

CONTRIBUTIONS TO A REVIEW OF PHILIPPINE  
SNAKES, II

THE SNAKES OF THE GENERA LIOPELTIS AND SIBYNOPHIS

By ALAN E. LEVITON

*California Academy of Sciences, San Francisco 18, California*

The Philippine snakes of two colubrid genera, *Liopeltis* and *Sibynophis*, are treated in this second contribution to a review of Philippine snakes. These genera have restricted distributions in those islands, both being limited to the islands of the Palawan Archipelago. Both, too, are evidently fairly recent derivatives of closely related populations now extant in Borneo.

The writer is grateful to Dr. Robert F. Inger, Chicago Natural History Museum (CNHM); Dr. Ernest E. Williams, Museum of Comparative Zoology, Harvard University (MCZ); Dr. Doris M. Cochran, United States National Museum (USNM); and Neil Richmond, Carnegie Museum, Pittsburg (CM), for permission to examine specimens under their charge. Thanks are also due to Dr. George S. Myers, Natural History Museum of Stanford University, for reading and criticizing the manuscript.

This work was supported partially by a research grant from the Penrose Fund of the American Philosophical Society of Philadelphia.

TERMINOLOGY

Standard length: distance from tip of snout to anal opening.

\*:Following locality under "Range" denotes locality from which material was examined.

Diagnosis: The salient characteristics of the species are summarized under this heading. The measurements given are for the largest specimen, one male and one female, examined.

Genus LIOPELTIS Fitzinger

*Liopeltis* FITZINGER (1843) 26 (type species *Herpetodryas tricolor* Schlegel, by monotypy).

*Phragmitophis* GÜNTHER (1862) 126 (type species *Herpetodryas tricolor* Schlegel, by monotypy).

*Definition.*—Maxillary teeth small, equal, 17 to 31 on each maxilla; head not distinct from neck; body cylindrical, tail long; scales smooth, in 15 to 17 longitudinal rows at mid-body; apical pits absent; ventrals rounded; subcaudals paired; anal plate single or divided; eye large; hemipenes unforked, large spines present in proximal portion of organ; hypapophyses not present on posterior dorsal vertebræ.

*Remarks.*—The genus *Liopeltis* was established by Fitzinger (1843) to accommodate a single species, *Herpetodryas tricolor* Schlegel. At the same time he also proposed the nominal genus *Gongylosoma* for *Coronella baliodeira* Schlegel. Duméril (1853), and Duméril, Bibron, and Duméril (1854) established the nominal genus *Ablabes*, and included among other species *Coronella baliodeira* Schlegel. Boulenger (1890) selected *C. baliodeira* Schlegel as type species of *Ablabes*, making it a junior objective synonym of *Gongylosoma* Fitzinger.

In 1858, Günther proposed the nominal genus *Cyclophis*. To this genus he referred, among others, the nominal species *Herpetodryas tricolor* Schlegel and *Coluber aestivus* Linnæus. The latter was subsequently selected type species of the genus by Schmidt and Necker (1936). *Cyclophis*, thus, is a junior objective synonym of *Opheodryas* Fitzinger (see below). Günther, in 1862, also proposed the nominal genus *Phragmitophis* to which he assigned one species, *Cyclophis tricolor*. *Phragmitophis* is a junior objective synonym of *Liopeltis* Fitzinger.

In 1894a, Boulenger, who uniformly rejected all Fitzinger's names, included under the generic name *Ablabes* ten species of snakes, two from North America, and eight from China and southeastern Asia. Cope (1898), Taylor (1922), and Werner (1929) accepted Boulenger's arrangement of the genus though Cope and Taylor used Fitzinger's earlier name *Liopeltis*.

In 1935, Pope reexamined the generic affinities of the Chinese (including Formosa and the Ryukyu Islands), North American, and Oriental species of *Liopeltis*. He concluded that the Chinese and North American species were congeneric and were generically distinct from the Oriental forms. He referred the Chinese and North American species to the nominal genus *Eurypholis* Hallowell, the type species of which is *Eurypholis semicarinatus* Hallowell from the Ryukyu Islands. The Oriental species, including *H. tricolor* and *C. baliodeira*, were retained in *Liopeltis*. Schmidt and Necker (1936) pointed out that Pope was in error in using *Eurypholis* Hallowell because this

name was preoccupied by *Eurypholis* Pietet proposed for a group of fossil fish in 1852. They substituted *Opheodryx* Fitzinger to accommodate the North American and Chinese species which Pope believed were congeneric.

