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# A division of the genus elapid genus *Loveridegelaps* McDowell, 1970 from the Solomon Islands, including formal description of four new species (Serpentes: Elapidae: Micropechiini: Loveridgelapina).

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**ABSTRACT**

The species described as *Hoplocephalus elapoides* Boulenger, 1890, from Florida Island in the Solomon Since the original description, widely divergent specimens have been found across the Solomon Islands.

However, no herpetologist has considered whether or not there is more than one species currently under this umbrella.

Inspection of specimens from the majority of islands *Loveridegelaps* have been found shows significant variation between specimens and of sufficient basis to warrant division into separate species.

This includes consistent differences in scalation, colouration and hemipene morphology and can be reliably used to separate each form.

As a result, of an assessment of the snakes and the relevant available genetic evidence involving species affected by the same geographical barriers, e.g. lizards of the genera *Corucia* Gray, 1855 and *Tribolonotus* Duméril and Bibron, 1839 as detailed by Austin *et al*. (2010) and Hagen *et al*. (2012), and the geological evidence of relevance, it is clear that the relevant forms are sufficiently divergent to warrant taxonomic recognition.

Thus five distinctive forms are herein given taxonomic recognition as full species. Other than *Loveridegelaps elapoides* (Boulenger, 1890), none have available names and so four are named for the first time according to the provisions of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

These are: *Loveridgelaps sloppi sp. nov*. from the New Georgia Group of Islands. *L. josephburkei sp. nov*. from the Shortland Islands, *L. yeomansi sp. nov*. from Guadalcanal and *L. fiacummingae sp. nov*. from Malaita.

**Keywords:** Taxonomy; snakes; genus; *Loveridgelaps*; species; *elapoides*; Boulenger; Solomon Islands; Solomons; Guadalcanal; Ngela; Nggela, Malaita; Shortland Island; New Georgia; Gizo; Santa Isabel; Florida Islands; Bougainville; new species; *sloppi*; *josephburkei*; *yeomansi*; *fiacummingae.*

## INTRODUCTION

The Solomons Black-banded Krait was originally described as *Hoplocephalus elapoides* Boulenger, 1890, from a specimen caught on Florida Island in the Solomon Islands.

It was transferred to a newly created monotypic genus *Loveridegelaps* by McDowell in 1970 on the basis of significant morphological differences to all other elapid species.

Hoser (2012), assigned this and related species to a relevant tribe and subtibe, Micropechiini and Loveridgelapina respectively.

Since the original description widely divergent specimens have been found across most major island groups within the Solomon Islands.

However, until now no herpetologist has considered whether or not there is more than one species currently under this umbrella.

Inspection of specimens from the majority of islands *Loveridegelaps* have been found shows significant variation between specimens and of sufficient basis to warrant division into separate species.

This includes consistent differences in scalation, colouration and hemipene morphology and can be reliably used to separate each form, including the substantial body of evidence published by McDowell (1970), who also inspected a number of specimens from across the Solomon Islands.

As a result, of an assessment of the snakes and the relevant available genetic evidence involving species affected by the same geographical barriers, e.g. lizards of the genera *Corucia* Gray, 1855 and *Tribolonotus* Duméril and Bibron, 1839 as detailed by Austin *et al*. (2010) and Hagen *et al*. (2012), and the geological evidence of relevance, it is clear that the relevant forms are sufficiently divergent to warrant taxonomic recognition.

They are clearly morphologically distinct, have significant divergences with respect to very conservative characters, such as hemipene morphology, indicating deep divergence and based

on parallel studies involving species affected by the same barriers, clearly form genetically distinct, separately evolving populations.

Thus five distinctive forms are herein given taxonomic recognition as full species. Other than *Loveridegelaps elapoides* (Boulenger, 1890), none have available names and so four are named for the first time according to the provisions of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

These are: *Loveridgelaps sloppi sp. nov*. from the New Georgia Group of Islands. *L. josephburkei sp. nov*. from the Shortland Islands, *L. yeomansi sp. nov*. from Guadalcanal and *L. fiacummingae sp. nov*. from Malaita.

It should also be noted that at the time of McDowell's (1970) study, he was isolated from molecular studies not available at the time and therefore could only speculate as to the taxonomic significance of divergent traits he observed and documented.

However prior to the publication of this paper I was able to match this evidence with what is now well known about the recent geological past, in terms of ice-age maxima, changing sea levels and climates and the roles these play in speciation, either in these relevant snakes or other reptile taxa affected by the same factors.

Divergences were ascertained on the basis of previous ice-age maxima connections between relevant islands as explained by authors such as Bruns *et al.* (2009), Russell and Coupe (1984) and recent molecular studies on both *Corucia* Gray, 1856 and *Tribolonotus* Duméril and Bibron, 1839 as published by Austin *et al*. (2010) and Hagen *et al*. (2012), and the relevant sources cited within.

Notwithstanding the theft of relevant materials from this author in an illegal armed raid on 17 August 2011, which were not returned (Court of Appeal Victoria 2014 and VCAT 2015) and not returned in breach of various earlier court orders, I have made a decision to publish this paper in view of the conservation significance attached to the formal recognition of unnamed species and on the basis that further delays may in fact put these otherwise unnamed taxa at greater risk of extinction.

I also note that Boseto and Pikacha (2016), wrote of a serious alleged decline in abundance of *Loveridgelaps* in recent years, meaning the species in the genus are at heightened risk.

They wrote: "Locals from Sasamugga also claimed that the rare and poorly known *Loveridgelaps elapoides*, one of the two terrestrial elapid snake species that has been previously documented on Choiseul, was once common in the Sirebe Rainforest area, but that the arrival of *R. marina* caused it to decline dramatically."

