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SNAKES, VI

THE SNAKES OF THE GENUS OXYRHABDIUM

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ONE TEXT FIGURE

The colubrid snakes of the genus *Oxyrhabdium* are restricted to the Philippines. To date no member of the genus has been taken from either the Sulu or Palawan Archipelagos, nor from Borneo or other islands of western Indonesia. Their possible discovery in the mountains of central and northern Borneo may well be anticipated. These are small burrowing snakes usually found under some sort of cover.

Two species are found in the Philippines, *O. modestum* and *O. leporinum*.

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TERMINOLOGY

*Standard length*: distance from tip of snout to anal opening.  
\* : following locality listed under "Range" indicates sites from which specimens were examined.

6(2 + 3[28-38]) 4: caudo-dorsal reduction formula indicates that caudo-dorsal scales reduce from six to four by fusion of lateral rows 2 and 3 at level of 28 to 38 subcaudal plates.

## Genus OXYRHABDIUM Boulenger

*Sténognathe* DUMÉRIL (1853) 466, 468 (vernacular; defined in key and by brief description: "*S. modestus*, nobis," only included species.)

*Stenognathus* [nec Chaudoir (1843) Coleoptera] DUMÉRIL, BIBRON, and DUMÉRIL (1854) 503 (type species *Stenognathus modestus* Duméril, Bibron, and Duméril, by monotypy).

*Oxyrhabdium* BOULENGER (1893) 302 (substitute name [but not so stated] for *Stenognathus* Duméril, Bibron, and Duméril; type species designated herein as *Stenognathus modestus* Duméril, Bibron, and Duméril, 1854).

*Definition.*—Maxillary teeth 25 to 36, small and subequal; mandibular teeth subequal; head not distinct from neck, sub-acuminate anteriorly; inter nasals small; nostril in divided nasal; preoculars absent; both the elongate loreal and pre-frontal border the orbit of the eye; eye moderate; pupil vertically subelliptic; anterior chin-shields greatly enlarged, sub-circular or oval, separated from contact with mental by the first pair of lower labials; body cylindrical; scales smooth, in 15 longitudinal rows, not reducing in number on posterior part of body, without apical pits; tail short; subcaudals paired; hypapophyses present on posterior vertebræ; hemipenes deeply forked, spinose.

*Remarks.*—The presence of hypapophyses, deeply forked hemipenes, and numerous subequal maxillary teeth leads me to conclude that *Oxyrhabdium* is unrelated to any genus of burrowing or semi-burrowing colubrid snakes presently known from either Indonesia or the Malay Peninsula. I believe the similarities in the arrangement of head shields, smoothness of scales, reduction in length of the tail, and reduction in the size of the eye, shared in part with other genera of Indo-Malayan burrowing snakes (e.g. *Agrophis*, *Brachyorrhus*, *Oreocalamus*, and *Rabdion*) must be attributed to convergence among, otherwise, unrelated but morphologically adapted groups.

*Oxyrhabdium* is similar to *Xylophis*, a genus of small burrowing snakes from southern India. Agreement in characters between these genera may best be appreciated by comparing the definitions of the two. The above genus *Oxyrhabdium* is defined. The following definition of *Xylophis* was taken from

Smith [(1943) 341-342]; two items at the end have been added:

"Maxillary teeth small, 20-30, those in the middle a little larger than the others; head not distinct from neck; nostril between two small nasals, directed forwards and outwards; eye moderate, with rounded or vertically sub-elliptic pupil; loreal elongated, touching the eye; no preocular; anterior genials very large, in contact with the mental. Body cylindrical, scales smooth, without apical pits, in 13 or 15 rows throughout; ventrals rounded; tail short; subcaudals paired. Hypapophyses developed throughout the vertebral column." Prefrontal borders the orbit of the eye; hemipenes deeply forked, without spines.

The obvious differences between *Oxyrhabdium* and *Xylophis* are: (1) presence of spines in the hemipenes of *Oxyrhabdium*, but absent in *Xylophis*; (2) anterior genials not in contact with the mental in *Oxyrhabdium*, but in contact in *Xylophis*; and (3) maxillary teeth subequal in *Oxyrhabdium*, but a few in the middle of the series tend to be slightly enlarged in *Xylophis*. In addition, there are some differences between the two groups in size and spatial arrangement of the head shields.

The over-all structural similarity of the two genera strongly suggests a possible common ancestry. Further, their distributions, which are restricted to the zoogeographic 'blind alleys' at the peripheries of the Oriental Region, and the apparent absence of related genera in the intervening areas, suggest that they are relic genera.

Two species of *Oxyrhabdium* are recognized in the Philippines: *Oxyrhabdium modestum* from Basilan, Mindanao, Dinagat, Samar, Leyte, Bohol, and *Oxyrhabdium leporinum*, with two subspecies from Luzon, and the western Visayan Islands.

