

Nine new species of *Katrinahoserserpenea* Hoser, 2012 from northern India, western China Vietnam, Burma, Thailand and Malaysia as well as a new genus of snake associated with *Xylophis* Beddome, 1878 from India (Serpentes: Pareidae).

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ABSTRACT

Nine divergent species within the genus *Katrinahoserserpenea* Hoser, 2012 (Serpentes: Pareidae) from northern India, western China, Thailand, Vietnam and Burma are formally named and described for the first time. Two species were formerly treated as populations of *K. (Dannyleeus) monticola* (Cantor, 1839), five of *K. (Katrinahoserserpenea) macularius* (Theobald, 1868) and two of *K. (Katrinahoserserpenea) margaritophorus* (Jan, 1866).

This paper continues the recent naming of new species within the Pareidae, underscoring previously underestimated snake biodiversity in the south Asian region.

The genus *Xylophis* Beddome, 1878, (subfamily Xylophiinae Deepak *et al.* 2019) as currently recognized are endemic to the Western Ghats of peninsular India. Molecular studies (e.g. Deepak *et al.* 2020) and morphology indicate two divergent lineages of great antiquity. One of these is formally placed in a new genus *Zilonear* gen. nov..

Keywords: Snakes; Serpentes; Pareidae; Asia; China; India; Thailand; Vietnam; Burma; *Katrinahoserserpenea*; *Pareas*; *Dannyleeus*; *macularius*; *monticola*; new genus; *Zilonear*; new species; *rayhammondi*; *danielmani*; *tongzhoujiae*; *mannixi*; *mconnachiei*; *daranini*; *rodneykingi*; *bobbottomi*; *evanwhittoni*.

INTRODUCTION

Hoser (2012b) formally divided the genus *Pareas* Wagler, 1830, type species *Dipsas carinata* Reinhardt along obvious phylogenetic lines.

This meant that most species were transferred to the new genus *Katrinahoserserpenea* Hoser, 2012, with a type species of *Amblycephalus boulengeri* Angel, 1920.

The divergent taxon originally described as *Dipsas monticola* Cantor, 1839 was placed in the subgenus *Dannyleeus* Hoser, 2012, within *Katrinahoserserpenea*.

This logical arrangement was immediately condemned and lampooned by the Wolfgang Wüster gang of thieves, who via their war-cry blog known as Kaiser *et al.* (2013) told all other herpetologists not to use the new genus and subgenus name.

To enforce this position, they reposted their blog and similar comments all over the internet many thousands of times, including on Search Engine Optimized (SEO) sites such as Wikipedia and Peter Uetz's "The Reptile Database".

On Uetz's site, at:

http://reptile-database.reptarium.cz/species?genus=Pareas&species=carinatus&search_param=%28%28search%3D%27Pareas%27%29%29

Wüster *et al.* had (as of 10 June 2020) written:

"Synonymy: Kaiser *et al.* 2013 rejected the (sub-) generic names *Dannyleeus* Hoser 2012, *Katrinahoserserpenea* Hoser 2012

invalid (sic) and rejected their use instead of *Pareas*."

More recently, Wüster *et al.* have taken it upon themselves to not bother attacking taxonomy in papers by Hoser, as they know them to be correct, but have instead decided to systematically rename the taxa previously named by Hoser, with a total number of illegally renamed taxa being nearly 100 as of June 2020 and including species and genera of Blind Snakes, Elapids, Agamids, Pythons, Crocodile, Geckos, Monitors, Skinks and Turtles.

These acts of taxonomic vandalism are in breach of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Through Kaiser *et al.* (2013) and other documents including, Kaiser (2012a, 2012b, 2013, 2014a, 2014b) and countless others by the same cohort, they have directed and harassed other herpetologists to not use names proposed by Hoser and to act in defiance of the *International Code of Zoological Nomenclature* and the edicts of the ICZN itself.

Their actions, arguments and lies have been thoroughly discredited by numerous authors including Cogger (2014), Dubois *et al.* (2019), Hoser, (2007, 2009, 2012a, 2012c, 2013a, 2015a-f, 2019a, 2019b) and sources cited therein.

Furthermore, scientific reality is hard to ignore and while placing all relevant species in a single genus *Pareas* (as opposed to splitting between that genus and *Katrinahoserserpenea*) Wang

et al. (2020) confronted scientific reality when they wrote: “*Pareas* is not monophyletic, but contains two highly supported clades, consistent with scale characters (Guo *et al.* 2011).”

Hoser (2016) also re-confirmed the earlier findings.

Deepak *et al.* (2020) also made the same findings, but as their paper was published in the predatory PRINO (peer reviewed in name only) online “journal” called *Zootaxa* as was Guo *et al.* (2011), there is simply no evidence to suggest any peer review of their papers.

In other words, three separate peer reviewed papers and two without peer review have come to the same obvious conclusion and yet the wholly unscientific and non peer reviewed document known as Kaiser *et al.* (2013) steadfastly attempts to hide peer reviewed scientific reality and is as of 2020 still being falsely peddled as herpetological consensus by the noisy minority known as the Wolfgang Wüster gang of thieves.

In the absence of any scientific basis to reject use of *Katrinahoserserpenea* Hoser, 2012 or *Dannyleeus* Hoser, 2020, and that both names are fully compliant with the rules of the *International Code of Zoological Nomenclature* both are used as correct within this paper.

An audit of previously described forms within *Katrinahoserserpenea* yielded a number of potentially undescribed species and among these, those that are obviously and undeniably new species-level taxa are formally described within this paper.

MATERIALS AND METHODS

The audit of the genus *Katrinahoserserpenea*, followed an earlier one on the audit of *Pareas sensu* Hoser (2012b), which yielded new species as published by Hoser (2016).

Specimens of all known putative species and all relevant and available literature was audited against type material, published descriptions, redescriptions and the like to flag any potentially unnamed forms.

When molecular evidence had been published or was available, it was used to assist in determination if populations represented new species. In the absence of molecular data, biogeographical information was utilized in terms of determining likely barriers to gene flow between morphologically similar, but geographically disjunct populations in order to determine likely species-level divergence. This same information was used to estimate species boundaries in the absence of significant collection in this understudied region.

The genus *Xylophis* Beddome, 1878 from south-west India has also come under recent scrutiny at the species level (see for example Deepak *et al.* 2020). However in spite of at least two studies indicating deep divergence of the two main species groups, both are presently treated as being within a single genus.

This point of view was tested and the result is already outlined in the abstract.

Literature relevant to the audit of *Katrinahoserserpenea*, *Pareas* and taxonomic conclusions herein include: Anderson (1871), Angel (1920), Athreya (2006), Barbour (1912), Boulenger (1896, 1900a, 1900b, 1905, 1914), Bourret (1935a, 1935b, 1937, 1939), Cantor (1839), Chan-ard *et al.* (2015), Chew (2017), Das *et al.* (2009), Das (1996, 2012), Deepak *et al.* (2020), de Rooij (1917), Dunaev and Orlova (2003), Figueroa *et al.* (2016), Goris and Maeda (2004), Götz (2002), Grossmann and Tillack (2003), Günther (1864), Guo and Deng (2009), Guo and Zhang (2015), Guo *et al.* (2011), Hauser (2017), Hei (2008), Hoser (2012b, 2016), Hoso (2017), Hoso and Hori (2008), Hoso *et al.* (2010), Huang (2004), Jan (1866), Jiang (2004), Kelly *et al.* (2003), Kraus and Brown (1998), Lalbiakzuala and Lalremsanga (2019), Laitanpuia *et al.* (2008), Lawson *et al.* (2005), Lenz (2012), Loredó *et al.* (2013), Maki (1931, 1937), Malkmus *et al.* (2002), Nguyen *et al.* (2009), Ota *et al.* (2007), Pope (1928), Pyron *et al.* (2011), Rao and Yang (1992), Savage (2015), Schleich and Kastle (2002), Sharma (2004), Smith (1923, 1930, 1943), Stanley (2017), Stejneger (1910), Tan and Lim (2013), Taylor

(1965), Theobald (1868), Van Denburgh (1909), Vidal *et al.* (2007), Vogel (2010, 2015), Wall (1908, 1909), Wallach *et al.* (2014), Wang *et al.* (2020), Yang *et al.* (2019), You *et al.* (2015), Zaher *et al.* (2019), Zhao (2006), Zhao and Adler (1993), Ziegler (2002) and sources cited therein.

References relevant to the potential division of *Xylophis* Beddome, 1878 and taxonomic conclusions herein include Beddome (1878), Bhupathy and Sathishkumar (2013), Boulenger (1890, 1893), Deepak *et al.* (2019, 2020), Duméril *et al.* (1854), Ganesh *et al.* (2012), Gower and Winkler (2007), Günther (1858, 1875), Inger *et al.* (1984), Jerdon (1865), Palot (2015), Ruane and Austin (2017), Santhoshkumar and Kannan (2017), Sharma (2004), Smith (1943), Wall (1919) and sources cited therein.

RESULTS

Nine hitherto unnamed species were identified.

With two exceptions, all were of taxa generally confined to hilly or higher altitude areas, separated by areas of lowland, being a common precursor to speciation in otherwise geographically proximate forms. This was particularly the case in terms of the relevant species, noting similar potentially excluding species occurred in intervening lowland areas. In this case the relevant species was *K. margaritophorus* (Jan, 1866) as defined by Hauser (2017), which is herein treated as a species complex.

K. margaritophorus (Jan, 1866) *sensu stricto* and the two newly named species until now treated as populations of this taxon appeared to exclude the other taxa where it/they occurred (sympatry only occurring where ranges abut). *K. margaritophorus sensu lato* was generally a lowland form/s as identified by data presented in Hauser (2017).

The putative species *K. tamdaoensis* (Bourret, 1935) from northern Vietnam and nearby southern China is herein treated as valid and is most like *K. macularius* Theobald, 1868 in terms of previously described forms (see elsewhere in this paper).

The putative species *K. (Dannyleeus) monticola* (Cantor, 1839), with a type locality of Naga Hills, Asám (=Assam), India, was found to comprise at least three morphologically distinctive species. Two are formally named herein for the first time.

