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In praise of subgenera, with ethics and within the rules of Zoology: taxonomic status of the snake genera *Calliophis* Gray, 1835, *Liophidium* Boulenger, 1896 and *Liopholidophis* Mocquard, 1904 (Serpentes).

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ABSTRACT

The use of subgenera to define well defined clades within genera has been little used by herpetologists in recent years.

Against that trend, in March 2009 Hoser reclassified Rattlesnakes (Crotalidae:Crotalini) and made substantial use of subgenera to define various groups. Quite properly, Hoser applied the rules of the Zoological Code (Ride *et al.* 1999) when he resurrected available names to define appropriate groups.

Also in March 2009, Hoser reclassified the True Cobras.

The following September, Wallach, Wüster and Broadley (2009), used the same concept to define a group of True Cobras, taking a leaf from Hoser's book and defining a subgenus.

However, they openly plagiarized Hoser's earlier paper and then unethically proposed a name in violation of the rules of Zoology.

The later authors renamed a Hoser genus as a subgenus, knowing full-well that Hoser had erected a valid name six months earlier.

The improper action of Wallach, Wüster and Broadley was justified with the obviously false claim that the original Hoser publication hadn't been published according to the Zoological Code.

Co-author Van Wallach had committed the same offence against other herpetologists twice previously, renaming genera properly named by the earlier authors (Fitzinger and Wells and Wellington).

More serious, were the later calls by Wolfgang Wüster and 8 others in 2013 in *Journal of Herpetology* (Kaiser *et al.* 2013) to other herpetologists to do the same thing for names they knew were valid according to the Zoological Code. Their reckless actions have now threated the entire science of zoology.

This paper reviews the taxonomic status of the snake genera *Calliophis* Gray, 1834, *Liophidium* Boulenger, 1896 and *Liopholidophis* Mocquard, 1904 and makes use of subgenera to define obvious morphological and phylogenetic groups.

However unlike the actions of Wüster and his associate Van Wallach, who continually break the rules to rename validly named taxa, this reclassification is ethical and within the rules. Therefore when a pre-existing name is available for a given group of species, it is in fact used in accordance with the zoological code.

Where no names are available, names are properly proposed and defined according to the Zoological Rules.

In terms of the relevant genera, existing available names are used and five subgeneric group names are also formally defined for the first time.

Keywords: Taxonomy; Snakes; Genus; *Calliophis*; *Liophidium*; *Liopholidophis*; Subgenus: *Doliophis*; *Swilea; Paulstokesus*; *Benmooreus*; *Mattborgus*; *Chrisnewmanus*.

INTRODUCTION

The use of subgenera to define well defined clades within genera has been little used by herpetologists in recent years.

While there is little agreement among herpetologists as to what defines a subgenus, most herpetologists who use the taxonomic level, define it along the lines of a group of species that are alike and yet clearly distinct from others in the same genus.

Usually, but not always, subgenera consist of more than one species, or alternatively, the nominate genus group will instead, even when the subgenus is removed.

As an exception to this, subgenera are sometimes defined for single species when they are quite divergent from others, or even one other in the genus, but the divergence does not quite make the level of genus level division according to the general criteria applied.

Subgenus may be applied when the divergence sits at the very borderline of where a genus would normally be defined, or the so-called "line in the sand".

The three genera *Calliophis* Gray, 1834, *Liophidium* Boulenger, 1896 and *Liopholidophis* Mocquard, 1904 as recognized at start 2013 all contain a number of species.

Within each genus are distinctive species groups, defined both morphologically and genetically.

Recent phylogenetic studies have confirmed the relationships between component species within the genera to show that the given species groups sit on the very cusp of what herpetologists would normally define as genera.

Noting the inertia of many herpetologists to so-called new taxonomy, these groups are defined within this paper for the first time ever as subgenera.

This allows for the given species groups to have proper taxonomic recognition according to the Zoological Code (Ride *et al.* 2009) and at the same time maintain stability for those herpetologists accustomed to calling these species by their currently known names.

Each of the three genera are dealt with separately below.

***CALLIOPHIS* GRAY, 1835.**

Calliophis Gray, 1835 is a genus with a checkered taxonomic history.

These snakes are generally known as Asian Coral snakes and are within the family Elapidae.

For many years, two or more species were placed in the genus *Maticora* Gray, 1834, which was according to Boulenger (1896) a nomen nudem.

Generally known as the long-glanded Coral Snakes, a distinctive feature of these particular snakes was the extremely elongated venom gland in two species that stretched way beyond the skull of the snake. *Maticora lineata* Gray, 1834 is the type species of the genus *Maticora* Gray, 1834, although that species was later synonymised with the species *Aspis intestinalis* Laurenti, 1768, better known as *Calliophis intestinalis* Laurenti, 1768.

Until the early 1900's many names were either proposed or in use for the Asian Coral Snakes, including of course *Calliophis* Gray, 1835 or *Maticora* Gray, 1834, as well as other names, the rest invariably being used for other taxa and in turn split off from this genus, although a number of authors used the name *Doliophis* Girard, 1857 for the snakes assigned to *Maticora* (Boulenger 1896).

By the late 1900's, *Calliophis* had become restricted to about a dozen known species and *Maticora*, (in common usage) just two.

In 2001, Slowinski *et al.* published a phylogenetic assessment of the Asian Coral snakes resulting in a reclassification of the group as then known.

They split off north-east Asian species and placed them in a new genus, *Sinomicrurus*. That genus was later split in 2012, by Hoser to include a new genus *Funkelapidus* for a small number of species (Hoser 2012b).

In 2001, Slowinski *et al.* also merged *Calliophis* and *Doliophis/Maticora* into the single genus *Calliophis*. They also removed the Phillippine species *Elaps calligaster* Wiegmann, 1834 from the genus and placed it in the available genus *Hemibungarus* Peters, 1862, effectively made monotypic.

Excluding the 2012 removal of species to the genus *Funkelapidus*, the Slowinski *et al.* taxonomy has been little changed in the period since 2001.

Notwithstanding this, further studies of both morphology, habits and molecular phylogenies produced, have all indicated that *Calliophis* as recognized at the genus level is effectively paraphyletic.

Taking a conservative position, the various species groups within *Calliophis* as recognized at the start of 2013 are herein accorded taxonomic recognition at the subgenus level for the first time.

There are of course five well defined species groups within the genus *Calliophis* as defined by Slowinski *et al.* (2001) as defined by previous authors including Boulenger (1896), McDowell (1986), Slowinski *et al.* (2001) and Smith *et al.* (2008, 2012).

Furthermore I note herein that further studies may well result in these subgenera being elevated to full genus-level groups at a later date, in line with the potentially too conservative position taken within this paper.

In accordance with the Zoological Code (Ride *et al.* 1999), I am bound by the critically important rules of 1/ Homonymy (Principal 5, Article 52 and elsewhere), 2/ Priority (Principal 3, Article 23 and elsewhere) and 3/ Stability (Principal 4, Articles 23, 65 and elsewhere) and the ethics of the Code (Section A).

This means that I must use (resurrect) available names for given taxa, if accorded the relevant recognition at levels above that of species. That is, if I intend moving them out of the genus *Calliophis* Gray, 1834, and another genus name is available, I must use it.

As a result and acting with proper ethics, I hereby transfer two species to the genus *Doliophis* Girard, 1857.

While the name *Doliophis* Girard, 1857 is a junior synonym of *Maticora* Gray, 1834, Gray did not provide a diagnosis for the genus and therefore the first name (*Maticora*) is invalid (see Boulenger 1896).

For the other three species groups, there are no available names, so in accordance with the Zoological Code, I hereby assign names to each of them, namely, *Paulstokesus subgen. nov., Benmooreus subgen. nov* and *Swilea subgen. nov.*.

This in effect means that the genus *Calliophis* Gray, 1834, has been effectively divided five ways.

As a result, I hereby redefine the genus as a whole and then formally describe the five component subgenera.

Important published studies on *Calliophis* as as defined by most authors to 2013 (including *Maticora* and *Hemibungarus*) include, Auliya (2006), Bahir (1999), Beddome (1864), Bernhard-Meyer (1869), Blackburn (1993), Bleeker (1959), Boie (1827), Bong Heang (1987), Boulenger (1890, 1894, 1896), Brongersma (1948), Castoe *et al.* (2007), Chan-ard *et al.* (1999), Cox *et al.* (1998), Daan and Hillenius (1966), D'Abreu (1913), Das and De Silva (2005), David and Vogel (1996), Deepak *et al.* (2010), Deraniyagala (1951), Duméril and Bibron (1835), Duméril *et al.* (1854), Fischer (1886), Gaulke (1994, 1999), Grandison (1972), Gray (1835), Grismer *et al.* (2010), Günther (1859a, 1862), Guptha and Rajasekhar (2011), Hien *et al.* (2001), Hoser (2012b), Jacobson (1937), Jan (1858), Kannan (2006), Kopstein (1938), Laurenti (1768), Leviton (1964), Leviton *et al.* (2003), Lim and Ng (1999), Lobo (2006), Phipson (1887), Pyron *et al.* (2011, 2013), Loveridge (1944), Malkmus (1985), Malkmus *et al.* (2002), Manthey (1983), Manthey and Grossmann (1997), McDowell (1986), Mirza and Ahmed (2009), Mirza and Pal (2010), Murthy (2010), Nguyen and Ziegler (2010), Orlov *et al.* (2003, 2009), Peters (1881), Sang *et al.* (2009), Sharma (2004), Shaw (1802), Shine and Nameer (2012), Slowinski *et al.* (2001), Smedley (1931), Smith (1993), Smith (1943), Smith *et al.* (2008, 2012), Somaweera (2006), Suranjan Karunarathna and Thasun Amarasinghe (2011), Taylor (1922, 1950, 1965), Teo and Rajathurai (1997), Tiedemann and Grillitsch (1999), Tweedie (1950), van Rooijen and van Rooijen (2004, 2007), Vogel and Freed (2006), Vyas (1998, 2007), Wall (1906, 1913, 1928), Whitaker and Captain (2004), and sources cited therein.

Hoser (2012b) provides a list of definitive references in terms of the genera *Sinomicrurus* and *Funkelapidus*.

GENUS *CALLIOPHIS* GRAY, 1834.

Type species: *Calliophis gracilis* Gray, 1835.

Diagnosis: Snakes of the genus *Calliophis* are separated from all other elapid snakes by the following suite of characters: Maxillary extends fowards beyond the palatine, with a pair of large grooved poison-fangs, but no other obvious teeth; mandibular teeth are subequal. Praefrontal bones in contact with each other on the median line. Head is small and not distinct from the neck. Eye is small with a round pupil; nostril is between two nasals; no loreal. Body cylindrical and very elongate. Scales are smooth, without pits in 13 midbody rows. Ventrals are rounded. The tail is short and the subcaudals are divided.

The Asian genera *Sinomicrurus* Slowinski *et al.* 2001 and *Funkelapidus* Hoser, 2012 are separated from *Calliophis* by the following: A well-developed medial fold bordering the basal pocket of the hemipenis and protruberant sclerified tail tip used defensively. Further distinguished from *Calliophis* by lacking the postorbital bone, having a bipartite AES muscle origin (dorsal origin on partietal bone and ventral origin on anterior venom gland), and a strongly bifurcated hemipenis ornamented only with spines and possessing the basal pocket.