*Key to the species and subspecies of Oxyrhabdium Boulenger*

- 1a. Second upper labial not or but slightly in contact with loreal; usually 8 upper labials (rarely 7), fifth and sixth (rarely fourth and fifth) bordering orbit; some reddish color usually present in dorsal coloration; young with a distinct white nuchal collar, but no other markings ..... *O. modestum*
- 1b. Second upper labial always broadly in contact with loreal; usually 7 upper labials (rarely 6), fourth and fifth bordering orbit; no red in the dorsal color; young with a distinct nuchal collar and a series of narrow light crossbands on the body and tail (may or may not be present in the adults).
  - 2a. Adults monochromatic above, without any trace of juvenile color pattern; ventrals plus subcaudals 192 to 230 (mean = 214.1). Luzon Island ..... *O. l. leporinum*

- 2b. Adults with narrow white crossbands and nuchal collar as in young; ventral plus subcaudals 221 to 235 (mean: ( $\delta + \text{♀}$ ) 228.7). Negros, Cebu and probably Panay island.

*O. l. visayanum*.

**OXYRHABDIUM MODESTUM (Duméril, Bibron, and Duméril).**

*Sténognathe modestus* DUMÉRIL (1853) 468.

*Stenognathus modestus* DUMÉRIL, BIBRON, and DUMÉRIL (1854) 504 (type loc: "Java"; syntypes [?in Paris Museum]; original description); PETERS (1861) 684 (Samar Island [Tubig]; considers *modestum* and *leporinum* as questioned synonyms); (1872) 587 (*modestum* compared with *Stenognathus brevisrostris* PETERS; considers type locality of *modestum* doubtful); JAN (1862) 28 (Giava" [= Java]; description); (1863) 35 (listed); (1865) Livr. 13, pl. 1, fig. 3; GÜNTHER (1873) 169 (considers *Rhabdosoma leporinum* Günther a synonym of *modestum*; questions type locality of *modestum*).

*Rhabdosoma modestum* GÜNTHER (1879) 77 (in part; Dinagat Island; listed).

*Geophis modestus* BOETTGER (1886) 106 (in part; distribution compiled; listed); CASTO DE ELERA (1895) 426 (distribution compiled; listed).

*Oxyrhabdium modestum* BOULENGER (1893) 392 (Dinagat Island; synonymy, description, counts of material examined); BOETTGER (1898) 32 (in part; Samar Island; listed); GRIFFIN (1911) 258 (in part; distribution compiled; listed in key); THOMPSON (1913) 214 (description of CAS 15235, anatomy; distribution compiled [includes Luzon, Samar, Leyte, Calamianes, Dinagat, and Mindanao]; source of data unknown); TAYLOR (1922a) 100, figs. 9a-c (Mindanao Island [Bunawan], Samar Island [Camp Gandara], Dinagat Island; synonyms, description, color in life, counts and measurements of material examined, ecological notes); (1922c) 295 (Mindanao Island [Zamboanga], Basilan Island, Leyte Island [Cabalian]; scutellation, counts and measurements of material examined, ecological notes); WERNER (1929) 44 (listed); LEVITON (1958) 289, fig. 1 (Basilan Island, Mindanao Island [Zamboanga City, Katipunan; Mt. McKinley, Bunawan], Dinagat Island, Leyte Island [Tarragona], Samar Island [Camp Gandara], Negros Island [Dumaguete]; synonymy, description, material examined, sexual dimorphism, ecological notes, distribution).

*Rhabdosoma leporinum* GÜNTHER (1858) 12 (in part; one of the types of *R. leporinum* Günther belongs to *O. modestum*); MÜLLER (1883) 283 (Mindanao Island; listed).

*Geophis schadenbergi* FISCHER (1885) 93, pl. 3, fig. 4 (type loc: "Süd-Mindanao"; syntypes in Dresden Museum; original description); BOETTGER (1886) 106 (distribution compiled; listed).

*Rangé*<sup>1</sup>.—(Figure 1.) BASILAN\*. BOHOL: Cantaub Barrio area\*. DINAGAT. LEYTE: Cabalian\*; Tarragona\*. MINDANAO: Agusan Province (Bunawan\*); Cotabato Province (Tatayan\*, Saub\*); Davao Province (Madaum\*; Mt. McKinley\*); Zamboanga Province (Zamboanga City\*; Katipunan\*). NEGROS: Negros Oriental Province (environs just north of Dumaguete\*). SAMAR: Camp Gandara; Tubig.

*Material examined* (43).—BASILAN: CAS 60344. BOHOL: Cantaub Barrio (SU 19359). LEYTE: Cabalian (MCZ 25667); Tarragona (CNHM 42797). MINDANAO: Without exact locality [probably Bunawan, Agusan Province] (MCZ 25666); Agusan Province: Bunawan (CM 2272 and 2273, 2276 to 2279, 2281 to 2288; CNHM 22589, 53386; MCZ 22079, 20080); Cotabato Province: Saub Cotabato (MCZ 25665), Tatayan Cotabato (MCZ 25668 and 25669); Davao Province: Madaum, Tagum (CNHM 53384 and 53385, 53387 to 53389); Mt. McKinley (CNHM 63383). Zamboanga Province: Dicao River, Katipunan (CNHM 68907); Zamboanga City (CAS 62038 and 62039). NEGROS: Negros Oriental Province: Dumaguete environs (SU 18224).<sup>2</sup> SAMAR: USNM 53531 and 53532, 122205 and 122206, 122213, 122216. PHILIPPINES: Without exact locality (CAS 15235).

