PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES

Vol. XXIX, No. 14, pp. 475–508, 10 figs. May 29, 1959

A REVIEW OF THE SNAKES OF THE GENUS *PSEUDORABDION* WITH REMARKS ON THE STATUS OF THE GENERA *AGROPHIS* AND *TYPHLOGEOPHIS* (SERPENTES: COLUBRIDAE)

BY

ALAN E. LEVITON
Department of Herpetology
California Academy of Sciences

AND

WALTER C. BROWN
Natural History Museum
Stanford University, California

Recent field work by one of the authors[1] on Negros Island, Philippine Islands, resulted in the collection of a series of specimens of *Pseudorabdion oxycephalum* Günther and *Pseudorabdion mcnamarae* Taylor. Close examination of the material suggests that *P. oxycephalum* is more similar to recognized species of *Typhlogeophis* Günther, and *P. mcnamarae* to recognized species of *Agrophis* Müller than is either to *Pseudorabdion longiceps* [= *Rabdion torquatum*, type species of the genus *Pseudorabdion*]. These findings have led us to reevaluate the status of these genera and of their included species.

[1] Dr. Brown visited the Philippine Islands on two occasions, during 1954–1955 and again during 1957. As a result of his activities, and with the generous assistance of the staff of the Department of Biology, Silliman University, Dumaguete, Negros Island, a considerable collection of amphibians and reptiles has been amassed. These specimens have been deposited at Stanford University.

In the course of this study we have become indebted to a number of persons for the loan of specimens under their care and for other courtesies. Dr. Lothar Forcart, Basel Museum; Dr. Jean Guibé, Paris Museum; and Dr. H. W. Parker and Mr. James C. Battersby, British Museum; have generously aided us by examining type specimens and answering our numerous questions regarding these materials. Mr. Charles M. Bogert, American Museum of Natural History; Dr. Doris M. Cochran, United States National Museum; Mr. Arthur Loveridge and Dr. Ernest E. Williams, Museum of Comparative Zoology, Harvard College; and Dr. Robert F. Inger, Chicago Natural History Museum, have made available to us their specimens of *Pseudorabdion.*

The investigations of the junior author in the tropical forests of the Philippine Islands, upon which this paper is in part based, have been supported since 1955 by grants from the National Science Foundation. Prior to 1955 the work was aided by a grant from the United States Educational Foundation in the Philippines.

The illustrations, with the exception of figure 7, were prepared by Mr. Walter Zawoski of the Stanford Research Institute. Figure 7, that of *Pseudorabdion sarasinorum,* was prepared by Mr. W. Schlier of the Basel Museum.

ABBREVIATIONS

The following abbreviations are used throughout this work:

CAS = California Academy of Sciences, San Francisco.
CNHM = Chicago Natural History Museum, Chicago, Illinois.
MCZ = Museum of Comparative Zoology, Harvard College, Cambridge, Massachusetts.
SU = Natural History Museum, Stanford University, California.
USNM = United States National Museum, Washington, D. C.

TERMINOLOGY

Several terms used in this paper require explanation or definition:

Caudodorsal scale reduction — the reduction of caudodorsal scales from six to four results from the fusion of the second and third scale rows; the position of this reduction is expressed in terms of the subcaudal plate, numbered by counting posteriorly from the anal aperture, opposite which the reduction takes place (indicated by the number in brackets []): *e.g.,* 6 (2 + 3 [8]) 4.

Loreal — any shield immediately behind the nasal shield which is distinct from the prefrontal or labial shields and which, even when it borders the orbit, does not prevent the preocular, if present, from also bordering the orbit.

Preocular — a shield immediately anterior to and bordering the orbit; when this shield is present the prefrontal does not enter the orbit.

Standard length — the distance from the tip of the snout to the anal aperture.

Subcaudals — these paired and enlarged shields on the underside of the tail are counted from the first overlapping pair immediately behind the anal aperture to the last overlapping pair just anterior to the tip of the tail.

Supraocular — a shield which borders the orbit from above and which normally prevents the frontal from bordering the orbit; this shield may be very small and occasionally fused to the postocular.

Ventrals — Dowling's method (1951, pp. 97–98) has been used in counting the enlarged shields on the underside of the body.

Genus **PSEUDORABDION** Jan

Rabdion DUMÉRIL, 1853, p. 441 (in part). DUMÉRIL, BIBRON and DUMÉRIL, 1854, p. 115 (in part).

Pseudorabdion JAN, 1862, p. 10 (type species *Rabdion torquatum* DUMÉRIL, BIBRON and DUMÉRIL, 1854, by monotypy).

Oxycalamus GÜNTHER, 1864, p. 199 (type species *Calamaria longiceps* CANTOR, 1847, by monotypy).

Typhlogeophis GÜNTHER, 1879, p. 77 (type species *Typhlogeophis brevis* GÜNTHER, 1879, by monotypy).

Pseudorhabdion BOULENGER, 1885, p. 389 (erroneous subsequent spelling).

Rhabdion BOETTGER, 1886, p. 106 (erroneous subsequent spelling).

Pseudorhabdium BOULENGER, 1894, p. 328 (erroneous subsequent spelling).

Agrophis MÜLLER, 1894, p. 827 (type species *Agrophis sarasinorum* MÜLLER, 1894, by monotypy).

Typhlogeophus CASTO DE ELERA, 1895, p. 425 (erroneous subsequent spelling).

DEFINITION: Head not distinct from neck; internasals present, smaller than enlarged prefrontals; loreal present or absent; preocular generally absent (present in *P. longiceps*) and prefrontal usually borders orbit; anterior temporals absent; 5 or 6 upper labials; scales in 15 longitudinal rows throughout, smooth, without apical pits; subcaudals paired; anal plate single; pupil round; maxillary teeth 8 to 21; hypapophyses absent on posterior vertebrae; hemipenes and sulcus spermaticus forked (in those species whose hemipenes have been examined).

REMARKS: The genus *Pseudorabdion* was established by Jan (1862, p. 10) to accommodate a single species, *Rabdion torquatum* Duméril, Bibron, and Duméril, which was formerly included with *Rabdion forsteni* Duméril, Bibron, and Duméril in the nominal genus *Rabdion* Duméril [= *Rhabdophidium* Boulenger; type species *R. forsteni* by subsequent selection by Leviton, 1958, p. 44].

Günther (1864, p. 199) proposed the genus *Oxycalamus* for a single

species, *Calamaria longiceps* Cantor. In 1873, he transferred *Rhabdosoma oxycephalum* Günther (1858) to this genus. Boulenger, in 1894, referred *Oxycalamus* to the synonymy of *Pseudorabdion* [=*Pseudorhabdium* Boulenger] having shown that *Calamaria longiceps* Cantor and *Rabdion torquatum* Duméril, Bibron, and Duméril were conspecific.

In 1917, Taylor described a new species of *Pseudorabdion, P. mcnamarae,* and in 1922 followed with a second new species, *P. minutum.* Thus four recognized species were assigned to *Pseudorabdion: P. longiceps, P. mcnamarae, P. minutum,* and *P. oxycephalum.*

Pseudorabdion longiceps, type species of the genus, is a distinctive species characterized by the presence of a small preocular, absence of the loreal, a large eye, 12 maxillary teeth, a rather narrow conical head, and a bifurcated hemipenis. In some of these characters *P. longiceps* agrees with its congeners; it differs in the details of ornamentation of the distal hemipenial walls, the presence of a preocular shield, the greater number of maxillary teeth, and in the larger eye.

Pseudorabdion mcnamarae has a loreal shield, thereby differing from both *P. longiceps* and *P. oxycephalum.* However, fusion of the loreal and the prefrontal would result in a pattern of head scutellation almost identical with *P. oxycephalum.* The supraocular and postocular shields are frequently fused together. The hemipenes of *P. mcnamarae* are identical in ornamentation to *P. oxycephalum;* they differ only in absolute length, *P. mcnamarae* having the shorter organ. Furthermore, both *P. mcnamarae* and *P. oxycephalum* have 7 or 8 maxillary teeth, 4 or 5 less than in *P. longiceps.*

Little need be said in regard to *P. minutum* at this time. It is very close to *P. mcnamarae,* differing only in having fewer subcaudals and the absence of a light nuchal collar.

Pseudorabdion oxycephalum appears to be the most highly adapted species in the genus. The loreal and preocular are both absent. The supraocular and postocular are fused together and both are fused to the ocular shield. The head is rather broad and the eye is very small (in some specimens the eye appears only as a slight darkened bulge beneath a thickened ocular shield). There are 8 maxillary teeth, and the tail is very short.

Over-all similarity among the four species of *Pseudorabdion* would indicate they are congeneric.

In 1879, Günther erected the genus *Typhlogeophis* for a presumably new species of blind burrowing snake, *T. brevis.* Except for the character of the eye, which is said to be absent in this species, we believe it is indistinguishable from *P. oxycephalum.* Mr. J. C. Battersby and Dr. H. W. Parker of the British Museum have kindly reexamined the type of *T. brevis* and concur in this view. However, they have stated *(in litt.)* that the con-

dition of preservation of the specimen does not permit a definite statement regarding the presence or absence of the eye.

In 1922, Taylor described a second species of *Typhlogeophis*. In *T. ater* the eye was said to be clearly visible, although "hidden" under the ocular shield. We have examined the type and find the condition of the eye to be similar to that in *P. oxycephalum*, specimens of which had not been seen by Taylor. Differences in head scutellation and dentition suggest *T. ater* is specifically distinct from *P. oxycephalum*, but not generically distinct.

At the time Müller (1894) proposed the nominal genus *Agrophis*, based upon a single species of *A. sarasinorum*, he suggested it might be congeneric with *Oxycalamus* Günther. *Agrophis sarasinorum* is a distinctive species possessing 1) a loreal shield, 2) 14 subequal maxillary teeth, 3) a large divided nasal shield, and 4) in having the mental separated from the anterior chin shields. The loreal shield is similar in appearance to that in *P. mcnamarae* and there are only two more maxillary teeth than are found in *P. longiceps*. The distinguishing characters of *A. sarasinorum* are, therefore, items 3 and 4. The hemipenes of this species are unknown. If they are found to be similar to those known among other species of *Pseudorabdion*, as we suppose, *Agrophis* should be placed into the synonymy of *Pseudorabdion*. In the present work we tentatively regard *Agrophis* as a synonym of *Pseudorabdion*.

Two additional species, usually assigned to *Agrophis*, *Geophis albonuchalis* Günther, and *A. saravacensis* Shelford, are more similar to *P. mcnamarae* than to *A. sarasinorum*. An elongate loreal is present in both species, the mental is in contact with the anterior chin shields, and the nasal shield, although somewhat larger than in species of *Pseudorabdion*, is undivided. There is a marked similarity between these species and *Pseudorabdion* in the relationships of the head shields, although this may be the result of convergence among morphologically adapted groups; *G. albonuchalis* agrees rather closely with *T. ater*, and *A. saravacensis* with *P. mcnamarae* and with a species described in this paper as new, *P. taylori*. *Agrophis saravacensis* differs from all mentioned species in the large number of maxillary teeth, 18 to 21 according to Mr. J. C. Battersby *(in litt.)*. The dentition of *G. albonuchalis* is not known. Based upon the evident agreement in scale patterns we are led to conclude that *G. albonuchalis* and *A. saravacensis* should be assigned to *Pseudorabdion*.

Two new species are described in this paper, *P. montanum* and *P. taylori*. Of these, *Pseudorabdion taylori* is of special interest inasmuch as it appears to be intermediate between *P. mcnamarae* and the Bornean species assigned to *Agrophis*. There is agreement with *P. mcnamarae* in the dentition. However, in the larger size of the nasal shield, *P. taylori* approaches *A. saravacensis*. The ornamentation of the distal portions of the hemipenes

in *P. taylori* differs from other species of *Pseudorabdion*. The differences are of details and do not affect the generic assignment of the species.

