

Two new species of Pipe Snake, Genus *Cylindrophis* (Squamata: Cylindrophiiidae) from Timor and Flores, Indonesia.

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RAYMOND T. HOSER

LSIDurn:lsid:zoobank.org:author:F9D74EB5-CFB5-49A0-8C7C-9F993B8504AE

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

Phone: +61 3 9812 3322 Fax: 9812 3355 E-mail: snakeman (at) snakeman.com.au

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ABSTRACT

Until now, Pipe Snakes Genus *Cylindrophis* Wagler, 1828 from the Lesser Sunda Islands, Indonesia have been treated as either *Cylindrophis (Cylindrophis) boulengeri* Roux, 1911 from Timor and Wetar or alternatively *Cylindrophis (Motteramus) opisthorhodus* (Boulenger, 1897) from Lombok, Sumbawa, Komodo and Flores.

Inspection of specimens from the relevant islands show morphologically divergent populations likely to have been isolated from one another from 1.3 to 1.5 MYA.

Therefore putative *C. boulengeri* from Timor and *C. opisthorhodus* from Flores and nearby Komodo are formally described and named in the scientific literature as two new species in accordance with the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999).

These snakes are not believed to be particularly common on the relevant islands, although this scarcity may be linked to their secretive habits. However it would be remiss for them to become extinct as a result of non-recognition of the said taxa.

Keywords: Herpetology; taxonomy; snake; nomenclature; Indonesia; Sunda; pipesnake; Timor; Sumbawa; Flores; Wetar; Komodo; Lombok; *Cylindrophis*; *Motteramus*; *boulengeri*; *wilsoni*; *opisthorhodus*; new species; *floresensis*; *timorensis*.

INTRODUCTION

It is common knowledge the diversity of reptile taxa in the Lesser Sunda Islands of Indonesia has until now, been seriously underestimated as shown for example by the recent papers of Hoser (2022a, 2022b, 2022c) and sources cited therein.

Within the fossorial lineage *Cylindrophis* Wagler, 1828 *sensu lato* it has been common knowledge for years that the diversity of the genus has been severely under estimated.

As part of an ongoing audit of Indonesian reptiles, *Cylindrophis* from the Lesser Sundas were reviewed with a view to confirming or refuting the current taxonomy.

As of 2022 there were two species recognized from these islands, being *Cylindrophis (Cylindrophis) boulengeri* Roux, 1911 with a type locality of Wetar Island, but also believed to be on nearby Timor, and the divergent taxon *Cylindrophis (Motteramus) opisthorhodus* (Boulenger, 1897) with a type locality of Lombok, but also apparently found on nearby Sumbawa, Komodo and Flores.

Specimens were audited from the known ranges of both putative species in order to confirm they were conspecific or otherwise, with a view to identifying and naming any hitherto unnamed forms.

MATERIALS AND METHODS

Specimens of *Cylindrophis* Wagler, 1828 from the Lesser Sundas were audited, including from museums, as well as quality published photos of specimens with known locality data.

Of particular interest was morphological divergences between populations known to have remained separated during recent ice-age maxima and using means to estimate likely divergence between extant island populations.

Relevant published literature was also examined, including Amarasinghe *et al.* (2015), Boulenger (1897), De Lang (2011a, 2011b, 2013), De Rooij (1915), Hoser (2013), Kieckbusch *et al.* (2018), McDiarmid *et al.* (1999), McDowall (1975), Mertens (1930), O'Shea *et al.* (2015), Roux (1911), Smith and Sidik (1998), Wallach *et al.* (2014) and sources cited therein.

Papers relating to divergences of similarly constrained species in the Lesser Sundas were also referred to, including Hoser (2022a-c), Pyron *et al.* (2013) and Reilly *et al.* (2017, 2019a-b, 2021).