*Taxonomic notes*: The distinctness of this species from its close relative, *O. leporinum*, has never been seriously questioned. Indeed, only Günther appears to have encountered serious difficulties in distinguishing between them. The syntypes of *Rhabdosoma leporinum* include one specimen of *leporinum* and one of *modestum*. In 1879, under the name *R. Modestum*, Günther includes one specimen of each species.

<sup>1</sup>Thompson [(1913) 214] includes Luzon and the Calamianes in the range of *O. modestum*. The former locality record probably results from confusion of this species with *O. leporinum*. The source for inclusion of the Calamianes in the range of *O. modestum* could not be determined. I do not believe the species occurs there.

Negros Island is included on the strength of a single specimen obtained by a student at Silliman University, Dumaguete, Negros Island, in 1951. Confirmation of the presence of a natural population of this species on Negros must await future collecting. I strongly doubt that the species will be found there.

<sup>2</sup>The same as in footnote 1.

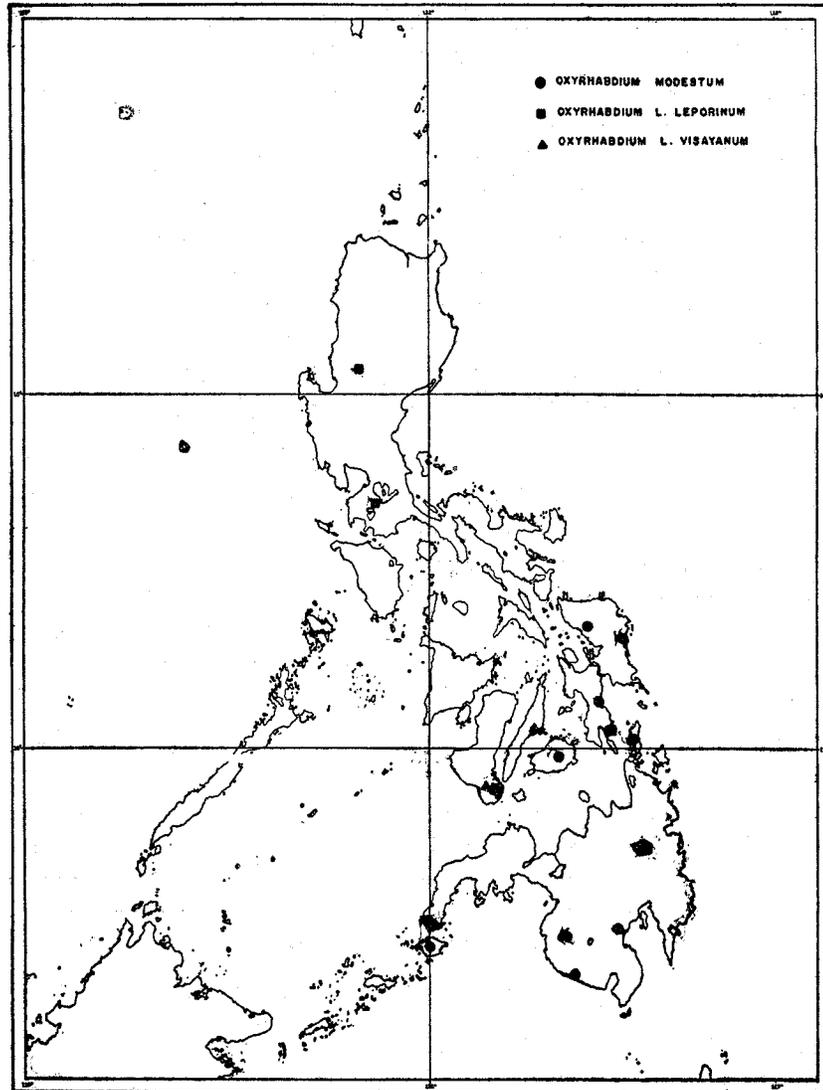


FIG. 1. Distribution of the species of *Oxyrhabdium* in the Philippines.

Comparison of Fischer's figures of *Geophis schadenbergi* with *O. modestum* leaves no doubt that the two are conspecific. There are 8 upper labials, the 5th and 6th shields border the eye, and the second shield is more broadly in contact with the nasal than the loreal.

