

A New Species of Kukri Snake, *Oligodon* (Colubridae), from Pulau Tioman, West Malaysia.

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Abstract. - A unique species of *Oligodon* is described from the type locality of Pulau Tioman, West Malaysia. In terms of scalation, it is most comparable with the Bornean *O. subcarinatus*, but does not exhibit any feeble keeling of scales. In addition, its body color and patterns are unique in having a red dorsum, pink ventral surface, and indistinct pale bars on the nape and body.

Key words. - *Oligodon*, kukri snake, Pulau Tioman, West Malaysia.

Introduction

The kukri snakes belonging to the genus *Oligodon* Boie, 1827 are so named because of the presence of unique posterior maxillary teeth, shaped like Ghurka kukri knives. In addition, members belonging to this genus are small to medium-sized ground dwelling species characterised by having a large slightly upturned rostral shield, short head, round pupil, and a cylindrical body with smooth scales (Tweedie, 1983; Cox et al., 1998). Many species possess a distinct dark chevron mark on the nape and a stripe across the anterior part of the head and down over/through the eye. Although *Oligodon* is well represented in South and Southeast Asia, there are only three species on Peninsular Malaysia, namely *O. octolineatus* Schneider, *O. purpurascens* Schlegel, and *O. signatus* Günther (Tweedie, 1983). In Borneo, eight species have been recorded [*O. annulifer* Boulenger, *O. cinereus* Günther, *O. everetti* Boulenger, *O. octolineatus* Schneider, *O. purpurascens* Schlegel, *O. signatus* Günther, *O. subcarinatus* Günther, and *O. vertebralis* Günther]. However, the occurrences of true *O. annulifer* and *O. cinereus* on Borneo remain to be verified (Stuebing and Inger, 1999).

On Pulau Tioman, ca. 40 km from the southeast coast of the peninsula, one species (*O. purpurascens*) has been reliably recorded thus far (Grismer et al., 2004; Hendrickson, 1966). The presence of *O. octolineatus* on the island, though possible, remains to be verified (Lim and Lim, 1999). Day (1990: 38) reported the presence of a distinct, new form of *Oligodon* from the cross-island (Tekek-Juara) trail, but did not provide any diagnostic characters. It was merely mentioned that this form resembled *O. signatus*, but had differences in terms of head scalation and dorsal colouration. We collected a specimen from the same locality on 16 July, 2001 that is different from all other nominal species of Malaysia and is herein named and described as new.

Materials and Methods

Prior to preservation in 10% formaldehyde, the specimen was photographed and liver tissue sampled. Total length, tail length, and snout-vent length were obtained using a measuring tape (to nearest 1 mm). Additional measurements taken, using vernier callipers (to nearest 0.1 mm), include eye diameter (ED); head length (HL), taken from the union of the posteromedial corners of the parietals to the tip of the snout; head depth (HD), taken from the dorsal surface of the head to the ventral surface of the jaw immediately posterior to the eye; and snout length (SL), taken from the anterior margin of the eye to the tip of the snout. The scale counts included upper labials, number of upper labials in contact with eye, lower labials, preoculars, postoculars, ventrals, subcaudals, and midbody scales. Comparative material was examined from the Zoological Reference Collection (ZRC) [Raffles Museum of Biodiversity Research (RMBR), National University of Singapore], the Department of Wildlife and National Parks, Peninsular Malaysia (DWNP) herpetological collection, the Bishop Museum, Hawaii (BPBM), and Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (ZMB).

Oligodon booliati, sp. nov.

Holotype: ZRC.2.5153, adult female, collected on the night of 16 July, 2001, at 2130 hrs by T. M. Leong and K. M. Crane, while it was crawling on a concrete staircase in primary forest along the Tekek-Juara trail, ca. 150 m asl., Pulau Tioman (Pahang, Peninsular Malaysia). Deposited at the Zoological Reference Collection (ZRC).

Paratypes: (1) BPBM 13933, subadult male, collected on 17 April 1962 by J. R. Hendrickson, at Ulu Lalang,



Figure 1. Dorsal view of *Oligodon booliati* holotype, ZRC.2.5153 (live coloration).

ca. 700 m asl and (2) ZMB 64446, adult female, collected in May 2001 by W. Grossmann and C. Scafer on the top of the Tekek-Juara Trail at 300 m asl.

Diagnosis. - 6-7 upper labials, 2nd and 3rd or 3rd and 4th touching eye, 7 lower labials, 17 mid-body scales, 143-153 ventrals, 54-60 subcaudals. Loreals present. Head scales without distinct patterns. No distinct stripe running through eye. In life, body deep maroon red dorsally and along flanks, salmon pink on the ventrals and subcaudals. Ventrals without dark spots. Indistinct dark brown transverse bars (19-22) on body, starting from nape and fading increasingly towards tail. Thin, dark brown stripes on anterior sides of 5th and 6th upper labials, immediately posterior to eye.