In summary, we conclude: 1) *P. longiceps, P. mcnamarae,* and *P. oxycephalum* are presumed to be congeneric as previously held *(Auct.);* 2) *Typhlogeophis brevis* and *P. oxycephalum* are probably conspecific and *Typhlogeophis* must be placed into the synonymy of *Pseudorabdion;* 3) *Typhlogeophis ater* must be transferred to *Pseudorabdion;* 4) *Agrophis sarasinorum* is probably congeneric with *P. mcnamarae;* 5) *Geophis albonuchalis* and *A. saravacensis* are both similar to *P. mcnamarae* and must be transferred to *Pseudorabdion.*

In the following pages each of the recognized species now included in *Pseudorabdion* is discussed in some detail. Two new species are described. Of the twelve nominal species placed in the genus, nine are recognized:
Geophis albonuchalis Günther = *Pseudorabdion albonuchalis* (Günther)
Typhlogeophis ater Taylor = *Pseudorabdion ater* (Taylor)
Typhlogeophis brevis Günther = *Pseudorabdion oxycephalum* (Günther)
Calamaria longiceps Cantor = *Pseudorabdion longiceps* (Cantor)
Pseudorhabdium mcnamarae Taylor = *Pseudorabdion mcnamarae* Taylor
Pseudorhabdium minutum Taylor = *Pseudorabdion mcnamarae* Taylor
Pseudorabdion montanum Leviton and Brown, new species
Rhabdomosa oxycephalum Günther = *Pseudorabdion oxycephalum* (Günther)
Agrophis sarasinorum Müller = *Pseudorabdion sarasinorum* (Müller)
Agrophis saravacensis Shelford = *Pseudorabdion saravacensis* (Shelford)
Pseudorabdion taylori Leviton and Brown, new species
Rabdion torquatum Duméril, Bibron, and Duméril = *Pseudorabdion longiceps* (Cantor)

KEY TO THE SPECIES OF PSEUDORABDION

1a. Loreal shield absent; prefrontal in contact with upper labials.
  2a. Preocular present; supraocular present; internasal not in contact with upper labials; maxillary teeth 11–12 ..... *P. longiceps*
  2b. Preocular absent; supraocular present or absent; internasals almost always in contact with upper labials.
    3a. Supraocular absent; frontal borders orbit; maxillary teeth more than 10 ..... *P. ater*
    3b. Supraocular present, fused to postocular; frontal does not border orbit; maxillary teeth 10 or less.
      4a. Each scale of outer row with dark centers and light borders; ventrals uniformly dark brown except for extreme posterior outer edges which are light; ocular shield usually fused to combined supra- and post-oculars; subcaudals (♂) 22–24, (♀) 16–17 ..... *P. oxycephalum*
      4b. Each scale of outer row with light centers; ventrals whitish with dark brown more or less confined to a broad median band; ocular

shield not fused to combined supra- and postoculars; subcaudals (♂) 28, (♀) 21–24 ..... *P. montanum*

1b. Loreal shield present; prefrontal not in contact with upper labials.

5a. Anterior chin shields not in contact with mental; nasal shield divided..... ..... *P. sarasinorum*

5b. Anterior chin shields in contact with mental; nasal shield not divided.

6a. Frontal borders orbit; ventrals 141 ..... *P. albonuchalis*

6b. Frontal does not border orbit.

7a. Ventrals 113; maxillary teeth 18–21; nasal shield large, its upper edge lies at level of top of eye ..... *P. saravacensis*

7b. Ventrals 122–145; maxillary teeth 7–9; nasal shield moderate to minute, its upper edge lies below level of top of eye.

8a. Light nuchal collar usually present; subcaudals 17–30; distal portion of hemipenes minutely spinose ..... *P. mcnamarae*

8b. Light nuchal collar absent; subcaudals more than 30; distal portion of hemipenes calycalute ..... *P. taylori*

Pseudorabdion longiceps (Cantor).

Figures 1 and 2.

Calamaria longiceps CANTOR, 1847, p. 910, pl. 40, fig. 1 (type locality: Pinang, Malay Peninsula; type in British Museum; original description).

Oxycalamus longiceps GÜNTHER, 1864, p. 199 (redescription of type specimen). STOLICZKA, 1873, p. 120 (Malaya [Penang]; description). BLANFORD, 1881, p. 218 (Singapore).

Pseudorhabdion longiceps BOULENGER, 1885, p. 389 (Nias Island). DE JEUDE, 1890, p. 183 (Sumatra [Singkarah]). BOETTGER, 1891, p. 107 (Sumatra [Deli]). BOULENGER, 1903, p. 175 (listed). BOURRET, 1936, p. 266, text-fig. 105 (synonymy, description, distribution compiled). HAAS, 1950, p. 562 (distribution compiled). TWEEDIE, 1953, pp. 51, 122, 129, text-fig. 12a–b (description); 1957, pp. 53, 126, 133, text-fig. 13a–b (description).

Pseudorhabdium longiceps BOULENGER, 1894, p. 329 (Borneo [Pontiana]; Nias; Sumatra [Deli]; Malaya [Perak, Pinang, Singapore]; description, counts and measurements of material examined); 1896, p. 646 (Borneo [Sarawak]). FLOWER, 1896, p. 886 (Malaya [Penang Hill, Perak, Singapore, Wellesley Prov.]). WERNER, 1896, p. 17 (Sumatra; counts). BOETTGER, 1898, p. 82 (Borneo [Pontianak]). FLOWER, 1899, p. 674 (distribution compiled). SCHENKEL, 1901, p. 163 (Sumatra [Indragiri, Oberlangkat]). GRIFFIN, 1911, p. 261 (Luzon Island [after Peters, 1861; probably in error]). BARBOUR, 1912, p. 119 (Sumatra). BOULENGER, 1912, p. 154 (Malaya [Pahang (Gunong Tahan), Penang, Perak, Selangor, Singapore]; Borneo; Sumatra; Celebes; Philippine Islands [probably in error]; description). SMITH, 1916, p. 161 (Siam [Ban Gnara, Patani]; note on eggs). DE ROOIJ, 1917, p. 146, text-fig. 61 (Borneo [Kuching, Penrissen Road, Pontianak, Sarawak, Sebruang Valley, Simanggang]; Celebes [Macassar]; Nias; Sumatra [Ajerbangis, Deli, Gunung, Indragiri, Langkat, Sahilan, Singkarah]; Malaya [Penang, Singapore]; Philippine Islands [probably in error]; description, distribution). ROBINSON and KLOSS, 1920, p. 303 (listed). TAYLOR, 1922a, p. 178 (distribution compiled; description quoted from Boulenger, 1894). SMITH, 1922, p. 267 (Malaya [Fraser's Hill]; not seen). DE ROOIJ, 1922, p. 234 (not seen). SWORDER, 1923, p. 65 (not seen). LÖNNBERG and RENDAHL, 1925, p. 2 (Sumatra [Bandar

Basoe]). CHASEN and SMEDLEY, 1927, p. 253 (Riou Archipelago [Pulu Galang]; not seen). WERNER, 1929, p. 164 (listed). BRONGERSMA, 1931, p. 35 (Sumatra); 1933, p. 22 (listed); 1934, p. 198 (listed).

Pseudorabdion longiceps SMITH, 1930, p. 57 (Malaya [Patani (Bangnara), Singapore]). SMEDLEY, 1931, p. 50 (listed). SUVATTI, 1950, p. 502 (listed).

Rabdion torquatum DUMÉRIL, 1853, p. 441 (nomen nudum). DUMÉRIL, BIBRON, and DUMÉRIL, 1854, p. 119 (type locality: Macassar; type in Paris Museum; original description). CASTO DE ELERA, 1895, p. 426 (various Philippine localities listed, but source of data unknown).

Pseudorabdion torquatum JAN, 1862, p. 10 (listed); 1863, p. 30 (listed); 1865, Livr. 10, pl. 3, fig. 3.

Rhabdion torquatum PETERS, 1861, p. 684 (listed). BOETTGER, 1886, p. 106 (distribution compiled).

MATERIAL EXAMINED (17): *Malaya:* CAS 16761–16767, SU 8546–8548 Singapore; SU 7805, 13191 Johore. *Sumatra:* USNM 82213, 82216, 82218 Tebing Tinggi; AMNH 2897–2898 (no exact locality).

TAXONOMIC NOTES: This is the most widely distributed species of *Pseudorabdion*. It differs from the other species in possessing a preocular shield. In other characters *P. longiceps* agrees most closely with *P. oxycephalum* and *P. ater*.

Pseudorabdion longiceps would appear to be the least specialized species of the genus. The eye is proportionally larger in relation to snout length, a preocular is present, the supraocular is large and prevents both prefrontal and frontal shields from bordering the eye, the postocular is well developed, and there is no evidence of fusion between circumorbital shields and the ocular scale. Among other species of *Pseudorabdion* there is a tendency toward reduction or loss of one or more of the lateral head shields and reduction in the size of the eye.

Peters' record of *P. longiceps* from Luzon Island is regarded as doubtful (see also: Haas, 1950, p. 562); it seems that either the locality data accompanying the specimen are in error or the identity of the specimen is incorrect. Peters' record has been widely quoted in the literature, generally without comment.

DIAGNOSIS: Loreal shield absent; preocular shield present; internasals not in contact with upper labials; supraocular shield present; frontal does not border orbit; anterior chin shields in contact with mental; maxillary teeth 11–12.

ORIGINAL DESCRIPTION: "Strongly iridescent soot-coloured, a shade lighter beneath; the scuta and scutella edged with whitish. Eyes and tongue black.

"Scuta, 131; scutella, 26.

"Hab.—Pinang.

"The head is elongated, narrow, conical, the muzzle rounded, projecting over the lower jaw. The anterior frontals are much smaller than the frontals,

which on the sides occupy the place of the absent frenal shield, and thus reach the second upper labial; the nasal is very small, rectangular, perforated by the rather large nostril near the lower anterior angle. The eye is comparatively large, between an obliquely placed rectangular preorbital and a similar postorbital shield; the supraorbitals are narrow, rectangular; the vertical, moderate, pentagonal, arched, and somewhat narrower at the anterior margin. The occipitals, the largest, are elongated, bordered below by the large fifth upper labial, and behind by a single pair of post-occipitals. Each jaw has five pairs of labials. Of the two pairs of mentals, the anterior is the longer, and is enclosed by the rostral and three anterior labials, the posterior pair by the fourth labial. The teeth are minute, sharp, reclining, all of equal size. The trunk is cylindrical, narrowed toward both extremities, covered with fifteen longitudinal series of smooth rhombic imbricate scales. The abdomen is arched, the short tail tapering to a blunt point. This species approaches to *Calamaria alba,* Linné (*C. brachyorrhos* Schlegel), but differs by its elongated shape of the shields of the head and its larger eyes. A single individual, captured by W. T. Lewis, Esq., on the Great Hill of Pinang, was of the following dimensions:

Length of the head	0⅜ inch.
Length of the trunk	5 inches.
Length of the tail	0⅝ inch.
	6⅛ inches.

"Circumference of the trunk $\frac{3}{16}$, of the neck ⅜, at the root of the tail ⅜ inch."

Supplemental description: Maxillary teeth 11–12; nasal small, longer than deep, undivided; loreal absent; internasals and prefrontals in contact with upper labials; preocular present; supraocular present, in contact with preocular; postocular present, distinct from supraocular; ocular shield not fused to circumorbital shields; anterior temporals absent; parietals in contact with fifth upper labial; 5 upper labials, the third and fourth bordering the orbit; 5 lower labials, the first 3 in contact with the anterior chin shields; mental in contact with chin shields; ventrals 129–148; subcaudals 17–29; anal plate single; total length 83–216 mm.; tail of total .074–.149.

Hemipenes extend to the twelfth subcaudal plate, forked at the end of the eighth plate; inner walls ornamented with longitudinal ridges except distally where minute spines are present in forked sections; no calyces or flounces present.

Color (in alcohol) above uniform dark brown; below medium brown except anterior surface of chin and lower portions of upper labials which are lighter; young have a narrow whitish collar at the level of the fourth

ventral plate, and a short whitish vertical bar or blotch covering parts of the fifth upper labial, the posterior edge of the posterior temporal and part of the parietal.