TABLE 1.—Summary of the variation in the number of ventral shields in *Oxyrhabdium modestum*.

| Island        | N  | Male mean | Range    | N  | Female mean | Range   |
|---------------|----|-----------|----------|----|-------------|---------|
| Basilan.....  |    |           |          | 1  | 168.0       |         |
| Mindanao..... | 10 | 174.5     | 168-187* | 20 | 174.8       | 162-191 |
| Dinagat.....  |    |           |          | 1  | 177.0       |         |
| Samar.....    | 1  | 164.0     |          | 5  | 168.0       | 164-170 |
| Leyte.....    | 1  | 162.0     |          |    |             |         |
| Negros.....   |    |           |          | 1  | 168.0       |         |

\* One young specimen not included had 153 ventrals which is likely abnormally low.

TABLE 2.—Summary of the variation in the number of subcaudal shields in *Oxyrhabdium modestum*.

| Island        | N  | Male mean | Range | N  | Female mean | Range |
|---------------|----|-----------|-------|----|-------------|-------|
| Basilan.....  |    |           |       | 1  | 59.0        |       |
| Mindanao..... | 11 | 63.9      | 60-70 | 20 | 57.9        | 53-64 |
| Dinagat.....  |    |           |       | 1  | 56.0        |       |
| Samar.....    | 1  | 60.0      |       | 5  | 54.2        | 49-61 |
| Leyte.....    | 1  | 66.0      |       |    |             |       |
| Negros.....   |    |           |       | 1  | 48.0        |       |

TABLE 3.—Summary of variation in head scutellation in *Oxyrhabdium modestum*.

|  |          |         |         |         |         |
|--|----------|---------|---------|---------|---------|
| Upper labials.....                                     | 8 (36)*  | 7 (3)   | 7/8 (2) | 5/7 (2) |         |
| Upper labials bordering eye.....                       | 5-6 (35) | 4-5 (5) | 4-5 (1) | 5-6 (2) |         |
|  |          |         | 5-6     | 4-5     |         |
| Lower labials.....                                     | 8 (5)    | 7 (16)  | 6 (4)   | 7/8 (2) | 7/8 (2) |
| Lower labials in contact with anterior<br>genials..... | 5 (19)   | 4 (9)   | 5/4 (3) | 5/6 (1) | 5/6 (1) |
| Loreal borders eye.....                                | Yes (38) | No (3)  |         |         |         |
| Postoculars.....                                       | 1 (1)    | 2 (36)  | 1/2 (1) | 2/1 (3) |         |

\* Number in parentheses indicates number of specimen examined showing character.

The type locality of *Stenognathus modestus* was given as "Java." Peters [(1872b) 587], Günther [(1873) 169], and Taylor [(1922a) 100] regard this as doubtful, and Haas (1950) excludes it from his checklist of Indo-Australian snakes. That *Oxyrhabdium modestum* may occur on Java is highly unlikely, and I believe the locality data accompanying the holotype is erroneous. In view of this, I proposed [Leviton (1958) 291] that the type locality for *Oxyrhabdium modestum* be designated as Mindanao Island, Philippines. Until more is known about the intraspecific variability of this species, I see no reason to further restrict the type locality.

Differences in scale counts suggest that the populations of *O. modestum* on western Mindanao (Zamboanga) and Basilan Island, eastern Mindanao and Dinagat Island, and Samar and

Leyte islands may be distinguished from each other. However, based upon available material I do not regard these differences to be of sufficient magnitude to designate the populations as distinct subspecies.

*Diagnosis.*—A small snake, rarely exceeding 500 mm in standard length; one fourth or less of the dorsal suture of the second upper labial in contact with the loreal; usually 8 upper labials, the 5th and 6th bordering the orbit of the eye; hemipenes extend from the twelfth to twenty-first subcaudal plates; other than a light nuchal collar in the young, no light crossbands are present on body or tail in either young or adults. Standard length: ( $\delta$ ) 449 mm, ( $\varphi$ ) 521 mm; tail length: ( $\varphi$ ) 123 mm, ( $\delta$ ) 95 mm.

*Descriptive notes.*—Maxillary teeth 31 to 36 (–?40); internasals very small, about a fourth as large as prefrontals; prefrontals border orbit of eye; loreal elongate, usually bordering orbit of eye; preocular absent; 1 or 2 postoculars; temporals 1 + 2 + 3; 8 upper labials, rarely 7, the fifth and sixth, rarely fourth and fifth, bordering the orbit of the eye, less than one-third of the dorsal suture of the second upper labial in contact with loreal; dorsal scales in 15 longitudinal rows throughout; caudo-dorsal scales reduce as follows: 6 (2 + 3 [18–38] 4(1 + 2) [44–55]) 2; ventrals [153–] 162 to 186; subcaudals 48 to 67; anal plate single.

Hemipenes extend to twelfth to twenty-first subcaudal plates, forked at third plate; basal spines minute, then spines rapidly increase in size to between third and sixth subcaudal plates, and then they become gradually smaller posteriorly and finally are limited in posterior third of organ to two narrow bands of minute spines flanking the sulcus.