Description of Holotype. - Adult female, total length: 510 mm, tail: 121 mm, snout-vent: 389 mm, ED: 2.2 mm, HL: 10.8 mm, HD: 6.9 mm, SL: 5.0 mm; head stout (HD/HL 0.64), slightly broader than neck; snout moderate, oblique in dorsal profile, oval in lateral profile; eye 20% of head length, pupil round; rostral shield large, triangular, visible from above, width (3.5 mm) greater than height (3.0 mm), concave below; rostral in direct contact with first upper labials, nasals and internasals; trapezoid prefrontals posterior to internasals, curving at canthus rostrals to meet triangular postnasals; single, almost tri-

angular frontal, slightly longer (4.8 mm) than wide (4.2 mm), posterior point terminating 1.2 mm beyond posterior margin of eye; frontal flanked by prominent supraoculars, length of supraocular (3.0 mm) 1.4 of ED; 7 upper labials, increasing in size to 6th, 3rd and 4th in contact with eye; a small (0.5 x 0.5 mm) loreal scale present on left, but absent on right, allowing contact between right prefrontal and 2nd upper labial; one preocular and one postocular present on both sides; 7 lower labials, first pair elongated transversely, confining mental to meet medially, 4th pair largest; anterior chinshields longer than (almost double) posterior chinshields; 17 scale rows at neck and midbody, but 15 at one head length anterior to vent; 143 ventrals, lateral margins visible from the sides; 59 subcaudals, all divided; anal shield single. Colour in life deep maroon red on dorsum and flanks (Fig. 1). Ventrals salmon pink, the colour becoming increasingly intense towards the tail tip (Fig. 2), without any melanistic pigmentation. Head scales without markings dorsally. Distinguishable grey-brown pigmentation visible in other head scales: dorsal portion of 4th upper labial (point of contact with eye), anterior margins of 5th and 6th upper labials, anterior margins of 1st to 4th lower labials, in between anterior chinshields towards the anterior, within mental, and lower surface of rostral. Crossbars on body faint. 21 crossbars from nape towards tail tip. Upon preservation, and storage in alco-

Table 1. Measurements, scale counts, and number of crossbars among *Oligodon booliati* sp. nov. type materials (holotype and two paratypes). L/R = Left/Right sides.

	Holotype ZRC.2.5153 Adult female	Paratype #1 BPBM 13933 Subadult male	Paratype #2 ZMB 64446 Adult female
Snout-vent length (mm)	389	260	291
Total length (mm)	510	348	373
Upper labials (L/R)	7/7	7/7	6/6
Upp. labials touching eye	3 rd & 4 th	3 rd & 4 th	2 nd & 3 rd
Lower labials (L/R)	7/7	7/7	7/7
Anterior nasal (L/R)	1/1	1/1	1/1
Posterior nasal (L/R)	1/1	1/1	1/1
Loreal (L/R)	1/0	1/1	1/1
Pre-ocular (L/R)	1/1	1/1	1/1
Post-ocular (L/R)	1/1	1/1	1/1
Supra-ocular (L/R)	1/1	1/1	1/1
Midbody	17	17	17
Ventrals	143	146	153
Subcaudals	59	60	54
# crossbars on body	21	22	19



Figure 2. Ventral view of *Oligodon booliati* holotype, ZRC.2.5153 (live colouration).

hol, the colours gradually faded to a lighter shade. A lateral view of the head is illustrated in Fig. 3.

Description of paratypes. - Rostral shield large, visible from above. BPBM 13933 has 7 upper labials with the 3rd and 4th touching eye. ZMB 64446 has 6 upper labials with the 2nd and 3rd touching the eye. Loreal scale (0.5 x 0.5 mm) present on both sides in BPBM 13933 and fused to the postnasal on both sides in ZMB 64446 (1.0 x 1.0 mm). One preocular and one postocular. Seven lower labials, 17 midbody scales, 146 ventrals, 60 subcaudals in BPBM 13933 and 153 ventrals and 54 subcaudals in ZMB 64446. First pair of infralabials separated medially by the mental in ZMB 64446. Total length (BPBM 13933): 348 mm; tail: 88 mm; snout-vent: 260

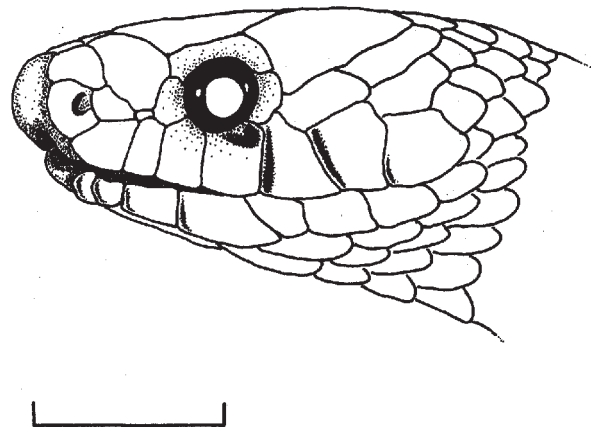


Figure 3. Lateral view of head (left side) of *Oligodon booliati* holotype, ZRC.2.5153. Scale bar = 5mm.