Thus five distinctive forms are herein given taxonomic recognition on the basis that likely divergences exceed the timeline determined as significant by Keogh *et al.* (2003).

Rafting between islands is not viewed as a significant means of dispersal or ongoing gene flow, beyond times of initial colonisation for reasons given by Hagen *et al*. (2012) and Balsai (1995) and also due to the absence of the genus from nearby island archipelagos beyond the Bougainville group.

Of relevance also is that the islands Guadalcanal and Malaita are separated from one another and the others by a sea depth of more than 200 metres and hence do not appear to have been joined at any stage in the last 5 million years.

**MATERIALS AND METHODS**

These are not formally explained in a number of my recent papers under the heading "Materials and methods" or similar, on the basis they are self evident to any vaguely perceptive reader. However, the process by which the following taxonomy and nomenclature in this and other recent papers by myself of similar form, has been arrived at, is explained herein for the benefit of people who have recently published so-called "criticisms" online of some of my recent papers. They have alleged a serious "defect" by myself not formally explaining "Materials And Methods" under such a heading.

The process involved in creating the final product for this and other relevant papers has been via a combination of the following:

Genera and component species are audited to see if their classifications are correct on the basis on known type specimens, locations and the like when compared with known phylogenies and obvious morphological differences between like species.

Original descriptions and contemporary concepts of the species are matched with available specimens from across the ranges of the species to see if all conform to accepted norms.

These may include those held in museums, private collections, collected in the field, photographed, posted on the internet or held by individuals, and only when the location data is good and any other relevant data available.

Where specimens do not appear to comply with the described species (and accepted concept of the species), this non-conformation is looked at with a view to ascertaining if it is worthy of taxonomic recognition or other relevant considerations on the basis of differences that can be tested for antiquity or deduced from earlier studies.

When this appears to be the case (non-conformation), the potential target taxon is inspected as closely as practicable with a view to comparing with the nominate form or forms if other similar taxa have been previously named.

Other relevant data is also inspected, including any available molecular studies which may indicate likely divergence of populations.

Where molecular studies are unavailable for the relevant taxon or group, other studies involving species and groups constrained by the same geographical or geological barriers, or with like distribution patterns are inspected as they give reasonable indications of the likely divergences of the taxa being studied herein.

Additionally other studies involving geological history, sea level and habitat changes associated with long-term climate change, including recent ice age changes in sea levels, versus known sea depths are utilized to predict past movements of species and genus groups in order to further ascertain likely divergences between extant populations (as done in this very paper).

When all available information checks out to show taxonomically distinct populations worthy of recognition, they are then recognized herein according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

This means that if a name has been properly proposed in the past, it is used. This is exactly what happens in this paper for the taxon originally described as *Hoplocephalus elapoides* Boulenger, 1890.

Alternatively, if no name is available, one is proposed accoding to the rules of the Code as is done four times in this paper.

As a matter of trite I mention that if a target taxon or group does check out as being "in order" or properly classified, a paper is usually not published unless some other related taxon is named for the first time.

The published literature relevant to the taxonomic judgements made within this paper includes papers relevant to Solomon Islands species affected by the same physical barriers to dispersion as well as those directly relevant to *Loveridgelaps* and combined, they include the following:

Adler *et al.* (1995), Austin *et al.* (2010), Balsai (1995), Barbour (1921), Boseto and Pikacha (2016), Boulenger (1884, 1886, 1890), Bruns *et al.* (1989), Cogger (1972), Dahl (1986), Duméril and Bibron (1839), Gray (1856), Greer (1982), Greer and Parker (1967), Greer and Simon (1982), Hagen *et al.* (2012), Hall (2002), Iskandar and Erdelen (2006), Keogh *et al.* (2003), Kinghorn (1928, 1937), McCoy (1980, 2006), McDowell (1970), Mys (1988), Ogilby (1890), Pianka and Vitt (2003), Pyron *et al.*

(2013), Reeder (2003), Rittmeyer and Austin (2015), Russell and Coupe (1984), Schmidt (1932), Williams and Parker (1964), Zweifel (1966), and sources cited therein.

Some material within descriptions below is repeated for different described taxa and this is in accordance with the provisions of the *International Code of Zoological Nomenclature* and the legal requirements for each description. I make no apologies for this.

**GENUS *LOVERIDGELAPS* McDOWELL, 1970.**

**Type species:** *Hoplocephalus elapoides* Boulenger, 1890.

**Diagnosis:** *Loveridgelaps* McDowell, 1970 is defined in detail by McDowell (1970) and this diagnosis is adopted herein as correct for the genus.

In summary the genus is defined as follows: Head slightly flattened and barely distinct from the neck. Eyes very small and a diagnostic difference between this and other Solomon Islands elapids. Nasal is single or divided which contacts the preocular. Rostral broad, frontal is as wide as long and wider than the supraoculars. 7 supralabials, with numbers 3 and 4 entering the eye. 1 or 2 postoculars. Temporals 1+2. Body is of moderate shape and size is to about 1 meter in total length in adults.

17 Mid body rows, 193-218 ventrals, anal entire and 31-38 all divided subcaudals.

The dorsal colouration is black with a regular series of bright yellow bands along the vertebral line. Laterally the banding is white, usually separated from the yellow bands by one or two rows of black scales. The head is usually white with irregular black markings on the rostral, labials, orbits and sometimes the occiput. Some melanotic forms are known.

**Distribution:** Endemic to the Solomon Islands Archipelago, including: Shortland, Choiseul, Santa Isabel, Rob Roy, Vella Lavella, Gizo, Guadalcanal, Ngela (AKA Nggela) or Florida Islands, Malaita.