Color (in alcohol) light brown (tan) to deep reddish brown above, the color darkest along the mid-dorsal line; below lighter reddish brown to creamy yellow; upper labials colored as venter. In the young a distinctive white or cream nuchal collar is present. In individuals over 200 mm in standard length, this collar is no longer evident. Adults more or less monochromatic; no distinctive markings present.

*Color in life.*—Above dark iridescent lavender-brown, becoming lighter on sides; belly immaculate creamy yellow; top of head darker, bluish brown to lavender; labials cream color to yellow; under part of tail a muddy cream, with an indistinct zigzag line between subcaudals; edges of body scales darker, giving the appearance of an indistinct network over body. [Taylor (1922a) 101.]

*Sexual dimorphism.*—The males tend to have longer tails, a higher average number of subcaudals, and a lower number of ventrals than the females.

The tail length/standard length ratio for eight males ranges from 0.241 to 0.302 (mean = 0.264). The same ratio for 12 females ranges from 0.201 to 0.242 (mean = 0.220). Comparison of the tail lengths between sexes suggests the differences are significant.

The data for ventral and subcaudal counts are summarized in Tables 1 and 2. The differences in ventral counts between sexes are slight, but subcaudal counts appear to be subject to a marked dimorphism.

Sexual dimorphism is also evident in the point of reduction of the caudal scales from 6 to 4 longitudinal rows. In three males reduction took place between the thirty-first and thirty-fourth subcaudal plates; in one male reduction occurred at the thirty-eighth subcaudal plate. In each instance the second and third longitudinal scale rows fused to bring about the loss of one row. In six females reduction took place between the twentieth and twenty-eighth subcaudal plates; in one individual reduction occurred at the eighteenth and nineteenth subcaudal plates; and in one specimen reduction occurred at the twenty-ninth and thirty-first subcaudal plates.

*Ecological notes.*—According to Taylor [(1922a) 103] specimens have been found on the forest floor under grass and leaves, and burrowing in among the roots of large fern trees. A single specimen collected at Abung-Abung, Basilan, was found at the base of a small palm tree [Taylor (1922c) 295]. Although most of the specimens for which data were available were collected near sea level, a single individual, CNHM 55383 was taken on Mt. McKinley, Mindanao Island, at an altitude of 6,300 feet.

Thompson [(1913) 215] recorded an earthworm of the family Perichoetidae from the stomach of CAS 15235. Earthworms were also found in the stomachs of the specimens examined here. No other items were noted in their diets.

A single observation by Taylor [(1922a) 101] suggests that the species is oviparous. One female examined by him contained eggs; unfortunately no information is given concerning their size or number.

## OXYRHABDIUM LEPORINUM (Günther).

*Rhabdosoma leporinum* GÜNTHER (1858) 12.

*Taxonomic notes.*—This species has been distinguished from *O. modestum* by the presence of 7 instead of 8 upper labials and by differences in the juvenile color pattern. Thought to have been confined to the highlands of northern Luzon [Taylor (1922a) 104], *O. leporinum* has since been collected at both low altitudes and on other islands of the Philippine Archipelago.

Peters' description of *Stenognathus brevirostris* has been carefully compared with specimens of *O. leporinum* and with the descriptions of *O. leporinum* by Günther and Boulenger. The two nominal species are obviously conspecific.

Two populations of *O. leporinum* may be distinguished in the Philippines. These include the typical form found on Luzon Island and a recently discovered population on the islands of Negros and Cebu. Recognition of these populations is based upon differences in adult color pattern and in the total count of ventral plus subcaudal shield.

*Diagnosis.*—A small snake attaining a length of about 600 mm in standard length; at least one-third to one-half of the dorsal suture of the second upper labial is in contact with the loreal; usually 7 upper labials (rarely 6), the fourth and fifth (rarely third and fourth) shields bordering the orbit of the eye; hemipenes extending from seventh to tenth subcaudal plate; light crossbands present on body and tail of juveniles. Standard length: (♂) 548 mm, (♀) 610 mm; tail length: (♂) 125 mm, (♀) 104 mm.

*Descriptive notes.*—Maxillary teeth 25 to 33; snout pointed; rostral about as broad as deep, or slightly more broad than deep; internasals about a fourth or fifth as large as enlarged prefrontals; latter shields border orbit of eye; frontal longer than prefrontals, about twice as broad as supraoculars, shorter than parietals; nasal usually divided, posterior portion largest; loreal elongate, two to three times as long as deep, usually bordering orbit of eye; preoculars absent; postoculars 2; temporals 1 + 2 + 3; 7 upper labials, rarely 6, last shield largest, fourth and fifth shields, rarely third and fourth, bordering orbit, more than a third of dorsal suture of second shield in contact with loreal; mental small, more than twice as broad as deep; six or seven lower labials, four or five in contact with enlarged, subcircular to suboval ante-

rior chin shields; first pair of lower labials usually in contact at mid-line.

Dorsal scales in 15 longitudinal rows throughout; ventrals 158 to 184; subcaudals 33 to 62 (see Tables 4 to 6 and accounts of subspecies for geographic and sexual differences); anal plate single.

