

ADDITIONAL RECORDS ON TWO RARE SNAKES FROM BORNEO, WITH THE CONFIRMATION OF *TRIMERESURUS MALCOLMI* LOVERIDGE AS A DISTINCT SPECIES

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ABSTRACT. - Recent fieldwork in Borneo has revealed that *Opisthotropis typica*, known previously only from Mt. Kinabalu, Sabah and Mt. Mulu, Sarawak, occurs in the lowlands below 300 meters asl in both Sabah and Sarawak. These records and the characteristics of the new specimens are discussed. *Trimeresurus sumatranus malcolmi* from Mt. Kinabalu was first described by Loveridge in 1938 as a subspecies. Specimens identical to those described by Loveridge have since been collected from the area around the Mt. Kinabalu Headquarters at approximately 1,700 meters asl, and based on a variety of scale characters are recognised as a distinct species, *Trimeresurus malcolmi*.

KEYWORDS. - *Opisthotropis*, *Trimeresurus*, Bornean snakes

INTRODUCTION

Despite a long history of zoological exploration, the snake fauna of Borneo is still not well known, with the ecology and distribution of many species particularly uncertain. Many species are known only from a few or even only a single known locality (Stuebing, 1991, 1993), which weakness perhaps reflects more the lack of collecting effort rather than actual rarity or restricted distributions. In recent years, collections by Field Museum of Natural History, the ITTO Lanjak-Entimau Project of the Sarawak Forest Department, and Sabah Parks have added to our knowledge of the distribution and abundance of several poorly documented snake species. In this paper we provide additional ecological and distributional information on the endemic *Opisthotropis typica* (Mocquard) and also confirm that the subspecies *Trimeresurus sumatranus malcolmi* described by Loveridge should in fact be regarded as a separate species, *Trimeresurus malcolmi* Loveridge.

MATERIALS AND METHODS

We have examined specimens in the collections of Field Museum of Natural History (FMNH), Sabah Parks (SP), Sarawak Museum (SM), and United States National Museum (USNM). We also list specimens from the collections of the Museum of Comparative Zoology, Harvard University (MCZ), and the National Reference Collection, National University of Singapore (NUS). We use the following counts and measurements standard in herpetological texts: scale rows around mid-body (SR), ventral scales (V), subcaudal scales (C), supralabials (SL), total length (TL), snout-vent length (SVL). We refer to sex as male (M), female (F), and juveniles unsexed (J).

Opisthotropis typica (Mocquard)

Material examined. - FMNH 63596, collected at Bukit Kretam, southeast end of Dewhurst Bay, Kinabatangan District, Sabah, 10 Jun. 1950, by Robert F. Inger. RBS 000085, RBS 000103, collected at Nanga Serembuang, Ulu Sekarang, Lanjak Entimau Wildlife Sanctuary, Sarikei District, Sarawak, 8-9 Oct. 1993, by Robert B. Stuebing.

Opisthotropis typica (Mocquard) was described on the basis of a single specimen from "Kina Balu" without any indication of elevation or habitat (Mocquard 1890). The species was redescribed by de Rooij (1917) and included in Smith's (1931) list of the fauna of Mt. Kinabalu, but the holotype remained the only known specimen until Mori (1993) discovered it on Mt. Mulu at 500 m. Like other species described from "Kina Balu," *O. typica* had been considered part of a montane fauna. We report here on three specimens (see Material examined) collected by us between sea level and 200 m, suggesting that the holotype was probably collected in the foothills of Mt. Kinabalu.

The new specimens, all females, agree very closely with the original description and illustrations. These snakes have flattened, shovel-like snouts and rather small eyes separated from the supralabials by small scales. The body scales are finely striated and strongly keeled, with small knobs on the keels. The dorsal head scales are also finely striated as shown in Mocquard's plate. The first six supralabials are much taller than wide and the last four (according to Mocquard) to six (in the new specimens) are divided horizontally into a larger upper portion and a smaller lower portion. The internasals are triangular, and very narrow anteriorly. The prefrontals are short, and in the specimen from Sabah, are fused. The supraculars are small; in one specimen the supraocular on one side is divided. Mocquard (1890) stated that the nasals meet behind the rostral, whereas in the new specimens, the nasals are separated by the internasals which meet the rostral. The holotype has the loreal on one side completely divided, and the one on the opposite side partially divided by a vertical suture. Two of the three new specimens have single loreals; the third has a divided left loreal.

Counts and measurements (female holotype in parentheses): Scale rows at mid-body 19 (19); ventrals 160-165 (176); subcaudals 91-96 (82); supralabials 11 (12), last six divided into large upper and small lower portions (only last three divided); infralabials 10 (10); preoculars 2 (2); postoculars 2 (2); suboculars 3 (3); temporals 1+2 (1+2); total length 322-502 mm (390); tail 27%-28% (24%) of total. Information on holotype from Mocquard (1890).

The specimen from Sabah (FMNH 63596) was found at 75 m above sea level on the ground at the edge of a small stream in primary rain forest. The two from Sarawak (RBS 000085, 000103) were found at 200 m in old secondary forest, one in a swamp pool along a small, sluggish stream and the other on a rock at the edge of a large river. The specimen from Mt. Mulu was found at 500 m along a small stream into which it dived when disturbed (Mori (1993).

