

**A NEW SPECIES OF *CYLINDROPHIS*
(SERPENTES: CYLINDROPHIIDAE)
FROM SARAWAK, WESTERN BORNEO**

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ABSTRACT. - A new species of fossorial snake, *Cylindrophis engkariensis*, from the Lanjak-Entimau Wildlife Sanctuary in southwestern Sarawak, Borneo, is described. It differs from other members of the genus in its distinctive colour pattern and the unique number of mid-body scale rows.

INTRODUCTION

Pipe snakes, formerly regarded as a subfamily of the Uropeltidae, are represented in Borneo by four species, *Cylindrophis rufus* (Laurenti), *Cylindrophis lineatus* Blanford, *Anomochilus leonardi* Smith and *Anomochilus weberi* v. Lidth de Jeude (De Rooij, 1917; Brongersma & Helle, 1951; Haile, 1958; Stuebing, 1991; Stuebing & Goh, 1993). Cundall *et al.* (1993) have recently assigned all members of the genus *Cylindrophis* to the family Cyndrophiiidae Fitzinger, 1843, while *Anomochilus* is now grouped under a new monogeneric family, Anomochilidae. Of the two species of *Cylindrophis* in Borneo, *C. rufus* is found throughout Southeast Asia, while *C. lineatus* is so far recorded exclusively from Sarawak. In Borneo, one specimen of *Anomochilus leonardi* has been found near Sepilok, Sandakan, in Eastern Sabah (Stuebing & Goh, 1993), while a single specimen of *Anomochilus weberi* was collected from Kutei, Kalimantan (Brongersma & Helle, 1951).

All cylindrophiiids (and anomochilids) are semifossorial, living under leaf litter, bark layers or other loose cover, and rarely in the soil. Despite their reclusive habits, specimens of *Cylindrophis rufus* are relatively common in museum collections. All specimens of *C. rufus* and *Cylindrophis lineatus* from Sarawak have been collected from coastal areas of the First and Second Divisions (Stuebing, 1991). Morphometric data from specimens of Sarawak *C. rufus* are given in Tables 1 and 2A. (Four specimens labelled "*Cylindrophis lineatus*?" in the Sarawak Museum are indistinguishable from the *C. rufus* taken from the same collection.) Concerning *Cylindrophis lineatus*, only the holotype could be located (BMNH 1946.1.16.5; Table 2B), purportedly collected in Singapore.

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Table 1. Specimens of *Cylindrophis rufus* Laurenti from Sarawak and Peninsular Malaysia

| Number | Locality | Scale rows (MB) | Ventrals | Character | | |
|-------------------------------|----------------------------|--------------------|----------|------------|---------------|--------|
| | | | | Subcaudals | Supra-labials | TL/T |
| Sarawak | | | | | | |
| (SSM) | | | | | | |
| Cd.3.1.1 | (Kuching, 1st Division) | 19 | 222 | 6+1 | 6 | 356/7 |
| f.o.p81 | (Kuching, 1st Division) | 19 | 210 | 6+1 | 6 | 507/8 |
| (ZRC) | | | | | | |
| ZRC.2.3007 | (Limbaug, 4th Division) | 19 | 210 | 5+1 | 6 | 392/8 |
| (FMNH) | | | | | | |
| 158631 | (Pesu, 4th Division) | 19 | 203 | 5+1 | 6 | - |
| 158630 | (Pesu, 4th Division) | 19 | 207 | 4+1 | 6 | - |
| 131778 | (Niah, 4th Division) | 19 | 203 | 5+1 | 6 | - |
| 131782 | (Niah, 4th Division) | 19 | 215 | 5+1 | 6 | - |
| 131765 | (Niah, 4th Division) | 19 | 207 | 5+1 | 6 | - |
| 148825 | (Niah, 4th Division) | 19 | 201 | 6+1 | 6 | - |
| Peninsular Malaysia/Singapore | | | | | | |
| (ZRC) | | | | | | |
| ZRC.2.3011 | (Kelantan) | 19 | 214 | 5+1 | 6 | 439/8 |
| ZRC.2.3020 | (Singapore) | 19 | 209 | 6+1 | 6 | 411/10 |
| ZRC.2.3018 | (Singapore) | 21 | 212 | 5+1 | 6 | 443/9 |
| ZRC.2.3024 | (Singapore) | 21 | 213 | 5+1 | 6 | 744/10 |