Color (in alcohol) above dark bluish brown, grayish brown, or deep brown, lighter on sides; below yellowish tan to whitish; upper labials colored as venter; dorsum may or may not be crossed by narrow whitish crossbands in the adults. Young individuals have a distinctive white or cream colored nuchal collar which is followed by a series of 35 or more narrow whitish crossbands on body and tail.

*Inter-island variation.*—The Negros-Cebu sample available for study differs from the Luzon sample most conspicuously in the adult color pattern. Individuals over 300 mm in standard length from Negros and Cebu retain the distinctive light crossbands which are characteristic of juveniles. Specimens of more than 300 mm in standard length from Luzon are monochromatic above and lack all traces of the juvenile color pattern.

The Luzon and Negros-Cebu samples also differ in the total of ventral plus subcaudal count. The ventral plus subcaudal count for 34 specimens from Luzon range from 192 to 230 (mean = 214.1); six specimens from Negros and Cebu range from 221 to 235 (mean = 228.7). Treating the sexes separately, the differences appear to be more pronounced: 17 Luzon males range from 210 to 225 (mean = 224.9); three males from Negros-Cebu range from 225 to 235 (mean = 228.0); 16 Luzon females range from 192 to 230 (mean = 209.3), and three females from Negros-Cebu range from 221 to 230 (mean = 226.3). cursory inspection of the above data suggests that the differences are meaningful (Table 4).

**OXYRHABDIUM LEPORINUM LEPORINUM (Günther).**

*Rhabdosoma leporinum* GÜNTHER (1858) 12 (type loc: Philippine Islands; type in British Museum, London; original description; one of the two syntypes was shown to be a specimen of *O. modestum* [Boulenger (1893) 303]).

*Oxyrhabdium leporinum* BOULENGER (1893) 303, pl. 19, fig. 4 (Luzon Island; synonymy, description, counts of material examined; GRIFFIN (1911) 258 (distribution compiled; listed in key); TAYLOR (1922a) 103, text-fig. 10a-b (Luzon Island [Mount Santo Tomas; Baguio]; synonymy, description, color in life, counts and measurements of material examined); (1922b) 161,

164 (Luzon Island [camp approximately 30 km. north of Baguio; Mt. Makiling]; listed); (1922c) 296 (Luzon Island [near Haight's (Pauai); Baguio]; scutellation, counts and measurements of material examined); (1922d) 137 (Luzon Island [Mt. Makiling]; listed).

*Oxyrhabdium leporinum leporinum* LEVITON (1958) 296 (Luzon Island [Baguio]; distribution compiled; synonymy, description, sexual dimorphism, ecological notes).

*Stenognathus brevirostris* PETERS (1872) 586 (type loc: Philippine Islands; whereabouts of types unknown; original description [syntypes include one adult and one juvenile]).

*Geophis brevirostris* CASTO DE ELERA (1895) 425 (listed).

*Range.*—LUZON: Benguet Subprovince (Baguio\*; Hights-in-the-Oaks\*; slopes of Mt. Santo Tomas; Government Camp 30 km. north of Baguio); Laguna Province (Mt. Makiling\*).

*Material examined (36).*—LUZON: without exact locality (CAS 62548, 62580; USNM 38046, 128123); Benguet Province: Hights-in-the-Oaks (USNM 38046); Baguio (AMNH 63378 to 63379, and 67094; GAS 61528; CM 2434, 2464; MCZ 776T to 778T<sup>3</sup>, 780T, 1130T and 1131T, 1133T, 1135T, 1137T, and 1138T, unnumbered T, 25655 to 25664; SU 7267; USNM 128123). Laguna Province: Mt. Makiling (MCZ 25653 and 25654).

*Diagnosis.*—A small snake whose adults (considered as individuals greater than 300 mm in standard length) are monochromatic above, without any trace of crossbanded pattern typical of young individuals; ventrals plus subcaudals 192 to 230 (mean = 214.1).

*Sexual dimorphism.*—Males and females do not differ significantly in the numbers of ventral shields present but they do in subcaudal counts. There is complete overlap in ventral plus subcaudal counts too, (Table 4) but the differences between the means are large and clearly point to a difference between sexes in the total number of shields.

The sexes do differ most strikingly in the tail length/standard length ratio. The ratio for 14 males ranges from 0.189 to 0.280 (mean = 0.219); the range for 10 females is 0.150 to 0.197 (mean = 0.174).

<sup>3</sup> Numbers followed by "T" indicate E. H. Taylor field numbers. These specimens, in the possession of the Museum of Comparative Zoology, Harvard University, have not been given MCZ catalog numbers.