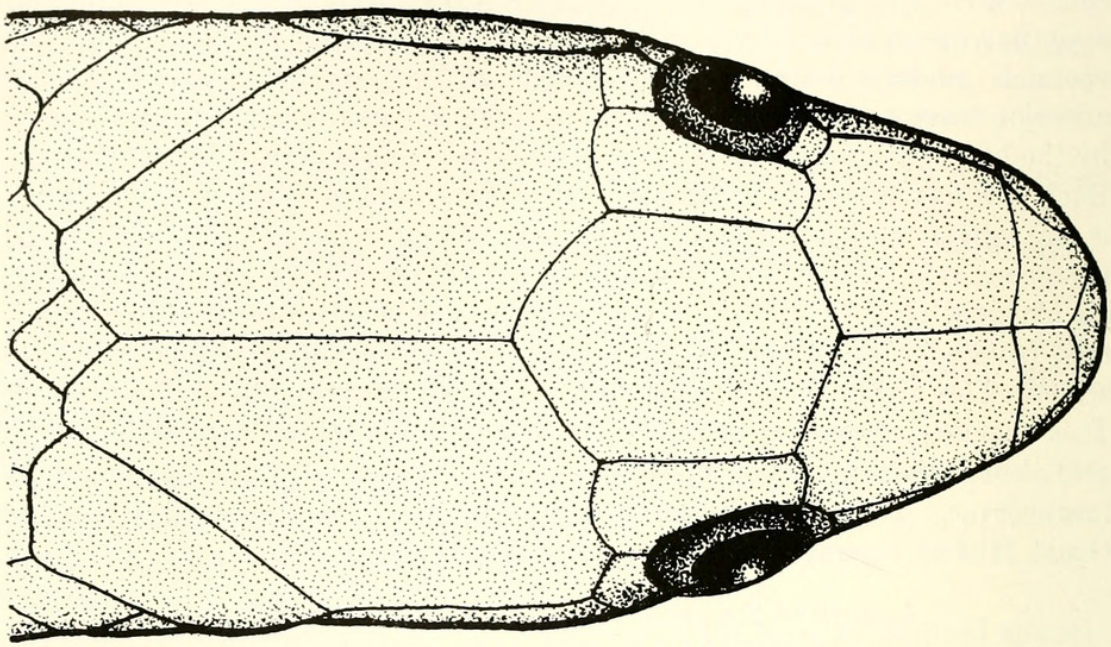

Figure 1. *Pseudorabdion longiceps.* Dorsal view of head.

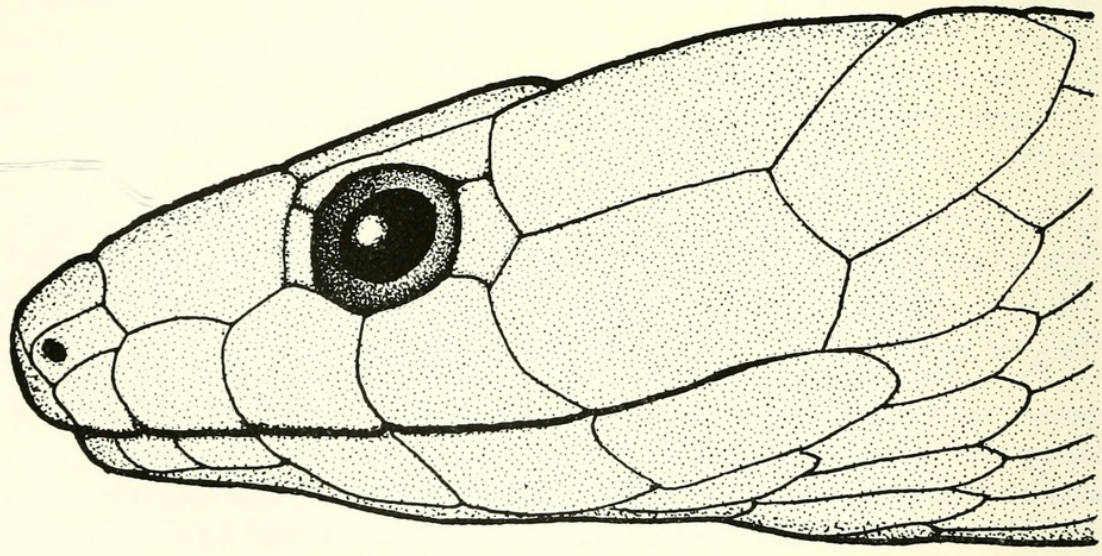

Figure 2. *Pseudorabdion longiceps.* Lateral view of head.

SEXUAL DIMORPHISM: Dimorphism in ventral and subcaudal counts is clearly indicated by the data. Males have fewer ventrals and more subcaudals than females. However, no differences are evident when the totals of ventrals plus subcaudals are compared between sexes. A summary of these data are presented in table I.

TABLE I

Sexual dimorphism in ventral and subcaudal counts between sexes in Pseudorabdion longiceps.

	Male			*Female*		
Shields	*No.*	*Mean ± S. D.*	*Range*	*No.*	*Mean ± S. D.*	*Range*
Ventrals	5	132.4±2.79	129–135	11	144.1±2.82	140–148
Subcaudals	5	27.2±0.40	26–29	11	18.4±0.43	17–20
Ventrals + Subc.	5	159.6±2.80	155–162	11	161.5±3.33	157–168

INTERISLAND VARIATION: As indicated by the data as summarized in tables II and III, there is little appreciable variation between Sumatran and Malayan samples. Malayan males have a few more ventral plates than Sumatran males, but this does not carry through with the females. It is doubtful that any significant conclusion can be based upon data drawn from the small sample of males studied.

ECOLOGICAL NOTES: It seems singulary remarkable that a species which has been rather frequently collected should yield no data on habits or habitat. Little is known of these animals, but it is presumed they are similar to other members of the genus. In this event, they probably feed for the most part on earthworms, are burrowers, and are oviparous in breeding habits.

TABLE II

Summary of subcaudal counts for samples of Pseudorabdion longiceps.

	Male			*Female*		
Island	*No.*	*Mean ± S. D.*	*Range*	*No.*	*Mean ± S. D.*	*Range*
Johore, M. P.	2	28.0	27–29	—	——	——
Singapore, M. P.	1	26	——	9	18.2±0.50	17–20
Sumatra	2	27.0	26–28	2	19.0	18–20

TABLE III

Summary of ventral counts for samples of Pseudorabdion longiceps

	Male			*Female*		
Island	*No.*	*Mean ± S. D.*	*Range*	*No.*	*Mean ± S. D.*	*Range*
Johore, M. P.	2	134.0	133–135	—	——	——
Singapore, M. P.	1	135.0	——	9	143.6±2.90	140–148
Sumatra	2	129.5	129–130	2	141.0	141

RANGE: *Indonesia:* Borneo (Kuching, Penrissen Road, Pontianak, Sebruang Valley, Simanggang); Celebes (Macassar); Nias; Sumatra (Ajer-

bangis, Deli, Gunung, Indragiri, Langkat, Oberlangkat, Sahilan, Singkarah, Tebing Tinggi). *Malaya:* (Bangnara, Fraser's Hill, Johore, Pahang [Gunong Tahan], Perak, Pinang, Selangor, Singapore, Wellesley Province). *Riou Archipelago:* Pulu Galang. *Thailand:* (Ban Gnara, Patani).

Pseudorabdion ater (Taylor).

Typhlogeophis ater TAYLOR, 1922b, p. 202, figs. 6–7 (type locality: Pasanaka, Zamboanga del Sur, Mindanao Island; type in California Academy of Sciences; original description).

MATERIAL EXAMINED (1): *Mindanao Island:* CAS 62043 Pasanaka (Holotype).

TAXONOMIC NOTES: Taylor placed this species in *Typhlogeophis* without explanation. He apparently did not compare it with specimens of Philippine *Pseudorabdion.*

Pseudorabdion ater, known from only the type specimen, is most similar to *P. oxycephalum* but lacks a supraocular and has more maxillary teeth. The frontal shield borders the orbit and is very broad. The diameter of eye/snout length index is intermediate between *P. oxycephalum* and *P. longiceps,* but since this measurement is taken from a young specimen, it seems probable that the index would approach that for *P. oxycephalum* in the adult.

DIAGNOSIS: Loreal absent; preocular absent; internasal in contact with upper labials; supraocular absent, frontal shield bordering orbit; postocular fused to ocular shield; anterior chin shields in contact with mental; maxillary teeth 12.

ORIGINAL DESCRIPTION: "Snout pointed, rostral higher than broad, distinctly visible above; internasals small, about equal to one-fourth the prefrontals, their mutual suture less than one-third the length of that between prefrontals, in contact with second labial; prefrontals large, touching two labials laterally, and ocular scale; no loreal; no preocular; frontal much broader than long, the anterior edge forming a straight transverse line on a level with the eyes; frontal about one-half the length of parietals, very broad, in contact with ocular; parietals elongate, nearly twice as long as wide, forming a mutual suture for more than half their length; nostril between first labial, which is fused with the anterior nasal, and a small nasal; five upper labials, third and fourth bordering ocular, which covers eye; the scale has a rounded, transparent prominence on anterior part, through which the eye is distinctly visible; no postocular distinct from ocular; no anterior temporals; one large posterior temporal bordering parietals, with two enlarged scales below it; no supraoculars; mental small, three times as

wide as deep; two pairs of chin shields, the anterior about three and one-half times the size of the second pair; three labials touching chin shields (four on right side); five lower labials. Ventrals 113, not keeled or angular; subcaudals 33; anal single; tail slender, pointed; scales smooth, in 15 rows, without apical pits.

"Measurements of *Typhlogeophis ater* sp. nov.

	mm.
Total length	173
Snout to vent	143
Tail	30
Width of head	4.5
Length of head	8
Width of body	4

"*Color in life.*—Uniform blackish brown, somewhat iridescent above; belly and region under tail slightly lighter blackish brown; head colored like body."

SUPPLEMENTAL DESCRIPTION: Maxillary teeth 12; caudodorsal scale reduce 6 (2+3 [23]) 4.

Hemipenes extend to eleventh subcaudal plate, forked at end of seventh plate; proximally there are thick longitudinal ridges which become narrowed in the forked sections; minute spines are present distally; sulcus lips very prominent.

REMARKS: The type specimen was collected from under a log in wet earth. (Taylor, 1922b, p. 203.)

RANGE: *Mindanao Island:* Pasanaka.

Pseudorabdion oxycephalum (Günther).

Figures 3 and 4.

Rhabdosoma oxycephalum GÜNTHER, 1858, p. 242 (type locality: Philippines; type in British Museum; original description).

Oxycalamus oxycephalus GÜNTHER, 1873, p. 168, figs. (counts of material examined). BOETTGER, 1886, p. 105 (listed). CASTO DE ELERA, 1895, p. 425 (Luzon Island [Nueva Ecija, Bataan]).

Pseudorhabdium oxycephalum BOULENGER, 1894, p. 329 (Negros Island; description). GRIFFIN, 1911, p. 262 (listed in key). TAYLOR, 1917, p. 364 (listed); 1922a, p. 179, fig. 14 (description after Boulenger, figs. after Günther [not Boulenger as stated]).

Typhlogeophis brevis GÜNTHER, 1879, p. 77 (type locality: Mindanao or Dinagat Island; type in British Museum; original description). BOETTGER, 1886, p. 106 (listed). BOULENGER, 1894, p. 351, pl. 20 (redescription of type specimen). GRIFFIN, 1911, p. 262 (listed in key). TAYLOR, 1922a, p. 183, text-fig. 16, pl. 24,

figs. 1–4 (description and figs. after Boulenger); 1922b, p. 202 (comparison with *T. ater*); 1928, p. 236 (listed in distribution chart).
Typhlogeophus brevis CASTO DE ELERA, 1895, p. 425 (listed).

MATERIAL EXAMINED (21): *Negros Island:* SU 18211–18212 Anopogon area, about 8 km. southwest of Siaton; SU 18213–18215, 18221 ridge on north side of Maite River, about 5 km. west of Luzuriaga; SU 18220 ridge on south side of Maite River, east side of Cuernos de Negros; SU 18216–18217 upper Mahaja Valley, about ½ km. west of Mayaposi Hill; SU 18218, 18222–18223, 18757 Mayaposi environs, about 23 km. west of Bais; SU 18219 about 5 km. south of Mayaposi Hill; SU 13192 Dumaguete; SU 19877–19878 Dungga Sitio, 16 km. south of Toyum Barrio, Cauayan Town; SU 18210 Calaogao Barrio, Cauayan; CNHM 61624 Mabaha, Bais; CNHM 61429 Inubungan, Sta. Catalina. *Calamian Island:* CAS 15296 (without exact locality).