K. rayhammondi sp. nov. is found on the southern edge of the Himalayas in northern India and *K. danielmani* sp. nov. is found in south-western China.

The three populations appear to be separated by major river valleys.

The putative species *K. macularius* Theobald, 1868 was found to comprise at least six regionally distinct species. The nominate form of *K. macularius* is from southern Burma and nearby western Thailand.

The newly described forms are *K. tongzhoujiaie* sp. nov. from Hainan, China, *K. danielmannixi* sp. nov. from Yunnan, China, *K. rodnekingi* sp. nov. from Vietnam, *K. daranini* sp. nov. from Western and northern Myanmar and *K. mconnachiei* sp. nov. from the Isthmus of Kra, in southern Thailand.

Specimens of putative *K. margaritophorus* (Jan, 1866) were inspected from all parts of the known range of the species.

Three distinctive forms were identified, all of which corresponded with well-known biogeographic barriers and gaps in collection records for museums. As a result, the specimens from Peninsula Malaysia and Hong Kong, were each formally named as new species.

These are *K. bobbottomi* sp. nov. from the Malay Peninsula and (presumably) nearby Sumatra and *K. evanwhittoni* sp. nov. from Hong Kong and adjacent parts of China.

The genus *Xylophis* Beddome, 1878, (subfamily Xylophiinae Deepak *et al.* 2020) as currently recognized are endemic to the Western Ghats of peninsular India. Molecular studies (e.g. Deepak *et al.* 2020) and morphology indicate two divergent lineages of great antiquity. One of these is formally placed in a new genus *Zilonear* gen. nov..

In terms of the following formal descriptions, the following should be noted: Spelling of names is deliberate and should not be

changed. Descriptions are of normal, healthy adult snakes unless otherwise stated. Material may be repeated in descriptions of taxa to ensure full compliance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

Material cited in this paper as downloaded from the internet was last checked as being online and as cited as of 20 June 2020 unless otherwise stated.

**KATRINAHOSERSERPENEA (DANNYLEEUS)
RAYHAMMONDI SP. NOV.**

LSIDurn:lsid:zoobank.org:act:BFACB7B4-4733-42E1-9294-1A5F4546537F

Holotype: A preserved male specimen at the Museum of Natural History, London, UK, specimen number 1880.11.10.147, collected at Darjeeling, India.

This facility allows access to its holdings.

Paratype: A preserved female specimen at the Museum of Natural History, London, UK, specimen number 1909.3.9.18-21, collected from near Darjeeling, India.

Diagnosis: In most respects *Katrinahoserserpenea* (*Dannyleeus*) *rayhammondi* sp. nov. and *K. danielmani* sp. nov. are similar to *K. monticola* (Cantor, 1839) and until now have been treated as the same taxon.

However both the new species are readily separated from *K. monticola* by their shorter body.

K. monticola is separated from the other two species by males having more than 193 ventrals and 84 subcaudals.

By contrast, male *K. rayhammondi* sp. nov. has 188 ventrals and 75 subcaudals.

K. danielmani sp. nov. is separated from both other species by males having 182-189 ventrals and 69-72 subcaudals.

K. rayhammondi sp. nov., *K. monticola* and *K. danielmani* sp. nov. are also separated by colouration. *K. rayhammondi* sp. nov. is yellowish brown (sometimes with reddish tinge as well as strong yellow tinge) and with indistinct or no obvious banding or markings on the posterior end of the body, versus orange in *K. monticola* with pattern extending the full length of the body and versus yellowish brown with pattern extending the full length of the body in *K. danielmani* sp. nov..

An image of *K. monticola* in life can be found in Vogel (2015) in figure 5, from Mizoram, India, or online at:

<https://www.flickr.com/photos/84335714@N07/15257990328/>

or:

<https://www.inaturalist.org/observations/1610555>

or:

<https://www.inaturalist.org/observations/18564088>

or:

<https://www.inaturalist.org/observations/18406607>

Two images of *K. rayhammondi* sp. nov. in life can be found online at:

http://www.aoc.nrao.edu/~sbhatnag/Nature/warunachal/Images/Snakes/rma_pareasSp1.jpg

and:

http://www.aoc.nrao.edu/~sbhatnag/Nature/warunachal/Images/Snakes/rma_pareasSp2.jpg

with specimens from Eaglenest Wildlife Reserve, India.

The three species form the entirety of the subgenus *Dannyleeus* Hoser, 2012 and are separated from all other species within *Katrinahoserserpenea* Hoser, 2012 and *Pareas* Wagler, 1830 by the following suite of characters (amended slightly to form a new diagnosis as opposed to Hoser, 2012):

These snakes are of a dark or light-brown dorsal colour, many dorsal scales having small black dots forming a transverse line or reticulation, there is a pre-frontal that enters the eye, there's no preocular and the loreal enters the eye, smooth dorsal scales, vertebral enlarged, the fourth upper labial enters the eye, there are more than 182 ventrals, more than 69 subcaudals and a black "X"-shaped mark behind the parietals.

Snakes in the genus *Pareas* Wagler, 1830 differ from taxa in the

genus *Katrinahoserserpenea* by cephalic scalation and distribution pattern.

Pareas species share three anterior temporals in contrast to the one or two (rarely three) anterior temporals in *Katrinahoserserpenea* species.

The frontal scale in *Pareas* is hexagonal with the lateral sides parallel to the body axis; this scale in

Katrinahoserserpenea is almost diamond-shaped or shield-shaped with the lateral sides converging posteriorly. The two anterior chin shields are longer than broad in

Katrinahoserserpenea, whereas in *Pareas* they are broader than long; this is a consistent way to separate the two genera.

Another consistent way to separate the genera is by the fact that in *Katrinahoserserpenea* species there is a pre-frontal that enters the eye, whereas in *Pareas* there is no prefrontal.

The snakes in the genus *Pareas* occur mainly throughout the Indochinese Peninsula and Sunda shelf Islands.

By contrast most species of *Katrinahoserserpenea* occur in southern China and the northern Indochinese Peninsula, extending south along the southern Indochinese Peninsula and west to north-east India.

Distribution: *K. rayhammondi* sp. nov. is known only from the type locality, but is presumed to also be found in immediately adjacent parts of Nepal, Bhutan and China.

Etymology: *K. rayhammondi* sp. nov. is named in honour of Ray Hammond of Hamilton in western Victoria, Australia, in recognition for his critically important and free of charge logistical services assisting various scientific projects by this author over many years.

KATRINAHOSERSERPENEA (DANNYLEEUS) DANIELMANI SP. NOV.

LSIDurn:lsid:zoobank.org:act:DB19D3CD-9B80-4083-8A7D-80C7CCD7AE60

Holotype: A preserved specimen at the Kuming Institute of Zoology at the Chinese Academy of Sciences, now at the Kuming Natural History Museum of Zoology at Kuming Institute of Zoology, China, specimen number KIZ047036 collected from Pingbian, Yunnan, China. This facility allows access to its holdings.

Paratype: A preserved specimen at the California Academy of Sciences, San Francisco, USA, specimen number CAS 224415 collected at Nagmung Township, Hakabo Razi National Park, between Ngawar Village and Lon Nut Village, Myanmar, Latitude 27.4605 N., Longitude 97.4907 E.

Diagnosis: In most respects *Katrinahoserserpenea* (*Dannyleeus*) *danielmani* sp. nov. and *K. rayhammondi* sp. nov. are similar to *K. monticola* (Cantor, 1839) and until now have been treated as the same taxon.

However both the new species are readily separated from *K. monticola* by their shorter body.

K. monticola is separated from the other two species by males having more than 193 ventrals and 84 subcaudals.

By contrast, male *K. rayhammondi* sp. nov. has 188 ventrals and 75 subcaudals.

K. danielmani sp. nov. is separated from both other species by males having 182-189 ventrals and 69-72 subcaudals.

K. rayhammondi sp. nov., *K. monticola* and *K. danielmani* sp. nov. are also separated by colouration. *K. rayhammondi* sp. nov. is yellowish brown (sometimes with reddish tinge as well as strong yellow tinge) and with indistinct or no obvious banding or markings on the posterior end of the body, versus orange in *K. monticola* with pattern extending the full length of the body and versus yellowish brown with pattern extending the full length of the body in *K. danielmani* sp. nov..

An image of *K. monticola* in life can be found in Vogel (2015) in figure 5, from Mizoram, India, or online at:

<https://www.flickr.com/photos/84335714@N07/15257990328/>

or:

<https://www.inaturalist.org/observations/1610555>

or:
<https://www.inaturalist.org/observations/18564088>
 or:
<https://www.inaturalist.org/observations/18406607>
 Two images of *K. rayhammondi* sp. nov. in life can be found online at:
http://www.aoc.nrao.edu/~sbhatnag/Nature/warunachal/Images/Snakes/rma_pareasSp1.jpg
 and:
http://www.aoc.nrao.edu/~sbhatnag/Nature/warunachal/Images/Snakes/rma_pareasSp2.jpg

with specimens from Eaglenest Wildlife Reserve, India.
 The three species form the entirety of the subgenus *Dannyleeus* Hoser, 2012 and are separated from all other species within *Katrinahoserserpenea* Hoser, 2012 and *Pareas* Wagler, 1830 by the following suite of characters (amended slightly to form a new diagnosis as opposed to Hoser, 2012):

These snakes are of a dark or light-brown dorsal colour, many dorsal scales having small black dots forming a transverse line or reticulation, there is a pre-frontal that enters the eye, there's no preocular and the loreal enters the eye, smooth dorsal scales, vertebral enlarged, the fourth upper labial enters the eye, there are more than 182 ventrals, more than 69 subcaudals and a black "X"-shaped mark behind the parietals.

Snakes in the genus *Pareas* Wagler, 1830 differ from taxa in the genus *Katrinahoserserpenea* by cephalic scalation and distribution pattern.

Pareas species share three anterior temporals in contrast to the one or two (rarely three) anterior temporals in *Katrinahoserserpenea* species.

