

A new genus of Asian Snail-eating Snake (Serpentes:Pareatidae).

RAYMOND T. HOSER

488 Park Road, Park Orchards, Victoria, 3134, Australia.

Phone: +61 3 9812 3322 Fax: 9812 3355 E-mail: viper007@live.com.au

Received 12 March 2012, Accepted 8 April 2012, Published 30 April 2012.

ABSTRACT

The family Pareatidae as recognized at start 2012, consisted of three widely recognized genera, namely *Aplopeltura* (one species), *Asthenodipsas* (3 species) and *Pareas* (eleven species).

However numerous studies have shown that nine species within *Pareas* are widely divergent of the nominate species and another.

This paper recognizes this divergence by formally creating and naming a new genus *Katrinahoserserpenea* gen. nov. for these species and also assigns a more divergent species to its own subgenus *Dannyleeus* subgen.nov. within this new genus according to the Zoological Code.

Keywords: Taxonomic revision; new genera; genus; species; *Dannyleeus*; *Katrinahoserserpenea*; *Pareas*; *Xenochrophis*; *Dendrelaphis*; *Boiga*; systematics.

INTRODUCTION

Numerous studies have been completed in terms of the snail eating snakes within the Pareatidae, currently occupying three genera.

At start 2012, these were: *Aplopeltura* (one species), *Asthenodipsas* (3 species) and *Pareas* (eleven species).

However almost without exception the taxonomic studies on these snakes have been mainly preoccupied with delineating species rather than genera.

Alternatively the genera themselves have been scrutinized from the perspective of their positions in higher taxonomic hierarchies at the family level and higher (e.g. Lawson et. al. 2005), rather than whether or not snakes are appropriately placed within given genera which have been previously assigned.

However in the wake of several molecular studies of snakes within these genera, including most notably that of Guo et. al. (2011) it is clear that *Pareas* in particular is paraphyletic.

The molecular results of Guo et. al. (2011) directly reflected the previously recorded morphological differences between the tested taxa, which composed all or most of the Pareatidae.

Table One (page 61) showed the taxa *Pareas carinatus* and *P. nuchalis*, to be more divergent from the rest of *Pareas* than the other two genera within the Pareatidae.

As a result of these results alone it is clear that the genus

Pareas as recognised in early 2012 needed to be divided.

As *P. carinatus* is the type species for the genus, it is the other eight species that need to be placed in a new genus.

Relevant publications about *Pareas*, which in combination provide further evidence in support of the division of the genus *Pareas* as defined to 2012 include those of Angel (1920), Barbour (1912), Boie (1828), Boulenger (1900), Boulenger (1914), Cantor (1839), Chen et. al. (2006), Cox et. al. (1998), Das et. al. (2009), de Rooij (1917), Dowling and Jenner (1988), Geissler et. al. (2011), Götz (2001), Götz (2002), Grossmann and Tillack (2003), Guo and Xuejiang (2006), Guo and Xuejiang (2009), Guo and Zhao (2004), Guo et. al. (2011), Hu et. al. (1980), Huang (2004), Inger, et. al. (1990), Jan (1866), Malkmus (1996), Malkmus et. al. (2002), Mell (1922), Mell (1931), Mertens (1930), Nguyen et. al. (2009), Ota et. al. (1997), Pauwels et. al. (2003), Pope (1928), Rao (1992), Schlegel (1837), Schmidt and Kunz (2005), Sclater (1891), Smedley (1931), Smith (1943), Stejneger (1910), Stuebing and Inger (1999), Taylor (1965), Van Denburgh (1909), Vogt (1922), Voris (2006), Wagler (1830), Whittaker and Captain (2004) and Zhao and Adler (1993).

GENUS PAREAS WAGLER, 1830

Diagnosis: The Oriental Slug Eating Snakes family Pareatidae, were for many years considered a subfamily of the Colubridae (Pareinae), although as long ago as 1956 Alfred Romer

considered them distinct at the family level based on morphology.