Table 2A. Specimens of *Cylindrophis lineatus* Blanford in the SSM

| Number | Locality | Scale rows (MB) | Ventrals | Character | | |
|------------|-------------------------------|--------------------|----------|------------|---------------|-------|
| | | | | Subcaudals | Supra-labials | TL/T |
| Cd.3.1.2.c | (Dalat, 6th Division) | 19 | 230 | - | 6 | 307/8 |
| Cd.3.1.2.d | (Kuching, 1st Division) | 19 | 197 | 5+1 | 6 | 454/9 |
| Cd.3.1.2.e | (Sg. Periok, 1st Division) | 21 | 183 | 5+1 | 6 | 492/9 |
| Cd.3.1.2.f | (Selantik, 2nd Division) | 19 | - | 5+1 | 6 | 379/8 |

* These four specimens labelled "*Cylindrophis lineatus*?" from the Sarawak Museum collection are consistent in pattern and other morphological characteristics with *Cylindrophis rufus*. All have a mental groove, and the mid-ventral scale row is approximately 1.5 x the width of the dorsal (body) scales, at mid-body. There is a partial to complete light collar encircling the neck at the occiput. The spots are all oval, elongate and distributed along the sides of the body in a dorsoventral orientation. The underside of the tail is light/cream coloured in alcohol, and the tail has a dark tip. None have a light supraocular streak. The sex of the specimens could not be determined. All localities are coastal.

Table 2B. Specimens of *Cylindrophis lineatus* Blanford (BMNH 1946.1.16)

| Number | Locality | Scale rows (MB) | Ventrals | Subcaudals | Supra-labials | TL/T |
|---------------------|-------------|--------------------|----------|------------|---------------|--------|
| BMNH 1946.1.16.5 | "Singapore" | 21 | 214 | 10 | 5 | 593/22 |

During fieldwork in the Lanjak-Entimau Wildlife Sanctuary of southwestern Sarawak, Borneo, an unusual specimen of a *Cylindrophis*-like snake was collected at the Base Camp, Nanga Segerak. The external morphology and colour pattern of this specimen is distinctly different in several aspects from any other previously described cylindrophids, and is here reported as a species new to science.

The abbreviations used are: ZRC = Zoological Reference Collection, Department of Zoology, National University of Singapore; FMNH = Field Museum of Natural History, Chicago; BMNH = British Museum (Natural Museum), London; and SSM = Sarawak Museum, Kuching. The type specimen is now held in the ZRC as a long-term loan.

TAXONOMY

Cylindrophis engkariensis, new species

(Fig. 1, 2)

Material examined. - Holotype - adult male (ZRC) (field tag RBS 8821), found in dead leaves in old secondary, mixed dipterocarp forest from Nanga Segerak (1°25'N 112°00'E), 245 m asl, headwaters of the Engkari River, Lanjak-Entimau Wildlife Sanctuary, Lubok Antu District, Second Division, Sarawak, Malaysia, coll. R. B. Stuebing, 12.viii.1993.

Diagnosis. - *Cylindrophis engkariensis*, new species, belongs to the genus *Cylindrophis* Wagler, because of the following combination of characters: small head not distinct from neck, covered with large symmetrical shields; the nostril in a single nasal, with no loreal or preocular scale; a mental groove present; tail short and blunt (De Rooij, 1917). The head scutellation and the smooth iridescent body scales are typical of *Cylindrophis*. However, *Cylindrophis engkariensis* is different from *Cylindrophis* sensu stricto (see Cundall *et al.*, 1993) in the number of mid-body scale rows, e.g. 17 in the former vs. 19-23 in the latter. Furthermore, unlike other species of *Cylindrophis*, the ventrals of *Cylindrophis engkariensis* are indistinguishable in width from the dorsals. *Cylindrophis engkariensis* also possesses a unique colour pattern of small, white, irregularly shaped paravertebral spots, and the tail dark (black) dorsally, and lighter ventrally with dark mottling. In contrast, *Cylindrophis rufus* is characterised by orange bands partially encircling a black body; an incomplete orange ring encircling the posterior portion of the head, and a broad orange band encircling the tail. Equally contrasting with the pattern of *C. engkariensis* is the BMNH holotype of *Cylindrophis lineatus*, which has (in alcohol) a yellowish head with a faint dark rostral spot, alternating dark and yellow bands along the sides, a irregular dark longitudinal stripe along the side, running the length of the body, two light paravertebral stripes and a middorsal dark stripe.