The frontal scale in *Pareas* is hexagonal with the lateral sides parallel to the body axis; this scale in

Katrinahoserserpenea is almost diamond-shaped or shield-shaped with the lateral sides converging posteriorly. The two anterior chin shields are longer than broad in *Katrinahoserserpenea*, whereas in *Pareas* they are broader than long; this is a consistent way to separate the two genera.

Another consistent way to separate the genera is by the fact that in *Katrinahoserserpenea* species there is a pre-frontal that enters they eye, whereas in *Pareas* there is no prefrontal.

The snakes in the genus *Pareas* occur mainly throughout the Indochinese Peninsula and Sunda shelf Islands.

By contrast most species of *Katrinahoserserpenea* occur in southern China and the northern Indochinese Peninsula, extending south along the southern Indochinese Peninsula and west to north-east India.

Distribution: *K. danielmani* sp. nov. is known from Yunnan, China and nearby parts of northern Myanmar.

Etymology: Named in honour of Daniel Man, an accountant of Mitcham, Victoria, Australia, in recognition of his services to Snakebusters, Australia's best reptiles shows and other wildlife conservation enterprises in Australia over a period of 30 years.

KATRINAHOSERSERPENEA (KATRINAHOSERSERPENEA) TONGZHOUJIAE SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:74AA0D00-80BE-47CA-876F-A539E78E0000

Holotype: A preserved specimen at Yinbin University, China, Cuiping District, Yibin, China, specimen number: YBU12016, collected from Hainan, China.

This facility allows access to its holdings.

Paratype: A preserved specimen at Yinbin University, China, Cuiping District, Yibin, China, specimen number: YBU17030, collected from Hainan, China.

Diagnosis: *Katrinahoserserpenea* (*Katrinahoserserpenea*) *macularius* (Theobald, 1868) has until now been treated as a wide-ranging species with a distribution encompassing potentially India (Darjeeling, Sikkim, West Bengal) (those records being doubted by Hauser 2017), Bangladesh, Myanmar

(= Burma): Kachin, Mandalay, Mon, Shan, Tanintharyi, Yangon, Thailand (Chiang Mai), Laos (Xiangkhouang), Vietnam (Bac Kan, Cao Bang, Hai Duong, Hoa Binh, Lai Chau, Nghe An, Quang Binh, Vinh Phuc), Northern West Malaysia, South China (Yunnan, Guangxi, Guangdong, Guizhou).

However previous studies including the molecular evidence, of Wang *et al.* (2020) and Deepak *et al.* (2020), as well as the morphological evidence of Hauser (2017) have confirmed that a number of species have been lumped within this putative taxon. Five relevant species are formally named in this paper.

The nominate form of *K. macularius* is from hilly parts of southern Myanmar and nearby western Thailand.

The newly described species are *K. tongzhoujiae* sp. nov. from Hainan, China, *K. danielmannixi* sp. nov. from Yunnan, China, *K. rodnekingi* sp. nov. from Vietnam south of the delta region of Hanoi and *K. daranini* sp. nov. from Western and northern Myanmar and *K. mcconnachiei* sp. nov. from the Isthmus of Kra, in southern Thailand.

All six preceding species are separated from the morphologically similar species *K. margaritophorus* (Jan, 1866) by the following suite of characters: Dorsal scales forming the median 7-13 rows are weakly keeled; nuchal region often with a butterfly or W-shaped collar with moderate or dense speckling; intensely black blotch (IBB) usually present on the seventh (and last) supralabial (rarely absent except in *K. danielmannixi* sp. nov.); ventral shields usually more than 148; belly speckling usually dense, often large blotches are present, but the prevalence of this last character is also somewhat species dependent (see below).

By contrast *K. margaritophorus* (*sensu lato*) is diagnosed and separated from the preceding species as follows: Dorsal scales are entirely smooth (no keels); nuchal region usually with pink, cream or yellow, entire or tripartite collar or spot without fine brown speckling; IBB usually absent on the seventh supralabial (very rarely present); ventral shields usually fewer than 158; belly speckling usually sparse, in particular anteriorly (adapted from Hauser 2017).

The type form of *K. macularius* is readily separated from *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. rodnekingi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by the following suite of characters: dorsum is mainly light brown with a very slight orange tinge; scattered dark brownish-black scales are arranged into indistinct cross bands or similar and with obvious white tips at the anterior end, therefore being only visible on the outward curved side of the snake, with the white being hidden under a scale on the inward curved side of the snake. Where bands form across the body, they are more-or-less continuous, with most scales in a given row being dark and few if any lighter gap scales are present. The top of the head is greyish brown and peppered all over. Labials have white on them near the lip and if the white is prominent it is always well barred with dark brown.

K. tongzhoujiae sp. nov. is readily separated from all of *K. macularius*, *K. danielmannixi* sp. nov., *K. rodnekingi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by having the following unique combination of characters: Dorsum is a dark olive brown and the dark blackish-brown scales scattered on the dorsum are clustered to form a distinctive series of spots all over the dorsal surface, as opposed to cross bands. The spots are irregularly spaced. The anterior upper surface of the head is uniformly grey.

K. danielmannixi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. rodnekingi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by being generally dark brown dorsally, with dark near black scales being generally arranged in cross-bands, but these are well spaced with more lighter coloured scales between the dark ones, making the banding indistinct on the fore-body, becoming absent on the posterior end of the body and tail. The side of the head and snout, anterior to the eye are dark grey, but the upper lip has a series of 3-5 small but well-defined white triangles, with

base of each on the lip and point facing up. These small triangles do not go anywhere near reaching the eye. The upper surface of the head and snout are black, other than for some brown blotches on the upper surface, these having ill defined boundaries.

The IBB on the last supralabial is absent and this scale is merely strongly peppered with grey.

K. rodnekingi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by the following character suite: Similar to *K. macularius* as described above, but separated from it by having a dark iris, versus light orangeish to red in *K. macularius*. The upper lip is bounded by a distinctive thick white line (sometimes yellowish) and if barring is present it is usually incomplete and/or indistinct.

The dorsum is greyish with a slight orangeish tinge. Snout is yellowish with grey peppering.

The belly of *K. rodnekingi* sp. nov. is heavily speckled with peppering and also with dark blotches, versus not so in *K. macularius*.

K. daranini sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. rodnekingi* sp. nov. and *K. mcconnachiei* sp. nov. by the following suite of characters: The dorsal side, with rows of keeled scales, is nearly completely black and shows no cross-bands of bicolored spots as seen in the other five species. A speckled, W-shaped nuchal collar typical of the other five species cannot be distinguished. On the belly there are rows of squarish, black blotches. The seventh (last) supralabial does not show a distinct IBB, but is heavily mottled with black or alternatively is completely black.

K. mcconnachiei sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. rodnekingi* sp. nov. and *K. daranini* sp. nov. by possessing a distinctive W-shaped collar with two distinctive 'tails' extending backwards. The W-shaped collar configuration is not seen in any of the other species. Otherwise *K. mcconnachiei* sp. nov. is similar in most other respects to *K. macularius*.

The putative species *K. tamdaoensis* (Bourret, 1935) from northern Vietnam and nearby southern China is herein treated as valid and is most like *K. rodnekingi* sp. nov. as described herein (separating it from the other species as well), but *K. tamdaoensis* is separated from that species by having reduced white on the upper lip (as compared to *K. rodnekingi* sp. nov.) and a very prominent IBB on the last supralabial.

All the preceding species and *K. margaritophorus* (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) are separated from all other species within *Katrinahoserserpenea* as defined by Hoser (2012b) by having a uniform brown, yellowish brown or blue gray above with a pattern including single dark (near black) scales forming cross-bands, broken cross bands or spotting, the single dark scales usually having a white tip at the anterior, which is exposed when the snake turns to face the surface outwards to stretch that surface. Venter brownish white, spotted or peppered with brown and sometimes with spots or squares. Rostral a little broader than deep; internasals about half the length of the prefrontals; latter entering the eye; frontal a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; supraocular moderate, nearly half the width of the frontal; a small loreal; one preocular, one postocular and three or more suboculars, excluding the labials from the eye; temporals much elongate, 2+2; seven upper labials, seventh very large; three pairs of large chin-shields. 15 midbody rows, dorsals may be weakly keeled, anal entire.

A photo of the type form of *K. macularius* in life can be found in Hauser (2017) on page 31 at top or online at:

<https://www.flickr.com/photos/herpguide/4094975909/>
and:

<https://www.flickr.com/photos/rushen/15360955943/>
and:

<https://www.flickr.com/photos/tontantravel/15765143819/>

A photo of *K. tongzhoujiae* sp. nov. in life can be found in Hei (2008) in Fig. 16 (page 4 bottom).

A photo of *K. danielmannixi* sp. nov. in life can be found in black and white in Yang and Rao (2008).

A photo of *K. margaritophorus* (Jan, 1866) in life can be found in Hauser (2017) on page 30 at top.

K. margaritophorus (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) is formally split three ways in this paper.

The relevant species are *K. margaritophorus* (Jan, 1866) restricted to Thailand generally north of Phuket and Nakhon Si Thammarat (8 degrees north) as well as Laos, South Vietnam and south east Myanmar., *K. bobbottomi* sp. nov., restricted to the Malay Peninsula south of about 8 degrees north and potentially nearby Sumatra, Indonesia and *K. evanwhittoni* sp. nov. from Hong Kong, nearby parts of China and adjacent parts of north Vietnam.

Distribution: *K. tongzhoujiae* sp. nov. from Hainan, China are known only from hilly parts of Hainan, China (mainly the southern parts of the island), where it is believed to be common and easily found. It is one of a number of endemic species from this area.

Etymology: Named in honour of Tongzhou Ji, (AKA Josie) originally from northern China, but now living in Sunbury, Victoria, Australia in recognition of her work in animal welfare, working with Snakebusters and the Victorian Dog Training Academy, doing Snake Avoidance training for dogs.

This training saves lives of both snakes and dogs and besides the animal welfare benefits, also has positive outcomes for wildlife conservation in that snakes do not get killed!.

KATRINAHOSERSERPENEA (KATRINAHOSERSERPENEA) DANIELMANNIXI SP. NOV.