Bourret (1936) reverted to the Boulengerian arrangement of *Liopeltis*, including under this name Chinese, North American, and Oriental species. However, Smith (1943) accepted the arrangement proposed by Pope, as did Haas (1950).

As understood by Smith (1943) and Haas (1950) the genus *Liopeltis* included among other species both *Herpetodryas tricolor* and *Coronella baliodeira*. In the course of this study seven of the ten species presently attributed to *Liopeltis* were seen, including those two. It is clear that the genus as presently constituted (Smith, 1943) is a heterogenous assemblage of species. Available data suggest the species may be divided into two groups, one typified by *C. baliodeira*, the other by *H. tricolor*:

<i>C. baliodeira</i>	<i>H. tricolor</i>
Scales in 13 rows at mid-body.	Scales in 15 to 17 rows.
Diameter of eye/head length less than 5.4.	Diameter of eye/head length more than 5.4.
Snout length/diameter of eye less than 1.4.	Snout length/diameter of eye more than 1.6.
Spines in proximal portion of hemipenes not enlarged.	Spines in proximal portion of hemipenes enlarged.
Nasal shield divided.	Nasal shield single, rarely divided.

In addition to the above, there is a marked difference in the shape of the head between the two species. In *C. baliodeira* the head is short, deep, and convex in profile and the eye is very large. In *H. tricolor* the head is long, shallow, and flattened in profile. *Ablabes longicaudus* Peters, and *Ablabes scriptus* Theobald agree with *C. baliodeira*. *Ablabes philippina* Boettger, *Cyclophis calamaria* Günther, *Ablabes rappi* Günther, and *Cyclophis frenatus* Günther agree with *H. tricolor*. No specimens of *Ablabes stoliczkae* Sclater or *Ablabes nicobariensis* Stoliczka have been seen.

The marked differences between the two groups suggest they are not congeneric. *Coronella baliodeira* and its relatives *A. scriptus* and *A. longicaudus* are hereby transferred to the genus *Gongylosoma* Fitzinger (type species *C. baliodeira*, by monotypy). *Liopeltis* is restricted to include *H. tricolor* and those

species most similar to it (see above). *Ablabes nicobariensis* and *A. stoliczkae* are temporarily retained in *Liopeltis* until their zoological status can be determined.

Two species of *Liopeltis* are recorded from the Philippines; both are found in the Palawan Archipelago. *Liopeltis tricolor*, known from Palawan Island in the Philippines, is widely distributed throughout western Indonesia; *L. philippina* is known only from the Philippines where it is found on the Calamian Islands and on Palawan. This latter species is obviously derived from *L. tricolor*. The two forms may be separated by at least one distinctive morphological character and by color pattern. Although similar morphologically, the two species appear to be reproductively isolated as evidenced by the occurrence of both forms in the Puerto Princesa region of Palawan Island without the appearance of intergrades.

*Key to the Philippine species of Liopeltis*

- 1a. Nasal shield fused to internasal; four brown longitudinal stripes on dorsum ..... *L. philippina*  
 1b. Nasal shield not fused to internasal; dorsum uniform above, without longitudinal stripes ..... *L. tricolor*

**LIOPELTIS PHILIPPINA (Boettger).**

*Ablabes philippinus* BOETTGER (1897) 164 (Culion and Samar islands; type locality designated as Culion Island [see below]; type in Senckenberg Museum; original description), (1898) 78 (listed); GRIFFIN (1911) 261 (Palawan Is. [Iwahig], listed in key); WERNER (1929) 152, 153 (listed).

*Liopeltis philippinus* Taylor (1922) 164, pl. 20 (synonymy; description; distribution compiled).

*Range.*—BUSUANGAO. CULION. PALAWAN: Puerto Princesa \*; Iwahig.

*Material examine* (2).—BUSUANGA: (CAS 15284). PALAWAN: Puerto Princesa (CNHM 53372).

*Taxonomic notes.*—This species is similar to *L. tricolor*, differing in relatively minor, but apparently constant characters. Both species occur on northern Palawan Island. Otherwise, *L. philippina* is known from the Calamianes group of islands north of Palawan. Boettger records one of the syntypes as coming from Samar Island. However, the record is seriously doubted, and it seems likely the locality datum accompanying the specimen is in error. Inasmuch as the locality datum accompanying the

<sup>1</sup> Boettger's [(1897) 164] Samar record for this species is doubted.

second of the two paratypes, *i.e.* Culion Island, agrees with other data available on the distribution of this animal, I hereby designate Culion Island, Calamianes group, type locality of *L. philippina*.