Description. - Head not distinct from neck, subequal in size to end of tail. Snout depressed dorsoventrally, tapering slightly. Eye distinct, lateral and very small, approximately four

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times its diameter from the nostril, and three times its diameter distant from the mouth, partially covered by frontal, supraocular and upper labial scales. Six supralabial scales, the third and fourth the tallest and entering the orbit, the fifth slightly longer than high. Rostral triangular, as tall as broad, extending onto upper surface of snout. A pair of large hexagonal prefrontals. Frontal subtriangular, narrowing posteriorly. Nasal scale large, bordering prefrontal. No separate loreal or preocular. A single large elongate supraocular, approximately half the size of the frontal. One postocular, subequal to eye, much smaller than supraocular.

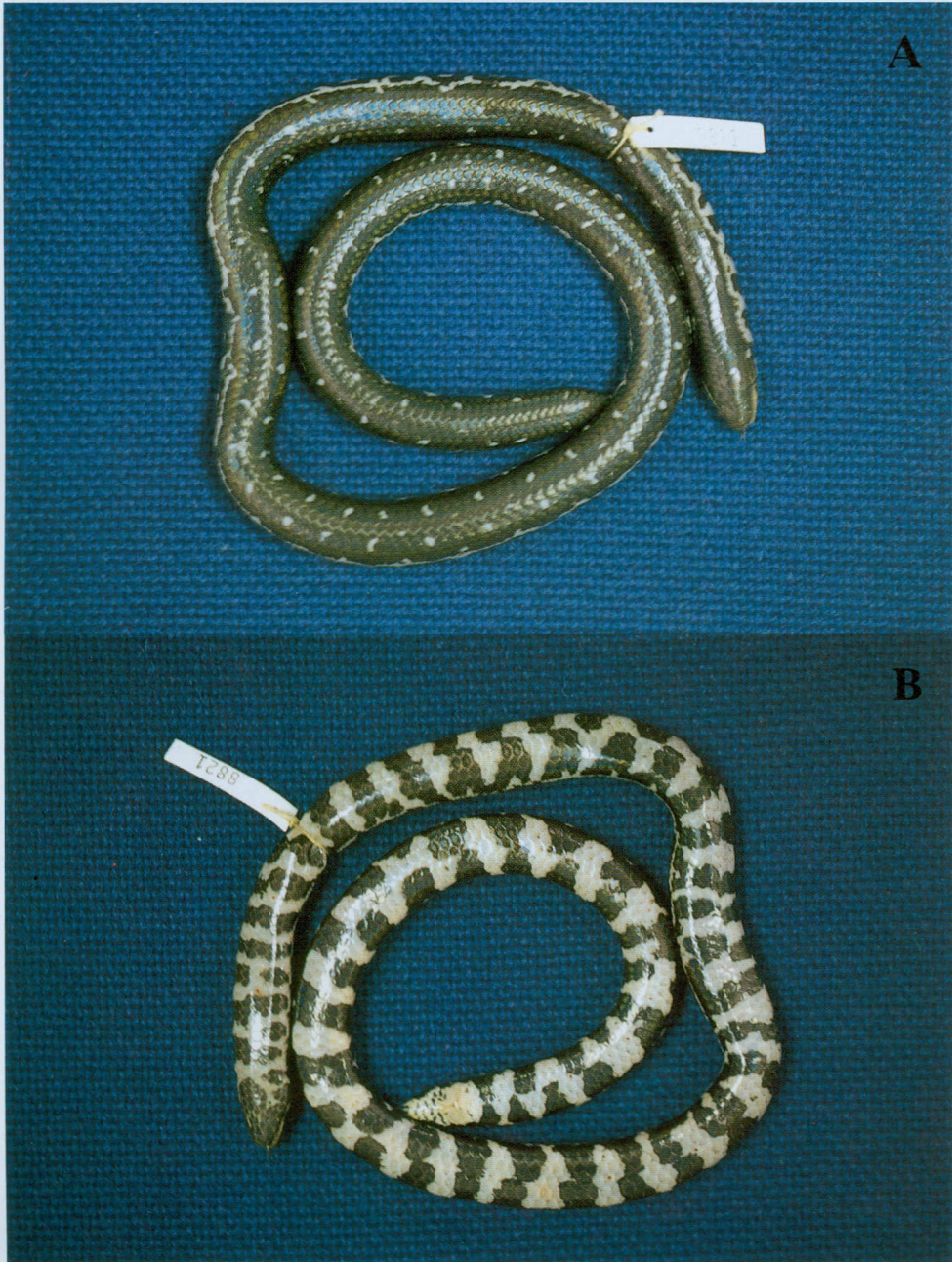


Fig. 1. *Cylindrophis engkariensis*, new species. Holotype male (ZRC). A, dorsal view; B, ventral view.