**Content:** *Loveridgelaps elapoides* (Boulenger, 1890) (type species); *L. sloppi sp. nov.*; *L. josephburkei sp. nov.*; *L. yeomansi sp. nov.*; *L. fiacummingae sp. nov.*.

***LOVERIDGELAPS ELAPOIDES* BOULENGER, 1890.**

**Holotype:** A specimen at the Natural History Museum, London, UK, specimen number, BM 1946. 1.18.98 (originally, 89.3.29.191) collected at Florida Islands, Solomon Islands.

**Diagnosis:** *Loveridgelaps elapoides* (Boulenger, 1890) from the Florida Islands Group, Santa Isabel and Choiseul is separated from all other *Loveridgelaps* McDowell, 1970 (excluding *L. josephburkei sp. nov.*), by the following suite of characters: The snout and ocular region are black, although the rest of the head and anteriormost neck are yellowish white, with or without a pair of small black spots on the occipital region of the head, behind the parietals. The black crossbands are of nearly equal width laterally and vertebrally, about five or six scale-lengths wide and separated by yellowish zones about three to four scales wide. Posteriorly, the pale zones contain black spots, and the black crossbands extend onto the tips of the ventrals and encircle the tail to form rings.

*L. elapoides* is separated from all other *Loveridgelaps* by having a belly that is either unmarked and unspotted (Florida Islands animals) or with considerable black spotting except on the forebody (Choiseul and Santa Isabel).

*L. josephburkei sp. nov*. known only from the Shortland Islands is similar in most respects to *L. elapoides* which it would otherwise be identified as, but differs from it by having small black spots, flecks and markings on the lower belly, but not on the mid-belly, and in not alternatively having an unmarked belly.

For *L. elapoides* there are about 22 crossbands on the body and tail, (Florida Islands animals) or 34 (Choiseul and Santa Isabel).

The hemipenis in male *L. elapoides* is unique for *Loveridgelaps* in the following properties: The everted organ extends to subcaudal nine, (versus 6 in *Loveridgelaps sloppi sp. nov*. from the New Georgia Group of Islands; 10 in *L. yeomansi sp. nov*. from Guadalcanal and 7-8 in *L. fiacummingae sp. nov*. from Malaita). In common with *L. fiacummingae sp. nov*. the hemipenis of *L. elapoides* is forked at subcaudal 7 or 8, versus 6 in *L. sloppi sp. nov*. and 9 in *L. yeomansi sp. nov*.. The sulcus is forked at subcaudals 5-8 in all species, but usually 7 in *L. elapoides.*

**Distribution:** Restricted to the Florida Islands, Santa Isabel and Choiseul.

***LOVERIDGELAPS SLOPPI SP. NOV.***

**Holotype:** A male specimen at the Museum of Natural History, London, UK, specimen number: 1933.3.4.2, from Gizo Island in the New Georgia group of islands in the Solomon islands.

The Museum of Natural History, London, UK is a facility that allows access to its holdings.

**Diagnosis:** *Loveridgelaps sloppi sp. nov*. from the New Georgia group of islands is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The entire head and anteriormost neck are yellowish white, except for a few dark flecks on the internasals and rostral and a narrow black border around each eye and nostril; the black crossbands are noticeably narrow laterally, but about five scale-lengths wide vertebrally, where the separating orange-yellowish white zones are two or three scale-lengths wide. There are 42 dark crossbands on the body and tail, versus never more than 34 in any other species of *Loveridgelaps.*

The pale zones and belly lack scattered black pigment, although the black crossbands extend onto the tips of the ventrals and completely traverse the subcaudals to form rings.

The hemipenis in male *L. sloppi sp. nov*. is unique for *Loveridgelaps* in the following properties: everted organ length to subcaudal 6 (versus 7 or more in all other species), forked at subcaudal 6 (versus 7 or more in all other species) and sulcus is forked at subcaudal 5 (in common with *L. fiacummingae sp. nov.* from Malaita).

*Loveridgelaps elapoides* (Boulenger, 1890) from the Florida Islands Group, Santa Isabel and Choiseul is separated from all other *Loveridgelaps* McDowell, 1970 (excluding *L. josephburkei sp. nov.*), by the following suite of characters: The snout and ocular region are black, although the rest of the head and anteriormost neck are yellowish white, with or without a pair of small black spots on the occipital region of the head, behind the parietals. The black crossbands are of nearly equal width laterally and vertebrally, about five or six scale-lengths wide, and separated by yellowish zones about three to four scales wide. Posteriorly, the pale zones contain black spots, and the black crossbands extend onto the tips of the ventrals and encircle the tail to form rings.

*L. elapoides* is separated from all other *Loveridgelaps* by having a belly that is either unmarked and unspotted (Florida Islands animals) or with considerable black spotting except on the forebody (Choiseul and Santa Isabel).

For *L. elapoides* there are about 22 crossbands on the body and tail, (Florida Islands animals) or 34 (Choiseul and Santa Isabel).

The hemipenis in male *L. elapoides* is unique for *Loveridgelaps* in the following properties: The everted organ extends to subcaudal nine, (versus 6 in *Loveridgelaps sloppi sp. nov*. from the New Georgia Group of Islands; 10 in *L. yeomansi sp. nov.* from Guadalcanal and 7-8 in *L. fiacummingae sp. nov*. from Malaita). In common with *L. fiacummingae sp. nov*. the hemipenis of *L. elapoides* is forked at subcaudal 7 or 8, versus 6 in *L. sloppi sp. nov*. and 9 in *L. yeomansi sp. nov*.. The sulcus is forked at subcaudals 5-8 in all species, but usually 7 in *L. elapoides.*

*L. josephburkei sp. nov*. known only from the Shortland Islands is similar in most respects to *L. elapoides* which it would otherwise be identified as, but differs from it by having small black spots, flecks and markings on the lower belly, but not on the mid-belly, and in not alternatively having an unmarked belly.