LSIDurn:lsid:zoobank.org:act:CB0625EC-A1BF-4F88-AC81-A3DF1B70D7F7

Holotype: A preserved specimen at Yinbin University, China, Cuiping District, Yibin, China, specimen number: YBU17062, collected from Jingdong, Yunnan, China. This facility allows access to its holdings.

Paratype: A preserved specimen at Yinbin University, China, Cuiping District, Yibin, China, specimen number: YBU17078, collected from Jingdong, Yunnan, China.

Diagnosis: *Katrinahoserserpenea* (*Katrinahoserserpenea*) *macularius* (Theobald, 1868) has until now been treated as a wide-ranging species with a distribution encompassing potentially India (Darjeeling, Sikkim, West Bengal) (those records being doubted by Hauser 2017), Bangladesh, Myanmar (= Burma): Kachin, Mandalay, Mon, Shan, Tanintharyi, Yangon, Thailand (Chiang Mai), Laos (Xiangkhouang), Vietnam (Bac Kan, Cao Bang, Hai Duong, Hoa Binh, Lai Chau, Nghe An, Quang Binh, Vinh Phuc), Northern West Malaysia, South China (Yunnan, Guangxi, Guangdong, Guizhou).

However previous studies including the molecular evidence, of Wang *et al.* (2020) and Deepak *et al.* (2020), as well as the morphological evidence of Hauser (2017) have confirmed that a number of species have been lumped within this putative taxon. Five relevant species are formally named in this paper.

The nominate form of *K. macularius* is from hilly parts of southern Myanmar and nearby western Thailand.

The newly described species are *K. tongzhoujiae* sp. nov. from Hainan, China, *K. danielmannixi* sp. nov. from Yunnan, China, *K. rodnekingi* sp. nov. from Vietnam south of the delta region of Hanoi and *K. daranini* sp. nov. from Western and northern Myanmar and *K. mcconnachiei* sp. nov. from the Isthmus of Kra, in southern Thailand.

All six preceding species are separated from the morphologically similar species *K. margaritophorus* (Jan, 1866) by the following suite of characters: Dorsal scales forming the median 7-13 rows are weakly keeled; nuchal region often with a butterfly or W-

shaped collar with moderate or dense speckling; intensely black blotch (IBB) usually present on the seventh (and last) supralabial (rarely absent except in *K. danielmannixi* sp. nov.); ventral shields usually more than 148; belly speckling usually dense, often large blotches are present, but the prevalence of this last character is also somewhat species dependent (see below).

By contrast *K. margaritophorus* (*sensu lato*) as defined by Hauser (2017) is diagnosed and separated from the preceding species as follows: Dorsal scales are entirely smooth (no keels); nuchal region usually with pink, cream or yellow, entire or tripartite collar or spot without fine brown speckling; IBB usually absent on the seventh supralabial (very rarely present); ventral shields usually fewer than 158; belly speckling usually sparse, in particular anteriorly (adapted from Hauser 2017).

The type form of *K. macularius* is readily separated from *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. rodnekingi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by the following suite of characters: dorsum is mainly light brown with a very slight orange tinge; scattered dark brownish-black scales are arranged into indistinct cross bands or similar and with obvious white tips at the anterior end, therefore being only visible on the outward curved side of the snake, with the white being hidden under a scale on the inward curved side of the snake. Where bands form across the body, they are more-or-less continuous, with most scales in a given row being dark and few if any lighter gap scales are present. The top of the head is greyish brown and peppered all over. Labials have white on them near the lip and if the white is prominent it is always well barred with dark brown.

K. tongzhoujiae sp. nov. is readily separated from all of *K. macularius*, *K. danielmannixi* sp. nov., *K. rodnekingi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by having the following unique combination of characters: Dorsum is a dark olive brown and the dark blackish-brown scales scattered on the dorsum are clustered to form a distinctive series of spots all over the dorsal surface, as opposed to cross bands. The spots are irregularly spaced. The anterior upper surface of the head is uniformly grey.

K. danielmannixi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. rodnekingi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by being generally dark brown dorsally, with dark near black scales being generally arranged in cross-bands, but these are well spaced with more lighter coloured scales between the dark ones, making the banding indistinct on the fore-body, becoming absent on the posterior end of the body and tail. The side of the head and snout, anterior to the eye are dark grey, but the upper lip has a series of 3-5 small but well-defined white triangles, with base of each on the lip and point facing up. These small triangles do not go anywhere near reaching the eye. The upper surface of the head and snout are black, other than for some brown blotches on the upper surface, these having ill defined boundaries.

The IBB on the last supralabial is absent and this scale is merely strongly peppered with grey.

K. rodnekingi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. daranini* sp. nov. and *K. mcconnachiei* sp. nov. by the following character suite: Similar to *K. macularius* as described above, but separated from it by having a dark iris, versus light orangeish to red in *K. macularius*. The upper lip is bounded by a distinctive thick white line (sometimes yellowish) and if barring is present it is usually incomplete and/or indistinct.

The dorsum is greyish with a slight orangeish tinge. Snout is yellowish with grey peppering.

The belly of *K. rodnekingi* sp. nov. is heavily speckled with peppering and also with dark blotches, versus not so in *K. macularius*.

K. daranini sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov.,

K. rodnekingi sp. nov. and *K. mcconnachiei* sp. nov. by the following suite of characters: The dorsal side, with rows of keeled scales, is nearly completely black and shows no cross-bands of bicolored spots as seen in the other five species. A speckled, W-shaped nuchal collar typical of the other five species cannot be distinguished. On the belly there are rows of squarish, black blotches. The seventh (last) supralabial does not show a distinct IBB, but is heavily mottled with black or alternatively is completely black.

K. mcconnachiei sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. rodnekingi* sp. nov. and *K. daranini* sp. nov. by possessing a distinctive W-shaped collar with two distinctive 'tails' extending backwards. The W-shaped collar configuration is not seen in any of the other species. Otherwise *K. mcconnachiei* sp. nov. is similar in most other respects to *K. macularius*.

The putative species *K. tamdaoensis* (Bourret, 1935) from northern Vietnam and nearby southern China is herein treated as valid and is most like *K. rodnekingi* sp. nov. as described herein (separating it from the other species as well), but *K. tamdaoensis* is separated from that species by having reduced white on the upper lip (as compared to *K. rodnekingi* sp. nov.) and a very prominent IBB on the last supralabial.

All the preceding species and *K. margaritophorus* (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) are separated from all other species within *Katrinahosersepena* as defined by Hoser (2012b) by having a uniform brown, yellowish brown or blue gray above with a pattern including single dark (near black) scales forming cross-bands, broken cross bands or spotting, the single dark scales usually having a white tip at the anterior, which is exposed when the snake turns to face the surface outwards to stretch that surface. Venter brownish white, spotted or peppered with brown and sometimes with spots or squares. Rostral a little broader than deep; internasals about half the length of the prefrontals; latter entering the eye; frontal a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; supraocular moderate, nearly half the width of the frontal; a small loreal; one preocular, one postocular and three or more suboculars, excluding the labials from the eye; temporals much elongate, 2+2; seven upper labials, seventh very large; three pairs of large chin-shields. 15 midbody rows, dorsals may be weakly keeled, anal entire.

A photo of the type form of *K. macularius* in life can be found in Hauser (2017) on page 31 at top or online at:

<https://www.flickr.com/photos/herpguide/4094975909/> and:

<https://www.flickr.com/photos/rushen/15360955943/> and:

<https://www.flickr.com/photos/tontantravel/15765143819/>

A photo of *K. tongzhoujiae* sp. nov. in life can be found in Hei (2008) in Fig. 16 (page 4 bottom).

A photo of *K. danielmannixi* sp. nov. in life can be found in black and white in Yang and Rao (2008).

A photo of *K. margaritophorus* (Jan, 1866) in life can be found in Hauser (2017) on page 30 at top.

K. margaritophorus (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) is formally split three ways in this paper.

The relevant species are *K. margaritophorus* (Jan, 1866) restricted to Thailand generally north of Phuket and Nakhon Si Thammarat (8 degrees north) as well as Laos, South Vietnam and south east Myanmar., *K. bobbottomi* sp. nov., restricted to the Malay Peninsula south of about 8 degrees north and potentially nearby Sumatra, Indonesia and *K. evanwhittoni* sp. nov. from Hong Kong, nearby parts of China and adjacent parts of north Vietnam.

Distribution: *K. danielmannixi* sp. nov. from Hainan, China are known to occur in Yunnan, China.

Etymology: Named in honour of Daniel Mannix, of Sunbury, Victoria, Australia, formerly of Sunshine Victoria, owner of the Victorian Dog Training Academy (VDTA) in recognition of his

work in animal welfare, working with Snakebusters and the Victorian Dog Training Academy, doing Snake Avoidance training for dogs. This training saves lives of both snakes and dogs and besides the animal welfare benefits, also has positive outcomes for wildlife conservation.

KATRINAHOSERSERPENEA (KATRINAHOSERSERPENEA) RODNEYKINGI SP. NOV.

LSIDurn:lsid:zoobank.org:act:B757D4F3-7D17-4965-AF1C-6F480517FD72

Holotype: A preserved specimen at the Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, specimen number ZFMK 86446 collected from Quang Binh, Phong Nha Ke Bang National Park, Vietnam. This facility allows access to its holdings.

Paratype: A preserved specimen at the Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, specimen number ZFMK 82925 collected from Nghe An, Vietnam.

Diagnosis: *Katrinahoserserpenea (Katrinahoserserpenea) macularius* (Theobald, 1868) has until now been treated as a wide-ranging species with a distribution encompassing potentially India (Darjeeling, Sikkim, West Bengal) (those records being doubted by Hauser 2017), Bangladesh, Myanmar (= Burma): Kachin, Mandalay, Mon, Shan, Tanintharyi, Yangon, Thailand (Chiang Mai), Laos (Xiangkhouang), Vietnam (Bac Kan, Cao Bang, Hai Duong, Hoa Binh, Lai Chau, Nghe An, Quang Binh, Vinh Phuc), Northern West Malaysia, South China (Yunnan, Guangxi, Guangdong, Guizhou).

