

CONTRIBUTIONS TO A REVIEW OF PHILIPPINE
SNAKES, III

THE GENERA MATICORA AND CALLIOPHIS

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ONE TEXT FIGURE

Two genera of small coral snakes (Family Elapidæ) are found in the Philippines. The genus *Maticora* is known from the Palawan Archipelago, Mindanao, Samar, and Jolo islands; *Calliophis* is known from Luzon, Polillo, Negros, Panay, and Cebu (Fig. 1). The two genera have not been taken together in the same island though Casto de Elera and Fischer reported *Calliophis* to have been taken in Mindanao, and Griffin listed *Maticora* from Manila, Luzon; these records are seriously doubted by this writer. While the Philippine populations of *Maticora* are very closely allied to populations of that genus extant in Borneo and elsewhere in western Indonesia and Malaya, the Philippine species of *Calliophis* is only distantly allied to its sole congener in western Indonesia, *C. gracilis*. The distinctness of the Philippine species of *Calliophis* and its restricted distribution in the Philippines (to the western Visayan and Luzon island groups) clearly indicates that the genus attained the Philippines long before the related genus *Maticora*.

Though similar in external appearance, the two genera differ strikingly in the development of their venom glands. These glands are of normal size and placement in *Calliophis*. In *Maticora* they are unique; they are exceedingly elongate and extend far back into the body cavity. In external appearance the two genera may be distinguished easily by color pattern, *Maticora* being striped, *Calliophis* barred on the dorsum, and in the Philippine species of both genera, in longitudinal dorsal scale rows at midbody, *Maticora* having 13, *Calliophis* 15.

The Philippine species of these genera are treated in detail below.

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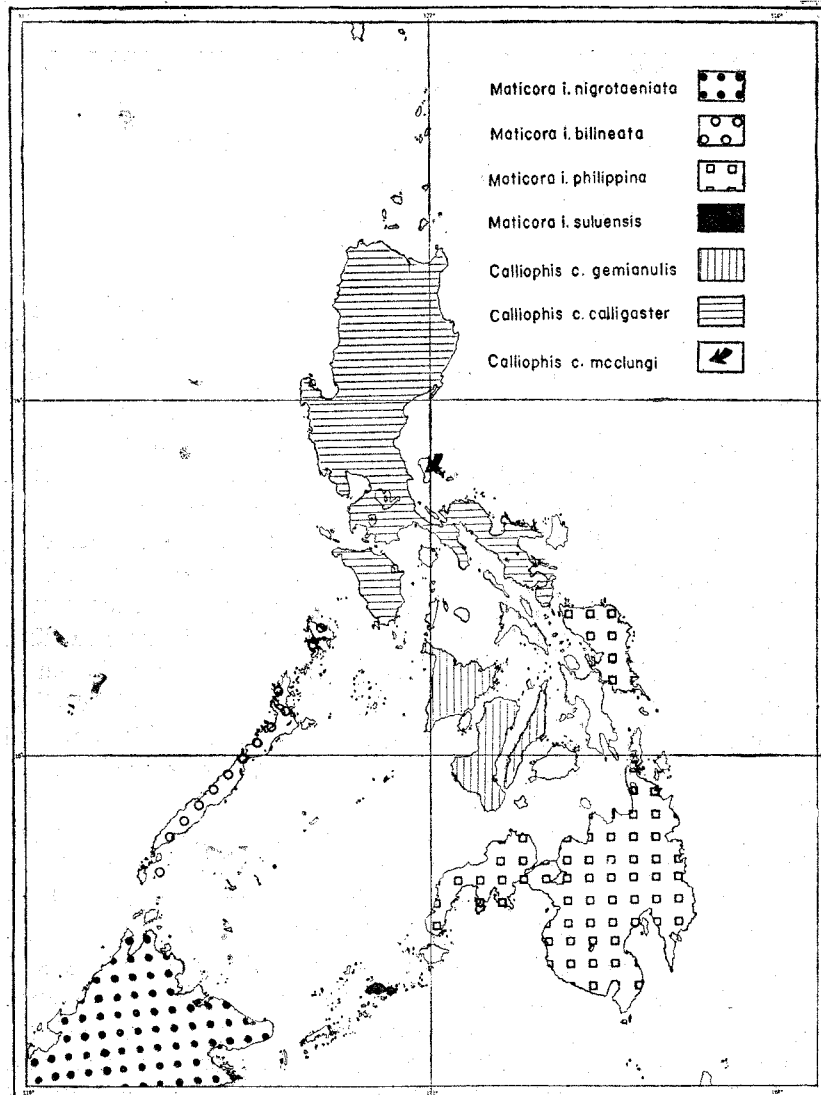


FIG. 1. Distribution of the Philippine species and subspecies of the genera *Maticora* and *Calliophis*.