TABLE 1.—Summary of variation between sexes in *Liopeltis philippina*.

Character	Male	Female
Ventrals.....	139-140	150
Subcaudals.....	114-119	110
Tail length/standard length.....	0.64	0.55

*Diagnosis.*—Scales in 15 longitudinal rows at mid-body; loreal absent; nasal shield single, anterior portion united with internasal; dorsum with four dark brown longitudinal stripes; subcaudals 110 to 119. Measurements: Body ( $\delta$ ) 341 mm, ( $\varnothing$ ) 335 mm; tail ( $\delta$ ) 219 mm, ( $\varnothing$ ) 183 mm.

*Descriptive notes.*—Maxillary teeth 29; posterior portion of nasal divided by horizontal suture which arises from center of nostril and extends to posterolateral border; 8 upper labials, fourth and fifth border orbit; 1 preocular; 2 postoculars; temporals 1 + 2; body dorsal scales reduce: 15 (3 + 4 [84-92]) 13; ventrals, 139 to 150; subcaudals, 110 to 119; anal plate divided.

Hemipenes extend to seventh subcaudal plate, unforked; sulcus spermaticus unforked; proximal half with well-developed spines which become somewhat larger toward middle of organ; spines abruptly become very small at middle of organ and cover entire distal half; no flaplike ridge in distal portion as in *L. tricolor*.

Color (in alcohol) light grayish tan to olive above; two dark olive brown dorsolateral stripes originate just behind head and extend onto tail, and two lateral olive brown stripes which originate just behind the eye extend to near anus.

*Sexual dimorphism.*—Data from three specimens, two of which were examined here and one recorded by Taylor [(1922) 164], suggest the sexes may differ in ventral counts and tail length/standard length ratio (Table 1). The position of reduction of the body scales from 15 to 13 may also be subject to sexual dimorphism. Data from two specimens are as follows: ( $\delta$ ) 15 (3 + 4 [91-92]) 13; ( $\varnothing$ ) 15 (3 + 4 [84-85]) 13.

*Inter-island variation.*—Neither is there evidence of geographic variation in the sample available for study nor is it indicated by material recorded in the literature.

**LIOPELTIS TRICOLOR (Schlegel).**

*Herpetodryas tricolor* SCHLEGEL (1837) 187, pl. 6, figs. 16-18 (type loc: Java; type in Leiden Museum; original description).

*Liopeltis tricolor* COPE (1860) 559 (listed as type species of genus); JAN (1869) Livr. 31, pl. 6, fig. 2; TAYLOR (1922) 162, pl. 11, figs. 3-5, pl. 19 (Bubuan Is; Palawan Is. [Iwahig, Taytay]; synonymy, description, variation, material examined, measurements and counts); Haas (1950) 560 (distribution compiled).

*Phragmitophis tricolor* GÜNTHER (1862) 126 (explanation for transferring *H. tricolor* to the new genus).

*Ablabes tricolor* BOULENGER (1894a) 281 (distribution compiled; synonymy, description, counts of material examined); FLOWER (1899) 673 (Singapore); GRIFFIN (1909) 599 (Palawan Is. [Iwahig]; listed), (1911) 201 (Palawan Is. [Iwahig]; listed in key, distribution compiled); BOULENGER (1912) 151 (distribution compiled; description); DE ROOIJ (1917) 138 (distribution compiled; description); TAYLOR (1918) 260 (Bubuan Is. [Tapián Group]; counts and measurements); WERNER (1929) 152, 153 (distribution compiled; listed in key).

*Gongylosoma tricolor* SWORDER (1923) 64 (not seen).

*Range.*—(Philippine localities only.) BUBUAN. PALAWAN: Iwahig\*; Taytay.

*Material examined* (7).—PALAWAN: Iwahig (CAS 62168; CNHM 15054); without exact locality (CM 8810). BORNEO: Sarawak: Limbang District (MCZ 11270). Without exact locality: CNHM 72453. JAVA: Buitenzorg (USNM 43477); Kosterm (CNHM 72453).

*Taxonomic notes.*—Specimens from Palawan do not differ from those from Java and Borneo. *Liopeltis tricolor* is treated as a monotypic species.