However previous studies including the molecular evidence, of Wang *et al.* (2020) and Deepak *et al.* (2020), as well as the morphological evidence of Hauser (2017) have confirmed that a number of species have been lumped within this putative taxon. Five relevant species are formally named in this paper.

The nominate form of *K. macularius* is from hilly parts of southern Myanmar and nearby western Thailand.

The newly described species are *K. tongzhoujiae sp. nov.* from Hainan, China, *K. danielmannixi sp. nov.* from Yunnan, China, *K. rodneykingi sp. nov.* from Vietnam south of the delta region of Hanoi and *K. daranini sp. nov.* from Western and northern Myanmar and *K. mconnachiei sp. nov.* from the Isthmus of Kra, in southern Thailand.

All six preceding species are separated from the morphologically similar species *K. margaritophorus* (Jan, 1866) by the following suite of characters: Dorsal scales forming the median 7-13 rows are weakly keeled; nuchal region often with a butterfly or W-shaped collar with moderate or dense speckling; intensely black blotch (IBB) usually present on the seventh (and last) supralabial (rarely absent except in *K. danielmannixi sp. nov.*); ventral shields usually more than 148; belly speckling usually dense, often large blotches are present, but the prevalence of this last character is also somewhat species dependent (see below).

By contrast *K. margaritophorus (sensu lato)* as defined by Hauser (2017) is diagnosed and separated from the preceding species as follows: Dorsal scales are entirely smooth (no keels); nuchal region usually with pink, cream or yellow, entire or tripartite collar or spot without fine brown speckling; IBB usually absent on the seventh supralabial (very rarely present); ventral shields usually fewer than 158; belly speckling usually sparse, in particular anteriorly (adapted from Hauser 2017).

The type form of *K. macularius* is readily separated from *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodneykingi sp. nov.*, *K. daranini sp. nov.* and *K. mconnachiei sp. nov.* by the following suite of characters: dorsum is mainly light brown with a very slight orange tinge; scattered dark brownish-black scales are arranged into indistinct cross bands or similar and with obvious white tips at the anterior end, therefore being only visible on the outward curved side of the snake, with the white being hidden under a scale on the inward curved side of the snake. Where bands form across the body, they are more-or-less continuous, with most scales in a given row being dark and

few if any lighter gap scales are present. The top of the head is greyish brown and peppered all over. Labials have white on them near the lip and if the white is prominent it is always well barred with dark brown.

K. tongzhoujiae sp. nov. is readily separated from all of *K. macularius*, *K. danielmannixi sp. nov.*, *K. rodneykingi sp. nov.*, *K. daranini sp. nov.* and *K. mconnachiei sp. nov.* by having the following unique combination of characters: Dorsum is a dark olive brown and the dark blackish-brown scales scattered on the dorsum are clustered to form a distinctive series of spots all over the dorsal surface, as opposed to cross bands. The spots are irregularly spaced. The anterior upper surface of the head is uniformly grey.

K. danielmannixi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. rodneykingi sp. nov.*, *K. daranini sp. nov.* and *K. mconnachiei sp. nov.* by being generally dark brown dorsally, with dark near black scales being generally arranged in cross-bands, but these are well spaced with more lighter coloured scales between the dark ones, making the banding indistinct on the fore-body, becoming absent on the posterior end of the body and tail. The side of the head and snout, anterior to the eye are dark grey, but the upper lip has a series of 3-5 small but well-defined white triangles, with base of each on the lip and point facing up. These small triangles do not go anywhere near reaching the eye. The upper surface of the head and snout are black, other than for some brown blotches on the upper surface, these having ill defined boundaries.

The IBB on the last supralabial is absent and this scale is merely strongly peppered with grey.

K. rodneykingi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. daranini sp. nov.* and *K. mconnachiei sp. nov.* by the following character suite: Similar to *K. macularius* as described above, but separated from it by having a dark iris, versus light orangeish to red in *K. macularius*. The upper lip is bounded by a distinctive thick white line (sometimes yellowish) and if barring is present it is usually incomplete and/or indistinct.

The dorsum is greyish with a slight orangeish tinge. Snout is yellowish with grey peppering.

The belly of *K. rodneykingi sp. nov.* is heavily speckled with peppering and also with dark blotches, versus not so in *K. macularius*.

K. daranini sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodneykingi sp. nov.* and *K. mconnachiei sp. nov.* by the following suite of characters: The dorsal side, with rows of keeled scales, is nearly completely black and shows no cross-bands of bicolored spots as seen in the other five species. A speckled, W-shaped nuchal collar typical of the other five species cannot be distinguished. On the belly there are rows of squarish, black blotches. The seventh (last) supralabial does not show a distinct IBB, but is heavily mottled with black or alternatively is completely black.

K. mconnachiei sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodneykingi sp. nov.* and *K. daranini sp. nov.* by possessing a distinctive W-shaped collar with two distinctive 'tails' extending backwards. The W-shaped collar configuration is not seen in any of the other species. Otherwise *K. mconnachiei sp. nov.* is similar in most other respects to *K. macularius*.

The putative species *K. tamdaoensis* (Bourret, 1935) from northern Vietnam and nearby southern China is herein treated as valid and is most like *K. rodneykingi sp. nov.* as described herein (separating it from the other species as well), but *K. tamdaoensis* is separated from that species by having reduced white on the upper lip (as compared to *K. rodneykingi sp. nov.*) and a very prominent IBB on the last supralabial.

All the preceding species and *K. margaritophorus* (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) are separated from all

other species within *Katrinahoserserpenea* as defined by Hoser (2012b) by having a uniform brown, yellowish brown or blue gray above with a pattern including single dark (near black) scales forming cross-bands, broken cross bands or spotting, the single dark scales usually having a white tip at the anterior, which is exposed when the snake turns to face the surface outwards to stretch that surface. Venter brownish white, spotted or peppered with brown and sometimes with spots or squares. Rostral a little broader than deep; internasals about half the length of the prefrontals; latter entering the eye; frontal a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; supraocular moderate, nearly half the width of the frontal; a small loreal; one preocular, one postocular and three or more suboculars, excluding the labials from the eye; temporals much elongate, 2+2; seven upper labials, seventh very large; three pairs of large chin-shields. 15 midbody rows, dorsals may be weakly keeled, anal entire.

A photo of the type form of *K. macularius* in life can be found in Hauser (2017) on page 31 at top or online at:

<https://www.flickr.com/photos/herpguide/4094975909/>

and:

<https://www.flickr.com/photos/rushen/15360955943/>

and:

<https://www.flickr.com/photos/tontantravel/15765143819/>

A photo of *K. tongzhoujiae* sp. nov. in life can be found in Hei (2008) in Fig. 16 (page 4 bottom).

A photo of *K. danielmannixi* sp. nov. in life can be found in black and white in Yang and Rao (2008).

A photo of *K. margaritophorus* (Jan, 1866) in life can be found in Hauser (2017) on page 30 at top.

K. margaritophorus (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) is formally split three ways in this paper.

The relevant species are *K. margaritophorus* (Jan, 1866) restricted to Thailand generally north of Phuket and Nakhon Si Thammarat (8 degrees north) as well as Laos, South Vietnam and south east Myanmar., *K. bobbottomi* sp. nov., restricted to the Malay Peninsula south of about 8 degrees north and potentially nearby Sumatra, Indonesia and *K. evanwhittoni* sp. nov. from Hong Kong, nearby parts of China and adjacent parts of north Vietnam.

Distribution: *K. rodneynkingi* sp. nov. occurs in hilly parts of Vietnam south of the delta region of Hanoi.

Etymology: Named in recognition of Rodney Glen King. He was born on 2 April, 1965 at Sacramento, California, USA and died on 17 June, 2012 (aged 47) at Rialto, California, USA allegedly from drowning. His name is synonymous with unlawful acts of police violence, brutality and corruption and the public exposure of it.

On 3 March 1991, King, at the time a construction worker was beaten by Los Angeles Police Department (LAPD) officers after a high-speed chase during his arrest for allegedly drunk driving on I-210. An unconnected civilian, George Holliday, filmed the incident from his nearby balcony and sent the footage to local news station KTLA.

The footage showed an unarmed King on the ground being brutally bashed by the police officers. The incident was covered by news media around the world and caused a massive outrage among others who had been similarly bashed by police behind closed doors.

At a press conference, announcing the fourteen officers involved would be disciplined, and three would face criminal charges, Los Angeles police chief Daryl Gates said:

"We believe the officers used excessive force taking him into custody. In our review, we find that officers struck him with batons between fifty-three and fifty-six times."

No charges were filed against the then 25-year-old King. On his release, he spoke to reporters from his wheelchair, with his injuries evident: a broken right leg in a cast, his face badly cut and swollen, bruises on his body, and a burn area to his chest where he had been jolted with a 50,000-volt stun gun. He

described how he had knelt, spread his hands out, and slowly tried to move so as not to make any 'stupid move,' being hit across the face by a billy club and shocked.

King said he was scared for his life as the police drew down on him.

Dallas chief of police William Rathburn ordered that all police watch the video as an instructional tape on how not to behave.

Four officers were eventually tried on charges of use of excessive force. Of these, three were acquitted, and the jury failed to reach a verdict on one charge for the fourth.

Within hours of the acquittals, the 1992 Los Angeles demonstrations started.

These were sparked by outrage among racial minorities over the trial's verdict and related, longstanding issues of endemic police corruption.

Aggressive police attacks on the peaceful protesters led to riots and the rioting ultimately lasted six days.

The end result was 63 people dead and another 2,383 injured.

The demonstrations and riots ended only after the California Army National Guard, the United States Army and the United States Marine Corps provided heavily armed reinforcements to re-establish control.

As a result of the protests, the USA Federal government prosecuted a separate civil rights case, obtaining grand jury indictments of the four officers for violations of King's civil rights. Their trial in a Federal district court ended on April 16, 1993, with two of the officers being found guilty and sentenced to serve prison terms. The other two were acquitted of the charges. In a separate civil lawsuit in 1994, the city of Los Angeles reluctantly awarded King \$3.8 million in damages.

In 2012, King was found dead in his swimming pool, just two months after publishing his memoirs. Officially at least, there was no foul play involving his untimely death.