*L. yeomansi sp. nov*. from Guadalcanal is separated from all

other *Loveridgelaps* McDowell, 1970, by the following suite of characters: Head as in *L. elapoides*, but black occipital spots expanded into large blotches that extend nearly or to the edges of the parietals. The black crossbands are about four to six scale-lengths wide, and the light zones may or may not contain some black spotting, but not so much as to connect the black bands. The belly has a small amount of black spotting, and the black crossbands impinge extensively on the ventrals (so that the last one or two bands on the body may be complete rings, like those of the tail). The crossbands are moderate in number (28 to 33 on body and tail).

The hemipenis in male *L. yeomansi sp. nov*. is unique for *Loveridgelaps* in the following properties: its length when everted is 10 subcaudals (versus 9 or less for all other species), it is forked at subcaudal number 9, versus 8 or less for all other species, and the sulcus is forked at subcaudal number 7 or 8.

*L. fiacummingae sp. nov*. from Malaita is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The colouration noticeably tends towards being melanotic as described by both McCoy (2006) and McDowell (1970). In more detail, the black occipital blotches extend well onto the parietals and become confluent with the black ocular regions and with one another, thus isolating the white area on the frontal as an irregular pale crown patch. The dark crossbands are very broad, but become narrower laterally, and tend to fuse with one another through connection with the black pigment in the whitish zones, which makes the counting of blotches somewhat arbitrary; the pale zones are reduced in width to one scale-length vertebrally. The belly is white and without flecks or blotches, but the tail is encircled by black rings.

Hemipene characteristics for *L. fiacummingae sp. nov*. appear within the mid-range for the genus, reaching to subcaudal 7 or 8 when fully everted, versus 6 in *L. sloppi sp. nov*., 9 in *L. elapsoides* and 10 in *L. yeomansi sp. nov*..

**Distribution:** *L. sloppi sp. nov*. is restricted to the New Georgia Group of Islands in the Solomon Islands.

**Etymology:** Named in honour of our living Great Dane (dog), named “Slopp” for services to educating people about being nice to animals, via our live animal shows and displays business.

***LOVERIDGELAPS JOSPEHBURKEI SP. NOV.***

**Holotype:** A specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.126267, from Near Harehare Village, Shortland Island, Solomon Islands (7°03' S, 155°52' E).
The Australian Museum, Sydney, NSW, Australia is a facility that allows access to its holdings.

**Diagnosis:** *L. josephburkei sp. nov*. known only from the Shortland Islands is similar in most respects to *L. elapoides* which it would otherwise be identified as, but differs from it by having small black spots, flecks and markings on the lower belly, but not on the mid-belly, and in not alternatively having an unmarked belly.

The hemipenes in male *L. josephburkei sp. nov*. are essentially similar to those of *L. elapoides.*

*Loveridgelaps elapoides* (Boulenger, 1890) from the Florida Islands Group, Santa Isabel and Choiseul is separated from all other *Loveridgelaps* McDowell, 1970 (excluding *L. josephburkei sp. nov.*), by the following suite of characters: The snout and ocular region are black, although the rest of the head and anteriormost neck are yellowish white, with or without a pair of small black spots on the occipital region of the head, behind the parietals. The black crossbands are of nearly equal width laterally and vertebrally, about five or six scale-lengths wide, and separated by yellowish zones about three to four scales wide. Posteriorly, the pale zones contain black spots, and the black crossbands extend onto the tips of the ventrals and encircle the tail to form rings.

*L. elapoides* is separated from all other *Loveridgelaps* by having a belly that is either unmarked and unspotted (Florida Islands animals) or with considerable black spotting except on the forebody (Choiseul and Santa Isabel). There are anywhere from 22 to 34 crossbands on the body and tail.

The hemipenis in male *L. elapoides* is unique for *Loveridgelaps* in the following properties: The everted organ extends to subcaudal nine, (versus 6 in *Loveridgelaps sloppi sp. nov*. from the New Georgia Group of Islands; 10 in *L. yeomansi sp. nov*. from Guadalcanal and 7-8 in *L. fiacummingae sp. nov*. from Malaita). In common with *L. fiacummingae sp. nov*. the hemipenis of *L. elapoides* is forked at subcaudal 7 or 8, versus 6 in *L. sloppi sp. nov*. and 9 in *L. yeomansi sp. nov*.. The sulcus is forked at subcaudals 5-8 in all species, but usually 7 in *L. elapoides.*

*Loveridgelaps sloppi sp. nov*. from the New Georgia group of islands is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The entire head and anteriormost neck are yellowish white, except for a few dark flecks on the internasals and rostral and a narrow black border around each eye and nostril; the black crossbands are noticeably narrow laterally, but about five scale-lengths wide vertebrally, where the separating orange-yellowish white zones are two or three scale-lengths wide. There are 42 dark crossbands on the body and tail, versus never more than 34 in any other species of *Loveridgelaps.* The pale zones and belly lack scattered black pigment, although the black crossbands extend onto the tips of the ventrals and completely traverse the subcaudals to form rings.

The hemipenis in male *L. sloppi sp. nov*. is unique for *Loveridgelaps* in the following properties: everted organ length to subcaudal 6 (versus 7 or more in all other species), forked at subcaudal 6 (versus 7 or more in all other species) and sulcus is forked at subcaudal 5 (in common with *L. fiacummingae sp. nov*. from Malaita).