Molecular evidence has suggested that this small group of snakes is in fact a lineage distinct from the family Colubridae (Vidal et al. 2007). They are smallish (usually under 600 mm as adults), of moderate to thin build, slightly vertically compressed and have a head distinct from a narrow neck, the snout often being blunt.

Members of the family Pareatidae are unique among Southeast Asian snakes and diagnosed in having large scales overlapping on their chins rather than having them separated by a straight groove. These snakes are known to feed mainly on terrestrial molluscs.

They have short skulls; relatively large eyes; a large nasal gland; have a relatively low number of scales at mid body (13-15 rows); the chin shields have no midline groove, and extend across the chin; they are nocturnal; they feed mostly upon gastropods and small vertebrates; and they lay eggs.

Observations on captive snakes eating snails suggests that they rest the upper jaw on a snail (preferred food) and use the mandibles to pull the snail's body out of its shell. These are thought to represent a basal lineage of the advanced snakes (Caenophidia).

As of early 2012 there were 3 recognized genera and about 15 species currently recognized, all inhabiting Southeast Asia.

Genus *Aplobeltura* is monotypic for the species *A. boa*.

Asthenodipsas consists of three species, namely *A. laevis*, *A. malaccanus* and *A. vertebralis*.

Snakes of the genus *Pareas* as presently recognized consists of about eleven species and are diagnosed by being small and slender with a blunt snout, no mental groove and no teeth on the anterior part of the maxillary.

Snakes in the genera *Aplobeltura* and *Asthenodipsas* are considerably thinner in build and more vertically compressed than seen in *Pareas* as recognized to date.

Pareas is herein now restricted to the species taxa *P. carinatus* and *P. nuchalis* (see the relevant diagnoses below).

Those two species differ from taxa in the genus *Katrinahoserserpenea* gen. nov. by cephalic scalation and distribution pattern.

P. carinatus and *P. nuchalis* share three anterior temporals in contrast to the one or two (rarely three) anterior temporals in *Katrinahoserserpenea* gen. nov. species.

The frontal scale in *P. carinatus* and *P. nuchalis* is hexagonal with the lateral sides parallel to the body axis; this scale in *Katrinahoserserpenea* gen. nov. is almost diamond-shaped or shield-shaped with the lateral sides converging posteriorly.

The two anterior chin shields are longer than broad in *Katrinahoserserpenea* gen. nov., whereas in *P. carinatus* and *P. nuchalis* they are broader than long; this is a consistent way to separate the two genera.

The snakes remaining in the genus *Pareas* occur mainly throughout the Indochinese Peninsula and Sunda Islands. By contrast most species of *Katrinahoserserpenea* gen. nov. occur in central and southern China and the northern Indochinese Peninsula, with only two species *Katrinahoserserpenea margaritophorus* and *K. hamptoni* being found in the southern Indochinese Peninsula.

GENUS *KATRINAHOSERSERPENEA* GEN. NOV.

Type species: *Amblycephalus Boulengeri* Angel, 1920

Diagnosis: Snakes of the genus *Pareas* as presently recognized consists of about eleven species and are diagnosed by being small and slender with a blunt snout, no mental groove and no teeth on the anterior part of the maxillary. This obviously applies to this genus.

Pareas is herein now restricted to the species taxa *P. carinatus* and *P. nuchalis*.

Those two species differ from taxa in the genus

Katrinahoserserpenea gen. nov. by cephalic scalation and distribution pattern.

P. carinatus and *P. nuchalis* share three anterior temporals in contrast to the one or two (rarely three) anterior temporals in *Katrinahoserserpenea* gen. nov. species.

The frontal scale in *P. carinatus* and *P. nuchalis* is hexagonal with the lateral sides parallel to the body axis; this scale in *Katrinahoserserpenea* gen. nov. is almost diamond-shaped or shield-shaped with the lateral sides converging posteriorly.