KATRINAHOSERSERPENEA (KATRINAHOSERSERPENEA) DARANINI SP. NOV.

LSIDURN:LSID:ZOOBANK.ORG:ACT:ABBF4766-7B29-4474-9405-4A107153DD7A

Holotype: A preserved specimen in the California Academy of Sciences, San Francisco, California, 94118, USA, specimen number CAS 235218, collected at an elevation of 4296 ft from Ke Har stream, Kanpetlet town, Mindat District, Chin State, Western Myanmar. Latitude 21.1220 N., Longitude 94.0301 E. This facility allows access to its holdings.

Paratypes: Three preserved specimens in the California Academy of Sciences, San Francisco, California, 94118, USA, specimen numbers CAS 245296, 245377, 255359, collected from the same part of Western Myanmar as the holotype.

Diagnosis: *Katrinahoserserpenea* (*Katrinahoserserpenea*) *macularius* (Theobald, 1868) has until now been treated as a wide-ranging species with a distribution encompassing potentially India (Darjeeling, Sikkim, West Bengal) (those records being doubted by Hauser 2017), Bangladesh, Myanmar (= Burma): Kachin, Mandalay, Mon, Shan, Tanintharyi, Yangon, Thailand (Chiang Mai), Laos (Xiangkhouang), Vietnam (Bac Kan, Cao Bang, Hai Duong, Hoa Binh, Lai Chau, Nghe An, Quang Binh, Vinh Phuc), Northern West Malaysia, South China (Yunnan, Guangxi, Guangdong, Guizhou).

However previous studies including the molecular evidence, of Wang *et al.* (2020) and Deepak *et al.* (2020), as well as the morphological evidence of Hauser (2017) have confirmed that a number of species have been lumped within this putative taxon. Five relevant species are formally named in this paper.

The nominate form of *K. macularius* is from hilly parts of southern Myanmar and nearby western Thailand.

The newly described species are *K. tongzhoujiae* sp. nov. from Hainan, China, *K. danielmannixi* sp. nov. from Yunnan, China, *K. rodneynkingi* sp. nov. from Vietnam south of the delta region of Hanoi and *K. daranini* sp. nov. from Western and northern Myanmar and *K. mconnachiei* sp. nov. from the Isthmus of Kra,

in southern Thailand.

All six preceding species are separated from the morphologically similar species *K. margaritophorus* (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) by the following suite of characters:

Dorsal scales forming the median 7-13 rows are weakly keeled; nuchal region often with a butterfly or W-shaped collar with moderate or dense speckling; intensely black blotch (IBB) usually present on the seventh (and last) supralabial (rarely absent except in *K. danielmannixi sp. nov.*); ventral shields usually more than 148; belly speckling usually dense, often large blotches are present, but the prevalence of this last character is also somewhat species dependent (see below).

By contrast *K. margaritophorus* is diagnosed and separated from the preceding species as follows: Dorsal scales are entirely smooth (no keels); nuchal region usually with pink, cream or yellow, entire or tripartite collar or spot without fine brown speckling; IBB usually absent on the seventh supralabial (very rarely present); ventral shields usually fewer than 158; belly speckling usually sparse, in particular anteriorly (adapted from Hauser 2017).

The type form of *K. macularius* is readily separated from *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by the following suite of characters: dorsum is mainly light brown with a very slight orange tinge; scattered dark brownish-black scales are arranged into indistinct cross bands or similar and with obvious white tips at the anterior end, therefore being only visible on the outward curved side of the snake, with the white being hidden under a scale on the inward curved side of the snake. Where bands form across the body, they are more-or-less continuous, with most scales in a given row being dark and few if any lighter gap scales are present. The top of the head is greyish brown and peppered all over. Labials have white on them near the lip and if the white is prominent it is always well barred with dark brown.

K. tongzhoujiae sp. nov. is readily separated from all of *K. macularius*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by having the following unique combination of characters: Dorsum is a dark olive brown and the dark blackish-brown scales scattered on the dorsum are clustered to form a distinctive series of spots all over the dorsal surface, as opposed to cross bands. The spots are irregularly spaced. The anterior upper surface of the head is uniformly grey.

K. danielmannixi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. rodnekingi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by being generally dark brown dorsally, with dark near black scales being generally arranged in cross-bands, but these are well spaced with more lighter coloured scales between the dark ones, making the banding indistinct on the fore-body, becoming absent on the posterior end of the body and tail. The side of the head and snout, anterior to the eye are dark grey, but the upper lip has a series of 3-5 small but well-defined white triangles, with base of each on the lip and point facing up. These small triangles do not go anywhere near reaching the eye. The upper surface of the head and snout are black, other than for some brown blotches on the upper surface, these having ill defined boundaries.

The IBB on the last supralabial is absent and this scale is merely strongly peppered with grey.

K. rodnekingi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by the following character suite: Similar to *K. macularius* as described above, but separated from it by having a dark iris, versus light orangeish to red in *K. macularius*. The upper lip is bounded by a distinctive thick white line (sometimes yellowish) and if barring is present it is usually incomplete and/or indistinct.

The dorsum is greyish with a slight orangeish tinge. Snout is

yellowish with grey peppering.

The belly of *K. rodnekingi sp. nov.* is heavily speckled with peppering and also with dark blotches, versus not so in *K. macularius*.

K. daranini sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.* and *K. mcconnachiei sp. nov.* by the following suite of characters: The dorsal side, with rows of keeled scales, is nearly completely black and shows no cross-bands of bicolored spots as seen in the other five species. A speckled, W-shaped nuchal collar typical of the other five species cannot be distinguished. On the belly there are rows of squarish, black blotches. The seventh (last) supralabial does not show a distinct IBB, but is heavily mottled with black or alternatively is completely black.

K. mcconnachiei sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.* and *K. daranini sp. nov.* by possessing a distinctive W-shaped collar with two distinctive 'tails' extending backwards. The W-shaped collar configuration is not seen in any of the other species. Otherwise *K. mcconnachiei sp. nov.* is similar in most other respects to *K. macularius*.

The putative species *K. tamdaoensis* (Bourret, 1935) from northern Vietnam and nearby southern China is herein treated as valid and is most like *K. rodnekingi sp. nov.* as described herein (separating it from the other species as well), but *K. tamdaoensis* is separated from that species by having reduced white on the upper lip (as compared to *K. rodnekingi sp. nov.*) and a very prominent IBB on the last supralabial.

All the preceding species and *K. margaritophorus* (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) are separated from all other species within *Katrinahosersepeneae* as defined by Hoser (2012b) by having a uniform brown, yellowish brown or blue gray above with a pattern including single dark (near black) scales forming cross-bands, broken cross bands or spotting, the single dark scales usually having a white tip at the anterior, which is exposed when the snake turns to face the surface outwards to stretch that surface. Venter brownish white, spotted or peppered with brown and sometimes with spots or squares. Rostral a little broader than deep; internasals about half the length of the prefrontals; latter entering the eye; frontal a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; supraocular moderate, nearly half the width of the frontal; a small loreal; one preocular, one postocular and three or more suboculars, excluding the labials from the eye; temporals much elongate, 2+2; seven upper labials, seventh very large; three pairs of large chin-shields. 15 midbody rows, dorsals may be weakly keeled, anal entire.

A photo of the type form of *K. macularius* in life can be found in Hauser (2017) on page 31 at top or online at:

<https://www.flickr.com/photos/herpguide/4094975909/>

and:

<https://www.flickr.com/photos/rushen/15360955943/>

and:

<https://www.flickr.com/photos/tontantravel/15765143819/>

A photo of *K. tongzhoujiae sp. nov.* in life can be found in Hei (2008) in Fig. 16 (page 4 bottom).

A photo of *K. danielmannixi sp. nov.* in life can be found in black and white in Yang and Rao (2008).

A photo of *K. margaritophorus* (Jan, 1866) in life can be found in Hauser (2017) on page 30 at top.

K. margaritophorus (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) is formally split three ways in this paper.

The relevant species are *K. margaritophorus* (Jan, 1866) restricted to Thailand generally north of Phuket and Nakhon Si Thammarat (8 degrees north) as well as Laos, South Vietnam and south east Myanmar., *K. bobbottomi sp. nov.*, restricted to the Malay Peninsula south of about 8 degrees north and potentially nearby Sumatra, Indonesia and *K. evanwhittoni sp.*

nov. from Hong Kong, nearby parts of China and adjacent parts of north Vietnam.

Distribution: *K. daranini sp. nov.* occurs in hilly western parts of Myanmar, generally near the type locality region.

Etymology: *K. daranini sp. nov.* is named in honour of Dara Nin, of Ringwood, Victoria, Australia, who for more than a decade has worked with Snakebusters, Reptile Parties and Reptile Shows to educate thousands of people about wildlife and conservation as well as other important wildlife research and conservation work.

KATRINAHOSERSERPENEA (KATRINAHOSERSERPENEA) MCCONNACHIEI SP. NOV.

LSIDDurn:lsid:zoobank.org:act:BC507D5A-FE66-4AD3-B998-3D8D00EB0BC6

Holotype: A preserved specimen at the Queen Saovabha Memorial Institute (QSMI) in Pathum Wan, Pathum Wan District, Bangkok 10330, Thailand, specimen number QSMI-0234, collected at Thung Song, Thailand, Latitude 8.1587 N., Longitude 99.6740 E. This facility allows access to its holdings.

Diagnosis: *Katrinahoserserpenea (Katrinahoserserpenea) macularius* (Theobald, 1868) has until now been treated as a wide-ranging species with a distribution encompassing potentially India (Darjeeling, Sikkim, West Bengal) (those records being doubted by Hauser 2017), Bangladesh, Myanmar (= Burma): Kachin, Mandalay, Mon, Shan, Tanintharyi, Yalong, Thailand (Chiang Mai), Laos (Xiangkhouang), Vietnam (Bac Kan, Cao Bang, Hai Duong, Hoa Binh, Lai Chau, Nghe An, Quang Binh, Vinh Phuc), Northern West Malaysia, South China (Yunnan, Guangxi, Guangdong, Guizhou).