*Diagnosis.*—Scales in 15 longitudinal rows at mid-body; loreal absent; nasal shield single, not united with internasal; dorsum monochromatic; subcaudals 103 to 133. Measurements: Body (♂) 330 mm, (♀) 281 mm; tail (♂) 205 mm, (♀) 167 mm.

*Descriptive notes.*—Maxillary teeth 28 to 31; 8 or 9 upper labials, fourth and fifth or fifth and sixth border orbit; 1 preocular, rarely 2; 2 postoculars: temporals 1 + 2; body dorsal scales reduced; 15 (3 + 4 [91-114]) 13; caudodorsal scales reduced: 6 (2 + 3 [9-161]) 4; ventrals 140 to 187; subcaudals 103 to 133; anal plate single.

Hemipenes extend to from fifth to eighth subcaudal plate, unforked; sulcus spermaticus unforked; proximal half with large spines; distally there is a prominent flaplike ridge beset with small spines; one large spine, two or three caudal plates in length, arises at juncture of large and small spines.

Color (in alcohol) deep brown above which gradually becomes lighter posteriorly; a black stripe originates on nasal, extends through eye, and passes onto body along second scale row for about two head-lengths behind head; immaculate cream below.

*Sexual dimorphism.*—A single female specimen was available for study. Literature records for four additional specimens said to be females were available; the sexing data are accepted with reservation. Five male specimens were examined, and literature records of five specimens said to be males were available.

Combining the author's data with those abstracted from the literature, the following ranges for ventrals and subcaudals are obtained:

	Male	Female
Ventrals .....	140-160	148-187
Subcaudals .....	116-133	103-133

The tail length/standard length ratio does not appear to differ between the sexes. The ratio for the five males examined here ranged from 0.58 to 0.66 (mean-0.631); the ratio for the single female was 0.60. The hemipenes are short structures, occupying less than 7 per cent of the tail, so it is not too surprising there should be little difference in the tail length/standard length ratio between sexes.

*Inter-island variation.*—There are indications of inter-island variation in ventral and subcaudal counts. Specimens from Borneo differ from both Javanese and Palawan individuals in their greater number of ventral and subcaudal shields. On the other hand, Palawan specimens appear to have shorter tails than specimens from Borneo or Java. Data for the above-mentioned characters are summarized in Table 2.

*Ecological notes.*—Little is known about the habits of these snakes. They are rather elongate, slender snakes, and presumably are arboreal. One specimen, indeed, was collected in a low tree [Taylor (1918) 260, (1922) 163].

Insect remains were found in the stomachs of three specimens. Stoliczka [(1873) 122] reported a spider from the stomach of

a Sumatran individual. In one specimen examined here, a few ventral plates of some snake were found in the stomach.

TABLE 2.—Summary of inter-island variation in several characters in *Liopeltis tricolor*.

Island	Ventrals			Subcaudals		Tail length/ standard length
	N	Males	Females	Males	Females	
Palawan.....	4	149(3)	148(1)	116-125(3)	124(1)	0.55-0.61(4)
Borneo.....	6	153-160(4)	167-171(2)	124-133(4)	127-133(2)	0.60-0.62(2)
Java.....	4	140-149(3)	187(1)	118-131(3)	108(1)	0.65-0.66(2)

NOTE: Number in parenthesis indicates the number of specimens for which data were available.

#### Genus SIBYNOPHIS (Fitzinger)

*Sibynophis* FITZINGER (1843) 26 (type species *Herpetodryas geminatus* Schlegel, by monotype).

*Enicognathus* [nec Gray (1840) Aves] Duméril, Bibron, and Duméril (1854) 328 [type species *Herpetodryas geminatus* Schlegel, by subsequent selection by Stejneger (1910) 102].

*Henicognathus* [nec Agassiz (1846); emendation of *Enicognathus* Gray (1840) Aves] COPE (1868) 132 paragraph 1, line 1 *et seq* (erroneous subsequent spelling of *Enicognathus*).

*Polyodontophis* BOULENGER (1890) 301 (type species *Herpetodryas geminatus* Schlegel, by reason of its status as a substitute name for *Enicognathus*).