TAXONOMIC NOTES: This small, distinctive species of *Pseudorabdion,* once thought to be rare, has been found with increasing frequency on Negros Island. The species has been recorded from other islands, Luzon (Casto de Elera, 1895), Mindanao or Dinagat (type of *Typhlogeophis brevis* Günther), and the Calamianes (specimen in the collection of CAS), but these records need confirmation.

Typhlogeophis brevis Günther, based upon a single specimen said to have come from Mindanao or Dinagat islands, has been distinguished from *P. oxycephalum* in having its eyes "hidden" beneath the ocular shield. Mr. James C. Battersby of the British Museum has reexamined the type of *T. brevis* and has supplied the following information *(in litt.)*: "The heads of *brevis* and *oxycephalum* appear very close except that in *oxycephalum* the eye can be seen whereas in *brevis* it cannot. This is due, I think, to the condition of the specimen which probably had a banging about before death and some scales have become white and obscured." In *P. oxycephalum* the eye is covered by an ocular shield which has become fused with the postocular and supraocular shields; and we have examined several specimens in which the ocular shield has become noticeably thickened, the eye being visible only as a dark circular area. In the absence of other characters by which to separate the nominal species, we regard them as conspecific and place *T. brevis* in the synonymy of *P. oxycephalum.*

Pseudorabdion oxycephalum, endemic to the Philippine Islands, does not appear to be close to Celebesian or Bornean species. Indeed, its closest relative, *P. montanum,* is at present known only from the highlands on Negros Island.

DIAGNOSIS: Loreal absent; preocular absent; internasal in contact with upper labials; supraocular and postocular shields fused together and to

ocular shield; anterior chin shields in contact with mental; maxillary teeth 8; centers of outer scales dark, edges light; ventrals uniformly dark except for narrow posterior edges which are light.

ORIGINAL DESCRIPTION: "Upper labials five, the third and fourth coming into the orbit; the fifth forming a long suture with the occipital shield; one temporal shield behind the suture. Uniform dusky blackish ash.

a. Adult. Philippines. From Mr. Cuming's collection.

"Description of the specimen.—Body moderate; tail very short, rather distinct from trunk, tapering; head small, narrow, with rather elongate and pointed muzzle, not distinct from neck; eye very small. Rostral shield small, with a slight groove in front just reaching the surface of forehead; anterior frontals small, posterior ones very large, forming the upper anterior edge of orbit, in direct contact with the second and third labial shields; vertical six-sided, as broad as long, with an obtuse angle in front and an acute one behind, lateral edges short, nearly parallel; occipitals moderate; superciliary small, and in this specimen it is united with posterior ocular; this may prove a peculiar character of the species. The loreal, which in the other species of *Rhabdosoma* forms a separate shield together with the anteorbital, is here united with the posterior frontal; five upper labials, the third and fourth coming into the orbit; the fifth as large as the preceding together, and forming a suture with the occipital shield, as in *Rhabdion;* one large temporal shield, not in contact with the shield behind the eye; two very small nasals, nostril between; medial lower labial small, the other labials narrow; two pairs of large chin-shields. Scales rather large, in fifteen rows; anal entire. Above uniform dusky blackish ash, the edges of the scales in the lateral series and of the ventral plates lighter. Teeth equal, smooth. Length of cleft of mouth 3/8″; length of tail 3/4″; total length 12″."

SUPPLEMENTAL DESCRIPTION: Maxillary teeth 8; nasal small, longer than deep, undivided, in contact with first upper labial only; prefrontals large, in contact with two upper labials and borders orbit of eye; preocular absent; postocular 1, small, fused to supraocular and to ocular shield; anterior temporals absent; parietals in contact with two upper labials; 5 upper labials, the third and fourth bordering the orbit; 5 lower labials, the first 3 in contact with the anterior chin shields; mental broader than deep, in contact with chin shields; ventrals 132–157; subcaudals 16–24; caudodorsal scales reduce 6 (2+3 [9–11]) 4; total length 111–282 mm.; tail of total .058–.115.

Hemipenes extend to the twelfth subcaudal plate, forked at the end of the tenth plate; sulcus forked; longitudinal ridges line walls except distally in forks where there are minute spines.

Color (in alcohol) uniform brown above, the posterior edges of the lateral scales and of the ventrals somewhat lighter than other parts of the scale, the darkest color being located at the base of each scale.

Color (in life) dark reddish brown to blackish above with more or less of a silvery iridescence and, generally, a more or less distinct darker ver-

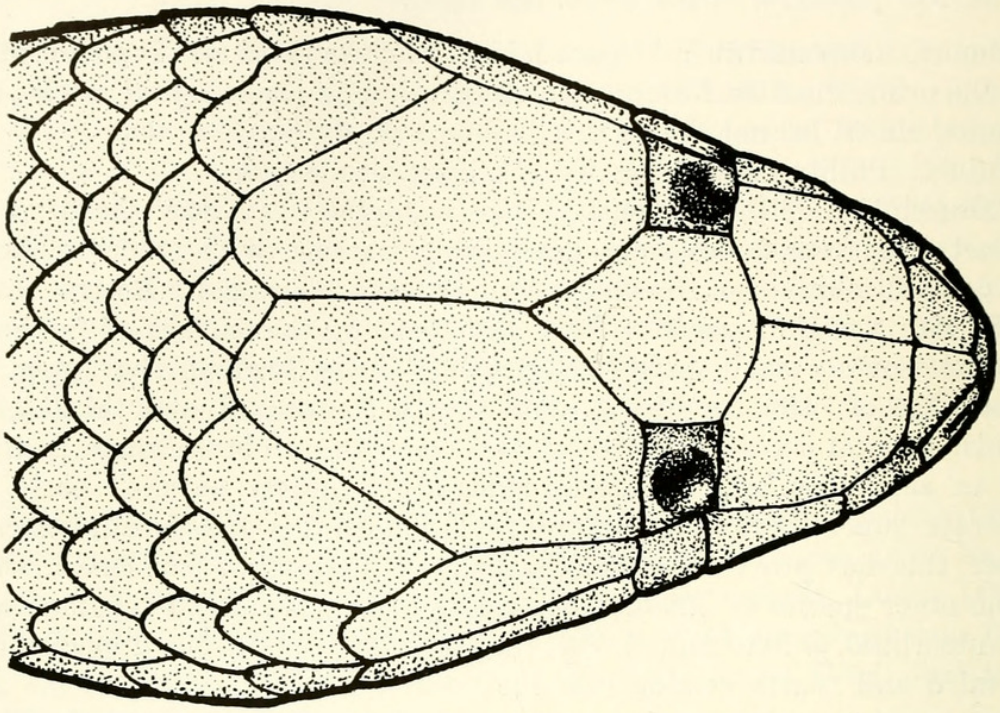

Figure 3. *Pseudorabdion oxycephalum*. Dorsal view of head.

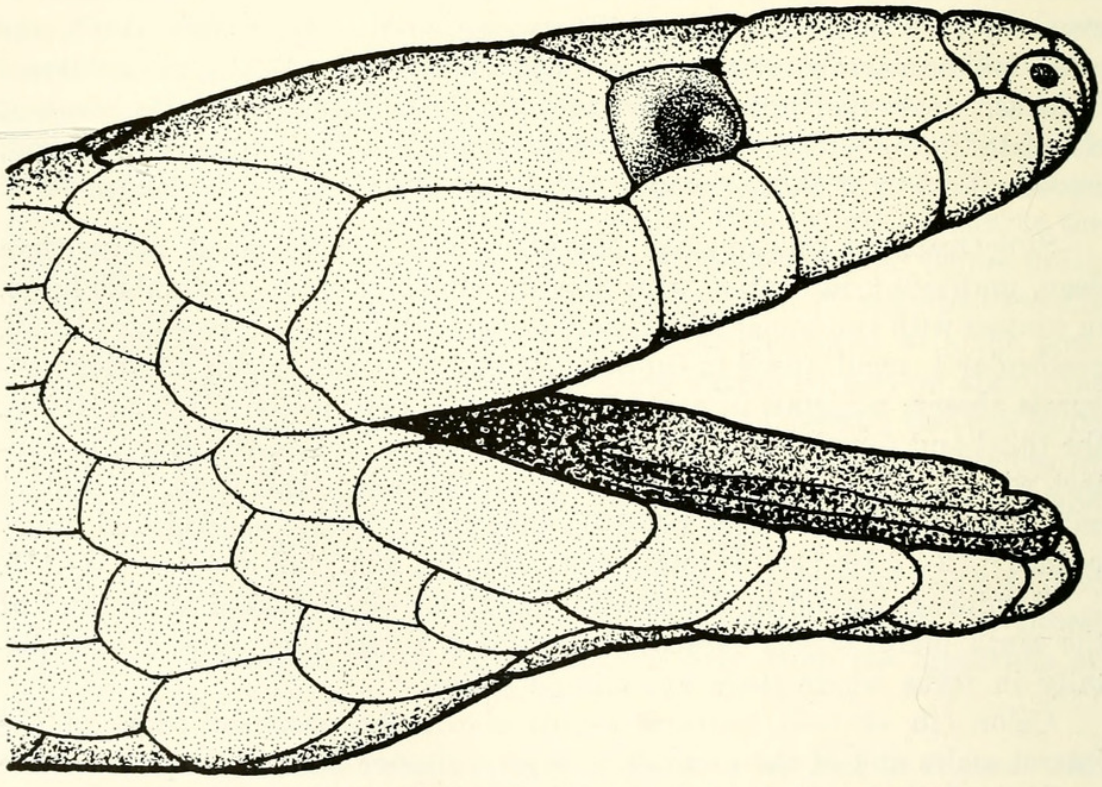

Figure 4. *Pseudorabdion oxycephalum*. Lateral view of head.

tebral stripe. Ventro-lateral surfaces, lower labials, chin shields, ventrals and subcaudals colored as above but each scale with light margins.

SEXUAL DIMORPHISM: The dimorphism in ventral and subcaudal counts and in the ratio of tail length/standard length is striking. Data for these are summarized in table IV.

TABLE IV

Sexual dimorphism in several characters in Pseudorabdion oxycephalum.

	Male			*Female*		
Character	*No.*	*Mean ± S. D.*	*Range*	*No.*	*Mean ± S. D.*	*Range*
Ventrals	7	139.3±4.74	132–144	14	151.1±4.00	144–157
Subcaudals	7	23.0±0.81	22–24	13	16.7±0.51	16–17
Tail length/SL	6	.114±.0076	.108–.129	13	.0724±.0058	.061–.082

INDIVIDUAL VARIATION: Among the specimens examined no differences were noted in the relative size, arrangement, or number of head shields, in the number of maxillary teeth, or in the fusion of the postocular and supraocular shields to each other and to the ocular shield. The numbers of ventrals and subcaudals alone were found to vary, and even this variation was within narrow limits within sexes.

ECOLOGICAL NOTES: Available data indicate that the specimens studied were collected between sea level and 3500 feet; ten of the 21 specimens were taken between 1700 and 2500 feet, and they were found either burrowed into the ground or under logs and rocks.

Annelid worms were found in the stomachs of three individuals.

Three females contained eggs in the oviduct; three eggs were present in one specimen, two in each of the others. The largest egg measured 20.5 mm. in length. The specimens containing eggs were collected on August 12, 1940, October 21–23, 1954, and on May 8–30, 1956. All were from Negros Island.

RANGE: *Negros Island:* Negros Oriental Province (Dumaguete; Mabaha; Anopogon area; north side of Maite River 5 or 6 km. west of Luzuriaga; south side of Maite River on east slope of Cuernos de Negros; upper Mahaja Valley; Mayaposi environs; 5 km. south of Mayaposi Hill); Negros Occidental Province (Calaogao Barrio; Dungga Sitio; Inubungan).