*L. yeomansi sp. nov*. from Guadalcanal is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: Head as in *L. elapoides*, but black occipital spots expanded into large blotches that extend nearly or to the edges of the parietals. The black crossbands are about four to six scale-lengths wide, and the light zones may or may not contain some black spotting, but not so much as to connect the black bands. The belly has a small amount of black spotting, and the black crossbands impinge extensively on the ventrals (so that the last one or two bands on the body may be complete rings, like those of the tail). The crossbands are moderate in number (28 to 33 on body and tail).

The hemipenis in male *L. yeomansi sp. nov*. is unique for *Loveridgelaps* in the following properties: its length when everted is 10 subcaudals (versus 9 or less for all other species), it is forked at subcaudal number 9, versus 8 or less for all other species, and the sulcus is forked at subcaudal number 7 or 8.

*L. fiacummingae sp. nov*. from Malaita is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The colouration noticeably tends towards being melanotic as described by both McCoy (2006) and McDowell (1970). In more detail, the black occipital blotches extend well onto the parietals and become confluent with the black ocular regions and with one another, thus isolating the white area on the frontal as an irregular pale crown patch. The dark crossbands are very broad, but become narrower laterally, and tend to fuse with one another through connection with the black pigment in the whitish zones, which makes the counting of blotches somewhat arbitrary; the pale zones are reduced in width to one scale-length vertebrally. The belly is white and without flecks or blotches, but the tail is encircled by black rings.

Hemipene characteristics for *L. fiacummingae sp. nov*. appear within the mid-range for the genus, reaching to subcaudal 7 or 8 when fully everted, versus 6 in *L. sloppi sp. nov*., 9 in *L. elapsoides* and 10 in *L. yeomansi sp. nov*..

**Distribution:** Known only from the Shortland Islands, Solomon

Islands, but may also occur elsewhere in the Bougainville group of islands.

**Etymology:** Named in honour of Joseph Burke of Joesph Burke Law, Melbourne, Victoria in recognition of his services to the administration of justice in Melbourne, Australia, by defending people against improper attacks from corrupt government employees.

***LOVERIDGELAPS YEOMANSI SP. NOV.***

**Holotype:** A specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.118881 from Guadalcanal, Solomon Islands (9°32'S, 160°12'E).
The Australian Museum, Sydney, NSW, Australia is a facility that allows access to its holdings.

**Paratypes:** A specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.9301, from Guadalcanal, Solomon Islands (9°32'S, 160°12'E).

A female specimen at the Museum of Comparative Zoology, Harvard University, USA, specimen number: MCZ 66899 from Guadalcanal, Solomon Islands.

A male specimen at the Museum of Natural History, London, UK, specimen number: 1936.10.4.64 from Guadalcanal, Solomon Islands.

A female specimen at the Museum of Natural History, London, UK, specimen number: 1967.834 from Guadalcanal, Solomon Islands.

**Diagnosis:** *L. yeomansi sp. nov*. from Guadalcanal is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: Head as in *L. elapoides*, but black occipital spots expanded into large blotches that extend nearly or to the edges of the parietals. The black crossbands are about four to six scale-lengths wide, and the light zones may or may not contain some black spotting, but not so much as to connect the black bands. The belly has a small amount of black spotting and the black crossbands impinge extensively on the ventrals (so that the last one or two bands on the body may be

complete rings, like those of the tail). The crossbands are moderate in number (28 to 33 on body and tail).

The hemipenis in male *L. yeomansi sp. nov*. is unique for *Loveridgelaps* in the following properties: its length when everted is 10 subcaudals (versus 9 or less for all other species), it is forked at subcaudal number 9, versus 8 or less for all other species, and the sulcus is forked at subcaudal number 7 or 8.

*Loveridgelaps elapoides* (Boulenger, 1890) from the Florida Islands Group, Santa Isabel and Choiseul is separated from all other *Loveridgelaps* McDowell, 1970 (excluding *L. josephburkei sp. nov*.), by the following suite of characters: The snout and ocular region are black, although the rest of the head and anteriormost neck are yellowish white, with or without a pair of small black spots on the occipital region of the head, behind the parietals. The black crossbands are of nearly equal width laterally and vertebrally, about five or six scale-lengths wide and separated by yellowish zones about three to four scales wide. Posteriorly, the pale zones contain black spots, and the black crossbands extend onto the tips of the ventrals and encircle the tail to form rings.

*L. elapoides* is separated from all other *Loveridgelaps* by having a belly that is either unmarked and unspotted (Florida Islands animals) or with considerable black spotting except on the forebody (Choiseul and Santa Isabel).

For *L. elapoides* there are about 22 crossbands on the body and tail, (Florida Islands animals) or 34 (Choiseul and Santa Isabel).

The hemipenis in male *L. elapoides* is unique for *Loveridgelaps* in the following properties: The everted organ extends to subcaudal nine, (versus 6 in *Loveridgelaps sloppi sp. nov*. from the New Georgia Group of Islands; 10 in *L. yeomansi sp. nov*. from Guadalcanal and 7-8 in *L. fiacummingae sp. nov*. from Malaita). In common with *L. fiacummingae sp. nov*. the hemipenis of *L. elapoides* is forked at subcaudal 7 or 8, versus 6 in *L. sloppi sp. nov*. and 9 in *L. yeomansi sp. nov*.. The sulcus is forked at subcaudals 5-8 in all species, but usually 7 in *L. elapoides.*

*L. josephburkei sp. nov*. known only from the Shortland Islands is similar in most respects to *L. elapoides* which it would otherwise be identified as, but differs from it by having small black spots, flecks and markings on the lower belly, but not on the mid-belly, and in not alternatively having an unmarked belly.