The Phillippine species within the genus *Hemibungarus* (*H. calligaster*, being monotypic for the genus) is separated from *Calliophis* by the following: 1/1 temporal formula; a raised sixth supralabial; colouration generally characterized by black dyads set on a red ground colour, commonly obscured by melanism; *Hemibungarus* is the only Asian Coral Snake characterised by a pattern of black bands or rings occurring in pairs.

The nominate subgenus *Calliophis*, is monotypic for the type species *Calliophis gracilis* Gray, 1835 and is readily separated from all other subgenera by the higher ventral count, being over 303, versus less than 293 for all other species.

The subgenus of *Calliophis*, subgenus *Doliophis*, consisting of the species *Calliophis* (*Doliophis*) *intestinalis* (Laurenti, 1768), and *Calliophis* (*Doliophis*) *bivirgata* (Boie, 1827), the type species, are readily separated from all other *Calliophis* by the nature of the development of their venom glands.

Instead of being confined to the temporal region, they extend along each side of the body for about one fifth of its length, gradually thickening and terminating in front of the heart with club-shaped ends. The presence of these glands may be easily detected without dissection by feeling the thickening and rigidity of the cardiac region in the beginning of the second fifth to third of the body, the heart being shifted back somewhat as compared to other snakes due to the extreme extensions of the venom glands.

The subgenus *Swilea subgen. nov*. is most readily separated from all other *Calliophis* by by the ventral count always being lower than 203, versus 212 or more in the rest.

The subgenus *Swilea subgen. nov*. is further separated from all other *Calliophis* by the following suite of characters: Body scales in 13 parallel longitudinal rows, not obliquely disposed; middorsal (vertebral) scales not enlarged; preocular in contact with nasal; males 174-186 ventrals, females 189-203 ventrals; males 25-31 subcaudals, females 21-25 subcaudals; 7 supralabials, anal divided, body above is brown to reddish brown, with black spots, the latter arranged longitudinally along each side of the back; head and nape black with some yellow markings including a yellow spot on each side of the occiput; upper labials yellow; tail, below, pale blue or gray. Total length 1300 mm; tail length 150 mm (Leviton *et al.* 2003, Slowinski *et al.* 2001).

The hemipenes in this subgenus are different to those of other *Calliophis*. In *Swilea*, the hemipenis is relatively longer and narrower than that of other *Calliophis.*

Unlike other *Calliophis*, the hemipenis of *Swilea* is characterized by having no terminal furcation of the sulcus, a plush of fine spinules on the tip of the organ and longitudinal zigzag plicae proximal to this distal plush of spinules.

Paulstokesus subgen. nov. are separated from all other *Calliophis* by having a small and spinous hemipenis with only slight terminal bilobation, short *sulcus* furcation, and no associated basal pocket.

Paulstokesus subgen. nov. are further separated from all other *Calliophis* by the following suite of characters: Rostral broader than deep, frontal as long as its distance

from the end of the snout and much shorter than the parietals; one praeocular and two postoculars; a single temporal; seven (rarely 8) upper labials, six lower labials, third and fourth entering the eye; anterior chin-shields as long as the posterior or a bit shorter, in contact with four labials. 13 mid-body rows, 218-254 ventrals; anal usually divided; 33-53 divided subcaudals.

Colouration may be one or other of three of the following:

1/ various colour varieties which are connected by insensible gradations; head and nape usually black, with an oblique yellow band, sometimes broken up into spots on each side from the parietals to behind the angle of the mouth. Upper lip yellow in front of and behind the eye; lower parts uniform red or orangeish (*Calliophis* (*Paulstokesus*) *nigrescens* (Günther, 1862)), or alternatively:

2/ having unicolored and dark body and tail dorsa, an orange head band, a salmon color to scarlet body and tail underside, no dark pigmentation on the last supralabial, and a wide post-temporal band (*Calliophis* (*Paulstokesus*) *castoe* Smith, Ogale, Deepak and Giri, 2012), or:

Dark purplish brown or blackish brown on the back with three or five longitudinal series of black light-edged spots (*Calliophis* (*Paulstokesus*) *beddomei* Smith, 1943).

Paulstokesus subgen. nov. is separated from *Benmoreus subgen. nov.* by the fact that the posterior levitor anguli oris ends on the venom gland, versus ending on the jaw in *Benmoreus subgen. nov.*

Benmoreus subgen. nov. is separated from *Paulstokesus subgen. nov* by the presence of a bluish ventral tail color and melanized tail base muscles and associated tissues.

Distribution: Southern Asia.

Content: *Calliophis intestinalis* (Laurenti, 1768)(Type species); *Calliophis beddomei* Smith, 1943; *Calliophis bibroni* (Jan, 1858); *Calliophis bivirgata* (Boie, 1827); *Calliophis castoe* Smith, Ogale, Deepak and Giri, 2012; *Calliophis gracilis* Gray, 1835; *Calliophis haematoetron* Smith, Manamendra-Arachchi and Somaweera, 2008; *Calliophis maculiceps* (Günther, 1858); *Calliophis melanurus* (Shaw, 1802); *Calliophis nigrescens* (Günther, 1862).

SUBGENUS *CALLIOPHIS* GRAY, 1834

Type species: *Calliophis gracilis* Gray, 1835.

Diagnosis: The nominate subgenus *Calliophis*, is monotypic for the type species *Calliophis gracilis* Gray, 1835 and is readily separated from all other subgenera by the higher ventral count, being over 303, versus less than 293 for all other species.

The subgenus of *Calliophis*, subgenus *Doliophis*, consisting of the species *Calliophis* (*Doliophis*) *intestinalis* (Laurenti, 1768), the type species and *Calliophis* (*Doliophis*) *bivirgata* (Boie, 1827), are readily separated from all other *Calliophis* by the nature of the development of their venom glands.

Instead of being confined to the temporal region, they extend along each side of the body for about one fifth of its length, gradually thickening and terminating in front of the heart with club-shaped ends. The presence of these glands may be easily detected without dissection by feeling the thickening and rigidity of the cardiac region in the beginning of the second fifth to third of the body, the heart being shifted back somewhat as compared to other snakes due to the extreme extensions of the venom glands.

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The subgenus *Swilea subgen. nov*. is further separated from all other *Calliophis* by the following suite of characters: Body scales in 13 parallel longitudinal rows, not obliquely disposed; middorsal (vertebral) scales not enlarged; preocular in contact with nasal; males 174-186 ventrals, females 189-203 ventrals; males 25-31 subcaudals, females 21-25 subcaudals; 7 supralabials, anal divided, body above is brown to reddish brown, with black spots, the latter arranged longitudinally along each side of the back; head and nape black with some yellow markings including a yellow spot on each side of the occiput; upper labials yellow; tail, below, pale blue or gray. Total length 1300 mm; tail length 150 mm (Leviton *et al.* 2003, Slowinski *et al.* 2001).

The hemipenes in this subgenus are different to those of other *Calliophis*. In *Swilea*, the hemipenis is relatively longer and narrower than that of other *Calliophis.*

Unlike other *Calliophis*, the hemipenis of *Swilea* is characterized by having no terminal furcation of the sulcus, a plush of fine spinules on the tip of the organ and longitudinal zigzag plicae proximal to this distal plush of spinules.

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Paulstokesus subgen. nov. are further separated from all other *Calliophis* by the following suite of characters: Rostral broader than deep, frontal as long as its distance from the end of the snout and much shorter than the parietals; one praeocular and two postoculars; a single temporal; seven (rarely 8) upper labials, six lower labials, third and fourth entering the eye; anterior chin-shields as long as the posterior or a bit shorter, in contact with four labials. 13 mid-body rows, 218-254 ventrals; anal usually divided; 33-53 divided subcaudals.

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2/ having unicolored and dark body and tail dorsa, an orange head band, a salmon color to scarlet body and tail underside, no dark pigmentation on the last supralabial, and a wide post-temporal band (*Calliophis* (*Paulstokesus*) *castoe* Smith, Ogale, Deepak and Giri, 2012), or:

Dark purplish brown or blackish brown on the back with three or five longitudinal series of black light-edged spots

(*Calliophis* (*Paulstokesus*) *beddomei* Smith, 1943).

Paulstokesus subgen. nov. is separated from *Benmoreus subgen. nov.* by the fact that the posterior levitor anguli oris ends on the venom gland, versus ending on the jaw in *Benmoreus subgen. nov.*

Benmoreus subgen. nov. is separated from *Paulstokesus subgen. nov* by the presence of a bluish ventral tail color and melanized tail base muscles and associated tissues.

Snakes of the genus *Calliophis* are separated from all other elapid snakes by the following suite of characters: Maxillary extends fowards beyond the palatine, with a pair of large grooved poison-fangs, but no other obvious teeth; mandibular teeth are subequal. Praefrontal bones in contact with each other on the median line. Head is small and not distinct from the neck. Eye is small with a round pupil; nostril is between two nasals; no loreal. Body cylindrical and very elongate. Scales are smooth, without pits in 13 midbody rows. Ventrals are rounded. The tail is short and the subcaudals are divided.

The Asian genera *Sinomicrurus* Slowinski *et al.* 2001 and *Funkelapidus* Hoser, 2012 are separated from *Calliophis* by the following: A well-developed medial fold bordering the basal pocket of the hemipenis and protruberant sclerified tail tip used defensively. Further distinguished from *Calliophis* by lacking the postorbital bone, having a bipartite AES muscle origin (dorsal origin on partietal bone and ventral origin on anterior venom gland), and a strongly bifurcated hemipenis ornamented only with spines and possessing the basal pocket.

The Phillippine species within the genus *Hemibungarus* (*H. calligaster*, being monotypic for the genus) is separated from *Calliophis* by the following: 1/1 temporal formula; a raised sixth supralabial; colouration generally characterized by black dyads set on a red ground colour, commonly obscured by melanism; *Hemibungarus* is the only Asian Coral Snake characterised by a pattern of black bands or rings occurring in pairs.

Content: *Calliophis intestinalis* (Laurenti, 1768) monotypic for the subgenus.

SUBGENUS *DOLIOPHIS* GIRARD, 1857

Type species: *Doliophis flaviceps* Girard, 1857.

Currently most widely known as: *Calliophis bivirgata* (Boie, 1827).

Diagnosis: The subgenus *Doliophis*, consisting of the species *Calliophis* (*Doliophis*) *intestinalis* (Laurenti, 1768) and *Calliophis* (*Doliophis*) *bivirgata* (Boie, 1827), the type species, are readily separated from all other *Calliophis* by the nature of the development of their venom glands.

Instead of being confined to the temporal region, they extend along each side of the body for about one fifth of its length, gradually thickening and terminating in front of the heart with club-shaped ends. The presence of these glands may be easily detected without dissection by feeling the thickening and rigidity of the cardiac region in the beginning of the second fifth to third of the body, the heart being shifted back somewhat as compared to other snakes due to the extreme extensions of the venom glands.

The nominate subgenus *Calliophis*, is monotypic for the type species *Calliophis gracilis* Gray, 1835 and is readily separated from all other subgenera by the higher ventral count, being over 303, versus less than 293 for all other species.

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The hemipenes in this subgenus are different to those of other *Calliophis*. In *Swilea*, the hemipenis is relatively longer and narrower than that of other *Calliophis.*

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Colouration may be one or other of three of the following:

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2/ having unicolored and dark body and tail dorsa, an orange head band, a salmon color to scarlet body and tail underside, no dark pigmentation on the last supralabial, and a wide post-temporal band (*Calliophis* (*Paulstokesus*) *castoe* Smith, Ogale, Deepak and Giri, 2012), or:

Dark purplish brown or blackish brown on the back with three or five longitudinal series of black light-edged spots (*Calliophis* (*Paulstokesus*) *beddomei* Smith, 1943).