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TERMINOLOGY

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

*: following locality listed under "Range" indicates specimens were seen from that site.

Scale reduction formula: 15(3 + 4 [90 — 100]) 13 indicates that dorsal scales reduce from 15 to 13 by fusion of third and fourth rows (on each side) between ventrals 90 and 100.

Genus MATICORA Gray

Maticora GRAY 2 (1834) pl. 86, fig. 2 (type species *Maticora lineata* Gray, by monotypy).

Pseudelaps [nec Fitzinger (1826) Reptilia] FITZINGER (1843) 28 (type species *Elaps frucatus* Schneider, by original designation).

Gongylocormus FITZINGER (1843) 28 (type species *Elaps bivirgatus* Kuhl, by original designation).

Doliophis GIRARD (1857) 182 (type species *Elaps flaviceps* Cantor, by monotypy).

Helminthoelaps JAN (1859a) 518 [p. 7 of reprint] [type species *Elaps bivirgatus* Kuhl, by subsequent designation by Stejneger (1922)].

Adeniophis PETERS (1871) 578 (type species *Callophis furcatus nigrotaeniatus* Peters, by original designation).

Aspis [nec Laurenti (1768) Reptilia] BARBOUR (1914) 92 (type species *Aspis intestinalis* Laurenti, by original designation).

Definition.—Maxilla extends forward beyond palatine; venom fangs followed after a diastema by one small tooth; head not distinct from neck; loreal absent; nostril between nasals; eye small, pupil round; body cylindrical, very elongate; tail short; scales in 13 longitudinal rows at midbody; subcaudals paired; venom glands very elongate, extending far back into body cavity, and terminating in an elongate club-shaped end; hypapophyses present throughout vertebral column.

Remarks.—The genera *Calliophis* and *Maticora* as now understood were established by Peters, in 1871, after he showed that there was a very striking difference in the structure of the venom glands between the two groups. Except for this difference, in which the venom glands in *Maticora* extend far back into the body cavity but in *Calliophis* are confined to the

head region, the two genera cannot be distinguished. They are obviously closely related.

Stejneger [(1922) 7-8] reviewed the nomenclatural history of the nominal genus *Maticora* and of its synonyms. I have accepted his conclusions and use the name *Maticora* rather than *Doliophis* of earlier authors [Boulenger (1896) 399, Taylor (1922a) 273, *et alii*].

Nineteen nominal species and subspecies are now included in this genus. Two of these have been listed from the Philippines (*M. bilineata* and *M. intestinalis*); a third, based on a series of specimens from the Sulu Archipelago, had been overlooked by all earlier authors (*M. intestinalis suluensis* Steindachner).

Loveridge [(1944) 106] briefly reviewed the species of *Maticora*. He regarded *M. bilineata* as a subspecies of *M. intestinalis*. *Maticora philippina* was retained as a distinct species, differing from *M. intestinalis* in the proportionally smaller eye. As with other authors, Loveridge failed to account for Steindachner's species.

I have seen specimen of each of the nominal species and subspecies of *Maticora* in the Philippines, and all but one, *M. intestinalis immaculata* Loveridge, from extra-Philippine localities. It is my opinion that the Philippine populations of *Maticora* are conspecific with *maticora intestinalis*, but insular isolation has resulted in the evolution of morphologically distinct geographic populations which are treated herein as subspecies.

Key to the Philippine subspecies of Maticora intestinalis

- 1a. Black crossbars on venter do not come in contact with black of sides; prefrontals, and usually internasals and rostral always white (red in life); dorsolateral light stripe narrow, occupying only parts of the third and fourth, or fourth and fifth scale rows; a distinct white line always present on the sides, occupying the entire first scale row, or parts of the first and second rows. *M. i. bilineata*
- 1b. Black crossbars on venter come into contact with black of sides; prefrontals may or may not be lighter than rest of head; dorsolateral stripe broad, tan to reddish brown, occupying part or all of the fourth, all of the fifth, and usually part of the sixth scale rows; no distinct white line on sides.
 - 2a. Prefrontals cream colored (red in life?), lighter than rest of head; cream crossbars on venter do not extend onto side of body above first scale row *M. i. suluensis*
 - 2b. Prefrontals colored like rest of head; cream crossbars on venter extend onto side of body, often to the fourth scale row. *M. i. philippina*

MATICORA INTESTINALIS (Laurenti).