*Loveridgelaps sloppi sp. nov*. from the New Georgia group of islands is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The entire head and anteriormost neck are yellowish white, except for a few dark flecks on the internasals and rostral and a narrow black border around each eye and nostril; the black crossbands are noticeably narrow laterally, but about five scale-lengths wide vertebrally, where the separating orange-yellowish white zones are two or three scale-lengths wide. There are 42 dark crossbands on the body and tail, versus never more than 34 in any other species of *Loveridgelaps.*

The pale zones and belly lack scattered black pigment, although the black crossbands extend onto the tips of the ventrals and completely traverse the subcaudals to form rings.

The hemipenis in male *L. sloppi sp. nov*. is unique for *Loveridgelaps* in the following properties: everted organ length to subcaudal 6 (versus 7 or more in all other species), forked at subcaudal 6 (versus 7 or more in all other species) and sulcus is forked at subcaudal 5 (in common with *L. fiacummingae sp. nov*. from Malaita).

*L. fiacummingae sp. nov*. from Malaita is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The colouration noticeably tends towards being melanotic as described by both McCoy (2006) and McDowell (1970). In more detail, the black occipital blotches extend well onto the parietals and become confluent with the black ocular regions and with one another, thus isolating the white area on the frontal as an irregular pale crown patch. The dark crossbands are very broad, but become narrower laterally, and tend to fuse with one another through connection with the black pigment in the whitish zones, which makes the counting of blotches somewhat arbitrary; the pale zones are reduced in width to one scale-length vertebrally. The belly is white and without flecks or blotches, but the tail is encircled by black rings.

Hemipene characteristics for *L. fiacummingae sp. nov*. appear within the mid-range for the genus, reaching to subcaudal 7 or 8 when fully everted, versus 6 in *L. sloppi sp. nov*., 9 in *L. elapsoides* and 10 in *L. yeomansi sp. nov*..

**Distribution:** Guadalcanal Island in the Solomon Islands.

**Etymology:** Named in honour of now deceased UK herpetologist, Luke Yeomans. For details relating to the etymology, see Hoser (2012).

***LOVERIDGELAPS FIACUMMINGAE SP. NOV.***

**Holotype:** A male specimen at the American Museum of Natural History (AMNH), New York, USA, specimen number: AMNH 43399, from Malaita, Solomon Islands.
The American Museum of Natural History (AMNH), New York, USA, is a facility that allows access to its holdings.

**Paratypes:** 1/ A male specimen at the American Museum of Natural History (AMNH), New York, USA, specimen number: AMNH 43400, from Malaita, Solomon Islands.

2/ A specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.2379 from Malaita, Solomon Islands (9°00'S, 161°00'E).

3/ A specimen at the Australian Museum, Sydney, NSW, Australia, specimen number: R.87382 from within a 3km radius of Bitaama, North Malaita, Solomon Islands (8°24'S, 160°36'E).

**Diagnosis:** *L. fiacummingae sp. nov*. from Malaita is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The colouration noticeably tends towards

being melanotic as described by both McCoy (2006) and McDowell (1970), separating this taxon from others in the genus. In more detail, the black occipital blotches extend well onto the parietals and become confluent with the black ocular regions and with one another, thus isolating the white area on the frontal as an irregular pale crown patch. The dark crossbands are very broad, but become narrower laterally, and tend to fuse with one another through connection with the black pigment in the whitish zones, which makes the counting of blotches somewhat arbitrary; the pale zones are reduced in width to one scale-length vertebrally. The belly is white and without flecks or blotches, but the tail is encircled by black rings.

Hemipene characteristics for *L. fiacummingae sp. nov*. appear within the mid-range for the genus, reaching to subcaudal 7 or 8 when fully everted, versus 6 in *L. sloppi sp. nov*., 9 in *L. elapsoides* and 10 in *L. yeomansi sp. nov*..

*Loveridgelaps elapoides* (Boulenger, 1890) from the Florida Islands Group, Santa Isabel and Choiseul is separated from all other *Loveridgelaps* McDowell, 1970 (excluding *L. josephburkei sp. nov*.), by the following suite of characters: The snout and ocular region are black, although the rest of the head and anteriormost neck are yellowish white, with or without a pair of small black spots on the occipital region of the head, behind the parietals. The black crossbands are of nearly equal width laterally and vertebrally, about five or six scale-lengths wide, and separated by yellowish zones about three to four scales wide. Posteriorly, the pale zones contain black spots, and the black crossbands extend onto the tips of the ventrals and encircle the tail to form rings.

*L. elapoides* is separated from all other *Loveridgelaps* by having a belly that is either unmarked and unspotted (Florida Islands animals) or with considerable black spotting except on the forebody (Choiseul and Santa Isabel).

For *L. elapoides* there are about 22 crossbands on the body and tail, (Florida Islands animals) or 34 (Choiseul and Santa Isabel).

The hemipenis in male *L. elapoides* is unique for *Loveridgelaps* in the following properties: The everted organ extends to subcaudal nine, (versus 6 in *Loveridgelaps sloppi sp. nov*. from the New Georgia Group of Islands; 10 in *L. yeomansi sp. nov*. from Guadalcanal and 7-8 in *L. fiacummingae sp. nov*. from Malaita). In common with *L. fiacummingae sp. nov*. the hemipenis of *L. elapoides* is forked at subcaudal 7 or 8, versus 6 in *L. sloppi sp. nov*. and 9 in *L. yeomansi sp. nov*.. The sulcus is forked at subcaudals 5-8 in all species, but usually 7 in *L. elapoides.*

*L. josephburkei sp. nov*. known only from the Shortland Islands is similar in most respects to *L. elapoides* which it would otherwise be identified as, but differs from it by having small black spots, flecks and markings on the lower belly, but not on the mid-belly, and in not alternatively having an unmarked belly.