Paulstokesus subgen. nov. is separated from *Benmoreus*

subgen. nov. by the fact that the posterior levitor anguli oris ends on the venom gland, versus ending on the jaw in *Benmoreus subgen. nov.*

Benmoreus subgen. nov. is separated from *Paulstokesus subgen. nov* by the presence of a bluish ventral tail color and melanized tail base muscles and associated tissues.

Snakes of the genus *Calliophis* are separated from all other elapid snakes by the following suite of characters: Maxillary extends fowards beyond the palatine, with a pair of large grooved poison-fangs, but no other obvious teeth; mandibular teeth are subequal. Praefrontal bones in contact with each other on the median line. Head is small and not distinct from the neck. Eye is small with a round pupil; nostril is between two nasals; no loreal. Body cylindrical and very elongate. Scales are smooth, without pits in 13 midbody rows. Ventrals are rounded. The tail is short and the subcaudals are divided.

The Asian genera *Sinomicrurus* Slowinski *et al.* 2001 and *Funkelapidus* Hoser, 2012 are separated from *Calliophis* by the following: A well-developed medial fold bordering the basal pocket of the hemipenis and protruberant sclerified tail tip used defensively. Further distinguished from *Calliophis* by lacking the postorbital bone, having a bipartite AES muscle origin (dorsal origin on partietal bone and ventral origin on anterior venom gland), and a strongly bifurcated hemipenis ornamented only with spines and possessing the basal pocket.

The Phillippine species within the genus *Hemibungarus* (*H. calligaster*, being monotypic for the genus) is separated from *Calliophis* by the following: 1/1 temporal formula; a raised sixth supralabial; colouration generally characterized by black dyads set on a red ground colour, commonly obscured by melanism; *Hemibungarus* is the only Asian Coral Snake characterised by a pattern of black bands or rings occurring in pairs.

Distribution: South-east Asia, not including China or the Indian subcontinent.

Content: *Calliophis* (*Doliophis*) *intestinalis* (Laurenti, 1768)(Type species); *Calliophis* (*Doliophis*) *bivirgata* (Boie, 1827).

SUBGENUS *SWILEA SUBGEN. NOV.*

Type species: *Elaps maculiceps* Günther, 1858.

Currently most widely known as: *Calliophis maculiceps* (Günther, 1858).

Diagnosis: The subgenus *Swilea subgen. nov*. is most readily separated from all other *Calliophis* by by the ventral count always being lower than 203, versus 212 or more in the rest.

The subgenus *Swilea subgen. nov*. is further separated from all other *Calliophis* by the following suite of characters: Body scales in 13 parallel longitudinal rows, not obliquely disposed; middorsal (vertebral) scales not enlarged; preocular in contact with nasal; males 174-186 ventrals, females 189-203 ventrals; males 25-31 subcaudals, females 21-25 subcaudals; 7 supralabials, anal divided, body above is brown to reddish brown, with black spots, the latter arranged longitudinally along each side of the back; head and nape black with some yellow markings including a yellow spot on each side of the occiput; upper labials yellow; tail, below, pale blue or gray. Total length 1300 mm; tail length 150 mm (Leviton *et al.* 2003, Slowinski *et al.* 2001).

The hemipenes in this subgenus are different to those of other *Calliophis*. In *Swilea*, the hemipenis is relatively longer and narrower than that of other *Calliophis.*

Unlike other *Calliophis*, the hemipenis of *Swilea* is characterized by having no terminal furcation of the sulcus, a plush of fine spinules on the tip of the organ and longitudinal zigzag plicae proximal to this distal plush of spinules.

The subgenus *Doliophis*, consisting of the species *Calliophis* (*Doliophis*) *intestinalis* (Laurenti, 1768), and *Calliophis* (*Doliophis*) *bivirgata* (Boie, 1827), the type species, are readily separated from all other *Calliophis* by the nature of the development of their venom glands.

Instead of being confined to the temporal region, they extend along each side of the body for about one fifth of its length, gradually thickening and terminating in front of the heart with club-shaped ends. The presence of these glands may be easily detected without dissection by feeling the thickening and rigidity of the cardiac region in the beginning of the second fifth to third of the body, the heart being shifted back somewhat as compared to other snakes due to the extreme extensions of the venom glands.

The nominate subgenus *Calliophis*, is monotypic for the type species *Calliophis gracilis* Gray, 1835 and is readily separated from all other subgenera by the higher ventral count, being over 303, versus less than 293 for all other species.

Paulstokesus subgen. nov. are separated from all other *Calliophis* by having a small and spinous hemipenis with only slight terminal bilobation, short *sulcus* furcation, and no associated basal pocket.

Paulstokesus subgen. nov. are further separated from all other *Calliophis* by the following suite of characters: Rostral broader than deep, frontal as long as its distance from the end of the snout and much shorter than the parietals; one praeocular and two postoculars; a single temporal; seven (rarely 8) upper labials, six lower labials, third and fourth entering the eye; anterior chin-shields as long as the posterior or a bit shorter, in contact with four labials. 13 mid-body rows, 218-254 ventrals; anal usually divided; 33-53 divided subcaudals.

Colouration may be one or other of three of the following:

1/ various colour varieties which are connected by insensible gradations; head and nape usually black, with an oblique yellow band, sometimes broken up into spots on each side from the parietals to behind the angle of the mouth. Upper lip yellow in front of and behind the eye; lower parts uniform red or orangeish (*Calliophis* (*Paulstokesus*) *nigrescens* (Günther, 1862)), or alternatively:

2/ having unicolored and dark body and tail dorsa, an orange head band, a salmon color to scarlet body and tail underside, no dark pigmentation on the last supralabial, and a wide post-temporal band (*Calliophis* (*Paulstokesus*) *castoe* Smith, Ogale, Deepak and Giri, 2012), or:

Dark purplish brown or blackish brown on the back with three or five longitudinal series of black light-edged spots (*Calliophis* (*Paulstokesus*) *beddomei* Smith, 1943).

Paulstokesus subgen. nov. is separated from *Benmoreus subgen. nov.* by the fact that the posterior levitor anguli oris ends on the venom gland, versus ending on the jaw in *Benmoreus subgen. nov.*

Benmoreus subgen. nov. is separated from *Paulstokesus subgen. nov* by the presence of a bluish ventral tail color and melanized tail base muscles and associated tissues.

Snakes of the genus *Calliophis* are separated from all other elapid snakes by the following suite of characters: Maxillary extends fowards beyond the palatine, with a pair of large grooved poison-fangs, but no other obvious teeth; mandibular teeth are subequal. Praefrontal bones in contact with each other on the median line. Head is small and not distinct from the neck. Eye is small with a round pupil; nostril is between two nasals; no loreal. Body cylindrical and very elongate. Scales are smooth, without pits in 13 midbody rows. Ventrals are rounded. The tail is short and the subcaudals are divided.

The Asian genera *Sinomicrurus* Slowinski *et al.* 2001 and *Funkelapidus* Hoser, 2012 are separated from *Calliophis* by the following: A well-developed medial fold bordering the basal pocket of the hemipenis and protruberant sclerified tail tip used defensively. Further distinguished from *Calliophis* by lacking the postorbital bone, having a bipartite AES muscle origin (dorsal origin on partietal bone and ventral origin on anterior venom gland), and a strongly bifurcated hemipenis ornamented only with spines and possessing the basal pocket.

The Phillippine species within the genus *Hemibungarus* (*H. calligaster*, being monotypic for the genus) is separated from *Calliophis* by the following: 1/1 temporal formula; a raised sixth supralabial; colouration generally characterized by black dyads set on a red ground colour, commonly obscured by melanism; *Hemibungarus* is the only Asian Coral Snake characterised by a pattern of black bands or rings occurring in pairs.

Distribution: Mainland south-east Asia.

Etymology: Named in honour of Verona (Vona) Swile, of Athlone, Cape Town, South Africa, for various contributions to African herpetology.

Swile is an African word meaning “hairy feet”.

Content: *Calliophis* (*Swilea*) *maculiceps* Günther, 1858 (monotypic for the subgenus).

SUBGENUS *PAULSTOKESUS SUBGEN. NOV.*

Type species: *Callophis nigrescens* Günther, 1862.

Currently generally known as *Calliophis nigrescens* (Günther, 1862).

Diagnosis: *Paulstokesus subgen. nov.* are separated from all other *Calliophis* by having a small and spinous hemipenis with only slight terminal bilobation, short *sulcus* furcation, and no associated basal pocket.

Paulstokesus subgen. nov. are further separated from all other *Calliophis* by the following suite of characters: Rostral broader than deep, frontal as long as its distance from the end of the snout and much shorter than the parietals; one praeocular and two postoculars; a single temporal; seven (rarely 8) upper labials, six lower labials, third and fourth entering the eye; anterior chin-shields as long as the posterior or a bit shorter, in contact with four labials. 13 mid-body rows, 218-254 ventrals; anal usually divided; 33-53 divided subcaudals.

Colouration may be one or other of three of the following:

1/ various colour varieties which are connected by insensible gradations; head and nape usually black, with an oblique yellow band, sometimes broken up into spots on each side from the parietals to behind the angle of the mouth. Upper lip yellow in front of and behind the eye; lower parts uniform red or orangeish (*Calliophis* (*Paulstokesus*) *nigrescens* (Günther, 1862)), or alternatively:

2/ having unicolored and dark body and tail dorsa, an orange head band, a salmon color to scarlet body and tail underside, no dark pigmentation on the last supralabial, and a wide post-temporal band (*Calliophis* (*Paulstokesus*) *castoe* Smith, Ogale, Deepak and Giri, 2012), or:

Dark purplish brown or blackish brown on the back with three or five longitudinal series of black light-edged spots (*Calliophis* (*Paulstokesus*) *beddomei* Smith, 1943).

Paulstokesus subgen. nov. is separated from *Benmoreus subgen. nov.* by the fact that the posterior levitor anguli oris ends on the venom gland, versus ending on the jaw in *Benmoreus subgen. nov.*

Benmoreus subgen. nov. is separated from *Paulstokesus subgen. nov* by the presence of a bluish ventral tail color and melanized tail base muscles and associated tissues.

The subgenus *Swilea subgen. nov*. is most readily separated from all other *Calliophis* by by the ventral count always being lower than 203, versus 212 or more in the rest.

The subgenus *Swilea subgen. nov*. is further separated from all other *Calliophis* by the following suite of characters: Body scales in 13 parallel longitudinal rows, not obliquely disposed; middorsal (vertebral) scales not enlarged; preocular in contact with nasal; males 174-186 ventrals, females 189-203 ventrals; males 25-31 subcaudals, females 21-25 subcaudals; 7 supralabials, anal divided, body above is brown to reddish brown, with black spots, the latter arranged longitudinally along each side of the back; head and nape black with some yellow markings including a yellow spot on each side of the occiput; upper labials yellow; tail, below, pale blue or gray. Total length 1300 mm; tail length 150 mm (Leviton *et al.* 2003, Slowinski *et al.* 2001).