RESULTS

Putative *Cylindrophis (Cylindrophis) boulengeri* Roux, 1911 from Timor are clearly divergent from the specimens on Wetar, the type locality, evolving separately and hence they are formally named herein as a new species, *C. timorensis* sp. nov.. Based

on the findings of Reilly *et al.* (2021) with respects of putative *Euanedwardsserpens subradiatus* (Schlegel, 1837) he found the Timor and Wetar populations diverged from one another 1.3 MYA, being a likely minimum divergence for the similarly constrained *Cylindrophis* populations, herein also treated as separate species.

Putative *Cylindrophis* (*Motteramus*) *opisthorhodus* (Boulenger, 1897) with a type locality of Lombok, but also apparently found on nearby Sumbawa, Komodo and Flores, also formed two distinct groups along the same line as the biogeographic barrier formed by the deep water gap between Sumbawa and Komodo, meaning the Lombok/Sumbawa populations formed one putative species and the Komodo/Flores population another.

Again, based on the fact that they are self-evidently divergent and evolving as different species, I again have no hesitation in naming the Komodo/Flores form as a new species *C. floresensis* *sp. nov.*

Based on the findings of Reilly *et al.* (2021) with respects of putative *Euanedwardsserpens subradiatus* (Schlegel, 1837) he found the Lombok/Sumbawa and Komodo/Flores populations diverged from one another 1.5 MYA, being a likely divergence for the similarly constrained *Cylindrophis* populations, herein also treated as separate species.

In terms of the formal descriptions that follow, the descriptions in accordance with the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) as part of the official scientific record are based on normal adult specimens in good health and without obvious signs of ill health, aging or any obvious abnormality.

CYLINDROPHIS (CYLINDROPHIS) TIMORENSIS SP. NOV.
LSIDurn:lsid:zoobank.org:act:556D67FD-E132-4F6F-B966-53DB24776607

Holotype: A preserved specimen at the Australian National Wildlife Collection, Canberra, ACT, Australia, specimen number ANWC Reptiles R02024 (labelled as "*Cylindrophis ruffus*") collected from Dili, East Timor, Latitude -8.5667 S., Longitude 125.5667 E.

This government-owned facility allows access to its holdings.

Paratype: A preserved specimen at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, specimen number MCZ Herp R-192946 collected from the Manatuto District, East Timor.

Diagnosis: *Cylindrophis* (*Cylindrophis*) *timorensis* *sp. nov.* from the island of Timor is separated from the closely related species *Cylindrophis* (*Cylindrophis*) *boulengeri* Roux, 1911 from nearby Wetar Island, by the having the light orangeish-yellow side bars meeting or nearly meeting at the mid-dorsal line, versus being well separated in *C. boulengeri*. On the body of *C. timorensis* *sp. nov.* the yellow-orange side bars meet or get close to the mid dorsal line, versus not so in *C. boulengeri*, where they are either reduced to the flanks or absent. Anterior to each eye in *C. timorensis* *sp. nov.* is a large yellow patch running from the upper labial to the upper surface of the snout. These whitish areas are absent or very reduced in *C. boulengeri*.

C. timorensis *sp. nov.* is in many respects similar to *Cylindrophis* (*Motteramus*) *wilsoni* Hoser, 2013 but along with *C. boulengeri* is separated from that species by having more than 190 ventrals, versus less than that in *C. wilsoni* and 11-12 as opposed to 14 dentary teeth (McDowall, 1975). For further differences and diagnostic characters of *C. wilsoni* refer to Hoser (2013).

In addition to the preceding characters: *C. boulengeri* and *C. timorensis* *sp. nov.* are separated from all other species of *Cylindrophis* by the following suite of characters: No longitudinal stripes on the body; less than 210 ventrals, but more than 190; 19-21 mid body rows (excluding ventrals); 11-14 dentary teeth; very tip of snout is dark; a pale bar or part thereof across the dorsum or flank of tail; a pale collar of some sort (may be broken) but extending up the sides of the back of the head to at least the level of the eye; ventrals no wider than the scales of next row on either side (versus being wider in similar or related species).

