and sixth upper labials below the eye, versus sixth and seventh in the other two species.

*Crudushaema allengreeri* sp. nov. is further separated from the other two species by the fact that toes of the addressed hind limb just meet the finger tips (not wrist); and there are nine (not 7 or 8) dark transverse bands on the nape and back.

*C. haroldcoggeri* sp. nov. is separated from both *C. allengreeri* sp. nov. and *C. semoni* by having 7 dark transverse bands on the nape and back versus 8 or 9 in the other two species.

The genus *Crudushaema* gen. nov. is readily separated from all other similar species and genera in New Guinea, including within *Lipinia* Gray, 1845 *sensu lato* by the following unique character suite: Limbs pentadactyle; frontonasal more broad than long; two frontoparietals; scales smooth with 26 midbody scale rows.

In more detail the genus is diagnosed as follows: Snout short; lower eyelid with a transparent disk; ear opening is very small, smaller than the palpebral disk, no lobules. Nostril in the nasal; no supranasals; frontonasal a little more broad than long, broadly in contact with the rostral and with the frontal, latter almost as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first longest; seven supraciliaries, first largest; frontoparietals nearly twice as large as the interparietal, behind which the parietals are in contact; two or three pair of nuchals; fifth and sixth or sixth and seventh upper labials below the eye. Scales smooth with 26-28 midbody scale rows, dorsals largest; the distance between the tip of the snout and the fore limb is contained nearly one time and a half in that between axilla and groin; preanals enlarged. Tail one time and one third the length of head and body.

Limbs strong, the hind limb reaches the wrist; digits slender, compressed, fourth toe with 21 lamellae below.

The colouration is light brown above with broad dark transverse bands, the first between the eye and the ear, seven, eight or nine on the nape and back, the posterior alternating on both sides; tail with 14 dark bands; limbs and digits banded with dark brown; flanks with short longitudinal blackish lines. Lower parts white (adapted and modified from De Rooij 1915).

**Distribution:** Known only from the type locality Stekwa River, Irian Jaya.

**Etymology:** Named in honour of Harold G. Cogger for services to herpetology and nomenclature spanning some decades,

including in his role as herpetology curator at the Australian Museum in Sydney, NSW, Australia. He now (as of 2019) lives at Pearl Beach in New South Wales, Australia.

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## A new subspecies of Mountain Dragon, *Rankinia hoserae* Hoser, 2015 from the Brindabella Ranges of south-east Australia.

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### ABSTRACT

A geographically isolated population of the *Rankinia diemensis* (Gray, 1841) species group, most similar to the Victorian taxon *R. hoserae* Hoser 2015 from the Brindabella Ranges on the New South Wales / Australian Capital Territory border is formally named as a subspecies.

**Keywords:** Taxonomy; nomenclature; Lizards; Agamids; Mountain Dragons; Australia; New South Wales, ACT, *Rankinia*; *diemensis*; *hoserae*; *boylani*; *neildaviei*; *jameswhybrowi*; *fergussonae*; new subspecies; *martinekae*.

### INTRODUCTION

The genus *Rankinia* was created by Wells and Wellington (1984), type species being *Grammatophora muricata diemensis* Gray, 1841.

Most recently the genus has been treated as monotypic for the species *Grammatophora muricata diemensis* Gray, 1841, based on a specimen from Tasmania and now known as *Rankinia diemensis* (Gray, 1841).

Most authorities including Cogger (2014) treat *Rankinia diemensis* (Gray, 1841) better-known as the Mountain Dragon as being monotypic for the genus and occurring in a range from Tasmania, through Victoria and north to central eastern New South Wales.

These lizards are found in sandy areas, heaths and the like, often at high altitude.

Their distribution appears to be patchy, probably due to habitat requirements as well as the influence of morphologically similar competing species within the genera *Amphibolurus* Wagler, 1830 and *Tympanocryptis* Peters, 1863, which share much of the same broad distribution.

Wells and Wellington (1984) formally named the population from the Sydney basin as *R. boylani*, reaffirmed by Wells and Wellington (1985).

However the use of this name to identify the relevant taxon has not had acceptance or use by publishing Australian herpetologists anywhere. This is in spite of clear and obvious morphological differences and a disjunct population from *R. diemensis*.

The basis of this non-acceptance of the validity of the taxon *R. boylani* has more to do with personality politics as practiced by a group known as the Wüster gang, who force their views on others using unethical and unlawful means as detailed by Hoser (2009, 2012a, 2012b, 2013, 2015a-f, 2019a, 2019b), ICZN (2013) and sources cited therein.