The hemipenes in this subgenus are different to those of other *Calliophis*. In *Swilea*, the hemipenis is relatively longer and narrower than that of other *Calliophis.*

Unlike other *Calliophis*, the hemipenis of *Swilea* is characterized by having no terminal furcation of the sulcus, a plush of fine spinules on the tip of the organ and longitudinal zigzag plicae proximal to this distal plush of spinules.

The subgenus *Doliophis*, consisting of the species *Calliophis* (*Doliophis*) *intestinalis* (Laurenti, 1768), and *Calliophis* (*Doliophis*) *bivirgata* (Boie, 1827), the type species, are readily separated from all other *Calliophis* by the nature of the development of their venom glands.

Instead of being confined to the temporal region, they extend along each side of the body for about one fifth of its length, gradually thickening and terminating in front of the heart with club-shaped ends. The presence of these glands may be easily detected without dissection by

feeling the thickening and rigidity of the cardiac region in the beginning of the second fifth to third of the body, the heart being shifted back somewhat as compared to other snakes due to the extreme extensions of the venom glands.

The nominate subgenus *Calliophis*, is monotypic for the type species *Calliophis gracilis* Gray, 1835 and is readily separated from all other subgenera by the higher ventral count, being over 303, versus less than 293 for all other species.

Snakes of the genus *Calliophis* are separated from all other elapid snakes by the following suite of characters: Maxillary extends fowards beyond the palatine, with a pair of large grooved poison-fangs, but no other obvious teeth; mandibular teeth are subequal. Praefrontal bones in contact with each other on the median line. Head is small and not distinct from the neck. Eye is small with a round pupil; nostril is between two nasals; no loreal. Body cylindrical and very elongate. Scales are smooth, without pits in 13 midbody rows. Ventrals are rounded. The tail is short and the subcaudals are divided.

The Asian genera *Sinomicrurus* Slowinski *et al.* 2001 and *Funkelapidus* Hoser, 2012 are separated from *Calliophis* by the following: A well-developed medial fold bordering the basal pocket of the hemipenis and protruberant sclerified tail tip used defensively. Further distinguished from *Calliophis* by lacking the postorbital bone, having a bipartite AES muscle origin (dorsal origin on partietal bone and ventral origin on anterior venom gland), and a strongly bifurcated hemipenis ornamented only with spines and possessing the basal pocket.

The Phillippine species within the genus *Hemibungarus* (*H. calligaster*, being monotypic for the genus) is separated from *Calliophis* by the following: 1/1 temporal formula; a raised sixth supralabial; colouration generally characterized by black dyads set on a red ground colour, commonly obscured by melanism; *Hemibungarus* is the only Asian Coral Snake characterised by a pattern of black bands or rings occurring in pairs.

Distribution: Indian subcontinent.

Etymology: Named in honour of Paul Stokes, owner of reptile supplies retail outlet, “Amazing Amazon” of Springvale Road, Glen Waverley, Melbourne, Victoria, Australia, in recognition for his many valuable contributions to herpetoculture in Australia.

Content: *Calliophis* (*Paulstokesus*) *nigrescens* (Günther, 1862)(Type species); *Calliophis* (*Paulstokesus*) *beddomei* Smith, 1943; *Calliophis* (*Paulstokesus*) *castoe* Smith, Ogale, Deepak and Giri, 2012.

SUBGENUS *BENMOOREUS SUBGEN. NOV.*

Type species: *Elaps bibroni* Jan, 1858.

Currently generally known as *Calliophis bibroni* (Jan, 1858).

Diagnosis: *Benmoreus subgen. nov.* is best diagnosed by the process of eliminating all other subgenera via identification of them.

Benmoreus subgen. nov. is separated from *Paulstokesus subgen. nov* by the presence of a bluish ventral tail color and melanized tail base muscles and associated tissues.

Paulstokesus subgen. nov. is separated from *Benmoreus subgen. nov.* by the fact that the posterior levitor anguli oris ends on the venom gland, versus ending on the jaw in *Benmoreus subgen. nov.*

Paulstokesus subgen. nov. are separated from all other *Calliophis* by having a small and spinous hemipenis with only slight terminal bilobation, short *sulcus* furcation, and no associated basal pocket.

Paulstokesus subgen. nov. are further separated from all other *Calliophis* by the following suite of characters: Rostral broader than deep, frontal as long as its distance from the end of the snout and much shorter than the parietals; one praeocular and two postoculars; a single temporal; seven (rarely 8) upper labials, six lower labials, third and fourth entering the eye; anterior chin-shields as long as the posterior or a bit shorter, in contact with four labials. 13 mid-body rows, 218-254 ventrals; anal usually divided; 33-53 divided subcaudals.

Colouration may be one or other of three of the following:

1/ various colour varieties which are connected by insensible gradations; head and nape usually black, with an oblique yellow band, sometimes broken up into spots on each side from the parietals to behind the angle of the mouth. Upper lip yellow in front of and behind the eye; lower parts uniform red or orangeish (*Calliophis* (*Paulstokesus*) *nigrescens* (Günther, 1862)), or alternatively:

2/ having unicolored and dark body and tail dorsa, an orange head band, a salmon color to scarlet body and tail underside, no dark pigmentation on the last supralabial, and a wide post-temporal band (*Calliophis* (*Paulstokesus*) *castoe* Smith, Ogale, Deepak and Giri, 2012), or:

Dark purplish brown or blackish brown on the back with three or five longitudinal series of black light-edged spots (*Calliophis* (*Paulstokesus*) *beddomei* Smith, 1943).

The subgenus *Swilea subgen. nov*. is most readily separated from all other *Calliophis* by by the ventral count always being lower than 203, versus 212 or more in the rest.

The subgenus *Swilea subgen. nov*. is further separated from all other *Calliophis* by the following suite of characters: Body scales in 13 parallel longitudinal rows, not obliquely disposed; middorsal (vertebral) scales not enlarged; preocular in contact with nasal; males 174-186 ventrals, females 189-203 ventrals; males 25-31 subcaudals, females 21-25 subcaudals; 7 supralabials, anal divided, body above is brown to reddish brown, with black spots, the latter arranged longitudinally along each side of the back; head and nape black with some yellow markings including a yellow spot on each side of the occiput; upper labials yellow; tail, below, pale blue or gray. Total length 1300 mm; tail length 150 mm (Leviton *et al.* 2003, Slowinski *et al.* 2001).

The hemipenes in this subgenus are different to those of other *Calliophis*. In *Swilea*, the hemipenis is relatively longer and narrower than that of other *Calliophis.*

Unlike other *Calliophis*, the hemipenis of *Swilea* is characterized by having no terminal furcation of the sulcus, a plush of fine spinules on the tip of the organ and longitudinal zigzag plicae proximal to this distal plush of spinules.

The subgenus *Doliophis*, consisting of the species

Calliophis (*Doliophis*) *intestinalis* (Laurenti, 1768), and *Calliophis* (*Doliophis*) *bivirgata* (Boie, 1827), the type species, are readily separated from all other *Calliophis* by the nature of the development of their venom glands.

Instead of being confined to the temporal region, they extend along each side of the body for about one fifth of its length, gradually thickening and terminating in front of the heart with club-shaped ends. The presence of these glands may be easily detected without dissection by feeling the thickening and rigidity of the cardiac region in the beginning of the second fifth to third of the body, the heart being shifted back somewhat as compared to other snakes due to the extreme extensions of the venom glands.

The nominate subgenus *Calliophis*, is monotypic for the type species *Calliophis gracilis* Gray, 1835 and is readily separated from all other subgenera by the higher ventral count, being over 303, versus less than 293 for all other species.

Snakes of the genus *Calliophis* are separated from all other elapid snakes by the following suite of characters: Maxillary extends fowards beyond the palatine, with a pair of large grooved poison-fangs, but no other obvious teeth; mandibular teeth are subequal. Praefrontal bones in contact with each other on the median line. Head is small and not distinct from the neck. Eye is small with a round pupil; nostril is between two nasals; no loreal. Body cylindrical and very elongate. Scales are smooth, without pits in 13 midbody rows. Ventrals are rounded. The tail is short and the subcaudals are divided.

The Asian genera *Sinomicrurus* Slowinski *et al.* 2001 and *Funkelapidus* Hoser, 2012 are separated from *Calliophis* by the following: A well-developed medial fold bordering the basal pocket of the hemipenis and protruberant sclerified tail tip used defensively. Further distinguished from *Calliophis* by lacking the postorbital bone, having a bipartite AES muscle origin (dorsal origin on partietal bone and ventral origin on anterior venom gland), and a strongly bifurcated hemipenis ornamented only with spines and possessing the basal pocket.

The Phillippine species within the genus *Hemibungarus* (*H. calligaster*, being monotypic for the genus) is separated from *Calliophis* by the following: 1/1 temporal formula; a raised sixth supralabial; colouration generally characterized by black dyads set on a red ground colour, commonly obscured by melanism; *Hemibungarus* is the only Asian Coral Snake characterised by a pattern of black bands or rings occurring in pairs.

Distribution: Indian subcontinent.

Etymology: Named in honour of Ben Moore, manager of reptile supplies retail outlet, “Amazing Amazon” of Springvale Road, Glen Waverley, Melbourne, Victoria, Australia, in recognition for his many valuable contributions to herpetoculture in Australia, including his own breeding projects for many taxa including Ant-hill Pythons (*Antaresia* (*Rawlingspython*) *perthensis*).

Content: *Calliophis* (*Benmoreus*) *bibroni* (Jan, 1858)(Type species); *Calliophis* (*Benmoreus*) *haematoetron* Smith, Manamendra-Arachchi and Somaweera, 2008; *Calliophis* (*Benmoreus*) *melanurus* (Shaw, 1802).

***LIOPHIDIUM* BOULENGER, 1896.**

The genus was created by Boulenger to accommodate the species, *L. trilineatum* Boulenger, 1896, from Madagascar.

As of 2013 there are ten described and generally recognized species, although it is clear that there are also more undescribed forms yet to be formally named.

Within the genus as recognized are at least three distinctive species groups, one in particular apparently quite divergent from the rest.

This is the clade including the species *Liophidium rhodogaster* (Schlegel, 1837) and the more recently described taxon *Liophidium pattoni* Vietes, Ratsoavina, Randrianiaina, Nagy, Glaw and Vences, 2010.

Besides obvious morphological divergence from the rest of the genus *Liophidium*, these two species have considerable molecular divergence from the rest.

Therefore they are herein formally placed in a new subgenus named for the first time, according to the Zoological Code (Ride *et al.* 1999).

Important published studies on *Liophidium* Boulenger, 1896 as as defined by most authors to 2013 include, Andersson (1910), Andreone *et al.* (2000, 2003), Barbour (1918), Bauer *et al.* (1995), Beolens *et al.* (2011), Boulenger (1888, 1893, 1896), D’Cruze *et al.* (2007, 2008, 2009), Domergue (1984), Durkin *et al.* (2011), Franzen *et al.* (2009), Gehring *et al.* (2010), Glaw and Vences (1994), Guibé (1958), Günther (1859b), Jan (1856), Kreutz (1989), Labanowski and Lowin (2011), Leviton and Munsterman (1956), Nagy *et al.* (2012), Peters (1874), Pyron *et al.* (2011), Schlegel (1837), Underwood (1967), Van Beest (2004), Vieites *et al.* (2010), Zaher *et al.* (2012), Ziegler *et al.* (1996) and sources cited therein.

GENUS *LIOPHIDIUM* BOULENGER, 1896.