*Definition*.—Teeth numerous, 35 to 48 on each maxilla, subequal or the first and last 2 or 3 slightly smaller than the rest; maxillary bone extends a distance of 8 to 14 teeth beyond ectopterygoid-maxillary articulation; maxillary process of palatine broad, articulates with palatine process of maxilla; no dorsomedial extension of palatine present; pterygoid not broad, without strongly-developed dorsolateral ramus; dentary bone free from posterior part of articular; compound bone (angulare and articulare) curves outward at its anterior end and joins dentary bone at an acute angle; body cylindrical, tail long; scales smooth, without apical pits, in 17 longitudinal rows throughout (except in *S. subpunctatus* in which there is a reduction to 15 scale rows just in front of the anal plate); ventrals rounded; subcaudals paired; anal plate divided; pupil round; hemipenes unforked, spinose throughout, calyculate distally; hypapophyses present on posterior vertebræ.

*Remarks.*—Until recently the genus *Sibynophis* included a number of widely scattered species inhabiting Madagascar, southeastern Asia, and Central America. Taylor and Smith (1943) proposed the American species be separated into a distinct genus, *Scaphiodontophis*. In 1956, Leviton and Munsterman found reason to refer the Malagasian species to a new genus *Parasibynophis* which Guibé [(1958) 205] suggested was a synonym of the Malagasian genus *Liophidium*. The genus *Sibynophis* is restricted to include a group of southeast Asian snakes only. Seventeen nominal species are now referred to it. Nine are currently recognized; one, *Sibynophis bivittatus*, enters the Philippines.

The structure of the lower jaw among the sibynophine snakes deserves note. A number of colubrid genera have been shown to possess modified lower jaws. In some, for example *Dipsas*, *Sibon*, and *Trachymenis*, the dentary bone is loosely articulated posteriorly with the compound bone (articulare and angulare). In *Sibynophis*, *Scaphiodontophis* and *Parasibynophis* [= *Liophidium*, fide Guibé, 1958], the posterior portion of the dentary bone is completely free from the compound bone. In fact, the compound bone joins the dentary at a point about one-third the distance from the anterior end of that bone and at an acute angle to its longitudinal axis. In *Dipsas*, the dentary lies immediately above the compound and the two are aligned along the same longitudinal axis. The situation in *Dipsas*, thus, does not differ strikingly from the normal colubrid condition.

*Dipsas* and *Sibynophis* agree with each other, and therefore differ from most other colubrid snakes, in two respects: (1) a slip of muscle, derived from the *adductor mandibulare* (= *adductor externis superficialis* la [Haas (1931)] and *adductor dentalis* [Dunn (1951)] inserts on the posterior end of the dentary (this condition, which is not common among colubrid snakes, presumably affords additional control for vertical movement of the dentary), and (2) the pterygoid bone extends beyond or does not attain the quadrate and is not attached to the quadrate by any ligamentous connection, which is the usual condition in colubrid snakes. Dunn [(1951) 355] suggested that this modification might permit independent movement of each of the four elements comprising the upper and lower jaws [see also Peters (1960) 15-17].

Dunn theorized that in *Sibon* and *Dipsas* the modifications of the lower jaw indicate changes primarily concerned with food

**habits.** Schmidt (1950) offered a similar explanation for *Sibynophis*. *Dipsas* and *Sibon* are known to feed upon soft-bodied organisms, especially snails and slugs, and the modifications noted may have some special significance in aiding the snake to engulf these foods. *Sibynophis* and its relatives subsist largely upon skinks. It may be that independent movements of the toothed bones permit the snake to grasp these smooth, rounded and "tough-skinned" animals in a viselike manner at any one moment with three of its four dentaries while the fourth is moved forward to a new position.

In the structure of their teeth, the sibynophine snakes differ from other colubrid groups. In *Sibynophis* and its relatives, the teeth are compressed, the anterior-medial edge being knife-like, the tip is somewhat rounded and the whole tooth only slightly recurved. The maxillary and mandibular teeth, among other colubrid genera, are strongly recurved, are generally cone-shaped, and terminate in needlelike points.

There seems to be other peculiarities in the dentition of the sibynophine snakes such as mode of replacement, which does not seem to follow the alternate pattern common to the colubrid snakes, but these have not been studied.

**SIBYNOPHIS BIVITTATUS (Boulenger).**

*Polyodontophis bivittatus* BOULENGER (1894b) 82 (type loc: Palawan Island; type in British Museum; original description), (1896) 597 (description quoted); BOETTGER (1898) 17 (Culion Island; listed); GRIFFIN (1909) 596 (listed), (1911) 256 (listed in key); THOMPSON (1913) 423 (describes hemipenes; suggests relationship to Colubrinæ rather than Natricinæ).