Localities needing confirmation include: *Luzon Island:* Nueva Ecija Province; Bataan Province. *Mindanao or Dinagat islands. Calamianes Islands.*

Pseudorabdion montanum Leviton and Brown, new species.

Figures 5 and 6.

DIAGNOSIS: Loreal usually absent, but when present not elongate and

not bordering orbit; preocular absent; internasal usually in contact with upper labials; prefrontal in contact with upper labials and bordering orbit; supraocular and postocular shields fused together but not fused to ocular shield; anterior chin shields in contact with mental; scales of outer rows with white centers; venter whitish, dark brown restricted to the midventral area, or if moderately distributed then only to the anterior half of the ventral shield; 9 maxillary teeth.

HOLOTYPE: Stanford University Reptile Register 21080, adult female, collected on the north side of the north peak of Cuernos de Negros, Negros Oriental Province, Negros Island, by W. C. Brown, M. Pinero, and T. Serate, April 22, 1958.

PARATYPES: (3): CAS 85476, SU 21081, 21083 collected at the same locality as the holotype by A. Alcala and T. Serate, April 22–May 6, 1958.

DESCRIPTION OF TYPE: Rostral small, barely visible from above, slightly more broad (2.4 mm.) than deep (2.2 mm.); internasals small, about one-third as large as prefrontals, in contact with second upper labial on left side, but not on right side; prefrontals large, in contact with second and third upper labials, bordering orbit; frontal as broad as long, about seven times as broad as supraocular and about two-thirds as long as parietals; nasal small, twice as long as deep, undivided, with a small nostril pierced near the anterior end; on right side a small loreal is present, formed from part of the prefrontal and part of the internasal; loreal not present on left side, although a short vertical suture is in evidence on the prefrontal (no loreal is present on any of the paratypes); preocular absent; one small postocular present, fused to supraocular, but not to ocular shield; anterior temporals absent; parietal in contact with fifth upper labial; five upper labials, third and fourth bordering the orbit, fifth the largest; mental almost twice as broad as deep, in contact with anterior chin shields; latter shields about one and one-half times as large as posterior pair; five lower labials, the first three in contact with anterior chin shields.

Scales in 15 longitudinal rows throughout; caudodorsal scales reduce 6 (–2 [8]) 4; ventrals 161; subcaudals 21; anal plate single.

Color (in alcohol) above dark iridescent purplish brown, becoming slightly lighter on the sides; scales of outer two rows with white centers, most prominent on anterior one-third of body; a whitish blotch present just behind angle of jaws extends to fourth scale row, and joins with white of venter; below whitish with a broad median dark area which covers more extensive areas of the ventrals posteriorly, but never more than one-half of the shield.

Measurements (in mm.): Standard length 495; tail length 36; head length 18.8; head width 10.4; snout length 6.1; diameter of eye 1.5.

Hemipenes (based on CAS 85476) very similar to *P. oxycephalum;* organ extends to end of eleventh subcaudal plate, forked at end of ninth plate; sulcus spermaticus forked; walls of unforked portion ornamented by a few distinct longitudinal ridges; forked portion of organ spinose, the spines being small and of uniform size.

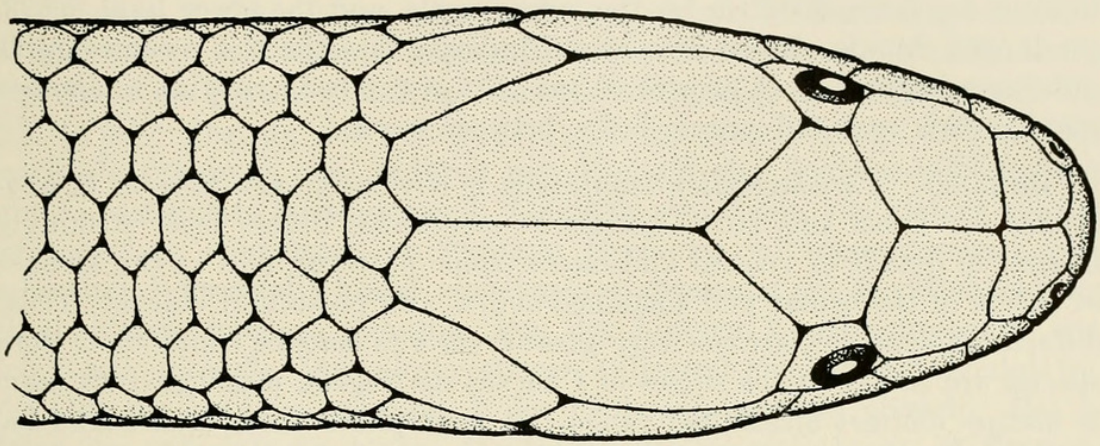

Figure 5. *Pseudorabdion montanum.* Dorsal view of head of holotype.

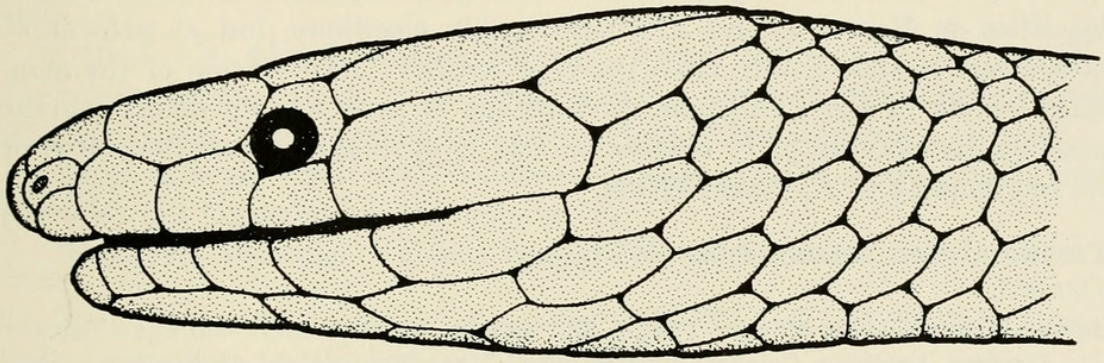

Figure 6. *Pseudorabdion montanum.* Lateral view of head of holotype.

VARIATION: Except for the absence of the loreal shield and for expected differences in ventral and subcaudal counts, the paratypes agree very closely with the holotype. Counts and measurements for these specimens are summarized in table V.

TABLE V

Summary of measurements and counts for specimens of Pseudorabdion montanum.

Specimen	*Sex*	*Ventrals*	*Subcaudals*	*Standard Length*	*Tail Length*
SU 21080	♀	161	21	495	36
SU 21081	♀	154	22	133	13
CAS 85476	♂	148	28	250	38
SU 21083	♂	145	28	122	16

SEXUAL DIMORPHISM: Two of the four specimens are females, two are males. As evidenced by the data given in table V the sexes differ in ventral and subcaudal counts. Marked dimorphism is also indicated by comparing the tail length/standard length ratios; two males range from 0.128–0.152, two females range from 0.073–0.098. It is noteworthy that the upper limit of the ratio, 0.152, is for the largest male, and the lower limit, 0.073, the largest female. These data would indicate that there is a considerable difference in the rate of growth of one part of the body relative to another part, in this case tail versus body, between sexes.

REMARKS: *Pseudorabdion montanum* is obviously very close to *P. oxycephalum*. From this latter species *P. montanum* differs most strikingly in size, in details of ventral and lateral color patterns, and in the absence of fusion of the ocular and combined supra- and postocular shields. These differences, however, are not very great from a taxonomic standpoint. Both species are found on the slopes of Cuernos de Negros, although they seem to occupy distinct altitudinal ranges; *P. oxycephalum* has been found between sea level and perhaps 3000 or 3500 feet and *P. montanum* has been taken above 3500 feet. *Pseudorabdion oxycephalum* has been taken at other localities on Negros Island, and presumably elsewhere, but at present *P. montanum* is known only from the type locality. Exploration of the montane forests in the Philippine Archipelago is necessary to determine the possible distribution of *P. montanum* and to evaluate further the status of its relationship to *P. oxycephalum*.

Pseudorabdion sarasinorum (Müller).

Figure 7.

Agrophis sarasinorum MÜLLER, 1894, p. 827, text-fig. (type locality: Gunung (Vulcan) Soudara, northern Celebes; type in Basel Museum; original description). BOULENGER, 1897, p. 222, pl. 13, fig. 1 (Celebes [Lokon Volcano, nr. Tomohon; Masarang Volcano]; description). DE ROOIJ, 1917, p. 143, text-fig. 59 (description; distribution compiled). HAAS, 1950, p. 561 (listed).

MATERIAL EXAMINED (2): The holotype (Basel Museum 1678) and one other specimen (Basel Museum 1679) were examined for us by Dr. Lothar Forcart.

TAXONOMIC NOTES: This species differs from other members of *Pseudorabdion* in not having the anterior chin shields in contact with the mental and in the larger, divided, nasal shield. Otherwise this species agrees with the "*mcnamarae*" group of the genus which is characterized by the presence of an elongate loreal.

DIAGNOSIS: Loreal shield present; preocular shield absent; supraocular shield present; frontal does not border orbit; anterior chin shields not in contact with mental; maxillary teeth 14.

ORIGINAL DESCRIPTION: "Rostrale rundlich spitz, weit nach hinter zwischen die internasalia zurückgeschlagen vom Nasenlock aus beiderseits etwas eingeschnitten. Sutur der internasalia nur halb so lang als die der praefrontalia, letztere an der Augenbegrenzung teilnehmend. Frontale rhombisch, kaum länger als breit. Parietalia gross.

"Nasalia 2, das vordere mit dem Nasenloch viel kleiner.—Supralabialia 5, das erste an beide nasalia grenzend, das zweite an postnasale und frenale, das dritte an frenale und Auge, das vierte an Auge und postoculare, das fünfte sehr lang, an das postoculare und der ganzen Länge nach an das parietale grenzend und dadurch den Kontakt der Schläfenbeschuppung mit d. postoculare ausschliessend. Letzteres sehr klein, viel kleiner als das supraoculare (linkerseits an unserem Exemplar mit dem parietale verschmolzen.) Parietalia hinter eingebuchtet abgestutzt, in der Einbuchtung eine grössere mediane Schuppe, von der hintern Vereinigungsstelle von lab. 5 mit parietale längs dieses letztern anliegend eine lange Nuchalplatte, die aber die mediane Schuppe an der Einbuchtung nicht erreicht. Das 1. Paar der infralabialia hinter der Spitze des mentale kaum in Spitzenberührung. Inframaxillaria in 2 Paaren, das zweite etwas kürzer als das erste.

"139 + 1 + 40.—Totallänge 235 mm., wovon der Schwanz 45 mm. Ob. dunkelgraubraun, stark irisierend, seitlich mehr rotbräunlich, unter schmutzigweiss, alle ventralia und subcaudalia vorne dunkler.

"Sehr nahe verwandt (möglicherweise identisch trotz Anwesenheit eines Frenale) mit Oxycalamus oxycephalus Gü.

"Fundort: Gunung (Vulcan) Soudara ca. 1200 m. 1 St."

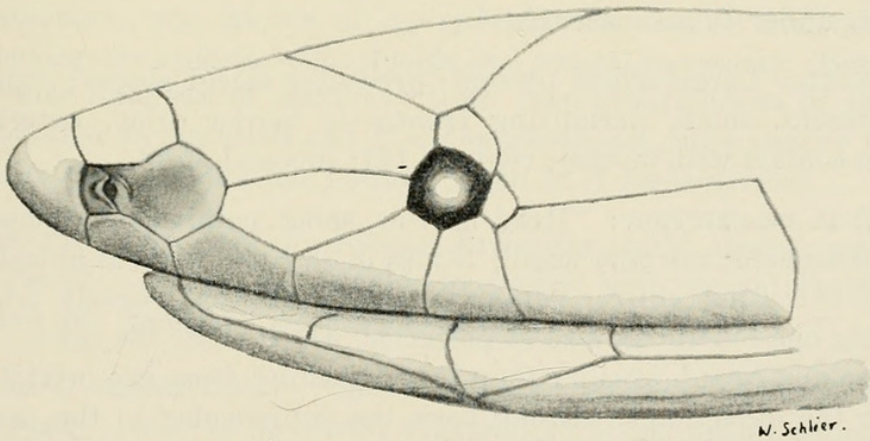

Figure 7. *Pseudorabdion sarasinorum.* Lateral view of head of Basel Museum 1679.