C. timorensis *sp. nov.* in life is depicted in O'Shea *et al.* (2015), in fig. 34 on page 112.

C. boulengeri is depicted in De Lang (2011b) on pages 132-133. Refer to Hoser (2013) for further diagnostic features of the genus *Cylindrophis* and other genera or subgenera within the family Cylindrophiiidae.

Distribution: *Cylindrophis* (*Cylindrophis*) *timorensis* *sp. nov.* is believed to be confined to the island of Timor and potentially Semau and Roti to the immediate south-west.

Conservation: The comments of Hoser (2019a, 2019b) apply to this taxon.

Etymology: *C. timorensis* *sp. nov.* is named in reflection of the type locality and where it occurs.

CYLINDROPHIS (MOTTERAMUS) FLORENSIS SP. NOV.
LSIDurn:lsid:zoobank.org:act:CAB00E7D-8D8A-4B66-9130-87C3DC05B8FC

Holotype: A preserved specimen at Museum Zoologicum Bogoriense, Bogor, Indonesia, specimen number MZB 1515, collected from Flores, East Nusa Tenggara, Indonesia.

This facility allows access to its holdings.

Paratype: A preserved specimen at the Florida Museum of Natural History, University of Florida, Florida, USA, specimen number UF Herp 28763 collected from Lolavi, Komodo Island, Indonesia.

Diagnosis: *Cylindrophis* (*Motteramus*) *floresensis* *sp. nov.* from the islands of Flores and Komodo is separated from the morphologically similar and closely related species *Cylindrophis* (*Motteramus*) *opisthorhodus* (Boulenger, 1897) with a type locality of Lombok and occurring on the adjacent Sumbawa by the following suite of characters: 1/ The dorsum is more-or-less a uniform brown colour, versus a heavily black peppered brown in *C. opisthorhodus*; 2/ There is either an absence of dark coloured scales or spots on the flanks, or they are faded, versus prominent black coloured scales or spots (these being scattered) in *C. opisthorhodus*; 3/ Thin mid-dorsal stripe is reasonably prominent, versus not so or effectively absent in *C. opisthorhodus*; 4/ Venter is mainly black, but with large irregularly shaped, but squareish white blotches running down either side of the belly in an irregular form, versus a venter in which the white forms mainly well-defined cross bands with jagged edges along all or most of the body length, broken up with black in *C. opisthorhodus*; 5/ Dorsum generally brown, versus with a strong greyish tinge in *C. opisthorhodus*;

The two species *C. floresensis* *sp. nov.* and *C. opisthorhodus* are separated from all other species within *Cylindrophis* Wagler, 1828 by the following unique suite of characters:

1/ Dorsum with longitudinal stripes of some form either along the mid dorsal line and/or along the flank, this contrasting with the otherwise paler dorsum; 2/ 23 midbody rows (excluding ventrals); 3/ 184-213 ventrals.

C. floresensis *sp. nov.* in life is depicted in De Lang (2011b) on pages 137-139 and online at:

<https://www.inaturalist.org/observations/10229714>

(last downloaded on 5 July 2022)

C. opisthorhodus in life is depicted in De Lang (2011b) on page 135 and online at:

<https://www.inaturalist.org/observations/100137266>

(last downloaded on 5 July 2022)

Refer to Hoser (2013) for further diagnostic features of the genus *Cylindrophis* and others within the family Cylindrophiiidae.

Distribution: *C. floresensis* *sp. nov.* is believed to be confined to the islands of Flores and Komodo, but possibly also occurs in the islands on Rinca, Adonara and Lembata, being a single landmass in recent glacial maxima.

Conservation: The comments of Hoser (2019a, 2019b) apply to this taxon.

Etymology: *C. floresensis* *sp. nov.* is named in reflection of the type locality and where the taxon occurs.

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CONFLICT OF INTEREST

None.

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