*Sibynophis bivittatus* TAYLOR (1922) 80, pl. 10, fig. 1 (Palawan Island, Busuanga Island [Minuit]; synonymy, description, variation, counts and measurements of material examined; WERNER (1929) 7 (listed in key); LEVITON and MUNSTERMAN (1956) 2 (listed).

*Range.*—BUSUANGA: Minuit. CULION: without exact locality\*. PALAWAN: Brooke's Point\*.

*Material examined* (6).—BUSUANGA: without exact locality (CAS 60548). CULION: without exact locality (CNHM 53368). PALAWAN: Brooke's Point (MCZ 25609); without exact locality (CNHM 53367, 53369). PHILIPPINES: without exact locality (CAS 15205).

*Taxonomic notes.*—This species appears to be endemic to the Palawan Archipelago. It is similar to *S. geminatus* of Indonesia. Unfortunately no specimens of *S. geminatus* from

Borneo have been available; the sample of *S. bivittatus* has been compared with specimens of *S. geminatus* from Java. The following major differences are evident: (1) a lower number of upper labials in *S. bivittatus* (usually eight rather than nine); (2) upper labials three to five (rarely four to five) border the orbit in *S. bivittatus*, four to six in *S. geminatus*; and (3) a white interocular bar is present in *S. bivittatus*, a white nuchal bar is present in *S. geminatus*. *Sibynophis g. insularis* Mertens agrees with *S. bivittatus* in the number of upper labials and the upper labials which border the orbit; they differ in coloration and dentition. I suspect that material from Borneo will be intermediate in character between *S. bivittatus* and Javanese *S. geminatus*.

Taylor's statement [(1922) 80], "The occurrence in the Philippines of a species of this genus [*Sibynophis*] is somewhat unusual, as no other member of the genus appears to have been discovered in any of the East Indian Islands," is without foundation. F. Boie (1827) described *S. geminatus* from Java, and the species has been recorded from Sumatra and Borneo by several authors [Boulenger (1893) 185; de Rooij (1917) 54].

*Diagnosis*.—Eight upper labials (rarely nine), the third to fifth or fourth and fifth bordering the orbit; two anterior temporals; white interocular bar present; no light nuchal bar; two narrow, white dorsolateral stripes present on dark background; subcaudals (?93) 110 to 112.

*Descriptive notes*.—Maxillary teeth 39 to 43; nasal shield small, divided, nostril small; loreal slightly longer than high; 1, rarely 2, preoculars; 2 postoculars, one or both of which are in contact with parietal; 8 upper labials, rarely 9, the third, fourth, and fifth, fourth and fifth, or fourth, fifth, and sixth bordering the orbit; temporals 2 + 2, the lower anterior shield in contact with the seventh and eighth upper labials: 9 lower labials, the first pair in contact behind the mental; caudodorsal scales reduced: 6 (2 + 3 [16–21] 4 (1 + 2 [86–96]) 2; ventrals 145 to 155; subcaudals (?93) 110 to 112; anal plate divided.

Hemipenes extend to the eleventh subcaudal plate, unforked; sulcus spermaticus unforked; basal portion with convoluted ridges beset with minute spines; proximal half spinose, with one very large spine flanked by two slightly shorter spines and followed by one or two transverse rows of moderate spines; distal half spinose, with very small irregularly-shaped calyces

having scalloped edges bearing minute spines at distal end; a prominent spongy, spinose ridge in distal half is coincident with the large spine in the proximal portion.

Color (in alcohol) dark brown above, which extends onto outer edge of ventrals or just to outer row of dorsal scales; a distinct white (while in life, too) dorsolateral stripe, occupying parts of the fourth, fifth, and occasionally sixth scale rows, originates either behind the eye or the parietals, and extends the length of the body and the tail; a distinct broad white [light salmon red in life [*vide* Taylor (1922) 82] interocular bar present; upper labials white, bordered above by a black stripe that passes through the eye; temporal region and internasals lack dense melanin pigment and are lighter than ground color. Venter immaculate creamy white (greenish yellow in life).

*Ecological notes.*—A single skink (unidentified) was found in the stomach of one individual. Skinks appear to form the principal, if not the only food taken by members of the genus [Wall (1921) 85; Pope (1935) 84, 87, 432; Smith (1943) 278; Taylor and Smith (1943) 304, 327; Leviton and Munsterman (1956) 7].

Nothing is known of the other habits or habitat of this species. Most species of *Sibynophis* appear to inhabit hilly regions at moderate or low altitudes. At least two species, *S. collaris* and *S. chinensis grahami*, are found at altitudes in excess of 5,000 feet (10,000 feet in the case of *S. collaris* from Nepal). One of the specimens of *S. bivittatus* collected by Taylor was taken at the seashore on Busuanga Island. Data for the other specimens are not available.