Type species: *Liophidium trilineatum* Boulenger, 1896.

Diagnosis: *Liophidium* Boulenger, 1896 is diagnosed by the following suite of characters: About 25 small maxillary teeth, closely set with the rear three slightly enlarged; the dentary bone is completely detatched from the articular posteriorly; head is small, not distinct from the neck; eye is small and with a round pupil; nostril between two nasals and the internasal. Body is cylindrical; scales smooth without pits and 17 mid-body scale rows; ventrals are rounded. The tail is short, subcaudals divided. Hypapophyses developed throughout the vertebral column.

Distribution: Madagascar.

Content: *Liophidium trilineatum* Boulenger, 1896 (Type species); *Liophidium apperti* Domergue, 1984; *Liophidium chabaudi* Domergue, 1984; *Liophidium maintikibo* Franzen, Jones, Raselimanana, D’Cruze, Glaw and Vences, 2009; *Liophidium mayottensis* (Peters, 1874); *Liophidium pattoni* Vieites, Ratsoavina, Randrianiaina, Nagy, Glaw and Vences, 2010; *Liophidium rhodogaster* (Schlegel, 1837); *Liophidium therezieni* Domergue, 1984; *Liophidium torquatum* (Boulenger, 1888);

Liophidium vaillanti (Mocquard, 1901).

SUBGENUS *MATTBORGUS SUBGEN. NOV*.

Type species: *Herpetodryas rhodogaster* Schlegel, 1837.

Generally currently known as *Liophidium rhodogaster* (Schlegel, 1837).

Diagnosis: The subgenus *Mattborgus subgen. nov.* is separated from the nominate subgenus *Liophidium* by the presence of a pinkish colour on the ventral side of the tail, although this colouration

extends to the ventrals in *L. rhodogaster* while these are bright yellow in *L. pattoni*. There are 60-92 ventrals and 54-81 subcaudals.

The subgenus consists of two described species.

Liophidium pattoni differs from its sister taxon (defined according to molecular data of Vietes *et al.* 2010), *Liophidium rhodogaster*, in exhibiting fewer ventral scales (160 versus 181-192) and fewer subcaudals (54 versus 61-81).

The two species also differ significantly in dorsal colour pattern, with *Liophidium rhodogaster* having a brown dorsum with a lateral dark brown thin line and a wide blackish dorsal band, and the *Liophidium pattoni* showing four very conspicuous bright pink-red discontinuous stripes, which change to blue-grey at mid-body, on a black ground colour. The head colouration also differs among both species, with a dark brown head with few whitish scales behind the eye in *Liophidium rhodogaster*, and a black and bright yellow pattern in *Liophidium pattoni* consisting of bright yellow supralabials, a black stripe reaching from the nasal scale through the eye and towards the posterior border of the head, and bright yellow upper postocular and temporal scales. From the snout to the supraocular scales, *Liophidium pattoni* shows a variable amount of bright yellow colour with small black patches.

Poor quality preserved hemipenes of both *Liophidium pattoni* and *Liophidium rhodogaster* and apparently show the hemipenes to be different in form to other *Liophidium* species and also to a limited extent, one another, (see Vietes *et al.* 2010 and Ziegler *et. al.* 1996 for the details).

Liophidium Boulenger, 1896 is diagnosed by the following suite of characters: About 25 small maxillary teeth, closely set with the rear three slightly enlarged; the dentary bone is completely detatched from the articular posteriorly; head is small, not distinct from the neck; eye is small and with a round pupil; nostril between two nasals and the internasal. Body is cylindrical; scales smooth without pits and 17 mid-body scale rows; ventrals are rounded.

The tail is short, subcaudals divided. Hypapophyses developed throughout the vertebral column.

Distribution: Madagascar.

Etymology: Named in honour of Matt Borg of Mount Cottrell, on the edge of western Melbourne, Victoria, Australia for numerous services to herpetology, herpetoculture and wildlife education in Australia

Content: *Liophidium* (*Mattborgus*) *rhodogaster* (Schlegel, 1837)(Type species); *Liophidium* (*Mattborgus*) *pattoni* Vieites, Ratsoavina, Randrianiaina, Nagy, Glaw and Vences, 2010.

***LIOPHOLIDOPHIS* MOCQUARD, 1904.**

Liopholidophis grandidieri Mocquard, 1904 was placed in the new genus *Liopholidophis* created by Mocquard at the same time.

Three species described in the preceding period had been assigned to other genera and were subsequently re-assigned to this genus. Two more species were described in 1996 and 2007, both of which are also the most divergent members of the genus.

While the taxonomy of *Liopholidophis* has been relatively stable in the period preceding 2013, molecular studies of Vieites *et al.* (2010), Pyron *et al.* (2011) and Nagy *et al.* (2012) have confirmed the divergence of two described species from the rest of the genus.

The molecular results also mirror important morphological differences between the species groups.

Notwithstanding the fact that there are at least two other undescribed species in this divergent group, it is important that these snakes be given taxonomic recognition.

Taking the conservative position, I herein describe a new subgenus for these divergent species according the the Zoological Code (Ride *et al.* 1999).

Important published studies on *Liopholidophis* Mocquard, 1904 as as defined by most authors to 2013 include, Barbour (1918), Boulenger (1893), Cadle (1996, 1998), D'Cruze *et al.* (2008), Fischer (1884), Glaw and Vences (1994), Glaw *et al.* (2007), Günther (1882), Mocquard (1904), Parker (1925), Peracca (1892), Pyron *et al.* (2011), Thomas *et al.* (2001), Werning and Wolf (2007), Williams and Wallach (1989), Nagy *et al.* (2012), and sources cited therein.

GENUS *LIOPHOLIDOPHIS* MOCQUARD, 1904.

Type species: *Liopholidophis grandidieri* Mocquard, 1904.

Diagnosis: The genus *Liopholidophis* is defined as follows: Eye small. Rostral nearly as deep as broad, visible from above; internasals broader than long, as long as or a little shorter than the praefrontals; frontal one and two thirds to one and three quarters as long as broad, longer than its distance from the end of the snout, shorter than the parietals; loreal as long as deep or deeper than long; one (rarely two) praeoculars and two postoculars; temporals 1+2; eight supralabials, fourth and fifth entering the eye; four infralabials in contact with the anterior chin shields, which are shorter than the posterior. Scales smooth in 17 midbody rows, 143-157 ventrals, anal divided with about 72 subcaudals in females and about 152 for males. The tail of the male is nearly half the body length, while the female's tail is two seventh's of the total body length. Colouration is olive-brown above, arker on the vertebral region; a dark brown or black lateral band from the end of the snout, through the eye to the angle of the mouth; two other more or less distinct lateral streaks on each side, one above and one below, the latter bordering the ventrals; upper lip yellowish; lower parts yellowish, uniform or black-spotted.

Distribution: Madagascar.

Content: *Liopholidophis grandidieri* Mocquard, 1904 (Type species); *Liopholidophis dimorphus* Glaw, Nagy, Franzen and Vences, 2007; *Liopholidophis dolicocercus*

(Peracca, 1892); *Liopholidophis grandidieri* Mocquard, 1904; *Liopholidophis rhadinaea* Cadle, 1996; *Liopholidophis sexlineatus* (Günther, 1882); *Liopholidophis varius* (Fischer, 1884).

SUBGENUS *CHRISNEWMANUS SUBGEN. NOV.*

Type species: *Liopholidophis rhadinaea* Cadle, 1996

Diagnosis: Separated from the nominate subgenus by one or other of the following suites of characters: pink ventral side, as well as light nape spots and extreme sexual dimorphism of tail lengths (*Liopholidophis rhadinaea* Cadle, 1996) or:

an immaculate whitish venter (versus black in subgenus *Liopholidophis*) (*Liopholidophis dimorphus* Glaw, Nagy, Franzen and Vences, 2007).

Distribution: Madagascar.

Etymology: Named in honour of Chris Newman of the United Kingdom, former editor and publisher of several important wildlife and reptile journals, including *Reptilian* and *Ophidia Review*, for his long term commitment and service to the science of herpetology and wildlife conservation in general.

Content: *Liopholidophis rhadinaea* Cadle, 1996 (Type species); *Liopholidophis dimorphus* Glaw, Nagy, Franzen and Vences, 2007.

THE DEFINING OF GENERA AND SUBGENERA WITHOUT ETHICS

Here I deal with examples of creating subgenera and genera without ethics and other issues of note.

On 21 September 2009 (or thereabouts), in an audacious move, Wales-based snake enthusiast Wolfgang Wüster and two friends (Van Wallach and Donald Broadley) falsely claimed in an online paper (Wallach, Wüster and Broadley 2009), published at: http://www.mapress.com/zootaxa/2009/f/zt02236p036.pdf

that seven earlier (2009) print publications by Raymond Hoser (this author), were not validly published under the ICZN rules, known as "the Code" (Ride *et al.* 1999). They simultaneously attempted to steal naming rights for the Spitting Cobras (genus *Spracklandus* Hoser 2009), published in one of these publications (Hoser, 2009b) renaming the genus *Afronaja* (as a subgenus) in their own online paper (Wallach, Wüster and Broadley 2009).

The authors went further and actively invited others to rename the Rattlesnake genera named by Hoser (2009a).

To the credit of other herpetologists globally, no one took up this invitation in the period to March 2013.

The detail of the above fraud was exposed by Hoser (2012a).

Put simply it was an audacious case of academic theft by the later authors who effectively bootlegged this author's work to try to steal naming rights for a genus of snakes, facilitated by a series of false claims against the original publication.

The falsity of the Wallach, Wüster and Broadley claim of non-publication of the Hoser papers was seen via recipts for the publications from places such as *Zoological Record*, which Wallach, Wüster and Broadley had deliberately and fraudulently chosen to overlook (Hoser 2012a).

In passing I note that Wüster's close friend, the notorious Van Wallach, has tried the stunt of renaming validly named taxa in breach of the Zoological Code's three critical rules of, 1/ Homonymy (Principal 5, Article 52 and elsewhere), 2/ Priority (Principal 3, Article 23 and elsewhere) and 3/ Stability (Principal 4, Articles 23, 65 and elsewhere) several times. He did this in 2006, when erecting the genus *Austrotyphlops* to usurp the properly named genus *Sivadictus* Wells and Wellington 1985, using the same type species (Wallach 2006). Coauthoring with Donald Broadley (of Wallach, Wüster and Broadley 2009 fame) in 2009, Wallach created the genus name *Afrotyphlops* to retrospectively usurp the valid Fitzinger 1843 name *Aspidorhynchus* for the same type species (Hoser 2012d, Wallach and Broadley 2009).

In 2013, Kaiser *et al.* (including Wüster as the main party promoting the publication), published a blog calling for the total destruction of the Zoological Code (Ride *et al.* 1999), by boycotting valid names of their choice for the purposes of them coining new names for the same taxa.

They had published a similar blog the year earlier (Kaiser 2012a, 2012b), that was rebutted and discredited in total by Hoser (2012c).

This unethical creation of subgenera and genera by this band of renegades threatens to destroy much of the progress in the science of Zoology over the past two centuries and must not be allowed to happen.

The authors of Kaiser *et al.* (2013) should be condemned for their reckless conduct.