However previous studies including the molecular evidence, of Wang *et al.* (2020) and Deepak *et al.* (2020), as well as the morphological evidence of Hauser (2017) have confirmed that a number of species have been lumped within this putative taxon. Five relevant species are formally named in this paper.

The nominate form of *K. macularius* is from hilly parts of southern Myanmar and nearby western Thailand.

The newly described species are *K. tongzhoujiae sp. nov.* from Hainan, China, *K. danielmannixi sp. nov.* from Yunnan, China, *K. rodnekingi sp. nov.* from Vietnam south of the delta region of Hanoi and *K. daranini sp. nov.* from Western and northern Myanmar and *K. mcconnachiei sp. nov.* from the Isthmus of Kra, in southern Thailand.

All six preceding species are separated from the morphologically similar species *K. margaritophorus* (Jan, 1866) by the following suite of characters: Dorsal scales forming the median 7-13 rows are weakly keeled; nuchal region often with a butterfly or W-shaped collar with moderate or dense speckling; intensely black blotch (IBB) usually present on the seventh (and last) supralabial (rarely absent except in *K. danielmannixi sp. nov.*); ventral shields usually more than 148; belly speckling usually dense, often large blotches are present, but the prevalence of this last character is also somewhat species dependent (see below).

By contrast *K. margaritophorus (sensu lato)* as defined by Hauser (2017) is diagnosed and separated from the preceding species as follows: Dorsal scales are entirely smooth (no keels); nuchal region usually with pink, cream or yellow, entire or tripartite collar or spot without fine brown speckling; IBB usually absent on the seventh supralabial (very rarely present); ventral shields usually fewer than 158; belly speckling usually sparse, in particular anteriorly (adapted from Hauser 2017).

The type form of *K. macularius* is readily separated from *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by the following suite of characters: dorsum is mainly light brown with a very slight orange tinge; scattered dark brownish-black scales are arranged into indistinct cross bands or similar and with obvious white tips at the anterior end, therefore being only visible on the outward curved side of the snake, with the white being hidden under a scale on the inward curved side of the snake. Where bands form across the body, they are more-or-

less continuous, with most scales in a given row being dark and few if any lighter gap scales are present. The top of the head is greyish brown and peppered all over. Labials have white on them near the lip and if the white is prominent it is always well barred with dark brown.

K. tongzhoujiae sp. nov. is readily separated from all of *K. macularius*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by having the following unique combination of characters: Dorsum is a dark olive brown and the dark blackish-brown scales scattered on the dorsum are clustered to form a distinctive series of spots all over the dorsal surface, as opposed to cross bands. The spots are irregularly spaced. The anterior upper surface of the head is uniformly grey.

K. danielmannixi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. rodnekingi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by being generally dark brown dorsally, with dark near black scales being generally arranged in cross-bands, but these are well spaced with more lighter coloured scales between the dark ones, making the banding indistinct on the fore-body, becoming absent on the posterior end of the body and tail. The side of the head and snout, anterior to the eye are dark grey, but the upper lip has a series of 3-5 small but well-defined white triangles, with base of each on the lip and point facing up. These small triangles do not go anywhere near reaching the eye. The upper surface of the head and snout are black, other than for some brown blotches on the upper surface, these having ill defined boundaries.

The IBB on the last supralabial is absent and this scale is merely strongly peppered with grey.

K. rodnekingi sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. daranini sp. nov.* and *K. mcconnachiei sp. nov.* by the following character suite: Similar to *K. macularius* as described above, but separated from it by having a dark iris, versus light orangeish to red in *K. macularius*. The upper lip is bounded by a distinctive thick white line (sometimes yellowish) and if barring is present it is usually incomplete and/or indistinct.

The dorsum is greyish with a slight orangeish tinge. Snout is yellowish with grey peppering.

The belly of *K. rodnekingi sp. nov.* is heavily speckled with peppering and also with dark blotches, versus not so in *K. macularius*.

K. daranini sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.* and *K. mcconnachiei sp. nov.* by the following suite of characters: The dorsal side, with rows of keeled scales, is nearly completely black and shows no cross-bands of bicolored spots as seen in the other five species. A speckled, W-shaped nuchal collar typical of the other five species cannot be distinguished. On the belly there are rows of squarish, black blotches. The seventh (last) supralabial does not show a distinct IBB, but is heavily mottled with black or alternatively is completely black.

K. mcconnachiei sp. nov. is readily separated from all of *K. macularius*, *K. tongzhoujiae sp. nov.*, *K. danielmannixi sp. nov.*, *K. rodnekingi sp. nov.* and *K. daranini sp. nov.* by possessing a distinctive W-shaped collar with two distinctive 'tails' extending backwards. The W-shaped collar configuration is not seen in any of the other species. Otherwise *K. mcconnachiei sp. nov.* is similar in most other respects to *K. macularius*.

The putative species *K. tamdaoensis* (Bourret, 1935) from northern Vietnam and nearby southern China is herein treated as valid and is most like *K. rodnekingi sp. nov.* as described herein (separating it from the other species as well), but *K. tamdaoensis* is separated from that species by having reduced white on the upper lip (as compared to *K. rodnekingi sp. nov.*) and a very prominent IBB on the last supralabial.

All the preceding species and *K. margaritophorus* (Jan, 1866)

(*sensu lato*) as defined by Hauser (2017) are separated from all other species within *Katrinahoserserpenea* as defined by Hoser (2012b) by having a uniform brown, yellowish brown or blue gray above with a pattern including single dark (near black) scales forming cross-bands, broken cross bands or spotting, the single dark scales usually having a white tip at the anterior, which is exposed when the snake turns to face the surface outwards to stretch that surface. Venter brownish white, spotted or peppered with brown and sometimes with spots or squares. Rostral a little broader than deep; internasals about half the length of the prefrontals; latter entering the eye; frontal a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; supraocular moderate, nearly half the width of the frontal; a small loreal; one preocular, one postocular and three or more suboculars, excluding the labials from the eye; temporals much elongate, 2+2; seven upper labials, seventh very large; three pairs of large chin-shields. 15 midbody rows, dorsals may be weakly keeled, anal entire.

A photo of the type form of *K. macularius* in life can be found in Hauser (2017) on page 31 at top or online at:

<https://www.flickr.com/photos/herpguide/4094975909/>

and:

<https://www.flickr.com/photos/rushen/15360955943/>

and:

<https://www.flickr.com/photos/tontantravel/15765143819/>

A photo of *K. tongzhoujiae* sp. nov. in life can be found in Hei (2008) in Fig. 16 (page 4 bottom).

A photo of *K. danielmannixi* sp. nov. in life can be found in black and white in Yang and Rao (2008).

A photo of *K. margaritophorus* (Jan, 1866) in life can be found in Hauser (2017) on page 30 at top.

K. margaritophorus (Jan, 1866) (*sensu lato*) as defined by Hauser (2017) is formally split three ways in this paper.

The relevant species are *K. margaritophorus* (Jan, 1866) restricted to Thailand generally north of Phuket and Nakhon Si Thammarat (8 degrees north) as well as Laos, South Vietnam and south east Myanmar., *K. bobbottomi* sp. nov., restricted to the Malay Peninsula south of about 8 degrees north and potentially nearby Sumatra, Indonesia and *K. evanwhittoni* sp. nov. from Hong Kong, nearby parts of China and adjacent parts of north Vietnam.

Distribution: *K. mconnachiei* sp. nov. occurs on the Isthmus of Kra, in southern Thailand and potentially nearby parts of northern Peninsula Malaysia.

Etymology: *K. mconnachiei* sp. nov. is named in honour of Scott McConnachie, of Reservoir, Victoria, Australia of the Victorian Dog Academy and Reservoir Dogs. Scott has worked with Daniel Mannix and Tongzhou Ji, (AKA Josie) originally from northern China, but both now living in Sunbury, Victoria, Australia at the Victorian Dog Training Academy (VDTA) (see elsewhere in this paper).

Scott McConnachie is recognized for his contributions to animal welfare and wildlife conservation, through his work with this author with Daniel Mannix and Tongzhou Ji doing Snake Avoidance training for dogs. This training saves lives of both snakes and dogs and besides the animal welfare benefits, also has positive outcomes for wildlife conservation in that dogs do not unnecessarily kill snakes.

KATRINAHOSERSERPENEA (KATRINAHOSERSERPENEA) BOBBOTTOMI SP. NOV.

LSIDurn:lsid:zoobank.org:act:DB43742B-D3F6-4F92-A372-18D26CB3D96A

Holotype: A preserved specimen at the Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany, specimen number ZFMK 70584 collected from north of Kuala Lumpur, Malaysia.

Paratype: A preserved female specimen of about 30 cm in total length, at the Zoological Reference Collection at the Raffles Museum of Biodiversity Research at the National University of Singapore specimen number ZRC 2.7018, collected at Pungol

Island, Singapore (since moved to the Lee Kong Chian Natural History Museum in 2014). The holotype is also depicted in colour Tan and Lim (2013).

Diagnosis: Until now *Katrinahoserserpenea bobbottomi* sp. nov. of Peninsula Malaysia has been treated as a southern population of *K. margaritophorus* (Jan, 1866) (*sensu lato*) as defined by Hauser (2017).

K. evanwhittoni sp. nov. is from Hong Kong, nearby parts of China and adjacent parts of north Vietnam and has also been treated as putative *K. margaritophorus*.

K. margaritophorus (Jan, 1866) is restricted to Thailand generally north of Phuket and Nakhon Si Thammarat (8 degrees north) as well as Laos, South Vietnam and south east Myanmar.

K. bobbottomi sp. nov. is restricted to the Malay Peninsula south of about 8 degrees north and potentially nearby Sumatra, Indonesia based on nine images published on the internet at: www.flickr.com, posted "Kurt (Orionmystery) G. See for example image at:

<http://www.flickr.com/photos/orionmystery/43307992385/> taken on 9 July 2018.

K. evanwhittoni sp. nov. is known from Hong Kong, nearby parts of China and adjacent parts of north Vietnam.

All three species are most readily separated from one another on the basis of colouration.