SUPPLEMENTAL DESCRIPTION: Maxillary teeth 14; mandibular teeth 17[2]; nasal large, divided, the anterior portion very small; loreal present, elongate,

[2] Müller stated in the original description that there were 8 mandibular teeth. Dr. Forcart kindly reexamined the holotype and determined there were actually 17 teeth, but many were hidden by the gums.

bordering the orbit; 1 postocular; 5 upper labials, the third and fourth bordering the orbit; prefrontals large, bordering the orbit; supraocular present; anterior chin shields do not contact mental but are separated by the first pair of lower labials; dorsal scales in 15 longitudinal rows throughout; ventrals 139–164 (after Boulenger, 1897, p. 222); subcaudals 36–40 (after Boulenger, *loc. cit.*).

Color (in alcohol) above dark brown; below whitish, the anterior edges of the ventrals darker.

RANGE: *Celebes Island:* Residency of Manado (Sundara Volcano [alt.: 4450 ft.]; Lokon Volcano [alt.: 5150 ft.]; Masarang Volcano [alt.: 4000 ft.]).

Pseudorabdion albonuchalis (Günther).

Geophis albonuchalis GÜNTHER, 1896, p. 229 (type locality: Baram, Sarawak, Borneo; whereabouts of type unknown; original description).

Agrophis albonuchalis BOULENGER, 1897, p. 222 (mentioned in text). DE ROOIJ, 1917, p. 144 (description after Günther). HAAS, 1950, p. 561 (listed).

Xylophis albonuchalis SHELFORD, 1901a, p. 58 (not seen).

MATERIAL EXAMINED: None.

TAXONOMIC NOTES: According to Mr. J. C. Battersby, the type cannot be located in the collections of the British Museum and, furthermore, there are no indications in the catalogue of the collections that the type specimen was ever deposited at the Museum. The whereabouts of the holotype of this species is, therefore, unknown. No other specimens have been collected.

For remarks regarding the probable affinities of *P. albonuchalis* see the discussion under *P. saravacensis.*

DIAGNOSIS: Loreal shield present; preocular shield absent; supraocular shield present, small, permitting frontal to border orbit; anterior chin shields in contact with mental; ventrals 141; subcaudals 43.

ORIGINAL DESCRIPTION: "Head narrow, snout pointed, body moderately stout, tail tapered; eye very small. Scales in 15 rows, without apical groove. Ventrals 141; anal entire; subcaudals 43. Anterior frontals triangular, small, only one-fourth the size of posterior, which enter the orbit. Vertical very large and broad, broader than long, reaching from one orbital margin across to the other, and pressing back the supraocular to the postero-superior angle of the orbit. Occipitals as long as the anterior shields together, and forming a long suture with the fifth upper labial. Two nasals. Loreal and anteocular confluent into one long shield. A minute postocular. Upper labials six, of which the third and fourth enter the orbit. Symphysial in direct contact with the mentalia, which are considerably longer than the post-mentalia. Six lower labials, the fifth long and narrow.

"Deep black, with a broad pure white collar, which covers half of the occipitals and the neck.

"One specimen, 9½ inches long (of which the tail takes 1⅝ inch), was discovered by Mr. Hose at Baram [Sarawak, Borneo]."

RANGE: Known only from the type locality.

Pseudorabdion saravacensis (Shelford).

Agrophis saravacensis SHELFORD, 1901b, p. 516 (type locality: Kuching, Sarawak, Borneo; type in British Museum; original description; allied to *Geophis albonuchalis*). DE ROOIJ, 1917, p. 144 (redescription of type). HAAS, 1950, p. 561 (listed).

MATERIAL EXAMINED (1): The holotype was examined for us by Mr. James C. Battersby.

TAXONOMIC NOTES: Only a single specimen of this Bornean species has been collected. It is evidently most closely allied to *P. albonuchalis,* also from Borneo. From this latter species *P. saravacensis* is distinguished by the lower number of ventrals and subcaudals, the frontal does not border the orbit (in this character *P. albonuchalis* approaches *P. ater*), and the nasal shield is undivided. Comparison of the descriptions of the two nominal species suggests a difference in the number of upper labials, but this probably results from different methods of counting the shield immediately following the fifth upper labial.

A loreal shield is present in *P. saravacensis,* and for this reason Shelford included it in the genus *Agrophis.* However, *P. saravacensis* differs from *P. sarasinorum,* type species of *Agrophis,* in its smaller undivided nasal and in having the anterior chin shields and mental in contact. Both species have greater numbers of maxillary teeth than other species of the genus. *Pseudorabdion saravacensis* and *P. albonuchalis* are more similar to *P. mcnamarae* in head scutellation, however, than to *P. sarasinorum.*

DIAGNOSIS: Loreal shield present; preocular shield absent; supraocular shield present; anterior chin shields in contact with mental; ventrals 113, subcaudals 26; maxillary teeth about 18–21.

ORIGINAL DESCRIPTION: "Snout obtusely pointed. Rostral large, its breadth nearly equal to its depth; praefrontals large, nearly as long as the frontal; frontal large, rhomboidal, slightly longer than broad, shorter than the parietals. Supraocular and postocular very small; five upper labials, third and fourth entering the eye, fifth largest and forming a suture with the parietal. Anterior chin-shields in contact with the symphysial and with three lower labials, longer than the posterior chin-shields. Scales in 15 rows. Ventrals 113; anal entire; subcaudals 26. Tail pointed, dark brown, strongly

iridescent; a red blotch on each side of the head just above the angle of the jaw, and an irregular red band on the neck.

"Total length 142 millim."

RANGE: Known only from the type locality.

Pseudorabdion mcnamarae Taylor.

Figure 8.

Pseudorhabdium mcnamarae TAYLOR 1917, p. 363, text-fig. 2a–e (type locality: Canlaon Volcano, Negros Island; type in Carnegie Museum; original description); 1922a, p. 180, text-fig. 15a–c (re-description of type); 1922b, p. 201 (suggests relationship to *P. minutum*).

Pseudorhabdium minutum TAYLOR, 1922b, p. 200, pl. 7, figs. 4–5 (type locality: Balbalan, Kalinga Subprovince, Luzon Island; type in California Academy of Sciences; original description.

MATERIAL EXAMINED (11): *Luzon Island:* CAS 61544 Kalinga Subprovince (Balbalan). *Negros Island:* MCZ 20091 Mt. Canlaon (paratype); SU 18208 ridge on north side of Maite River, 5–6 km. W. of Luzuriaga; SU 18209 Lake Balinsasayao area; SU 19533 Cabagnaan area, 16 km. east of La Castellana; SU 21086–21088, 21090 Dayungan, ridge on northeast peak of Cuernos de Negros; SU 21089 Maite River Gorge.

TAXONOMIC NOTES: In possessing a loreal shield this species agrees with the Bornean and Celebesian species formerly placed in the genus *Agrophis.* In other characters *P. mcnamarae* approaches *P. oxycephalum. Pseudorabdion taylori,* a new species described herein from Mindanao, is obviously related to *P. mcnamarae* as is *P. minutum,* described by Taylor from Luzon Island.

In regard to *P. minutum,* Taylor concluded that it differed from *P. mcnamarae* ". . . in numerous characters. The tail of this new species [*minutum*] is proportionally much shorter, with fewer ventrals; the markings and color are different; the frontal is shorter and truncate in front, and the rostral is smaller." (Taylor, 1922b, p. 201.)

The type of *P. minutum,* which was not sexed by Taylor, is a young female. We have compared it with available specimens of *P. mcnamarae* and with counts and measurements of male and female *P. mcnamarae* given by Taylor (1922b, p. 180). According to Taylor the frontal shield in *P. minutum* is ". . . shorter and truncate in front." We find this character of little value in distinguishing the two species. Among specimens of *P. mcnamarae* examined by us, including a paratype, the frontal is always broadly truncate in front, rather than triangular as indicated by Taylor. Furthermore, in so far as the "shorter" frontal is concerned, Taylor appears to have been unsure of this character in *P. mcnamarae* for he states that the frontal is ". . . a little wider than long [p. 180]," ". . . equal width vs. length [p. 181],"

and ". . . length slightly exceeds width [p. 181]." (Taylor, 1922a, pp. 180–181.) The proportionally shorter tail and fewer ventral shields agree with female specimens of *P. mcnamarae*.

The type specimen of *P. minutum* differs from specimens of *P. mcnamarae* in only two characters: 1) slightly fewer subcaudals, and 2) absence of a light nuchal collar. Because of the shortness of the tail in these forms and because of the relatively few subcaudal shields normally present, the difference of three subcaudal shields between the minimum for *P. mcnamarae* and the count for *P. minutum* may be significant. However, it must be noted that the single specimen of *P. minutum* was collected in the highlands of Kalinga Subprovince, on Luzon Island, at an altitude in excess of 5000 feet. It is not unusual for snakes that live at higher elevations to have fewer ventral and subcaudal shields than individuals of the same species frequenting lower altitudes.

We do not believe that available data indicate *P. minutum* and *P. mcnamarae* are specifically distinct.

DIAGNOSIS: Loreal shield present; preocular shield absent; supraocular present; ocular shield rarely fused to other shields; anterior chin shields in contact with mental; maxillary teeth 8; subcaudals less than 30; distal portion of hemipenes with minute spines.

ORIGINAL DESCRIPTION: "Rostral small, about as wide as high, a large part visible from above; internasals moderate, five-sided, sutures with nasal and prefrontal equal; forms its shortest suture with the loreal; prefrontals nearly three times as large as internasals, entering eye, touching frontal, loreal, internasal, and supra-ocular; longest suture with loreal, shortest with supra-ocular; frontal hexagonal, a little wider than long, sides touching supra-oculars shortest, parietal sides longest; parietals at least twice as long as wide, six-sided, in contact with fifth labial; nasal rectangular, much elongate, with nostril pierced near anterior edge close by the rostral; behind this is a very much enlarged, elongate, coffin-shaped loreal, in contact with second and third labials, entering eye; supra-ocular extending over only posterior part of eye and somewhat behind; postocular fused with supra-ocular; no anterior temporals; a single large posterior temporal lies behind fifth labial, bordering on the parietal; five upper labials, fifth largest, in the following order of size: 5, 3, 4, 2, 1; third and fourth enter eye; lower labials five; mental small, in contact with anterior chin shields, separating first labials; three labials touch anterior chin shield; second pair of chin shields slightly smaller; anal undivided; ventrals, 140; subcaudals, 22; eye very small; scales smooth, in 15 rows.

"Color in life.—Above very shiny, more or less iridescent, dark blackish brown to bluish brown; about the neck is a more or less distinct yellow collar (dim or wanting in adults) formed above by three or four small yellow

spots; a cream-colored spot on the fifth upper labial; below canary to yellowish cream with a dark area on the outer edges of each ventral; latter ventrals mottled and subcaudals almost uniformly dark; occasionally dark areas on the middle part of the ventrals.

"Measurements of the type of *Pseudorhabdium mcnamarae* sp. nov.

	mm.
"Length	242
"Snout to anus	220
"Tail	21
"Width of head	5.5
"Width of body	5"

SUPPLEMENTAL DESCRIPTION: Maxillary teeth 8; nasal small, undivided; loreal present, elongate, borders orbit; postocular 1, often fused to supraocular; ocular shield usually distinct, occasionally fused with supraocular or postocular; mental in contact with anterior chin shields; scales in 15 rows; caudodorsal scales reduce 6 (2+3 [11]) 4; ventrals 128–145; subcaudals (17)20–27; total length 158–204 mm.; tail of total .086–.127.

Hemipenes extend to the tenth subcaudal plate, forked at end of eighth plate; walls ornamented by a series of longitudinal ridges in proximal two-thirds of organ; in forked portions minute spines present.