As a summary of that paper and in rebuttal of the various false claims made within, the following key points are noted:

· Hinrich Kaiser and eight other renegades, namely Mark O'Shea, Wolfgang Wüster, Wulf Schleip, Paulo Passos, Hidetoshi Ota, Luca Luiselli, Brian Crother and Christopher Kelly, herein cited as Kaiser *et al.* (2013) made numerous demonstrably false claims about Hoser and another herpetologist Richard Wells to justify their plans to attack the rules of the Zoological Code.

· A claim by Kaiser *et al.* (2013) that Hoser's descriptions of taxa from 2000 to 2012 were unsupported by evidence was effectively refuted by their other claims that Hoser had engaged in "harvesting of clades from published phylogenetic studies for description as new genera or subgenera" and used evidence "lifted from others".

· The papers and taxonomic decisions by Hoser (and Wells) were based on robust cited evidence and comply with the established rules of Zoological Nomenclature (Ride *et al.* 1999) of homonymy, priority and stability.

· Kaiser, O'Shea, Wüster and Schleip have been exposed many times as serial liars.

· Schleip, Crother and Wüster have all been exposed previously for "Grievous taxonomic misconduct" by knowingly publishing descriptions of invalid taxa or junior synonyms and falsifying data.

· O'Shea, Wüster and Schleip have for 15 years engaged in a cynical destabilization of taxonomy and nomenclature in breach of the rules, motivated by a deep personal hatred of Raymond Hoser.

· Over time, Hoser and Wells taxonomic and nomenclatural judgments have been accepted as correct by other herpetologists as confirmed by molecular studies and their names widely used (millions of times)(e.g. *Broghammerus*, *Antaresia*).

· O'Shea, Wüster and Schleip have repeatedly committed the morally repugnant crime of plagiarization, that is the theft of another person's research without correct attribution.

· Kaiser *et al.* have repeatedly misrepresented and misquoted the Zoological Code to further their defective arguments.

· Kaiser *et al.* have several times made an open call for others to act in breach of the numerous sections of the Rules of Zoological nomenclature including 1/ Homonymy (Principal 5, Article 52 and elsewhere), 2/ Priority (Principal 3, Article 23 and elsewhere) and 3/ Stability (Principal 4, Articles 23, 65 and elsewhere) and the ethics of the Code (Section A).

· Kaiser *et al.* seek to coin new names for hundreds of validly named taxa in breach of the Zoological Rules, with no restriction on other authors or names they may later deem "unscientific" in order to rename taxa properly named by others.

· The term "unscientific" is in effect a code word of Kaiser, Wüster and the other renegades for those works of people they take a hatred to, or alternatively otherwise seek to rename taxa that has been properly named previously.

· In an act of "taxonomic vandalism" and "evidence free taxonomy", as co-author of Kaiser *et al.*, Brian Crother did in 2012, change the names of over 100 species of lizard, none of which had ever been the subject of a phylogenetic study. In 2008 Brian Crother engaged in another act of evidence free taxonomy to improperly reassign names to dozens of north American taxa (Pauly *et al.* 2009).

· The proposals of Kaiser *et al.* were designed to irreparably destabilize Zoological nomenclature.

· The proposals of Kaiser *et al.* (2013) if copied by others (as they suggested on page 20) and elsewhere would create general taxonomic and nomenclatural chaos and effectively destroy the rules of zoology.

· The proposals of Kaiser *et al.* if acted upon would potentially put lives at risk through misidentification of venomous taxa, including through excessive numbers of invalid junior synonyms resulting from their mass renaming exercise.

· An alleged loophole within the Zoological Code proposed by Kaiser *et al.*, by which they see a means to rename hundreds of species and genera by alleged "reversal of priority" is flawed. This was because they misquoted the relevant section of Code omitting the key line, that relating to date of first descriptions usage needing to be prior to 1899, rendering the scheme "clearly ridiculous and unworkable" (Shea 2013).

· The use of the alleged loophole within the Zoological Rules proposed by Kaiser *et al.*, to unlawfully rename validly named taxa, subsequent to deliberate boycott of the correct names has been attempted before and failed. This included by Sprackland, Smith and Strimple (1997) (ICZN case 3043) and their scheme failed. The illegal attempt to reverse priority was emphatically rejected by the ICZN in their judgment, Opinion 1970. *Bulletin of Zoological Nomenclature* 58(1), 30 March 2001 in Volume 58.

· Claims by Kaiser *et al.* of widespread support for their position was fabricated and false. In fact the only support they got from most other herpetologists was for a proposition that taxonomy should be evidence based and subject to peer review. However it is in fact Kaiser *et al.* who break both "rules" by engaging in evidence free taxonomy and in the absence of effective peer review.

· Contrary to the published claims of Kaiser *et al.* (2013), they did not have support of the Australian Society of Herpetologists to boycott Hoser names and illegally coin names for those taxa themselves (ASH 2013).

· On the basis of the preceding, the assault on the established rules of zoological nomenclature by Kaiser *et al.* (2013) should as a matter of course be rejected by herpetologists. The gang of nine must be condemned for their gross misconduct.

· In summary genera and subgenera of reptiles should be named on the basis of evidence, within the rules, and ethically.

REFERENCES CITED

Andersson, L. G. 1910. Reptiles and batrachians from the north-west of Madagascar collected by V. Kaudern, 1906-1907. *Arkiv för Zoologi* 7(7):1-15.

Andreone, F., Randrianirina, J., Jenkins, P. D. and Aprea, G. 2000. Species diversity of Amphibia, Reptilia and Lipotyphla (Mammalia) at Ambolokopatrika, a rainforest between the Anjanaharibe-Sud and Marojejy massifs, NE Madagascar. *Biodiversity and Conservation* 9:1587-1622.

Andreone, F., Glaw, R. A., Nussbaum, C. J., Raxworthy, M., Vences, M. and Randrianirina, J. E. 2003. The amphibians and reptiles of Nosy Be (NW Madagascar) and nearby islands: a case study of diversity and conservation of an insular fauna. *J. Nat. Hist.* 37(17):2119-2149.

ASH (Australian Society of Herpetologists) 2013. Minutes of the 37th AGM of the Australian Society of Herpetologists Inc. ASH AGM 2013:Point Wolstencroft, NSW:8 pp.

Auliya, M. 2006. Taxonomy, Life History, and conservation of giant reptiles in west Kalimantan. *Natur und Tier Verlag*, Münster:432 pp.

Bahir, M. M. 1999. Scaring the enemy:The slender coral snake. *Sri Lanka Nature*, September:22-24.

Barbour, T. 1918. Vertebrata from Madagascar. 2. Amphibia and Reptilia. *Bull. Mus. Comp. Zool. Harvard* 61(14):479-489.

Bauer, A. M., Günther, R. and Klipfel, M. 1995. *The herpetological contributions of Wilhelm C. H. Peters (1815-1883).* SSAR Facsimile Reprints in Herpetology:714 pp.

Beddome, R. H. 1864. Description of a new species of *Elaps* from Malabar. *Proc. Zool. Soc. London* 1864:179.

Bernhard-Meyer, A. 1869. The poison-glands of *Callophis intestinals*, *C. bivirgatus*. *Ann. Mag. Nat. Hist.* (4)4:74.

Beolens, B., Watkins, M. and Grayson, M. 2011. *The Eponym Dictionary of Reptiles*. Johns Hopkins University Press, Baltimore, USA.

Blackburn, D. G. 1993. Standardized criteria for the recognition of reproductive modes in squamate reptiles. *Herpetologica* 49(1):118-132.

Bleeker, P. 1859. Reptilien van Sintang. *Natuurkundig Tijdschrift voor Nederlandsch Indie* 20:200-220.

Boie, F. 1827. Bemerkungen über Merrem's Versuch eines Systems der Amphibien, 1. Lieferung: Ophidier. *Isis van Oken* 20:508-566.

Bong Heang, K. 1987. An annotated checklist of the herpetofauna of Ulu Endau, Johore, Malaysia. *Malayan Nature J.* 41(2-3):413-423.

Boulenger, G. A. 1888. Descriptions of new Reptiles and Batrachians from Madagascar. *Ann. Mag. nat. Hist.* (6)1:101-107.

Boulenger, G. A. 1890. The Fauna of British India, Including Ceylon and Burma. Reptilia and Batrachia. Taylor and Francis, London:xviii+541 pp.

Boulenger, G. A. 1893. Catalogue of the snakes in the British Museum (Nat. Hist.) I. London (Taylor and Francis):448 pp.

Boulenger, G. A. 1894. On the herpetological fauna of Palawan and Balabac. *Ann. Mag. Nat. Hist.* (6)14:81-90.

Boulenger, G. A. 1896. Catalogue of the snakes in the British Museum, Vol. 3. London (Taylor and Francis):xiv+727 pp.

Brongersma, L. D. 1948. Notes on *Maticora bivirgata* (Boie) and on *Bungarus flaviceps* Reinh. *Zoologische Mededelingen* 30:1-29.

Cadle, J. E. 1996. Snakes of the genus *Liopholidophis* (Colubridae) from Eastern Madagascar: New species, revisionary notes, and an estimate of phylogeny. *Bull. Mus. Comp. Zool. Harvard* 154(5):369-464.

Cadle, J. E. 1998. The identity of *Leptophis varius* Fischer, 1884 and placement of *Liopholidophis pinguis* Parker, 1925 in its synonymy. *Journal of Herpetology* 32(3):434-437.

Castoe, T. A., Smith, E. N., Brown, R. M. and Parkinson, C. L. 2007. Higher-level phylogeny of Asian and American coralsnakes, their placement within the Elapidae (Squamata), and the systematic affinities of the enigmatic Asian coralsnake *Hemibungarus calligaster* (Wiegmann, 1834). *Zoological Journal of the Linnean Society* 151:809-831.

Chan-ard, T., Grossmann, W., Gumprecht, A. and Schulz, K. D. 1999. *Amphibians and reptiles of peninsular Malaysia and Thailand - an illustrated checklist.* Bushmaster Publications, Würselen, Gemany:240 pp.

Cox, M. J., Van Dijk, P. P., Nabhitabhata, J. and Thirakhupt, K. 1998. *A Photographic Guide to Snakes and Other Reptiles of Peninsular Malaysia, Singapore and Thailand.* Ralph Curtis Publishing:144 pp.

Daan, S. and Hillenius, D. 1966. Catalogue of the type specimens of amphibians and reptiles in the Zoological Museum, Amsterdam. *Beaufortia* 13:117-144.

D'Abreu, E. A. 1913. The Occurrence of the Slender Coral Snake (*Callophis trimaculatus*) at Nagpur, Central Provinces. *J. Bombay nat. Hist. Soc.* 22:634.

Das, I. and De Silva, A. 2005. *Photographic guide to snakes and other reptiles of Sri Lanka*. New Holland Publishers:144 pp.

David, P. and Vogel, G. 1996. *The snakes of Sumatra. An annotated checklist and key with natural history notes*. Bücher Kreth, Frankfurt/M.

D'Cruze, N., Sabel, J. Green, K., Dawson, J., Gardner, C., Robinson, J., Starkie, G., Vences, M. and

Glaw, F. 2007. The First Comprehensive Survey of Amphibians and Reptiles at Montagne des Francais, Madagascar. *Herpetological Conservation and Biology* 2(2):87-99

D'Cruze, N., Köhler, J., Franzen, M. and Glaw, F. 2008. A conservation assessment of the amphibians and reptiles of the Forêt d'Ambre Special Reserve, north Madagascar. *Madagascar Conservation and Development* 3(1):44-54.