K. bobbottomi sp. nov. (adults) are readily separated from both other species by the presence of a continuous broad orange band of at least two scales width across the back of the nape and significant white peppering of the rear upper labials. While some (aberrant) specimens of *K. margaritophorus* from Thailand may also have orange or pink across the rear of the nape it is not as brilliant as seen in *K. bobbottomi* sp. nov., is invariably broken, or fails to go fully across the neck and the rear upper labials are not peppered with white, but are instead either grey or white, the white forming well a well defined bar or rectangle on the upper lip.

Most *K. margaritophorus* have irregularly shaped yellow or white blotches or markings across the rear of the nape.

K. evanwhittoni sp. nov. is separated from the preceding two species by having a distinctively grey head and nape, with grey upper labials to the lower point of the lip with only slight white peppering and no white on the upper lip. The spotted scales are distinctively black, versus very dark brown in the other two species. Any marking or bar across the rear of the nape is either absent or grey in colour, and therefore indistinct.

Female *K. evanwhittoni* sp. nov. have over 50 subcaudals, versus less than 50 in the other two species.

K. macularius, *K. mconnachiei* sp. nov., *K. tongzhoujiae* sp. nov., *K. danielmannixi* sp. nov., *K. rodneykingi* sp. nov., *K. daranini* sp. nov., *K. tamdaoensis* (Bourret, 1935), *K. margaritophorus* (Jan, 1866), *K. bobbottomi* sp. nov. and *K. evanwhittoni* sp. nov. are separated from all other species within *Katrinahoserserpenea* as defined by Hoser (2012b) by having a uniform brown, yellowish brown or blue gray above with a pattern including single dark (near black) scales forming cross-bands, broken cross bands or spotting, the single dark scales usually having a white tip at the anterior, which is exposed when the snake turns to face the surface outwards to stretch that surface. Venter brownish white, spotted or peppered with brown and sometimes with spots or squares. Rostral a little broader than deep; internasals about half the length of the prefrontals; latter entering the eye; frontal a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; supraocular moderate, nearly half the width of the frontal; a small loreal; one preocular, one postocular and three or more suboculars, excluding the labials from the eye; temporals much elongate, 2+2; seven upper labials, seventh very large; three pairs of large chin-shields. 15 midbody rows, dorsals may be weakly keeled, anal entire.

The holotype of *K. bobbottomi* sp. nov. is also depicted in colour Tan and Lim (2013).

A photo of the type form of *K. margaritophorus* (Jan, 1866) in life (conforming with the original species description) can be found in Hauser (2017) on page 30 at top.

A photo of *K. evanwhittoni* sp. nov. in life can be found online at: https://www.biosch.hku.hk/ecology/hkreptiles/snake/Pareas_margaritophorus.html

Distribution: *K. bobbottomi* sp. nov. is known to occur on the Malay Peninsula south of 8 Degree North, southwards to Singapore (where it is probably introduced) and probably also on Sumatra.

Etymology: Named in honour of investigative journalist Bob (Robert) Bottom, formerly of New South Wales, Australia, but more recently of Queensland, Australia, in recognition of a stellar career exposing organised crime and political corruption in Australia, including through several best-selling books.

KATRINAHOSERSERPENEA (KATRINAHOSERSERPENEA) EVANWHITTONI SP. NOV.

LSIDurn:lsid:zoobank.org:act:5D023578-0437-43E5-8130-D27B38F551FA

Holotype: A preserved specimen at the Field Museum of Natural History, Chicago, Illinois, USA, specimen number FMNH 256973 collected at Hong Kong (China). This facility allows access to its holdings.

Paratypes: Two preserved specimens at the Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt-am-Main, Germany, specimen numbers SMF 20791 and SMF 20792 collected from Hong Kong (China).

Diagnosis: Until now *Katrinahoserserpenea bobbottomi* sp. nov. of Peninsula Malaysia has been treated as a southern population of *K. margaritophorus* (Jan, 1866).

K. evanwhittoni sp. nov. is from Hong Kong, nearby parts of China and adjacent parts of north Vietnam and has also been treated as putative *K. margaritophorus*.

K. margaritophorus (Jan, 1866) is restricted to Thailand generally north of Phuket and Nakhon Si Thammarat (8 degrees north) as well as Laos, South Vietnam and south east Myanmar.

K. bobbottomi sp. nov. is restricted to the Malay Peninsula south of about 8 degrees north and potentially nearby Sumatra, Indonesia based on nine images published on the internet at: www.flickr.com, posted "Kurt (Orionmystery) G. See for example image at: <http://www.flickr.com/photos/orionmystery/43307992385/> taken on 9 July 2018.

K. evanwhittoni sp. nov. is known from Hong Kong, nearby parts of China and adjacent parts of north Vietnam.

All three species are most readily separated from one another on the basis of colouration.

K. bobbottomi sp. nov. (adults) are readily separated from both other species by the presence of a continuous broad orange band of at least two scales width across the back of the nape and significant white peppering of the rear upper labials. While some (aberrant) specimens of *K. margaritophorus* from Thailand may also have orange or pink across the rear of the nape it is not as brilliant as seen in *K. bobbottomi* sp. nov., is invariably broken, or fails to go fully across the neck and the rear upper labials are not peppered with white, but are instead either grey or white, the white forming well a well defined bar or rectangle on the upper lip.

Most *K. margaritophorus* have irregularly shaped yellow or white blotches or markings across the rear of the nape.

K. evanwhittoni sp. nov. is separated from the preceding two species by having a distinctively grey head and nape, with grey upper labials to the lower point of the lip with only slight white peppering and no white on the upper lip. The spotted scales are distinctively black, versus very dark brown in the other two species. Any marking or bar across the rear of the nape is either absent or grey in colour, and therefore indistinct.

Female *K. evanwhittoni* sp. nov. have over 50 subcaudals, versus less than 50 in the other two species.

K. macularius, *K. mconnachiei* sp. nov., *K. tongzhoujiaei* sp. nov., *K. danielmannixi* sp. nov., *K. rodneymingyi* sp. nov., *K. daranini* sp. nov., *K. tamdaoensis* (Bourret, 1935), *K. margaritophorus* (Jan, 1866), *K. bobbottomi* sp. nov. and *K. evanwhittoni* sp. nov. are separated from all other species within *Katrinahoserserpenea* as defined by Hoser (2012b) by having a uniform brown, yellowish brown or blue gray above with a pattern including single dark (near black) scales forming cross-bands, broken cross bands or spotting, the single dark scales usually having a white tip at the anterior, which is exposed when the snake turns to face the surface outwards to stretch that surface. Venter brownish white, spotted or peppered with brown and sometimes with spots or squares. Rostral a little broader than deep; internasals about half the length of the prefrontals; latter entering the eye; frontal a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; supraocular moderate, nearly half the width of the frontal; a small loreal; one preocular, one postocular and three or more suboculars, excluding the labials from the eye; temporals much elongate, 2+2; seven upper labials, seventh very large; three pairs of large chin-shields. 15 midbody rows, dorsals may be weakly keeled, anal entire.

The holotype of *K. bobbottomi* sp. nov. is also depicted in colour Tan and Lim (2013). A photo of the type form of *K. margaritophorus* (Jan, 1866) in life (conforming with the original species description) is in Hauser (2017) on page 30 at top.

A photo of *K. evanwhittoni* sp. nov. in life can be found online at: https://www.biosch.hku.hk/ecology/hkreptiles/snake/Pareas_margaritophorus.html

Distribution: *K. evanwhittoni* sp. nov. is restricted to Hong Kong and southern China and adjacent parts of north-east Vietnam.

Etymology: *K. evanwhittoni* sp. nov. is named in honour of Sydney-based Australian investigative journalist Evan Whitton, who wrote numerous best-selling books on judicial corruption.

ZILONEAR GEN. NOV.

LSIDurn:lsid:zoobank.org:act:0E81DC7B-D13E-4C90-A4C9-8AF5D907B829

Type species: *Platypteryx perroteti* Duméril, Bibron and Duméril, 1854

Diagnosis: Until now snakes within the genus *Zilonear* gen. nov. have been treated as species within the genus *Xylophis* Beddome, 1878, with a type species of *Geophis stenorhynchus* Günther, 1875.

Xylophis Beddome, 1878, is also the type species of the subfamily, Xylophiinae Deepak *et al.* (2019).

Recognition of a new family by Deepak *et al.* (2019) and a new species closely related to the most divergent species within the genus *Xylophis* as recognized as of 2020, by Deepak *et al.* (2020) led to this review of the genus-level classification and found sufficient divergence both genetically and morphologically to warrant genus-level division as done herein.

Zilonear gen. nov. species have until now been treated as *Xylophis* and would until now be diagnosed as being of this genus and in turn the entirety of the subfamily Xylophiinae. *Zilonear* gen. nov. species are readily separated from *Xylophis* by having dorsal scales in 13 rows at midbody; supraocular notably larger than postocular; six or more infralabials.

By comparison *Xylophis* species have dorsal scales in 15 rows at midbody; supraocular and postocular shields subequal in size; five infralabials. Deepak *et al.* (2019), found a divergence of the two preceding genera of over 30 MYA.

Both genera are separated from all other snakes by the following unique suite of characters: Maxillary teeth 20 to 25, small and of equal size; mandibular teeth equal. Head not distinct from neck; eye small, with round pupil; nostril pierced between two small nasals; internasals small; no preocular,

loreal and prefrontal entering the eye. Body cylindrical: scales smooth in 13 or 15 rows, without apical pits; ventrals rounded. Tail short, subcaudals in two rows. Hypapophyses developed

throughout the vertebral column. As a result of the preceding, the genus *Xylophis* comprises just two recognized species, namely *Xylophis stenorhynchus* (Günther, 1875) (type for genus) and *X. captaini* Gower and Winkler, 2007.

Distribution: South-west India.

Eytymology: The name *Zilonear* is wholly made up. It is a hybrid of “Xylophis” and the word “near”, or close to, with the “X” and “y”, being converted to “Z”, hence “*Zilonear*”.

Content: *Zilonear perroteti* (Duméril, Bibron and Duméril, 1854) (type species); *Z. mosaicus* (Deepak, Narayanan, Das, Rajkumar, Easa, Sreejith and Gower, 2000).

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CONFLICTS OF INTEREST - NONE