Aspis intestinalis LAURENTI (1768) 106.

Taxonomic notes.—Boulenger (1896) and Taylor (1922a) recognized two species of *Maticora* in the Philippines, *M. bilineata* and *M. philippina*.

Maticora bilineata has been distinguished from *M. philippina* by its presumably larger eye, and from *M. intestinalis* by having a shorter frontal shield. Both characters have been found to vary considerably. Loveridge (1944) concluded that *M. bilineata* was conspecific with *M. intestinalis*, but differences in color pattern seemed to justify their separation as distinct subspecies.

Maticora philippina has been distinguished from *M. intestinalis* on the basis of its smaller eye. In other characters, *M. philippina* closely resembles *M. intestinalis* from Borneo. Comparison of the ratio for the diameter of eye/distance to mouth (see Table 1) in small series of *M. intestinalis* from several islands indicates: (1) that there is considerable intra-population variation in this character, and (2) that the Philippine sample (excluding those from Palawan) tends to average a slightly smaller eye than samples from elsewhere. The marked similarity between the Philippine and Bornean samples which are distinguished by only one somewhat variable

TABLE 1.—Summary of the variation in the diameter of eye/distance to mouth ratio in *Maticora intestinalis*.

Island	N	Diameter of eye/ distance to mouth	
		Mean	Range
Singapore	3	0.99	0.86-1.10
Pulu Bakong	1	0.93
Sumatra	9	0.84	0.55-1.00
Pulu Tockus	1	0.79
Java	7	0.89	0.73-1.40
Borneo	1	0.83
Jolo	1	0.75
Mindanao	7	0.69	0.50-0.82
Samár	1	*
Palawan Archipelago	15	0.88	0.65-1.00

* Specimens too poorly preserved to obtain accurate measurements.

character suggests they are conspecific. In view of the fact that the Bornean population differs from *M. intestinalis* from Java, and elsewhere in relatively minor details of color pattern, it is only reasonable to conclude that the Bornean,

and as a consequence the Philippine populations, are thereby assignable to that species.

Boulenger [(1896) 402-404] recognized seven varieties (? subspecies) of *M. intestinalis*. Haas [(1950) 601-602] recognized five subspecies from Indonesia, and Wagner [(1954) 56] also lists five forms from Indonesia. Of the seven varieties listed by Boulenger (five varieties or subspecies recognized by others) and a new subspecies described by Loveridge (1944), six have been recorded from Borneo, two from Sumatra, and one each from Java and Malaya. A close examination of the situation reveals that each variation in color pattern has been assigned a name. Disregarding minor intra-population variation in color pattern, such as whether the narrow black bars on the venter tend to be narrower, equal to, or broader than the light interspaces, the following major differences in color pattern obtain: (1) a light median stripe is present bordered by brown or black and then flank by two wider light brown to reddish brown or gray dorso-lateral stripes; (2) the mid-dorsal stripe is black or dark brown, but the dorsolateral stripes are prominent, and are reddish brown, light brown, or gray, and may vary from one to almost three scale rows in width; and (3) the mid-dorsal light stripe is very prominent, tends to be narrow, is white or yellow (in alcohol) and usually bifurcates on the head; the dark dorsolateral stripes are usually obscured, but distinct light, narrow, lateral stripes are usually present.