The two anterior chin shields are longer than broad in *Katrinahoserserpenea* gen. nov., whereas in *P. carinatus* and *P. nuchalis* 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* gen. nov. there is a pre-frontal that enters their eye, whereas in *P. carinatus* and *P. nuchalis* there is no prefrontal.

The snakes remaining in the genus *Pareas* occur mainly throughout the Indochinese Peninsula and Sunda Islands. By contrast most species of *Katrinahoserserpenea* gen. nov. occur in central and southern China and the northern Indochinese Peninsula, with only two species *Katrinahoserserpenea margaritophorus* and *K. hamptoni* being found in the southern Indochinese Peninsula.

Distribution: Asia, with the centre of distribution (most species) being China.

Common name: Asian Snail-eating Snakes.

Etymology: Named in honor of my mother, Katrina Hoser, for services to herpetology over 50 years.

Species within the genus *Katrinahoserserpenea* gen. nov.

Katrinahoserserpenea boulengeri (Angel, 1920) (type species)

Katrinahoserserpenea chinensis (Barbour, 1912)

Katrinahoserserpenea formosensis (Van Denburgh, 1909)

Katrinahoserserpenea hamptoni (Boulenger, 1905)

Katrinahoserserpenea iwasakii (Maki, 1937)

Katrinahoserserpenea margaritophorus (Jan, 1866)

Katrinahoserserpenea monticola (Cantor, 1839)

Katrinahoserserpenea nigriceps Guo and Deng, 2009

Katrinahoserserpenea stanleyi (Boulenger, 1914)

DANNYLEEUS SUBGEN. NOV.

Type species: *Dipsas monticola* Cantor, 1839

Diagnosis: Separated from all other species within the genera *Katrinahoserserpenea* gen. nov. (subgenus *Katrinahoserserpenea* subgen. nov.) and *Pareas* by the following suite of characters: It is of a dark or light-brown dorsal color, 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 190 ventrals, more than 72 subcaudals and a black "X"-shaped mark behind the parietals.

The subgenus is monotypic for the species *Katrinahoserserpenea monticola* (Cantor, 1839).

Distribution: West China, including Tibet to India.

Etymology: Named in honor of Danny Lee of Sydney, Australia, a good friend of mine of many decades and for various services to wildlife and conservation over the period 1977-1997.

KATRINAHOSERSERPENEA SUBGEN. NOV.

Type species: *Amblycephalus Boulengeri* Angel, 1920

Diagnosis: The diagnosis for this subgenus, is effectively a reversal of the diagnosis for the subgenus *Dannyleeus* subgen. nov..

Dannyleeus (the rest of the genus), is separated from all other species within the genera *Katrinahoserserpenea* gen. nov. (subgenus *Katrinahoserserpenea* subgen. nov.) and *Pareas* by the following suite of characters: It is of a dark or light-brown

dorsal color, 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 190 ventrals, more than 72 subcaudals and a black "X"-shaped mark behind the parietals.

In *Katrinahoserserpenea* gen. nov. there is a pre-frontal that enters the eye, whereas in *P. carinatus* and *P. nuchalis* (the entirety of the genus *Pareas*) there is no prefrontal.

For further differences, see under the diagnosis for *Katrinahoserserpenea* gen. nov. above.

Distribution: Asia, centred in the region of China.

Content: All of the genus *Katrinahoserserpenea*, except the species *Katrinahoserserpenea monticola* (Cantor, 1839).

Etymology: Named in honor of Katrina Hoser (see for the genus *Katrinahoserserpenea* gen. nov.).

SPECIES REMAINING IN THE GENUS PAREAS WAGLER 1830.

Pareas carinatus (Boie, 1828) (Type species)

Pareas nuchalis Boulenger, 1900

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Hoser 2012 - Australasian Journal of Herpetology 12:12-15.

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Invoice Number: 16539 Date: 7/04/2012
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