mm. Total length (ZMB 64446): 373 mm; tail: 82 mm; snout-vent: 291 mm. Anal shield single, subcaudals paired. Colour in preservative faded to a cream colour. No distinctly striking markings on head, faint crossbars on body (22 in BPBM 13933, 19 in ZMB 64446). Measurements and scale counts of type materials are summarised in Table 1.

Etymology. - This new species is named in honor of Lim Boo Liat, of the Department of Wildlife and National Parks (Peninsular Malaysia), whose contributions to our better understanding of Malaysia's natural history dates back to the 1950's. His publications include the description of a new snake (*Macrocalamus tweediei* Lim, 1963) and the popular reference book *Poisonous Snakes of Peninsular Malaysia* (Lim, 1982).

Table 2. Comparisons between the *Oligodon* species (arranged alphabetically) of Peninsular Malaysia and Borneo, including *Oligodon booliati* sp. nov. (measurements and scalations after Manthey & Grossmann, 1997). Lo = Loreal, UL = Upper Labials, MB = Midbody, V = Ventrals, SC = Subcaudals.

<i>Oligodon</i> species	Total length (cm)	Lo	UL	UL touching eye	MB	V	SC
<i>annulifer</i>	43	1	7-8	3 & 4	15	148-162	40-58
<i>booliati</i> sp. nov.	51	1	6-7	2 & 3/3 & 4	17	143-153	54-60
<i>cinereus</i>	73	1	7-8	4 & 5	15/17	151-185	29-43
<i>everetti</i>	42	1	7	3 & 4	15	138-154	46-65
<i>octolineatus</i>	68	1	6	3 & 4	17	155-197	43-61
<i>purpurascens</i>	95	1	8	4 & 5/5	19/21	160-210	40-60
<i>signatus</i>	60	0	7	3 & 4	17	141-157	47-59
<i>subcarinatus</i>	40	1	7	3 & 4	17	155-166	50-54
<i>taeniatus</i>	34	1	8	3-5	17	146-169	30-47
<i>vertebralis</i>	35	1	7	3 & 4	15	136-154	35-54

Discussion

The number of upper labials (6-7) in *Oligodon booliati* may be used to distinguish it from *O. purpurascens* (8) and *O. taeniatus* (8), although *O. annulifer* and *O. cinereus* may occasionally possess eight upper labials. *O. booliati* shares the same number of midbody scales (17) as *O. octolineatus*, *O. signatus*, and *O. subcarinatus* (instead of 15 in *O. annulifer*, *O. everetti* and *O. vertebralis*) but may be distinguished from *O. octolineatus* by the absence of any longitudinal stripes along the body, from *O. signatus* by the presence of loreal scales, and from *O. subcarinatus* by the lack of feeble keels on its scales. This new species is assumed to be endemic to Pulau Tioman. Comparisons of measurements and scalation between *O. booliati* and the other species of *Oligodon* in Peninsular Malaysia and Borneo are summarised in Table 2.

Comparative Material Examined

Oligodon bitorquatus. - ZRC.2.3875, Bandung, West Java; ZRC.2.3876, Gunong Hedjo, Cheribon, West Java; ZRC.2.3957, Pengalengan, Java.

Oligodon octolineatus. - ZRC.2.2295, 2399, 2559, 3161, 3850, 3853-3855, 3859-3860, 3865, 5058, Singapore; 3861, 3863-3864, Johor Bahru, Johor, Peninsular Malaysia; 3862, 3867, Selangor, Peninsular Malaysia.

Oligodon purpurascens. - ZRC.2.3869, Sumatra, Indonesia; ZRC.2.3877-3879, Singapore; ZRC.2.3880-3881, Pulau Gallang, Riau, Sumatra, Indonesia; ZRC.2.3882, 3884, 3885, 3887, Johor, Peninsular Malaysia; ZRC.2.3883, Forest Research Institute Malaysia, Kepong, Selangor, Peninsular Malaysia; ZRC.2.3886, 3888, Fraser's Hill, Pahang, Peninsular Malaysia; Bishop Mus. 14211, Pulau Tioman.

Oligodon signatus. - DWNPR.0005, Forest Research Institute Malaysia, Kepong, Selangor, Peninsular Malaysia; ZRC.2.4159, Bukit Asahan, Malacca, Peninsular Malaysia; ZRC.2.3203, 3388, 3400, 3871-3873, 3958, 4842, Singapore.

Oligodon taeniatus. - ZRC.2.4161, Bangkok, Thailand.

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