The basic color pattern categories outlined above may be associated with geographically distinct populations. Category (1) is associated with specimens from the Malay Peninsula and western Sumatra; (2) characterizes individuals from Borneo and the Philippines (which may be further subdivided [see below]); and category (3) is associated with specimens from eastern Sumatra and Java.¹

The populations of this snake from Borneo and the Philippines may be subdivided into several morphologically and geographically distinct groups. Of these the most distinctive are represented by specimens from the Palawan Archipelago, from the eastern Philippines (excluding the Sulu Archipelago), and from the Sulu Archipelago. The Palawan-Calamianes population differs from the typical Bornean form in always having

¹In Sumatra, intergradation between Javanese-eastern Sumatran and Malayan-western Sumatran populations has resulted in a confusion of intermediate color patterns among individuals from that region.

a very distinct white line along the outer scale row, the black crossbars on the venter do not contact the black lateral color, and the light dorsolateral stripe is narrow and occupies parts of two rows of scales rather than the whole of two rows. Specimens from the eastern Philippines (excluding the Sulu Islands) agree with the Bornean form in color pattern, although there is a tendency for the black to be concentrated into rings rather than uniformly distributed over the dorsum. However, the eye tends to be smaller. Lastly, specimens from the Sulu Islands are similar in color pattern to typical Bornean specimens, but they differ in having fewer ventral shields.

In recognition of the differences among island populations outlined in the paragraphs above, the following subspecies of *Maticora intestinalis*² are recognized:

Maticora i. intestinalis—Java and eastern Sumatra

Maticora i. lineata—western Sumatra and Malaya

Maticora i. nigrotaeniata—Borneo, Celebes

Maticora i. bilineata—Palawan and Busuanga islands

Maticora i. suluensis—Sulu Archipelago (Jolo Island)

Maticora i. philippina—Mindanao and Samar islands

It is necessary to remark on the selection of a type locality of the *forma typica*. The type locality of *Aspis intestinalis* was given by Laurenti as "Africa. This is obviously erroneous. According to Laurenti's description, however, it is evident that his specimen belongs to the Javanese-east Sumatran population, for he indicates that the mid-dorsal stripe is bifurcated in front of the eyes:

Corpore aequali tenui; linea longitudinali dorsi, & laterum; dorsali ante oculos bifurcata.

I hereby select the island of Java as type locality of *Aspis intestinalis* Laurenti.

Diagnosis.—Venter usually with an alternating series of black and light crossbars; head, at least posteriorly, dark, subcaudals 15 to 33. Standard length: (♂) 578 mm, (♀) 505 mm; tail length: (♂) 47 mm, (♀) 40 mm.

Descriptive notes.—Maxillary teeth 1+1 (one fang followed after a diastema by a small tooth); diameter of eye equal to 0.5 to 1.4 times the vertical distance to the mouth; snout rounded; rostral about as broad as deep; prefrontals more

² Loveridge (1944) described *M. intestinalis immaculata* from Sarawak, Borneo, based on a single specimen which differed from typical Bornean individuals in lacking black crossbars on the venter. I strongly suspect that the example Loveridge had before him was abnormal in this character.

than twice as large as internasals; frontal slightly longer than broad, more than two times as broad as supraocular, as long as the distance to the rostral or beyond; nasal large, subtriangular, tapering posteriorly, undivided, with large nostril loreal absent; preocular 1, in contact with nasal and eye; postoculars 2; 1 large anterior temporal; 6 upper labials, third shield highest, third and fourth border orbit; 5 lower labials, the first pair in contact behind mental, the first three shields in contact with anterior chin shields; both pair of chin shields about equal in size; scales in 13 longitudinal rows throughout; dorsal scales reduce 15 (-2 [3-9]) 13; caudodorsal scales reduce 6 (2 + 3 [5-20]) 4; ventral and subcaudal counts see Tables 2 and 3 (counts according to Boulenger [(1896) 402] range as follows: ventrals 197 to 273; subcaudals 15 to 33); anal plate undivided.

Hemipenes extend to twelfth subcaudal plate, forked at tenth plate; sulcus spermaticus unforked; walls of organ uniformly spinose except at basal end.

Color (in alcohol) variable but basically dark brown to black above usually with a light mid-dorsal stripe, a light brown dorsolateral stripe, and frequently a light lateral stripe; below with an alternating sequence of black and light crossbars; tail cream above and below with black annuli. In life the cream-colored areas are probably red.

Inter-island variation.—Inter-island variation in color pattern and diameter of eye versus vertical distance to the mouth have already been discussed (see taxonomic notes above).

Variation in ventral and subcaudal counts cannot be clearly associated with geographic variation in all cases. The lowest ventral counts are found among specimens from the Riou Archipelago and Malay Peninsula and among specimens from the Sulu Archipelago. The Malay-Riou populations have already been distinguished as distinct subspecies on the basis of color pattern, and the tendency toward a lower ventral count may be an additional distinguishing character.