Trimeresurus malcolmi Loveridge

Material examined. - *Trimeresurus malcolmi*: SM unnumbered, Kundasang, Ranau District, Sabah; SP KP/R(S)/0072 and SP KNP 01495, Kinabalu Park Headquarters, Ranau District, Sabah. *Trimeresurus sumatranus*: FMNH 71643-44, Pa Berayong, Lawas District, Sarawak; FMNH 76326, Matang, Kuching District, Sarawak; FMNH 138687-90, 148829-30, Nanga Tekalit, Kapit District, Sarawak; FMNH 158671, Sungai Pesu, Bintulu District, Sarawak. FMNH 230063-64, Danum Valley Field Centre, Lahad Datu District, Sabah; FMNH 239947-48, Marak Parak, Kota Marudu District, Sabah; USNM 134123, Ranau, Ranau District, Sabah; USNM 134125, Poring Station, Kinabalu Park, Ranau District, Sabah.

Loveridge (1938) described the subspecies *Trimeresurus sumatranus malcolmi*, which he named in honor of Dr. Malcolm A. Smith, a famous student of the Southeast Asian herpetofauna. The earliest known specimen was collected by F.N. Chasen in 1929 at Lumu-Lumu (1675 m) on Mt. Kinabalu; this specimen, apparently deposited in the Raffles Museum cannot be located now in NUS. The holotype (MCZ 43604), from Bundu Tuhan (1000 m) and two paratypes (MCZ 43605-06) from Kiau (915 and 1000 m, respectively) were collected by J. A. Griswold, Jr. in 1937. Additional specimens have been found on Kinabalu by N. S. Haile in 1961 (reputedly deposited in the Sarawak Museum, but not locatable now) at Kundasang (1525 m) and more recently at Kinabalu Park Headquarters (1600 m) by Alim Biun and Paul Iambun (SP collection).

Loveridge (1938) maintained that his new form, *T. s. malcolmi*, differed from *T. sumatranus* "...of Sumatra (and the Sarawak lowlands, etc.) by its fewer midbody scale rows (19 as against 21), fewer ventrals (168-174 as against 180-191) and constant absence of a white lateral line." Morphometric data (Table 1) on additional material substantiates these differences in scale counts and in addition indicate that *T. s. malcolmi* has higher subcaudal counts (Mann-Whitney test, $P < .05$; females only). Only juveniles (<800 mm total length) of *T. sumatranus* have the white lateral line Loveridge referred to. In view of these differences, we propose that the subspecies be recognised as a distinct species under the name *Trimeresurus malcolmi* Loveridge.

Loveridge (1938) noted that the types had a "post-subocular" scale, three preoculars, and three postoculars "plus subocular." The recently collected specimens agree with these counts. Loveridge described the coloration as follows: "Above black, tending to form indistinct transverse bands, each scale on the head and back with a light green apical spot, the amount of green increasing towards the flanks...; each scale on tail...with an apical red spot. Below, pale green, each ventral and subcaudal shield edged with black." In the recently collected specimens from Kinabalu, the upper surfaces of head and body are black with bright green flecks formed by a green triangle occupying the posterior portion of each dorsal scale. The ventrals are green with a dark posterior edge and a light green anterior border. The tail pattern consists of rows of uniform, parallel red dots within dark green caudal scales, while the subcaudals are light green.

Table 1. Morphometric comparison of *Trimeresurus malcolmi* Loveridge and *T. sumatranus* (Raffles).

| Region | Sex | No. | TL | SVL | SR | V | C | SL |
|--------------------------------|-----|-----|-----------|----------|-------|---------|-------|------|
| <i>Trimeresurus malcolmi</i> | | | | | | | | |
| Sabah | F | 4 | 1210-1330 | 970-1120 | 19 | 168-174 | 61-64 | 8-9 |
| Sabah | M | 3 | 1060-1220 | 870-1025 | 19 | 169-173 | 64-81 | 8-9 |
| <i>Trimeresurus sumatranus</i> | | | | | | | | |
| Sarawak | F | 8 | 695-1355 | 607-1158 | 21-23 | 182-190 | 55-64 | 8-9 |
| Sarawak | M | 2 | 708-1223 | 590-1037 | 21 | 186-190 | 61-66 | 8-9 |
| Sabah | F | 3 | 1053-1145 | 905-985 | 21 | 186-191 | 57-62 | 8-10 |
| Sabah | M | 2 | 617-903 | 528-775 | 21 | 183-184 | 59-65 | 9 |
| Sabah | J | 1 | 380 | 320 | 21 | — | — | 8 |

The areas where *Trimeresurus malcolmi* has been found between 1,000 and 1,600 meters on Mt. Kinabalu are covered by oak forests, primary within the park boundaries, but disturbed on the outside. All specimens were found on the forest floor, though they have been seen dead on the road (Tan Fui Lian, *pers. comm.*). The diet is unknown, but a specimen kept alive in Kinabalu Park for several years fed on small mammals such as rats and ground squirrels (Tan Fui Lian, *pers. comm.*)

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