Hoser (2007) published an appeal to herpetologists to ignore the Wüster gang and to stop the general suppression of the Wells and Wellington works as it was hampering wildlife conservation. This in turn led to the Wüster gang adding myself (Hoser) to the target list of herpetologists whose works they sought to use improper means to suppress and force others to do likewise (Kaiser 2012a, 2012b, 2013, 2014a, 2014b and Kaiser *et al.* 2013).

The relevant response to the false claims and pseudoscience of the Wüster Gang (AKA Kaiser *et al.*) are dealt with in Hoser (2015a-f) and sources cited therein.

Ng *et al.* (2013) published a molecular phylogeny showing six well defined species within what had until then been treated as *R. diemensis*.

However they chose not to recognize any bar *R. diemensis* (in line with Cogger *et al.* 1983) as for Ng *et al.* to do so, would have necessitated them recognizing the most divergent lineage being *R. boylani* and to do so was against the forced edicts of the Wüster gang.

There is little doubt that Ng *et al.* (2013) did not want to become a target of the illegal harassment by the Wüster gang, including false complaints made to law enforcement authorities to generate illegal raids on them and their families, telephone death threats at odd times of the day and night and other illegal forms of attack.

Refusing to be bullied by the unlawful and unscientific demands of the Wüster gang, Hoser (2015g) formally described all identified lineages as full species, including four for the first time.

These newly named species were *R. hoserae*, *R. neildaviei* and *R. jameswhybrowi* from Victoria and *R. fergussonae* from mid-western New South Wales. Hoser (2015g) restricted *R. diemensis* to Tasmania and nearby islands and recognized *R. boylani* as the form from the Sydney basin.

The populations previously treated as *R. diemensis* in the region

between Sydney and the Victorian border were effectively ignored by Ng *et al.* (2013).

Hoser (2015g) did similar, but had managed to ascertain that the specimens from the uplands along the coast south of Sydney in New South Wales were clearly affiliated with *R. boylani*, whereas those from the Australian Capital Territory and south through the Snowy Mountains were most closely affiliated with *R. hoserae* (in particular) and *R. jameswhybrowi*.

More recent inspection of further specimens from the Brindabella Ranges at the northern extremity of the range of animals that are morphologically similar to the Victorian species indicates that they are sufficiently different to warrant separate recognition as a unique taxonomic entity.

The same population is physically cut off from *Rankinia* to the north, south and east and is also reproductively isolated.

Based on the geological history of the area and intervening areas of both unsuitable habitat and competing species, it is reasonable to infer that this isolation is ancient, meaning that the Brindabella Ranges population has evolved in isolation from the rest and will continue to do so.

Therefore I have no hesitation in recognizing it as a taxonomic entity in accordance with the rules as set out in the *International code of Zoological Nomenclature* (Ride *et al.* 1999).

In the absence of comparative DNA material from the relevant population, I have chosen to conservatively name this taxon as a subspecies of *R. hoserae*.

Should a detailed molecular analysis of this population be done at some stage in the future, there is a strong likelihood that this taxon may have to be elevated to the status of full species.

**RANKINIA HOSERAE MARTINEKAE SUBSP. NOV.**

**LSID** urn:lsid:zoobank.org:act:81E4537C-F191-40FE-8AF0-12E5BBC39181

**Holotype:** A preserved specimen at the Australian Museum in Sydney, New South Wales, Australia, specimen number R.44758, collected at 24km West of Mount Franklin, at Condor Creek, ACT, Australia, Latitude 35.32 S., Longitude 148.83 E. This is a government-owned facility that allows access to its holdings.

**Paratype:** A preserved specimen at the Australian National Wildlife Collection, Canberra, ACT, Australia, specimen number R02939 collected at Coree Flats, Brindabella Range, on Two Sticks Road, New South Wales, Australia, Latitude 35.28 S., Longitude 148.82 E.

**Diagnosis:** *Rankinia hoserae martinekae sp. nov.* is similar in most respects to nominate *R. hoserae* Hoser, 2015, which it would be identified as using the description of that taxon in Hoser (2015g).

Typical *R. hoserae hoserae* in life is depicted in Robertson and Coventry (2019) at page 215, top left.