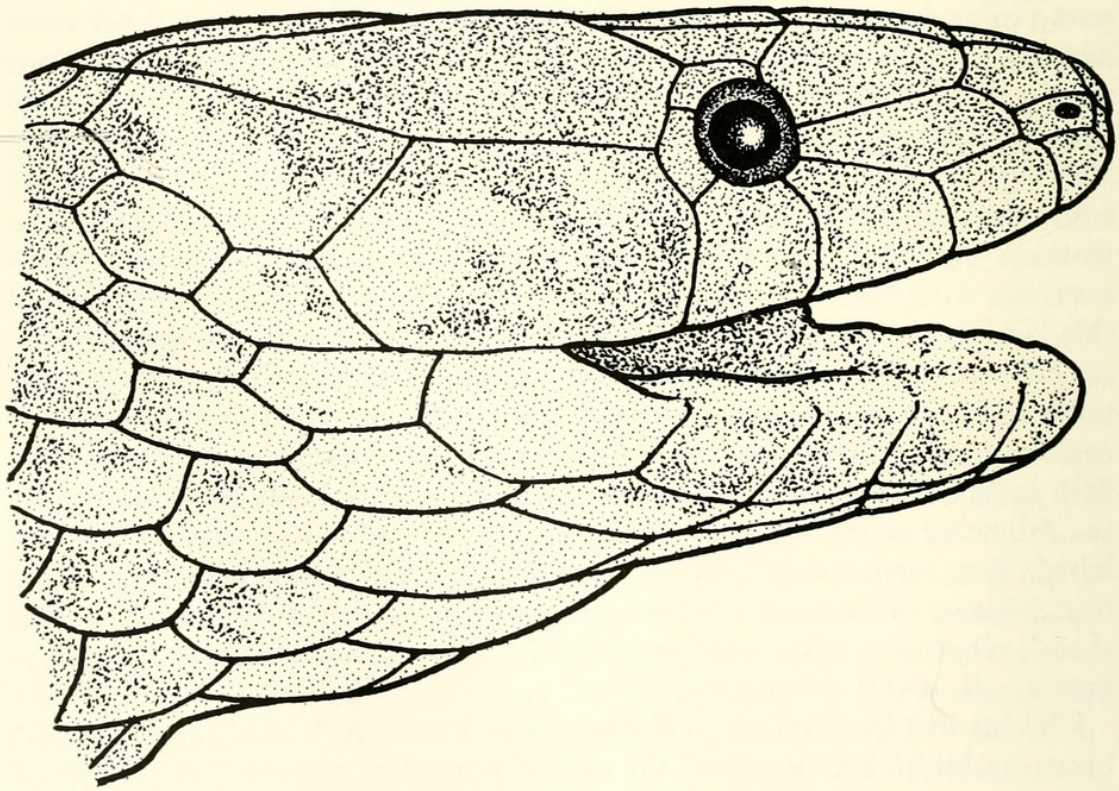

Figure 8. *Pseudorabdion mcnamarae.* Lateral view of head.

Color (in alcohol) dark bluish brown to dark brown above; in young specimens a narrow yellowish collar present on neck; below creamy yellow, gradually darkening posteriorly; lateral edges of ventrals usually dark brown.

Color (in life) : See original description.

SEXUAL DIMORPHISM : Dimorphism in ventral and subcaudal counts is clearly indicated by the data. There are fewer ventrals and more subcaudal shields in males than in females. There is no overlap in the range for these shields between sexes. In the ratio of tail length/standard length, the differences between sexes are equally striking, the tail in male specimens being much longer in proportion to the standard length than in the females.

By comparison, it is noteworthy that the total of ventral and subcaudal shield counts shows considerable overlap between sexes, and although there is a difference of five shields between the means of the counts, dimorphism is not very marked. This suggests that the total number of vertebrae present in these snakes is not subject to pronounced sexual dimorphism.

TABLE VI

Sexual dimorphism in several characters in the sample[3] *of* Pseudorabdion mcnamarae *from Negros Island.*

	Male			*Female*		
Character	*No.*	*Mean ± S. D.*	*Range*	*No.*	*Mean ± S. D.*	*Range*
Ventrals	11	130.6±3.48	126–135	9	141.1±3.41	136–145
Subcaudals	11	27.4±0.93	26–29	9	21.8±0.82	20–23
Ventrals + subcaud.	11	157.9±3.34	153–163	9	162.8±3.36	157–167
Tail length/SL	9	0.136±.006	.124–.145	9	0.097±.005	.090–.106

[3] Included in the calculations above are measurements and counts given by Taylor (1922a, p. 182) and those obtained from the specimens examined. The counts of the type of *P. minutum* are not included.

ECOLOGICAL NOTES: According to Taylor (1917, p. 364; 1922a, p. 181) the species was found to be common on Canlaon Volcano, at altitudes of 800 to 900 meters. Two of the specimens examined by us were collected at altitudes between 825 and 1130 meters. All specimens were taken from under logs and rotting trash piles. The stomachs of specimens examined in this study were empty, but Taylor states that they feed primarily upon earthworms. Females collected in December contained undeveloped eggs (Taylor, 1917, p. 364).

RANGE: *Luzon Island:* Kalinga Subprovince (Balbalan). *Negros Island:* Negros Occidental Province (Mount Canlaon; Cabagnaan area, 16 km. east of La Castellana); Negros Oriental Province (Lake Balinsasayao area; vicinity about 5 to 6 km. west of Luzuriaga).

Pseudorabdion taylori Leviton and Brown, new species.
Figures 9 and 10.

DIAGNOSIS: Loreal present; preocular shield absent; supraocular present; ocular shield not fused to other shields; anterior chin shields in contact with mental; subcaudals more than 30; maxillary teeth 7; distal portion of hemipenes calyculate.

HOLOTYPE: Museum of Comparative Zoology 25749, adult male, collected at Saub, Cotabato Province, Mindanao Island, by E. H. Taylor, April 24–25, 1923.

PARATYPES (2): CAS 85427, MCZ 25748 collected at same locality as the holotype and by same collector.

DESCRIPTION OF TYPE: Rostral moderate, visible from above, more broad than deep; internasals about two-fifths as large as prefrontals; latter shields

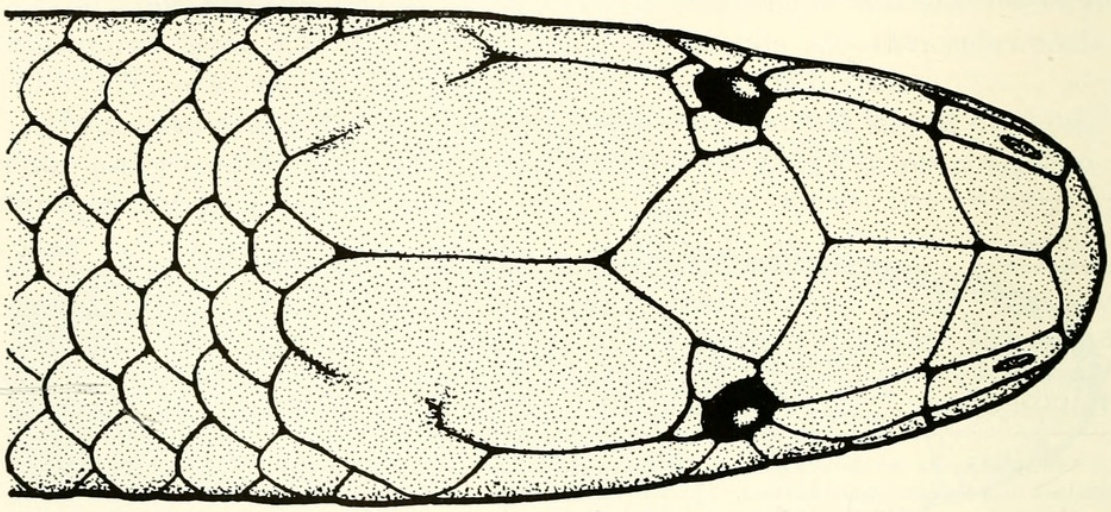

Figure 9. *Pseudorabdion taylori.* Dorsal view of head of holotype.

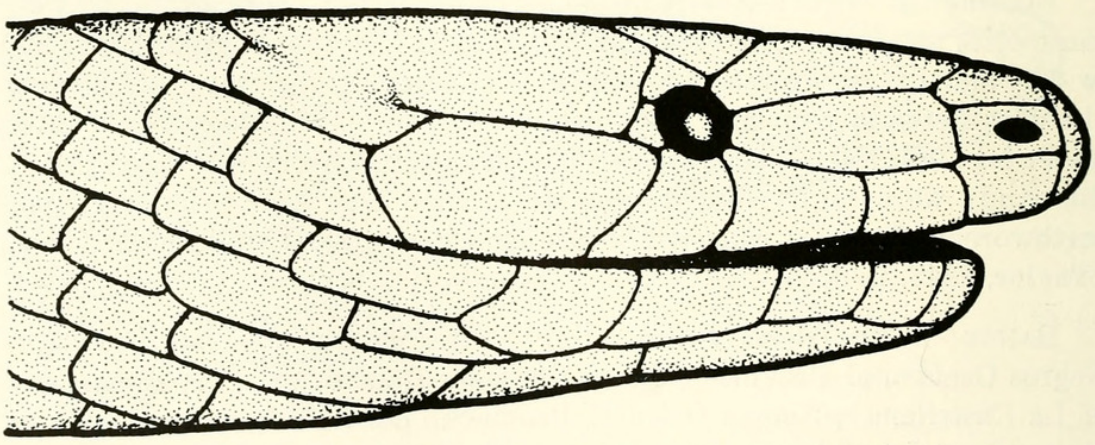

Figure 10. *Pseudorabdion taylori.* Lateral view of head of holotype.

large, bordering orbit; frontal large, about as long as wide, shorter than parietals, separated from border of orbit by a small supraocular; nasal shield large, rectangular, undivided, almost twice as long as deep, the nostril nearer to the anterior end; loreal elongate, more than twice as long as deep, in contact with two or three upper labials and with eye; one small postocular, not fused to supraocular; anterior temporals absent; five upper labials, the fifth the largest, the third and fourth bordering the orbit; mental in contact with anterior chin shields; five lower labials, the first three in contact with the anterior chin shields; posterior chin shields about two-thirds as long as anterior pair.

Scales in 15 longitudinal rows throughout; caudodorsal scales reduce 6 (2+3 [22–24] 4; ventrals 122; subcaudals 40; anal plate single.

Hemipenes extend to the twelfth subcaudal plate, forked at end of ninth plate; proximal half with narrow longitudinal ridges followed just in front of the forked area by a few transverse plicae; forked sections calyculate; spines absent.

Measurements (in mm.): Standard length 170; tail length 41; head length 9.0; head width 4.8; snout length 3.0; diameter of eye 0.8.

Color (in alcohol) above uniform medium brown; below immaculate light tan; no prominent markings of any kind present. Under the microscope each of the dorsal scales is seen to be edged posteriorly by slightly darker brown than the rest of the scale.

VARIATION: Variations among the three available specimens were limited to expected differences in ventral and subcaudal counts. Counts and measurements for these specimens are summarized in table VII.

TABLE VII

Summary of counts and measurements for specimens of Pseudorabdion taylori.

Specimen	*Sex*	*Ventrals*	*Subcaudals*	*Standard Length*	*Tail Length*
MCZ 25748	♀	131	35	195	34
MCZ 25749	♂	122	40	170	41
CAS 85427	♀	134	33	189	32

SEXUAL DIMORPHISM: As evidenced by the data given in table VII, the sexes markedly differ in ventral and subcaudal counts and in the tail length/standard length ratio.

REMARKS: *Pseudorabdion taylori* is very close to *P. mcnamarae,* differing principally in the more numerous subcaudal shields, longer tail, and in the proportionally larger head shields. Comparison of one specimen of

P. taylori and one of *P. mcnamarae,* both females and both of approximately the same size, illustrate these differences:

	P. taylori	*P. mcnamarae*
Standard length	189mm.	185mm.
Tail length	32.0	17.5
Snout length	3.2	2.4
Diameter of eye	0.7	0.6
Nasal shield (length/width)	1.1/0.5	0.7/0.3
Rostral (broad/deep)	1.5/1.1	1.0/1.0
Frontal (length/width)	2.5/2.4	1.8/1.8

The two species also differ in the detailed ornamentation of the hemipeneal walls, being calyculate in the forked sections in *P. taylori* and minutely spinose in *P. mcnamarae.*

Pseudorabdion taylori may be related to the Bornean species *P. saravacensis* and *P. albonuchalis.* However, the structure of the hemipenes is unknown for either of these latter species. There are marked differences in head scale pattern between *P. albonuchalis* and *P. taylori* and in dentition between *P. saravacensis* and the new species.