A large temporal, approximately equal in size to supraocular, bordering the fourth and fifth supralabials, behind and much larger than the postocular. A second temporal about half the size of the first, posterior to the supraocular. A pair of irregularly shaped parietals posterior to the frontals, approximately equal in size to the supraoculars. Five infralabials. Mental half the size of first infralabial. One pair of chin shields, separated from a mental groove by the first pair of infralabials.



Fig. 2. *Cylindrophis engkariensis*, new species. Holotype male (ZRC). A, dorsal view of head; ventral view of caudal region.

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Dorsal scales smooth, glossy, producing diffraction colors. Scales weakly imbricate posteriorly. Ventrals not distinguishable from lateral scales. Anal divided. Hemipenis simple, coniform and smooth.

Nine maxillary teeth. Midventrals 234 to vent. Subcaudals 5+terminal scute. Last 7-8 dorsal scales increasingly rugose posteriorly. Terminal scute entirely rugose, with evenly distributed, slightly raised tubercles. Scale rows (excluding the mid-ventral row): 17:17:17. Adult male, total length (TL) = 485, tail (T) = 12, Wt. = 42g.

Colour in alcohol. - Black with paired, small irregular light spots along dorsal surface from behind nape to tail, each spot covering about half of one scale. Head with light streak from posterior border of eye parallel to supralabials, ending slightly beyond jaw angle. Snout entirely dark. Lower surface with alternating black and white transverse bands, divided at the midline. White bands partially connected along sides of body forming an irregular white line. Tail black above, white with black mottling below, except for black tip.

Habitat. - Lanjak-Entimau Wildlife Sanctuary is an area of approximately 168000 hectares of primary and old secondary rain forest in the interior of western Sarawak, Malaysian Borneo, between 120-150 km inland. The sanctuary lies between the town of Lubok Antu at the southern end of the Batang Ai Reservoir and the Ulu Katibas area, and with most of the western boundary lying along the Sarawak-Kalimantan (Indonesia) Border. The terrain is rugged, forming the watershed of two of Sarawak's largest rivers, the Batang Lupar and the Rejang. While most of the forests of the ridges are undisturbed, the riverine areas have been exploited for shifting agriculture by the local Iban people in the past, though almost all regenerating areas of the forest are likely to be more than 50 years old. The forest varies in composition and stature, the tallest being the mixed dipterocarp forests (compared to kerangas or mossy forests). *Temuda*, or areas regenerating after shifting agriculture have more fruit tree species, and few trees with a diameter breast height greater than 60 cm.

The first Lanjak-Entimau site sampled for herpetofauna was located at the headwaters of the Engkari River, at the junction of a stream called Nanga Segerak (ca. 1°25'N 112°00'E). Sarawak Wildlife and National Parks Ranger, Bangan Empulu, discovered the snake in the forest floor leaf litter beneath his camp bed.

Taxonomic remarks. - *Cylindrophis engkariensis* is distinct from other *Cylindrophis* species in the number of mid-body scale rows (17 in the former vs. 19-23 in the others). The ventrals of *Cylindrophis engkariensis* are also indistinguishable from the dorsals, unlike the other *Cylindrophis* species known from Borneo. In these two scale characters, *C. engkariensis* resembles *Anomochilus*, in which all Peninsular Malaysian specimens described thus far have 17 mid-body scale rows and indistinguishable ventrals. Interestingly, the Sabah (Borneo) specimen of *Anomochilus leonardi* has 17 mid-body scale rows (Stuebing & Goh, 1993).

The colour pattern of *C. engkariensis* is unique among Southeast Asian cylindrophiids. No other species possesses a light post ocular streak and series of small paired, white paravertebral spots. *Cylindrophis lineatus* is longitudinally striped, with the head and tail yellowish or red (De Rooij, 1917). *Cylindrophis rufus* has either incomplete cross-bands or elongated oval spots in a dorso-ventral orientation, usually with a wide, colourful (often orange) collar just posterior to the head and a similarly coloured band encircling the tail. *Anomochilus leonardi* and *A. weberi* possess large rounded light blotches and a prominent

band encircling the tail. In contrast, the tail of *Cylindrophis engkariensis* is bicoloured, black dorsally and white ventrally with dark mottling. In life, *C. engkariensis* bears no indication of any reddish or orange colouration of the head or tail.

The number of ventrals in *C. engkariensis* is up to 15% greater than that of *C. rufus* (Table 1), approximately equal to that of *C. lineatus* (Table 2B) and similar the number for *Anomochilus* ($V = 214-252$; Stuebing & Goh, 1993).

Overall, *C. engkariensis* is an atypical member of the Cylindrophidae, whose the relationships to one another await further investigation.

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