The two subspecies (*R. hoserae martinekae sp. nov.* and *R. hoserae hoserae*) are however separated by the following characters (in living adults): six light semi-circles on each side of the body with their bases running off the dorso-lateral lines, versus seven in *R. hoserae hoserae*; strong orangeish red on the upper lateral surfaces versus greyish in *R. hoserae hoserae*; dark patches on the upper surface of the anterior tail are ill-defined versus well defined in *R. hoserae hoserae*. Male *R. hoserae martinekae sp. nov.* have prominent spines on the lower flanks of the body, versus present but not prominent in *R. hoserae hoserae sp. nov.*, both taxa otherwise being relatively spinose members of *Rankinia* in terms of the upper body. Within the genus *Rankinia*, each of the six morphologically similar species as identified by Hoser (2015g) are identified and separated from one another as follows:

*Rankinia hoserae sp. nov.* is the taxon found around Anglesea on the central Victorian coast and the highlands of central Victoria in scattered locations including Kinglake National Park and Wombat State Forest. It is separated from the other five

species in *Rankinia* Wells and Wellington, 1984 by the following characters: the hind legs have no obvious banding; exceptionally large spines on the upper body and in particular between the rear legs; some of the scale spines on the rear of the hind legs are either white or yellowish in colour; scales forming the nuchal crest are small, distinct and apart.

*Rankinia jameswhybrowi sp. nov.* is the species found in the hills just east of Lake Eildon, Victoria and in the ranges to the north of there. It is separated from the other five species of *Rankinia* Wells and Wellington, 1984 by the following characters: the lighter dorso-linear blotches above the lateral flanks are of even curvature when viewed from above and noticeably elongate in shape and to an extent not seen in any of the other species; the tail is strongly banded, versus indistinctly banded in the other species; the nuchal crest is so poorly developed as to appear absent.

*Rankinia diemensis* (Gray, 1841), herein restricted to Tasmania and Bass Strait Islands, is separated from the other five species in *Rankinia* Wells and Wellington, 1984 by the following characters: the lateral spines running on each side from the base of the tail are smaller than the lateral spines along the sides of the body; the lighter dorso-linear blotches above the lateral flanks are of even curvature when viewed from above; there are distinct white-tipped spines on the posterior lateral edge of the back legs; the spines of the nuchal crest are distinctive in that they are easily noticed.

*Rankinia boylani* Wells and Wellington, 1984, herein restricted to NSW in the vicinity of the Sydney basin, including the Blue Mountains, as far west at Mount Victoria (the type locality), but presumed to include most other specimens of *Rankinia* from New South Wales north of Goulburn, is separated from the other five species in *Rankinia* Wells and Wellington, 1984 by the following characters: the lateral spines running on each side from the base of the tail are considerably larger than the lateral spines along the sides of the body; the lighter dorso-linear blotches above the lateral flanks are not of even curvature when viewed from above, these being larger at the posterior edge; there are no distinct white-tipped spines on the posterior lateral edge of the back legs; the spines of the nuchal crest are not distinctive in that they are easily not noticed.

*Rankinia neildaviei sp. nov.* herein confined to the Grampians in south-western Victoria, is separated from the other five species in *Rankinia* Wells and Wellington, 1984 by the following characters: the dorsal spines on the anterior part of the tail are large; there are no distinct white-tipped spines on the posterior lateral edge of the back legs; the lighter dorso-linear blotches above the lateral flanks are all or mostly of even curvature when viewed from above; the banding on the hind limbs is distinct (as opposed to obvious banding that is indistinct in some other species in the genus, including *R. diemensis* and *R. boylani*).

*Rankinia fergussonae sp. nov.* from Goonoo National Park, NSW is defined and separated from the other five species in the genus *Rankinia* Wells and Wellington, 1984 by the following: It is similar in most respects to *R. boylani*, from which it is differentiated by its more prominent nuchal crest scales (prominent versus very hard to see) and the presence of a well-developed white line along the lower lateral flank of the body on either side, which is indistinct in *R. boylani* and usually not white in colour, but light greyish instead or if whitish in *R. boylani*, is invariably broken.

The genus *Rankinia* Wells and Wellington, 1984, is separated from all other Australian agamids by the following suite of characters:

Body is without very large conical spines or a spiny nuchal hump; no large skin frill around the neck; tail is not compressed and with a lateral keel, it does not have a strongly differentiated dorsal keel; a vertebral series of enlarged scales present or absent on the back; if present, three or more femoral pores present on each side; femoral pores present; a single row of spinose scales on sides of the base of the tail; lower edge of

supralabials straight or at most slightly curved, forming a more or less straight or even edge to the upper lip; no row of enlarged scales from below eye to above ear; dorsal scales of body heterogeneous, but with either distinctive vertebral and paravertebral rows of enlarged, keeled or spinose scales and with a poorly developed nuchal crest (that varies in development between species), no dorsal crest and sometimes a distinct vertebral ridge; tympanum distinct; enlarged spinose scales along each side of the base of the tail.

**Distribution:** *R. hoseerae martinekae* subsp. nov. are known only from the Brindabella Ranges in the ACT and NSW, Australia.

**Etymology:** Named in honour of Maryann Martinek from Bendigo, Victoria, Australia in tribute for services to wildlife conservation. For detail see the etymology in Hoser (2018).

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