D'Cruze, N., Olsonn, A., Henson, D., Kumar, S. and Emmett, D. 2009. The Amphibians and Reptiles of the Lower Onilahy River Valley, a Temporary Protected Area in Southwest Madagascar. *Herpetological Conservation and Biology* 4:62-79.

Deepak, V., Harikrishnan, S., Vasudevan, K. and Smith, E. N. 2010. Redescription of Bibron's coral snake, *Calliophis bibroni* Jan 1858 with notes and new records from south of the Palghat and Shencottah Gaps of the Western Ghats, India. *Hamadryad* 35(1):1-10.

Deraniyagala, P. E. P. 1951. Some new races of the snakes *Eryx*, *Callophis*, and *Echis*. *Spolia Zeylanica*, 26:147-150.

Domergue, C. A. 1984. Notes sur les serpents de la region malgache 3. Description de trois especes nouvelles rapportees au genre *Liophidium* Boulenger, 1896. *Bull. Mus. natn. Hist. nat., Paris* 5(4)1983:1109-1122.

Duméril, A. M. C., and Bibron, G. 1835. Erpétologie Générale ou Histoire Naturelle Complète des Reptiles, Vol. 2. Librairie Encyclopédique de Roret, Paris:iv+680 pp.

Duméril, A. M. C., Bibron, G. and Duméril , A. H. A. 1854. *Erpétologie générale ou histoire naturelle complète des reptiles. Tome septième. Deuxième partie, comprenant l'histoire des serpents venimeux*. Paris, Librairie Encyclopédique de Roret:i-xii+781-1536.

Durkin, L., Steer, M. D., and Belle, E. M. S. 2011. Herpetological surveys of forest fragments between Montagne D'Ambre National Park and Ankarana Special Reserve, Northern Madagascar. *Herpetological Conservation and Biology* 6(1):114-126.

Fischer, J. G. 1884. Über einige afrikanische Reptilien, Amphibien und Fische des Naturhistorischen Museums. II. Über einige Reptilien von Nossi-Bé und Madagaskar. Jahrbuch des Naturhistorisches Museums Hamburg 1883: 33-38.

Fischer, J. G. 1886. Ueber eine Kollektion Reptilien und Amphibien von der Insel Nias und über eine zweite Art der Gattung Anniella Gray Abh. *Naturw. Ver. Hamburg* 19(1):3-10.

Franzen, M. J., Jones, J., Raselimanana, A. P., Nagy, Z. T., D'Cruze, N. and Glaw, F. 2009. A new black-bellied snake (Pseudoxyrhophiinae:*Liophidium*) from western Madagascar, with notes on the genus *Pararhadinaea*.

Amphibia-Reptilia 30(2):73-183.

Gaulke, M. 1994. Contribution to the snake fauna of the Sulu Archipelago, with the description of a new subspecies of *Dendrelaphis caudolineatus* (Gray, 1834). *Herpetological Journal* 4(4):136-144.

Gaulke, M. 1999. Die Herpetofauna von Calauit Island (Calamianes-Inseln, Provinz Palawan, Philippinen) (Amphibia et Reptilia). *Faun. Abh. Staatl. Mus. Tierk.* Dresden 21(19).

Gehring, P. -S., Ratsoavina, F. M. and Vences, M. 2010. Filling the gaps - amphibian and reptile records from lowland rainforests in eastern Madagascar. *Salamandra* 46(4):214-234.

Glaw, F. and Vences, M. 1994. *A Fieldguide to the Amphibians and Reptiles of Madagascar*. Vences and Glaw Verlag, Köln.

Glaw, F., Nagy, Z. T., Franzen, M. and Vences, M. 2007. Molecular phylogeny and systematics of the pseudoxyrhophiine snake genus *Liopholidophis* (Reptilia, Colubridae): evolution of its exceptional sexual dimorphism and descriptions of new taxa. *Zoologica Scripta* 36:291-300.

Grandison, A. G. C. 1972. The Gunong Benom Expedition 1967. 5. Reptiles and amphibians of Gunong Benom with a description of a new species of *Macrocalamus*. *Bull. Br. Mus. nat. Hist. (Zool.)*, London, 23:45-101.

Gray. J. E. 1835. Illustrations of Indian Zoology, chiefly selected from the collection of Major - General Hardwicke. Vol. 2. London (1833-1834):263 pp., 95 plates.

Grismer, L. L., Chan, K. O., Grismer, J. L., Wood, Jr., P. L. and Norhayati, A. 2010. A checklist of the herpetofauna of the Banjaran Bintang, Peninsular Malaysia. *Russian Journal of Herpetology* 17(2):147-160.

Guibé, J. 1958. Les serpents de Madagascar. *Memoires de l'Institut Scientifique de Madagascar* 12:189-260.

Günther, A. 1859a. On the genus *Elaps* of Wagner. *Proc. Zool. Soc. London* 1859:79-89.

Günther, A. 1859b. On the geographical distribution of reptiles. *Ann. Mag. Nat. Hist.* (3)3:221-237.

Günther, A. 1862. On new species of snakes in the collection of the British Museum. *Ann. Mag. nat. Hist.* (3)9:124-132.

Günther, A. 1882. Ninth contribution to the knowledge of the fauna of Madagascar. *Ann. Mag. nat. Hist.* (5)9:262-266.

Guptha, M. B. and Rajasekhar, M. 2011. Sighting of Slender Coral Snake *Calliophis melanurus* in Seshachalam Hills, Eastern Ghats, India: a new record, *Reptile Rap* (12):4-6.

Hien, P., Grossmann, W. and Schäfer, C. 2001. Beitrag zur Kenntnis der landbewohnenden Reptilienfauna von Pulau Tioman, West-Malaysia. *Sauria* 23(4):11-28.

Hoser, R. T. 2009a. A reclassification of the rattlesnakes; species formerly exclusively placed in the genera *Crotalus* and *Sistrurus*. *Australasian Journal of Herpetology* 6:1-21.

Hoser, R. T. 2009b. A reclassification of the true cobras; species formerly referred to the genera *Naja*, *Boulengerina* and *Paranaja*. *Australasian Journal of Herpetology* 7:1-15.

Hoser, R. T. 2012a. Exposing a Fraud! *Afronaja* Wallach, Wüster and Broadley 2009, is a junior synonym of *Spracklandus* Hoser 2009! *Australasian Journal of Herpetology* 9:1-64.

Hoser, R. T. 2012b. A New Genus of Coral Snake from Japan (Serpentes:Elapidae). *Australasian Journal of Herpetology* 12:3-5.

Hoser, R. T. 2012c. Robust taxonomy and nomenclature based on good science escapes harsh fact-based criticism, but remains unable to escape an attack of lies and deception. *Australasian Journal of Herpetology* 14:37-64.

Hoser, R. T. 2012d. A review of the extant scolecophidians ("blindsnakes") including the formal naming and diagnosis of new tribes, genera, subgenera, species and subspecies for divergent taxa. *Australasian Journal of Herpetology* 15:1-64.

ICZN 2001. Opinion 1970. *Bulletin of Zoological Nomenclature* 58(1).

Jacobson, E. 1937. A case of snake-bite (*Maticora intestinalis*). *Bull. Raffl. Mus.* (13):77-79.

Kannan, P. 2006. Occurrence of the striped coral snake (*Calliophis nigrescens* Günther) in Mudumalai wildlife sanctuary, southern India. *Cobra* 63:11-13.

Jan, G. 1858. Plan d'une iconographie descriptive des ophidiens et description sommaire de nouvelles espèces des serpents. *Rev. Mag. Zool. Paris* (2)10:438-449, 514-527.

Jan, G. 1866. *Iconographie générale des ophidiens. 16. Livraison*. J.B. Bailière et Fils, Paris.

Kaiser, H. 2012a. SPAM email sent out to numerous recipients on 5 June 2012.

Kaiser, H. 2012b. Point of view. Hate article sent as attachment with SPAM email sent out on 5 June 2012.

Kaiser, H., Crother, B. L., Kelly, C. M. R., Luiselli, L., O'Shea, M., Ota, H., Passos, P., Schleip, W. D. and Wüster, W. 2013. Best practices: In the 21st Century, Taxonomic Decisions in Herpetology are Acceptable Only When supported by a body of Evidence and Published via Peer-Review. *Herpetological Review* 44(1):8-23.

Kopstein, F. 1938. Ein Beitrag zur Eierkunde und zur Fortpflanzung der Malaiischen Reptilien. *Bull. Raffl. Mus.* (14):81-167.

Kreutz, R. 1989. Zur Kenntnis einiger Nattern aus Madagaskar. *Herpetofauna* 11(61):25-34.

Labanowski, R. J. and Lowin, A. J. 2011. A reptile survey in a dry deciduous forest fragment in northern Madagascar showing new records for the little-known snake *Pararhadinaea melanogaster* and a range extension for the skink *Amphiglossus tanysoma*. *Herpetology Notes* 4:113-121.

Laurenti, J. N. 1768. *Specimen medicum, exhibens synopsin reptilium emendatam cum experimentis circa venena et antidota reptilium austracorum, quod authoritate et consensu*. Joan, Thomae, Vienna:217 pp.

Leviton, A. E. 1964. Contributions to a review of Philippine snakes. III. The genera *Maticora* and *Calliophis*. *Philippine J. Sci.* 92:523-550.

Leviton, A. E. and Munsterman, H. E. 1956. The generic status and subfamily relationships of the colubIid snakes of the genus *Sibynophis* in Madagascar. *Occ. Pap. Nat. Hisl. Mus. Stanford Univ.* (4):1-11.

Leviton, A. E., Wogan, G. U. O, Koo, M. S., Zug, G. R., Lucas, R. S. and Jens V. 2003. The Dangerously Venomous Snakes of Myanmar Illustrated Checklist with Keys. *Proc. Cal. Acad. Sci.* 54(24):407-462.

Lim, K. K.P. and Ng, H. H. 1999. The terrestrial herpetofauna of Pulau Tioman, Peninsular Malaysia. *Raffles Bull. Zool.*, Suppl. No. 6:131-155.

Lobo, A. S. 2006. *Uropeltis macrolepis* in the diet of *Calliophis nigrescens. Hamadryad* 30(1): 200-201.

Mocquard, M. F. 1904. Description de quelques reptiles et d'un batracien nouveaux de la collection du Muséum. *Bull. Mus. Natl. Hist. Nat. Paris* 10(26):301-309.

Parker, H. W. 1925. New and rare reptiles and batrachians from Madagascar. *Ann. Mag. nat. Hist.* (9)16:390-394.

Peracca, M. G. 1892. Descrizione di nuove specie di Rettili e Anfibi di Madagascar. *Boll. Mus. Zool. Tor.* 7(112):1-5.

Peters, W. C. H. 1874. Über eine von Hrn. F. Pollen und van Dam auf Madagascar und anderen ostafrikanischen Inseln gemachte Sammlung von Amphibien. *Monatsber. königl. Akad. Wiss. Berlin*. 1873 (December):792-795.

Phipson, H. M. 1887. The poisonous snakes of the Bombay presidency. *J. Bombay Nat. Hist. Soc*. 2:244-250.

Loveridge, A. 1944. A new elapid snake of the genus *Maticora* from Sarawak, Borneo. *Proc. Biol. Soc. Washington* 57:105-106.

Malkmus, R. 1985. Amphibien und Reptilien vom Mount Kinabalu (4101 m), Nordborneo. *Herpetofauna* 7(35): 6-13.