*Loveridgelaps sloppi sp. nov*. from the New Georgia group of islands is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: The entire head and anteriormost neck are yellowish white, except for a few dark flecks on the internasals and rostral and a narrow black border around each eye and nostril; the black crossbands are noticeably narrow laterally, but about five scale-lengths wide vertebrally, where the separating orange-yellowish white zones are two or three scale-lengths wide. There are 42 dark crossbands on the body and tail, versus never more than 34 in any other species of *Loveridgelaps.* The pale zones and belly lack scattered black pigment, although the black crossbands extend onto the tips of the ventrals and completely traverse the subcaudals to form rings.

The hemipenis in male *L. sloppi sp. nov*. is unique for *Loveridgelaps* in the following properties: everted organ length to subcaudal 6 (versus 7 or more in all other species), forked at subcaudal 6 (versus 7 or more in all other species) and sulcus is forked at subcaudal 5 (in common with *L. fiacummingae sp. nov.* from Malaita).

*L. yeomansi sp. nov*. from Guadalcanal is separated from all other *Loveridgelaps* McDowell, 1970, by the following suite of characters: Head as in *L. elapoides*, but black occipital spots expanded into large blotches that extend nearly or to the edges of the parietals. The black crossbands are about four to six scale-lengths wide, and the light zones may or may not contain some black spotting, but not so much as to connect the black bands. The belly has a small amount of black spotting, and the black crossbands impinge extensively on the ventrals (so that the last one or two bands on the body may be complete rings, like those of the tail). The crossbands are moderate in number (28 to 33 on body and tail).

The hemipenis in male *L. yeomansi sp. nov*. is unique for *Loveridgelaps* in the following properties: its length when everted is 10 subcaudals (versus 9 or less for all other species), it is forked at subcaudal number 9, versus 8 or less for all other species, and the sulcus is forked at subcaudal number 7 or 8.

**Distribution:** Malaita Island in the Solomon Islands.

**Etymology:** Named in honour of Fia Cumming, former investigative journalist, of Lyons, ACT, Australia, formerly of Chatswood, NSW, for her enormous contributions to wildlife conservation in Australia as detailed in the book *Smuggled-2: wildlife Trafficking, Crime and Corruption in Australia* (Hoser, 1996).
The previous naming of one or more taxa in her honour as "*cummingi*" in the masculine, was deliberate as in Australian slang language "it took balls', an alleged male quality to take the enormous personal risks and costs she endured when publishing her detailed expose's of wildlife crime in Australia, and so the name "*cummingi*" as proposed by Hoser (1998) and/or elsewhere, should not be amended unless mandatory according to the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

**NOTES ON THE DESCRIPTIONS FOR ANY POTENTIAL REVISORS**

Unless mandated by the rules of the *International Code of Zoological Nomenclature*, none of the spellings of the newly proposed names should be altered in any way. Should one or more newly named taxa be merged by later authors to be trated as single species, the order of prority of retention of names should be as follows: *sloppi*; *josephburkei*; *yeomansi*; *fiacummingae*, which is the order (page priority) of the descriptions within this text.

**REFERENCES CITED**

Adler, G. H., Austin, C. C. and Dudley, R. 1995. Dispersal and speciation of skinks among archipelagos in the tropical Pacific Ocean. *Evolutionary Ecology* 9:529-541.

Austin, C. C., Rittmeyer, E. N., Richards, S. J. and Zug, G. R. 2010. Phylogeny, historical biogeography and body size evolution in Pacific Island Crocodile skinks *Tribolonotus* (Squamata; Scincidae). *Molecular Phylogenetics and Evolution* 57(1):227-236.

Balsai, M. J. 1995. Husbandry and Breeding of the Solomon Islands Prehensile-tailed Skink, *Corucia zebrata*. *The Vivarium* 7(1):4-11.

Barbour, T. 1921. Reptiles and amphibians from the British Solomon Islands. *Proc. New England zool. Club* 7:91-112.

Boseto, D. and Pikacha, P. (eds) 2016. A. report on baseline biodiversity inventory of Mount Maetambe to Kolobangara River Corridor, Choiseul Island, Solomon Islands. Downloaded from the website of Ecological Solutions Solomon Islands at: http://ecologicalsolutions-si.com/files/110494600.pdf

Boulenger, G. A. 1884. Diagnoses of new reptiles and batrachians from the Solomon Islands, collected and presented to the British Museum by H. B. Guppy, Esq., M. B., H. M. S. 'Lark.'. *Proc. Zool. Soc. London* 1884:210-213.

Boulenger, G. A. 1886. On the reptiles and batrachians of the Solomon Islands. *Trans. Zool. Soc. London* 12:35-62.

Boulenger, G. A. 1890. Fourth contribution to the herpetology of the Solomon Islands. *Proc. Zool. Soc. London* 1890:30-31.

Bruns, T. R., Vedder, J. R. and Cooper, A. K. 1989. Geology of the Shortland Basin Region, Central Solomons Trough, Solomon Islands - Review and New Findings. pp. 125-144 in Vedder, J.G., and Bruns, T. R., (editors), 1989. *Geology and offshore resources of Pacific island arcs Solomon Islands and Bougainville, Papua New Guinea Regions*: Houston, Texas, Circum-Pacific Council for Energy and Mineral Resources, Earth Science Series, v. 12.

Cogger, H. G. 1972. A new scincid lizard of the genus *Tribolonotus* from Manus Island, New Guinea. *Zool. Mededelingen* 47:202-210.

Court of Appeal Victoria. 2014. Hoser v Department of Sustainability and Environment [2014] VSCA 206 (5 September 2014).

Dahl, A. L. 1986. *Review of the protected areas system in Oceania.* IUCN/UNEP, Gland, Switzerland.

Duméril, A. M. C. and Bibron, G. 1839. *Erpétologie Générale on Histoire Naturelle Complète des Reptiles*. Vol.5. Roret/Fain et Thunot, Paris:871 pp.