All species whose breeding habits are known are oviparous, laying two to five eggs (*S. collaris*, *S. chinensis*, and *S. subpunctatus*).

*Remarks.*—All specimens seen here were males. None of the specimens of *S. bivittatus* reported in the literature were sexed. Therefore, measurements and counts for females are not available for comparison.

#### REFERENCES

- BOETTGER, OSKAR. Neue Reptilien und Batrachier von den Philippinen. Zool. Anz. 20 (1897) 161-166.
- BOETTGER, OSKAR. Katalog der Reptilien Sammlung in Museum der Sencken-bergischen Naturforschenden Gesellschaft in Frankfurt am Main. 2. Teil. Schlangen. Frankfurt-am-Main (1898) ix + 160 pp.

- BOIE, FRIEDRICH. Bemerkungen über Merrem's Versuch eines Systems der Amphibien. *Isis* (von Oken) **20** (1827) columns 506-566.
- BOULENGER, GEORGE ALBERT. The fauna of British India including Ceylon and Burma. Reptilia and Batrachia. London (1890) 541 pp.
- BOULENGER, GEORGE ALBERT. Catalogue of the snakes in the British Museum (Natural History). Volume I, containing the families Typhlopidae, Glauconiidae, Boidae, Ilysiidae, Uropeltidae, Xenopeltidae, and Colubridae aglyphae, part. London (1893) xiii + 448 pp., 28 pls.
- BOULENGER, GEORGE ALBERT. Catalogue of the snakes in the British Museum (Natural History). Volume II, containing the conclusion of the Colubridae aglyphae. London (1894a) xi + 382 pp., 20 pls.
- BOULENGER, GEORGE ALBERT. On the herpetological fauna of Palawan and Balabac. *Ann. Mag. Nat. Hist.*, ser 6 **14** (1894b) 81-90.
- BOULENGER, GEORGE ALBERT. Catalogue of the snakes in the British Museum (Natural History). Volume III, containing the Colubridae (Opisthoglyphae and Proteroglyphae), Amblycephalidae, and Viperidae. London (1896) xiv + 727 pp., 25 pls.
- BOULENGER, GEORGE ALBERT. A vertebrate fauna of the Malay Peninsula from the Isthmus of Kra to Singapore including the adjacent islands. *Rept. Batr.* London (1912) xiii + 286 pp., 1 map.
- BOURRET, RENÉ. Les Serpents de l'Indochine. Tome II. *Cat. Syst. Descr.*, Toulouse (1936) 505 pp.
- COPE, EDWARD DRINKER. Catalogue of the Colubridae in the museum of the Academy of Natural Sciences of Philadelphia. Part 3. *Proc. Acad. Nat. Sci. Philadelphia* **12** (1860) 553-566.
- COPE, EDWARD DRINKER. Additional descriptions of Neotropical Reptilia and Batrachia not previously known. *Proc. Acad. Nat. Sci. Philadelphia* (1868) 119-140.
- COPE, EDWARD DRINKER. The crocodilians, lizards, and snakes of North America. *Ann. Rept. Smithsonian Inst.*, Washington, D.C., for 1900 (1898) 153-1294, 36 pls.
- DUNN, EMMETT REID. The status of the snake genera *Dipsas* and *Sibon*, a problem for "Quantum evolution." *Evolution* **5** (1951) 355-358.
- DUMÉRIL, AUGUST HENRI ANDRÉ. Prodrôme de la classification des reptiles ofidiens. *Mem. Acad. Sci. Inst. France* **23** (1853) 399-536, 2 pls.
- DUMÉRIL, AUGUST MARIE CONSTANT, GABRIEL BIBRON, and A.H.A. DUMÉRIL. *Erpétologie générale ou histoire naturelle complète des reptiles*. Paris **7** (1854) xvi + 780 + xii + 781-1536 pp.
- FITZINGER, LEOPOLDO JOSEPH FRANZ JOHANN. *Systema Reptilium*. Vindobonae (1843) 206 pp.
- FLOWER, STANLEY SMYTH. Notes on a second collection of reptiles made in the Malay Peninsula and Siam, from November 1896 to September 1898, with a list of the species recorded from those countries. *Proc. Zool. Soc. London* (1899) 600-696, pls. 36-37.
- GRIFFIN, LAWRENCE EDMONDS. A list of snakes found in Palawan. *Philipp. Jour. Sci.* § A **4** (1909) 595-601.