TABLE 4.—Summary of the variation in the number of ventral plus subcaudal shields in *Oxyrhabdium leporinum*.

| Island      | N  | Male mean | Range   | N  | Female mean | Range   |
|-------------|----|-----------|---------|----|-------------|---------|
| Luzon.....  | 17 | 224.9     | 210-225 | 16 | 209.5       | 192-230 |
| Negros..... | 2  | 228.0     | 225-231 | 2  | 229.0       | 228-230 |
| Cebu.....   | 1  | 235.0     | -----   | 1  | 221.0       | -----   |

TABLE 5.—Summary of the variation in the number of ventral shields in *Oxyrhabdium leporinum*.

| Island      | N  | Male mean | Range   | N  | Female mean | Range   |
|-------------|----|-----------|---------|----|-------------|---------|
| Luzon.....  | 19 | 168.6     | 162-176 | 17 | 169.6       | 158-184 |
| Negros..... | 2  | 171.0     | 169-173 | 2  | 177.0       | 177     |
| Cebu.....   | 1  | 173.0     | -----   | 1  | 173.0       | -----   |

TABLE 6.—Summary of the variation in the number of subcaudal shields in *Oxyrhabdium leporinum*.

| Island      | N  | Male mean | Range | N  | Female mean | Range |
|-------------|----|-----------|-------|----|-------------|-------|
| Luzon.....  | 18 | 49.4      | 37-57 | 16 | 40.4        | 33-46 |
| Negros..... | 2  | 57.0      | 56-58 | 2  | 52.0        | 51-53 |
| Cebu.....   | 1  | 62.0      | ----- | 1  | 48.0        | ----- |

*Ecological notes.*—Taylor [(1922a) 104] states that specimens were dug up along an irrigation ditch and under rocks; he also obtained a single specimen crawling along an open forest path. All of the Taylor specimens were collected at moderate altitudes. Those from Baguio and Mount Santo Tomas were taken at elevation of about 2,000 meters; one specimen taken on Mount Makiling (= Mount Maquiling) was collected at an elevation of 780 meters. A single specimen in the Stanford collection was obtained by Dr. A. W. C. T. Herre near Baguio at an altitude of 5,000 feet.

Nothing is known of the breeding habits of this animal.

#### OXYRHABDIUM LEPORINUM VISAYANUM Leviton.

*Oxyrhabdium leporinum visayanum* LEVITON (1958) 299, fig. 2 (type loc: headwaters of Maite River, on slopes of Cuernos de Negros, Negros Oriental Province, Negros Island; type in Natural History Museum, Stanford University; original description, ecological notes).

*Range.*—CEBU: Antuwanga area\*. NEGROS: Negros Occidental Province (Bagtik River Valley\*); Negros Oriental Province (vicinity of Luzuriaga\*).

*Material examined (6).*—CEBU: Antuwanga area, about 7 km. southwest of Cebu City (SU 17922, 18226). NEGROS: Negros Occidental Province: Bagtik River Valley, about 4 to 5 km. southwest of Dungga, 17 km. southwest of Toyum Barrio, Cauayan Town (SU 20810); Negros Oriental Province: Bonghong Sitio, Luzuriaga) CAS; 89796); near headwaters of Maite River, Cuernos de Negros (SU 18907, holotype); ridge on north side of Maite River, about 6 km. west of Luzuriaga (SU 18225).

*Diagnosis.*—A small snake, close to *Oxyrhabdium leporinum* from Luzon but differing in the adult stage by the presence of a series of 35 to 38 light bands, characteristic of the young of both populations, but absent from the adults of the typical form, and by the higher average number of ventrals plus subcaudals (221 to 235 as compared to 208 to 226 for the typical form).

*Sexual dimorphism.*—There is an obvious dimorphism in the number of subcaudal shields, the males having a higher number than the females (Table 6). The males also appear to have longer tails than females, based upon differences in the tail length/standard length ratio: the range for 3 males is 0.228 to 0.229; for 3 females the range is 0.160 to 0.204.

A difference in the position of reduction of the caudo-dorsal scales further suggests that the shape of the tails differs between sexes: (♂) 6 (2+3 [28-38]) 4 (1+2 [56-62]) 2; (♀) (2+3 [19-29]) 4 (1+2 [43-51]) 2.

*Ecological notes.*—According to Dr. Walter C. Brown, who was instrumental in obtaining all the specimens reported on here, these individuals were obtained from under logs and rocks and at the base of ferns. The specimens were collected at altitudes ranging from 1,500 to 3,000 feet. All were collected during December, February, March and April of 1954 and 1955.

Earthworms were found in the guts of two specimens.