SUMMARY

Upon reexamination of the type species of the genera *Pseudorabdion, Typhlogeophis,* and *Agrophis,* it is concluded that they are congeneric. *Typhlogeophis brevis, T. ater, Agrophis saravacensis, A. sarasinorum,* and *Geophis (= Agrophis) albonuchalis* are transferred to *Pseudorabdion.* Also included in *Pseudorabdion* are *P. longiceps, P. mcnamarae, P. minutum,* and *P. oxycephalum.* Two new species are described, *P. montanum,* from Negros Island, and *P. taylori* from Mindanao Island. *Pseudorabdion minutum* is regarded as a synonym of *P. mcnamarae,* and *Typhlogeophis brevis* a synonym of *P. oxycephalum.*

LITERATURE CITED

BARBOUR, THOMAS

1912. A contribution to the zoogeography of the East Indian Islands. *Memoirs of the Museum of Comparative Zoölogy, Harvard College,* 44:1–203, 8 pls.

BLANFORD, W. T.

1881. On a collection of reptiles and frogs, chiefly from Singapore. *Proceedings of the Zoological Society of London,* 1881: 215–227.

BOETTGER, OSCAR

1886. Aufzählung der von den Philippinen bekannten Reptilien und Batrachier. *Bericht über die Senckenbergische natursforschende Gesellschaft,* 1886; 91–134.

BOETTIGER, OSCAR—Cont.

1892. Liste von Kriechtieren und Lurchen aus dem tropischen Asien u. aus Paupuasien. *Bericht Offenbacher verein für naturkunde*, 21–22: 65–157.

1898. Katalog der Reptilien-Sammlung im Museum der Senckenbergischen Naturforschenden Gesellschaft in Frankfurt am Main. II. Teil (Schlangen). Frankfurt am Main, ix + 160 pp.

BOULENGER, GEORGE ALBERT

1885. A list of reptiles and batrachians from the Island of Nias. *Annals and Magazine of Natural History*, ser. 5, vol. 16:388–389.

1894. Catalogue of the snakes in the British Museum (Natural History). Volume II, containing the conclusion of the Colubridae aglyphae. London, xi + 382 pp., 20 pls.

1896. Catalogue of the snakes in the British Museum (Natural History). Volume III, containing the Colubridae (opisthoglyphae and proteroglyphae), Amblycephalidae and Viperidae. London, xiv + 727 pp., 25 pls.

1897. A catalogue of the reptiles and batrachians of Celebes, with special reference to the collections made by Drs. P. and F. Sarasin in 1893–1896. *Proceedings of the Zoological Society of London*, 1897: 193–237, pls. 7–16.

1903. Report on the batrachians and reptiles. In: Annandale, N., and Robinson, H. C., Fasciculi Malayensis. Zoology. Part I. University Press of Liverpool, pp. 127–176, pls. 5–10.

1912. A vertebrate fauna of the Malay Peninsula from the Isthmus of Kra to Singapore including the adjacent islands. Reptilia and Batrachia. London, xiii + 294 pp.

BOURRET, RENÉ

1936. Les serpents de l'Indochine. Part II. Catalogue systematique descriptif. Toulouse, 505 pp.

BRONGERSMA, L. D.

1931. Reptilia. In: Résultats scientifique du voyage aux Indes Orientales Néerlandaises de LL. AA. RR. le Prince et la Princesse Léopold de Belgique. *Mémoires du Musee Royal d'Histoire naturelle de Belgique*, Hors série, 5:3–39, 4 pls.

1933. Herpetological notes I–IX. *Zoologische Mededeelingen*, 16:1–29.

1934. Contributions to Indo-Australian herpetology. *Zoologische Mededeelingen*, 17:161–251, pls.

CANTOR, THEODORE

1847. Catalogue of reptiles inhabiting the Malayan Peninsula and islands. *Journal of the Asiatic Society of Bengal*, 16:897–952.

CHASEN, F. N., and N. SMEDLEY

1927. A list of reptiles from Pulau Galang and other islands of the Rhio Archipelago. *Journal of the Malayan Asiatic Society, Singapore*, 5:351–355.

DOWLING, HERNDON G.

1951. A proposed standard system of counting ventrals in snakes. *British Journal of Herpetology*, 1(5):97–98.

DUMÉRIL, AUGUSTE HENRI ANDRE

1853. Prodrome de la classification des reptiles ophidiens. *Mémoires de l'Academie des Sciences de l'Institut de France*, 23:399–536, 2 pls.

DUMÉRIL, ANDRE MARIE CONSTANT, GABRIEL BIBRON and A. H. A. DUMÉRIL

1854. Erpétologie général ou histoire naturelle complète des reptiles. Paris, vol. 7, part 1, xvi + 780 pp.

ELERA, CASTO DE

1895. Catálogo sistemático de toda la Fauna de Filipinas conocida hasta el presente, y á la vez el de la coleccion zoológica del Museo de PP. Dominicos del Colegio-Universidad de Sto. Tomas de Manila, escrito con motivo de la Exposición Regional Filipina. Manila, vol. 1, viii + 701 pp.

FLOWER, STANLEY SMYTH

1896. Notes on a collection of reptiles and batrachians made in the Malay Peninsula in 1895–96; with a list of the species recorded from that region. *Proceedings of the Zoological Society of London*, 1896: 856–914, pls. 44–46.

1899. 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. *Proceedings of the Zoological Society of London*, 1899: 600–696, pls. 36–37.

GRIFFIN, LAWRENCE E.

1911. A checklist and key of Philippine snakes. *The Philippine Journal of Science*, sect. D, vol. 6:253–268.

GÜNTHER, ALBERT

1858. Catalogue of colubrine snakes in the collection of the British Museum. London, xvi + 281 pp.

1864. The reptiles of British India. London, xxvii + 452 pp., 26 pls.

1873. Notes on some reptiles and batrachians obtained by Dr. Adolf Bernhard Meyer in Celebes and the Philippine Islands. *Proceedings of the Zoological Society of London*, 1873: 165–172, pls. 17–18.

1879. List of the mammals, reptiles and batrachians sent by Mr. Everett from the Philippine Islands. *Proceedings of the Zoological Society of London*, 1879: 74–79, pl. 4.

1896. Description of two new species of snakes from Sarawak. *Annals and Magazine of Natural History*, ser. 6, vol. 17:228–229.

HAAS, C. P. J. DE

1950. Checklist of the snakes of the Indo-Australian Archipelago. (Reptiles, Ophidia). *Treubia*, 20:511–625.

JAN, GEORG

1862. Prodromo della iconografia generale degli ofidi. V. Gruppo: Calamaridae. *Archivio per la Zoologia*, 2:xii + 76, pls. 6–8, 17, d, f (of reprint; original not seen).

1863. Elenco sistematico degli ofidi descritti e disegnati per l'iconografia generale. Milano, vii + 143 pp.

JAN, GEORG—Cont.

1865. Iconografia generale des ophidiens. Paris, Livraison 10, pl. 3.

JEUDE, LIDTH DE

1890. Reptilia from the Malay Archipelago. II. Ophidia. In: Weber, M., *Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien*. No. 2, pp. 178–192, pls. 15–16.

LEVITON, ALAN EDWARD

1958. Reinstatement of the generic name Rabdion A. H. A. Duméril, for a monotypic genus of Asian burrowing snakes. *Herpetologia*, 14:47–48.

LÖNNBERG, EINAR, and HIALMAR RENDAHL

1925. Dr. E. Mjöberg's zoological collections from Sumatra. 2. Reptiles and batrachians. *Arkiv för Zoologi, Stockholm*, 17A(23):1–3.

MÜLLER, F.

1894a. Reptilien und Amphibien aus Celebes. *Verhandlungen der Naturforschenden Gesellschaft in Basel*, 10:825–843.

1894b. Reptilien und Amphibien aus Celebes. (II. Bericht.) *Verhandlungen der Naturforschenden Gesellschaft in Basel*, 10:862–869.

PETERS, WILHELM CARL HARTWIG

1861. Übersicht (vergl. Monatsberichte 1859, p. 269) der von Hrn. F. Jagor auf Malacca, Java, Borneo und den Philippinen gesammelten und dem Kgl. zoologischen Museum übersandten Schlangen. *Monatsberichte der Königlichen Preussischen Akademie der Wissenschaften zu Berlin*, (1862), pp. 683–691.

ROBINSON, HERBERT C., and C. B. KLOSS

1920. Nominal list of the species of reptiles and batrachians occurring in Sumatra. *Journal of the Federated Malay States Museums, Kuala Lumpur*, 8:297–306.

ROOIJ, NELLY DE

1917. The reptiles of the Indo-Australian Archipelago. II. Ophidia. Leiden, xiv + 324 pp.

1922. Fauna Simalurensis. Reptilia. *Zoologische Mededeelungen*, 6:217–238.

SCHENKEL, E.

1901. Achter Nachtrag zum Katalog der herpetologischen Sammlung des Basler Museums. *Verhandlungen der Naturforschenden Gesellschaft in Basel*, 13:142–199.

SHELFORD, R.

1901a. A list of the reptiles of Borneo. *Journal of the Straits Branch of the Royal Asiaaic Society, Singapore*, 1901: 43–69.

1901b. On two new snakes from Borneo. *Annals and Magazine of Natural History*, ser. 7, vol. 8:516–517.

SMEDLEY, N.

1931. Notes on some Malaysian snakes. *Bulletin of the Raffles Museum*, no. 5, pp. 49–54.

SMITH, MALCOLM ARTHUR

1916. On a collection of reptiles and batrachians from Peninsula Siam. *Journal of the Natural History Society of Siam*, 2:148–171.

1922. On a collection of reptiles and batrachians from the mountains of Pahang, Malay Peninsula. *Journal of the Federated Malay States Museums, Kuala Lumpur*, 10:263–282.

1930. The Reptilia and Amphibia of the Malay Peninsula from the Isthmus of Kra to Singapore including the adjacent islands (A supplement to Dr. G. A. Boulenger's Reptilia and Batrachia, 1912). *Bulletin of the Raffles Museum*, no. 3, pp. xviii + 149.

STOLICZKA, F.

1873. Notes on some species of Malayan Amphibia and Reptilia. *Journal of the* Asiatic Society of Bengal, 42:111–126, pl. 11.

SUVATTI, CHOTE

1950. The fauna of Thailand. Bangkok Dept. Fisheries, ii + 1100 pp.

SWORDER, G. H.

1923. A list of the snakes of Singapore Island. *Singapore Naturalist*, 2:55–73.

TAYLOR, EDWARD HARRISON

1917. Snakes and lizards known from Negros, with descriptions of new species and new subspecies. *The Philippine Journal of Science*, sect. D, vol. 12, pp. 353–382, 2 pls.

1922a. The snakes of the Philippine Islands. *Bureau of Science, Manila, Monograph 16*, 312 pp., 37 pls.

1922b. Additions to the herpetological fauna of the Philippine Islands, I. *The Philippine Journal of Science*, 21:161–205, pls. 1–7.

1928. Amphibians, lizards, and snakes of the Philippines. In: Dickerson, R., Distribution of life in the Philippines. *Bureau of Science, Manila, Monograph 21*, pp. 214–242, pls. 27–32.

TWEEDIE, M. F. W.

1953. The snakes of Malaya. Singapore, 139 pp., 12 pls.

1957. The snakes of Malaya. Singapore, 2nd Ed., 143 pp., 165 pls.

WERNER, FRANZ

1896. Zweiter Beitrag zur Herpetologie der indo-orientalischen Region. *Verhandlungen der kaiserlich-königlichen Zoologisch-botanischen Gesellschaft in Wien*, 46:6–24, pl. 1.

1929. Übersicht der Gattungen und Arten der Familie Colubridae. III. Teil (Colubridae). *Zoologische Jahrbücher*, 57:1–196.