Gray, J. E. 1856. New genus of fish-scaled lizards (Scissosarae) from New Guinea. *Ann. Mag. Nat. Hist.* (2)18:345-346.

Greer, A. E. 1982. A new species of *Geomyersia* (Scincidae) from the Admirality Islands, with a summary of the genus. *Journal of Herpetology* 16(1):61-66.

Greer, A. E. and Parker, F. 1967. A new scincid lizard from the northern Solomon Islands. *Breviora* (275):1-20.

Greer, A. E. and Simon, M. 1982. *Fojia bumui*, an unusual new genus and species of scincid lizard from New Guinea. *Journal of Herpetology* 16(2):131-139.

Hagen, I. J., Donnellan, S. C. and Bull, M. 2012. Phylogeography of the prehensile-tailed skink *Corucia zebrata* on the Solomon Archipelago. *Ecology and Evolution* (2012), 2(6):1220-1234.

Hall, R., 2002. Cenozoic geological and plate tectonic evolution of SE Asia and the SW Pacific: computer-based reconstructions, model and animations. *J. Asian Earth Sci.* 20:353-431.

Hoser, R. T. 1996. *Smuggled-2: wildlife Trafficking, Crime and Corruption in Australia.* Kotabi P/L., Doncaster, Victoria, 3108, Australia:260 pp.

Hoser, R. T. 1998. Death Adders (Genus *Acanthophis*): An overview, including descriptions of Five new species and One subspecies. *Monitor - Journal of the Victorian Herpetological Society* 9(2):20-41.

Hoser, R. T. 2012. *Yeomansus*: A New Genus for the Slender Racer (Serpentes:Colubridae). *Australasian Journal of Herpetology* 14:3-5.

Iskandar, D. T. and Erdelen, W. R. 2006. Conservation of amphibians and reptiles in Indonesia: issues and problems. *Amphibian and Reptile Conservation* 4(1):60-87.

Keogh, S. J., Scott, A. W., Fitzgerald, M. and Shine, R. 2003. Molecular phylogeny of the Australian venomous snake genus *Hoplocephalus* (Serpentes, Elapidae) and conservation genetics of the threatened *H. stephensii*. *Conservation Genetics* 4:57-65.

Kinghorn, J. R. 1928. Herpetology of the Solomon Islands. *Rec. Austral. Mus.* 16:123-178.

Kinghorn, J. R. 1937. A new species of skink from the Solomon Islands. *Records of the Australian Museum* 20(1):1-2.

McCoy, M. 1980. *Reptiles of the Solomon Islands*. Wau Ecology Institute Handbook 7. Wau Ecology Institute, Wau, Papua New Guinea.

McCoy, M. 2006. *Reptiles of the Solomon Islands*. Pensoft Series Faunistica 57:212 pp.

McDowell, S. B. 1970. On the status and relationships of the Solomon Island elapid snakes. *Journal of Zoology*, London 161:145-190.

Mys, B. 1988. The zoogeography of the scincid lizards from North Papua New Guinea (Reptilia: Scincidae). I. The distribution of the species. *Bull. Inst. Roy. Sci. Nat. Belgique* (Biologie) 58:127-183.

Ogilby, J. D. 1890. Report on a zoological collection from the Solomon Islands. Part 2. *Rec. Austr. Mus.* 1:5-7.

Pianka, E. R. and Vitt, L. J. 2003. *Lizards - Windows to the Evolution of Diversity.* University of California Press, Berkeley:347 pp.

Pyron, R. A., Burbrink, F. T. and Wiens, J. J. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. *BMC Evolutionary Biology* 13:93.

Reeder, T. W. 2003. A phylogeny of the Australian *Sphenomorphus* group (Scincidae: Squamata) and the phylogenetic placement of the crocodile skinks (*Tribolonotus*): Bayesian approaches to assessing congruence and obtaining confidence in maximum likelihood inferred relationships. *Molecular Phylogenetics and Evolution* 27:384-397.

Ride, W. D. L. (*ed.*) *et al.* (on behalf of the International Commission on Zoological Nomenclature) 1999. *International code of Zoological Nomenclature* (Fourth edition). The Natural History Museum - Cromwell Road, London SW7 5BD, UK (also commonly cited as "The Rules", "Zoological Rules" or "ICZN 1999").

Rittmeyer, E. N. and Austin, C. C. 2015. Combined next-generation sequencing and morphology reveal fine-scale speciation in Crocodile Skinks (Squamata: Scincidae: *Tribolonotus*). *Mol Ecol.* 2015 Jan, 24(2):466-83. doi: 10.1111/mec.13030. Epub 2015 Jan 9.

Russell, E. and Coupe, S. 1984. *The Macquarie World Illustrated Atlas*. Kevin Weldon, Macquarie Library, Chatswood, NSW, Australia:511 pp.

Schmidt, K. P. 1932. Reptiles and Amphibians from the Solomon Islands. *Field Mus. Nat. Hist. Zool. Ser.* 18(9):175-190.

Victorian Civil and Administrative Tribunal (VCAT). 2015. *Hoser v Department of Environment Land Water and Planning* (Review and Regulation) [2015] VCAT 1147 (30 July 2015).

Williams, E. E. and Parker, F. 1964. The snake, genus *Parapistocalamus* on Bougainville, Solomon Islands. *Senckenberg. biol.* 45:543-552.

Zweifel, R. G. 1966. A New Lizard of the Genus *Tribolonotus* (Scincidae) from New Britain. *American Museum Novitates* 2264:1-12.

**CONFLICT OF INTEREST**

The author has no known conflicts of interest in terms of this paper and conclusions within.

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