- GRIFFIN, LAWRENCE EDMONDS. A check list and key of Philippine snakes. *Philip. Jour. Sci.* § D 6 (1911) 253-268.
- GUIBE, JEAN. Les serpents de Madagascar. *Mem. Inst. Sci. Madagascar*, ser. A 12 (1958) 189-260.
- GÜNTHER, ALBERT CARL LUDWIG GOTTHILF. Catalogue of the colubrine snakes in the collection of the British Museum. London (1858) xvi + 281 pp.
- GÜNTHER, ALBERT CARL LUDWIG GOTTHILF. On new species of snakes in the collection of the British Museum. *Ann. Mag. Nat. Hist.*, ser. 3 9 (1862) 124-132, pls. 9-10.
- HAAS, C. P. J. DE. Check list of snakes of the Indo-Australian Archipelago (Reptiles, Ophidia). *Treubia* 20 (1950) 511-625.
- HAAS, GEORG. Die kiefermuskulatur und die Schädelmechanik der Schlangen in vergleichender Darstellung. *Zool. Jahrb., Anat.* 53 (1931) 127-198.
- JAN, GEORG. *Iconographic générale des Ophidiens*. Milan (1869) Livr. 31.
- LEVITON, ALAN EDWARD, and HAROLD ERNEST MUNSTERMAN. The generic status and subfamily relationships of the colubrid snakes of the genus *Sibynophis* in Madagascar. *Occ. Pap. Nat. Hist. Mus. Stanford Univ.*, No. 4 (1956) 1-11.
- PETERS, JAMES ARTHUR. The snakes of the subfamily Dipsadinae. *Misc. Publ., Mus. Zool. Univ. Michigan*, No. 114 (1960) 224 pp., 8 pls.
- POPE, CLIFFORD HARRISON. The reptiles of China. In: *Natural History of Central Asia*. New York 10 (1935) x + 604 pp., 27 pls.
- ROOIJ, NELLY DE. The reptiles of the Indo-Australian Archipelago. *Ophidia*. Leiden 2 (1917) 334 pp.
- SCHLEGEL, HERMANN. *Essai sur la physionomie des serpens*. Partie Descriptive. La Haye (1837) 605 pp., 21 pls.
- SCHMIDT, KARL PATTERSON. Modes of evolution discernible in the taxonomy of snakes. *Evolution* 4 (1950) 79-86.
- SCHMIDT, KARL PATTERSON, and WALTER L. NECKER. The scientific name of the American smooth green snake. *Herpetologica* 1 (1936) 63-64.
- SMITH, MALCOLM ARTHUR. *Fauna of British India, Ceylon and Burma*, including the whole of the Indo-Chinese sub-region. *Reptilia and Amphibia*. Vol. III. *Serpentes*. London (1943) xii + 583 pp., 1 map.
- STOLICZKA, FERDINAND. Notes on some species of Malayan Amphibia and Reptilia. *Jour. Bombay Nat. Hist. Soc.* 42 (1873) 111-126.
- SWORDER, G. H. A list of the snakes of Singapore Islands. *Singapore Nat.* 2 (1923) 55-73.
- TAYLOR, EDWARD HARRISON. Reptiles of the Sulu Archipelago. *Philip. Jour. Sci.* § D 13 (1918) 233-267, 3 pls.

- TAYLOR, EDWARD HARRISON. The snakes of the Philippine Islands. Monog. Bur. Sci., Manila, No. 16 (1922) 312 pp., 37 pls.
- TAYLOR, EDWARD HARRISON, and HOBART MUIRHEAD SMITH. A review of the American sibynophine snakes, with a proposal of a new genus. Univ. Kansas Sci. Bull. 29 (1943) 301-337, pls. 21-25.
- THOMSON, JOSEPH CHEESMANN. Contributions to the anatomy of the Ophidia. Proc. Zool. Soc. London (1913) 414-425.
- WALL, FRANK. Remarks on the Indian species of *Dendrophis* and *Dendrelaphis*. Rec. Indian Mus. 22 (1921) 151-162.
- WERNER, FRANZ. Übersicht der Gattungen und Arten der Schlangen aus der Familie Colubridæ. III. Teil (Colubrinæ) mit einem Nachtrag zu den übrigen Familien. Zool. Jahrb., Syst. 57 (1929) 1-196.