## REFERENCES

- BOETTGER, OSKAR. Aufzählung der von den Philippinen bekannten Reptilien und Batrachier. *Mer. Senckenbergischen Naturf. Ges.* (1886) 91-134.
- BOETTGER, OSKAR. Katalog der Reptilien Sammlung in Museum der Senckenbergischen Naturforschenden Gesellschaft in Frankfurt-am-main. 2. Teil. Schlangen. Frankfurt-am-Main (1898) ix + 160 pp.
- BOULENGER, GEORGE ALBERT. Catalogue of the snakes in the British Museum (Natural History). Volume 1, containing the families Typhlopidae, Glauconiidae, Boidae, Ilysiidae, Uropeltidae, Xenopeltidae, and Colubridae aglyphæ, part. London (1893) xiii + 448 pp., 28 pls.
- DUMÉRIL, AUGUST HENRI ANDRE. Prodrome de la classification des reptiles ofidiens. *Mém. Acad. Sci. Inst. France* 23 (1853) 399-536.
- DUMÉRIL, AUGUST MARIE CONSTANT, GABRIEL BIBRON, and A. H. A. DUMÉRIL. *Erpétologie générales ou histoire naturelle complète des reptiles.* Paris 7 (1854) xvi + 780 + xii + 1536 pp.
- ELERA, CASTO DE. Catálogo sistemático de toda la Fauna de Filipinas conocida hasta al presente, y á la vez et de la Colección zoológica del Museo de PP. Dominicos del Colegio-Universidad de Santo Tomas de Manila. Manila 1 (1895) viii + 701 pp. [Ophidiens, pp. 423-445.]
- FISCHER, JOHANN GUSTAV. Ichthyologische und Herpetologische Bemerkungen. Part IV: Ueber eine Kollektion von Amphibien und Reptilien von Mindanao. *Jahrb. Hamburg wiss. Anst.* 2 (1885) 80-81.
- GRIFFIN, LAWRENCE EDMONDS. A check-list and key of Philippine snakes. *Philip. Jour. Sci.* § D 6 (1911) 253-268.
- GÜNTHER, ALBERT CARL LUDWIG GOTTHILF. Catalogue of colubrine snakes in the collection of the British Museum. London (1858) xvi + 281 pp.
- GÜNTHER, ALBERT CARL LUDWIG GOTTHILF. Notes on some reptiles and batrachians obtained by Dr. Adolf Bernhard Meyer in Celebes and the Philippine Islands. *Proc. Zool. Soc. London* (1873) 165-172, pl. 18.
- GÜNTHER, ALBERT CARL LUDWIG GOTTHILF. List of the mammals, reptiles and batrachians sent by Mr. Everett from the Philippine Islands. *Proc. Zool. Soc. London* (1879) 74-79.
- HAAS, C. P. J. DE. Checklist of the snakes of the Indo-Australian Archipelago (Reptiles, Ophidia). *Treubia* 20 (1950) 511-625.
- JAN, GEORG. Enumerazione sistematica delle specie d'ofidi del gruppo Calameridae. *Arch. Zool. Anat. Fis.*, fasc. 1 2 (1862) 1-76, pls. 5-6, fasc. 2, pls. 17-18.
- JAN, GEORG. Elenco sistematico, degli ofidi descritti e disegnati per l'Iconografia Generale. Milano (1863) vii + 143 pp.
- JAN, GEORG. *Iconographie générale des ophidiens.* Paris and Milan (1865) [1860-1881], 52 Lvr.
- LEVITON, ALAN EDWARD. A review of the Philippine snakes of the genus *Oxyrhabdium* (Serpentes: Colubridae). *Wasmann Jour. Biol.* 15 (1958) 285-303.

- MÜLLER, FRITZ. Dritter Nachtrag zum Katalog der herpetologischen Sammlung des Basler Museums. Verh. Naturf. Ges. Basle 7 (1883) 274-299.
- PETERS, WILHELM CARL HARTWEG. Eine Zweite Uebersicht [vergl. Monatsberichte (1859) 269] der von Hrn. F. Jagor auf Malacca, Java, Borneo und den Philippinen gesammelten und dem Kgl. zoologischen Museum übersandten Schlangen. Monatsb. Akad. wiss. Berlin (1861) 683-691.
- PETERS, WILHELM CARL HARTWEG. Berselbe berichtete über drei neue Schlangenarten (*Calamaria bitorques*, *Stenognathus brevirostris*, und *Hemigungarus gemianulis*) von den Philippinen. Monatsb. Akad. wiss. Berlin (1872) 585-587.
- 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.
- TAYLOR, EDWARD HARRISON. The snakes of the Philippine Islands. Monog. Bureau Sci., Manila, No. 16 (1922a) 312 pp., 37 pls.
- TAYLOR, EDWARD HARRISON. Additions to the herpetological fauna of the Philippine Islands. I. Philip. Jour. Sci. § D 21 (1922b) 161-204.
- TAYLOR, EDWARD HARRISON. Additions to the herpetological fauna of the Philippine Islands. II. Philip. Jour. Sci. § D 21 (1922c) 257-302.
- TAYLOR, EDWARD HARRISON. Herpetological fauna of Mount Makiling. Philippine Agri. 11 (1922d) 127-139.
- THOMPSON, JOSEPH CHEESMAN. Notes on serpents in the family Colubridæ. Proc. Acad. Nat. Sci. Philadelphia 65 (1913) 213-218.
- WERNER, FRANZ. Uebersicht der Gattungen und Arten der Schlangen aus der Familie Colubridæ. III. Teil (Colubridæ). Mit einem Nachtrag zu den übrigen Familien. Zool. Jahrb., Syst. 57 (1929) 1-196.