Malkmus, R., Manthey, U., Vogel, G., Hoffmann, P. and Kosuch, J. 2002. *Amphibians and reptiles of Mount Kinabalu (North Borneo).* A. R. G. Ganther Verlag, Rugell:404 pp.

Manthey, U. 1983. Exkursion am Mt. Kinabalu (4101 m), Nordborneo, Teil 3: Checkliste der Herpetofauna oberhalb 600 m ü. NN. *Herpetofauna* 5(23):20-31.

Manthey, U. and Grossmann, W. 1997. *Amphibien and Reptilien Südostasiens*. Natur und Tier Verlag (Münster):512 pp.

McDowell, S. B. 1986. The architecture of the corner of the mouth of Colubroid snakes. *Journal of Herpetology* 20:353-407.

Mirza, Z. and Ahmed, J. J. 2009. Note on predation of *Calliophis melanurus* Shaw, 1802 (Serpents: Elapidae) by *Scolopendra* sp. *Hamadryad* 34(1):166.

Mirza, Z. and Pal, S. 2010. Notes on the effect of a bite from *Calliophis melanurus* Shaw, 1802 (Serpents: Elapidae: Calliophinae). *Reptile Rap* (9):7-8.

Murthy, T. S. N. 2010. *The reptile fauna of India*. B.R. Publishing, New Delhi:332 pp.

Nagy, Z. T., Sonet, G., Glaw, F. and Vences, M. 2012. First Large-Scale DNA Barcoding Assessment of Reptiles in the Biodiversity Hotspot of Madagascar, Based on Newly Designed COI Primers. *Plos One* 7(3):1-11.

Nguyen, T. Q. and Ziegler, T. 2010. New discoveries of amphibians and reptiles from Vietnam. *Bonn Zool. Bull.* 57(2):137-147.

Orlov, N. L., Ryabov, S. A., Van Sang, N. and Truong, N. Q. 2003. New records and data on the poorly known snakes of Vietnam. *Russian Journal of Herpetology* 10:217-240.

Orlov, N. L., Kharin, V. E., Ananjeva, N. B., Tao, N. T. and Truon, N. Q. 2009. A New Genus and Species of Colubrid Snake (Squamata, Ophidia, Colubridae) from South Vietnam (Lam Dong Province). *Russian Journal of Herpetology* 16(3):228-240.

Pauly, G. B., Hillis, D. M. and Cannatella, D. C. 2009. Taxonomic freedom and the role of official lists of species names. *Herpetologica* 65(2):115-118.

Peters, W. C. H. 1881. Die Verschiedenheit von Syngnathus (Belonichthys) zambiezensis Ptrs. und S. (B.) mento Bleeker und über eine neue Art der Schlangengattung *Callophis* von den Philippinen. *Sitzungsber. Ges. naturf. Freunde Berlin* 1881 (7):107-109.

Pyron, R. A. *et al.* 2011. The phylogeny of advanced snakes (Colubroidea), with discovery of a new subfamily and comparison of support methods for likelihood trees**.** *Mol. Phylogenet. Evol.* 58:329-342.

Pyron, R. A., *et al.* 2013. Genus-level phylogeny of snakes reveals the origins of species richness in Sri Lanka**.** *Mol. Phylogenet. Evol.* 66:969-978.

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

Sang, N. V., Cuc, H. T. and Truong, N. Q. 2009. *Herpetofauna of Vietnam*. Chimaira, Frankfurt:768 pp.

Schlegel, H. 1837. *Essai sur la physionomie des serpens*. Partie Générale: xxviii +251 S. + Partie Descriptive: 606 S. + xvi. La Haye (J. Kips, J. HZ. et W. P. van Stockum).

Sharma, R. C. 2004. *Handbook Indian Snakes*. Akhill Books, New Delhi:292 pp.

Shaw, G. 1802. *General Zoology, or Systematic Natural History*. Vol.3, part 2. G. Kearsley, Thomas Davison, London:313-615.

Shea, G. 2013. Email to Raymond Hoser dated Fri, 8 Mar 2013 04:29:39 +0000.

Shine, G. and Nameer, P. O. 2012. First record of Slender Coral Snake *Calliophis melanurus* (Shaw, 1802) south of the Palghat Gap, Western Ghats. *Reptile Rap* (14):33-35.

Slowinski, J. B., Boundy, J. and Lawson, R. 2001. The phylogenetic relationships of Asian coral snakes (Elapidae: *Calliophis* and *Maticora*) based on morphological and molecular characters. *Herpetologica* 57(2):233-245.

Smedley, N. 1931. Amphibians and reptiles from the Cameron Highlands, Malay Peninsula. *Bull. Raffl. Mus.*, (Singapore), 6:105-123.

Smith, B. E. 1993. Notes on a collection of squamate reptiles from eastern Mindanao, Philippine Islands part 2: Serpentes. *Asiatic Herpetological Research* 5:96-102.

Smith, E. N., Manamendra-Arachchi, K. and Somaweera, R. 2008. A new species of coralsnake of the genus *Calliophis* (Squamata: Elapidae) from the Central Province of Sri Lanka. *Zootaxa* 1847:19-33.

Smith, E. N., Ogale, H., Deepak, V. and Giri, V. B. 2012. A new species of coralsnake of the genus *Calliophis* (Squamata: Elapidae) from the west coast of peninsular India. *Zootaxa* 3437:51-68.

Smith, M. A. 1943. *The Fauna of British India, Ceylon and Burma, Including the Whole of the Indo-Chinese Sub-Region. Reptilia and Amphibia. 3 (Serpentes).* Taylor and Francis, London:583 pp.

Somaweera, R. 2006. *The Snakes of Sri Lanka*. Wildlife Heritage Trust of Sri Lanka, Colombo:270 pp.

Sprackland, R., Smith, H. M. and Strimple, P. 1997. Case 3043, *Varanus teriae* Sprackland, 1991 (Reptilia, Squamata): proposed conservation of the specific name. *Bulletin of Zoological Nomenclature* 54(2):100-102.

Suranjan Karunarathna, D. M. S. and Thasun Amarasinghe, A. A. 2011. A preliminary survey of the reptile fauna in Nilgala Forest and its vicinity, Monaragala district, Sri Lanka. *Taprobanica* 3(2):69-76.

Taylor, E. H. 1922. *The snakes of the Philippine Islands*. Manila (Bureau of Printing or Science), Monograph 16:312 pp.

Taylor, E. H. 1950. The snakes of Ceylon. *Univ. Kansas Sci. Bull.* 33(14):519-603.

Taylor, E. H. 1965. The serpents of Thailand and adjacent waters. *Univ. Kansas Sci. Bull*. 45(9):609-1096.

Teo, R. C. H. and Rajathurai, S. 1997. Mammals, reptiles and amphibians in the Nature Reserves of Singapore - diversity, abundance and distribution. *Proc. Nature Reserves Survey Seminar. Gardens' Bulletin Singapore* 49:353-425.

Thomas, R. A., Di Bernardo, M. and Grillitsch, H. 2001. *Philodryas pallidus* Werner, 1926: a synonym of the Colubrid snake *Liopholidophis varius* (Fischer, 1884) from Madagascar. *Journal of Herpetology* 35(1):120-122.

Tiedemann, F. and Grillitsch, H. 1999. Ergänzungen zu den Katalogen der Typusexemplare der Herpetologischen Sammlung des Naturhistorischen Museums in Wien. *Herpetozoa* 12(3/4):147-156.

Tweedie, M. W. F. 1950. Notes on Malayan reptiles, No.2. *Bull. Raffl. Mus*. (23):191-199.

Underwood, G. 1967. A comprehensive approach to the classification of higher snakes. *Herpetologica* 23(2):161-168.

Van Beest, P. 2004. Herpetologische waarnemingen op Madagaskar, aprol 2001 deel 4: het Noorden. *Lacerta* 62(6):226-255.

van Rooijen, J. and van Rooijen, M. 2004. Einige Beobachtungen zur terrestrischen Schlangenfauna auf der Halbinsel Santubong, Sarawak, Ost-Malaysia. *Sauria* 26(4):19-28.

van Rooijen, J. and van Rooijen, M. 2007. The land snakes of the Santubong Peninsula, Sarawak, Borneo: A preliminary list of species with natural history notes. *Russian Journal of Herpetology* 14(1):27-38.

Vieites, D. R., Ratsoavina, F. M., Randrianiaina, R. -D., Nagy, Z. T., Glaw, F. and Vences, M. 2010. A rhapsody of colours from Madagascar: discovery of a remarkable new snake of the genus *Liophidium* and its phylogenetic relationships. *Salamandra* 46(1):1-10.

Vogel, G. and Freed, P. 2006. Zur Haltung der Bauchdrüsenotter *Maticora bivirgata flaviceps* (Cantor, 1839) im Terrarium. *Reptilia* (Münster) 11(57):72-76.

Vyas, R. 1988. Extension range of the striped coral snake (*Callophis nigrescens*). *Hamadryad* 13(2):3-4 .

Vyas, R. 2007. Herptofauna of Puma Wildlife Sanctuary, Gujarat, India. *Reptile Rap* (8):10-15.

Wall, F. 1906. The poisonous snakes of India and how to recognize them, Part II. *J. Bombay Nat. Hist. Soc.* 17:299-334.

Wall, F. 1913. Varieties of *Hemibungarus nigrescens* and *Hydrophis torquatus. J. Bombay nat. Hist. Soc*. 22:638.

Wall, F. 1928. *The Poisonous Terrestrial Snakes of our British Indian Dominions (including Ceylon) and how to recognize them. With symptoms of snake poisoning and treatment. Fourth edition.* Bombay Natural History Society, Bombay:173 pp.

Wallach, V. 2006. The nomenclatural status of Australian *Ramphotyphlops* (Serpentes: Typhlopidae). *Bulletin of the Maryland Herpetological Society* 42(1):8-24.

Wallach, V. And Broadley, D. 2009. A review of the eastern and southern African blind-snakes (Serpentes: Typhlopidae), excluding *Letheobia* Cope, with the description of two new genera and a new species. *Zootaxa* 2255:1-100 (online paper).

Wallach, V., Wüster, W. and Broadley, D. G. 2009. In praise of subgenera: Taxonomic status of Cobras of the genus *Naja* Laurenti (Serpentes:Elapidae). *Zootaxa* 2236:26-36. Published online at: http://www.mapress.com/zootaxa/2009/f/zt02236p036.pdf

Werning, H. and Wolf, C. 2007. Gebirge und Hochland - Reptilien und Amphibien in einem extremen Lebensraum. *Draco* 7(27):4-27.

Whitaker, R. and Captain, A. 2004. *Snakes of India*. Draco Books:500 pp.

Williams, K. L. and Wallach, V. 1989. *Snakes of the World. 1. Synopsis of snakes generic names*. Krieger, Malabar, Florida:234 pp

Zaher, H., Grazziotin, F. P., Graboski, R., Fuentes, R. G., Sa´nchez-martinez, P. 2012. Phylogenetic relationships of the genus *Sibynophis* (Serpentes: colubroidea*) Pap. Avuls. Zool*. 52(12):141-149.

Ziegler, T., Vences, M., Glaw, F. and Böhme W. 1996. Remarks on the genital morphology of the Malagasy snake genus *Liophidium* (Reptilia, Serpentes, Colubridae). *ACTA Biol. Benrodis* 8:157-159.

CONFLICT OF INTEREST

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

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