Among specimens from the Sulu Archipelago, one examined here, and sixteen others reported on by Steindachner [(1891) 295], the number of ventrals for both males and females ranged from 197 to 218. The similarity in color pattern obviously relates the Sulu sample to the Bornean population. However, specimens from Borneo as well as elsewhere in the Philippines average 30 to 40 ventrals more than the average of the Sulu Archipelago sample (compare diagnoses of subspecies).

In subcaudal counts the Javanese sample seems to average a slightly lower count in both sexes. The differences, however, are not great, and it is doubtful that any significance can be attached to them.

Body proportions are quite similar for all samples; they are subject to a marked sexual dimorphism. No inter-island variation could be detected in these proportions.

TABLE 2.—Summary of the variation in the number of ventral shields in *Maticora intestinalis*.

Island	Male			Female		
	N	Mean	Range	N	Mean	Range
Singapore	2	222.0	215-229	2	249.5	247-250
Pulu Bakong	1	209.0				
Sumatra	3	231.3	230-233	6	274.7	244-300
Pulu Tockus				1	241.0	
Java	2	251.5	250-253	6	279.5	272-289
Borneo (Kinabalo)	1	238.0				
Jolo	1	* 202.0				
Mindanao	5	242.8	236-250	4	248.8	237-258
Samar				1	270.0	
Balabac	1	240.0				
Palawan	8	252.6	236-260	3	275.0	266-285
Busuanga	3	234.0	232-237	1	256.0	

TABLE 3.—Summary of the variation in the number of subcaudal shields in *Maticora intestinalis*.

Island	Male			Female		
	N	Mean	Range	N	Mean	Range
Singapore	2	26.0	26	2	20.3	20-21
Pulu Bakong	1					
Sumatra	3	26.6	26-27	6	21.7	20-24
Pulu Tockus				1	22.0	
Java	2	23.0	22-24	6	19.7	16-22
Borneo	1	24.0				
Jolo	1	** 28.0				
Mindanao	6	27.8	25-30	4	23.5	20-27
Samar				1	21.0	
Balabac	1	28.0				
Palawan	9	28.8	24-31	3	23.6	23-25
Busuanga	2	27.5	27-28	1	25.0	

* This does not include Steindachner's data [(1891) 259].

** Tail damaged.

MATICORA INTESTINALIS BILINEATA (Peters).

- Callophis bilineatus* PETERS (1881) 109 (type loc: "Palawan" [= Palawan Island]; type in Berlin Museum; original description); BOETTGER (1886) 117 (listed).
- Adeniophis bilineatus* BOULENGER (1894) 84 (Balabac, Palawan; description); BOETTGER (1895) 5 (Busuanga; counts, distribution).
- Doliophis bilineatus* BOULENGER (1896) 404 (Balabac, Palawan [Puerto Princesa], Mindanao [doubtful]; synonymy, description, counts); BOETTGER (1898) 124 (Palawan, Culion; listed); (1911) 266 (distribution compiled; listed in key); TAYLOR (1922a) 274, pl. 34, figs. 5-6, pl. 35, fig. 3 (Palawan [Iwahig], Mindanao [doubtful]; synonymy, description, variation, measurements and counts of material examined, common names, distribution).
- Maticora intestinalis bilineata* LOVERIDGE (1944) 106 (listed in key); LEVITON (1961) 102 (listed in key; Balabac, Busuanga, Culion, Palawan).

Range.³—BALABAC *. Busuanga: Borac Bay *; Sungai *. PALAWAN: Iwahig *; Puerto Princesa *. CULION.

Material examined (18).—BALABAC: without exact locality (CM 2568). BUSUANGA: Borac Bay (SU 13235); Dimaniang (CNHM 53555); Sungai (SU 13234); without exact locality (CAS 62068). PALAWAN: Iwahig (CAS 62169 and 62170); Puerto Princesa (CAS 15814); without exact locality (CAS 62145 and 62146; CM 2569; USNM 38378; CNHM 15018, 15020, and 15021). PHILIPPINES: without exact locality (CAS 15347; CNHM 41120 and 41121).

Diagnosis.—Black crossbars on venter do not come in contact with black on side of body; prefrontals, and usually internasals, rostral and first 2 upper labials white (alcohol specimens); a distinct white line always present on side of body between first and second scale row, or the first scale row completely white; dorsum of tail with two or three black rings, otherwise red or cream but no black. Standard length: (♂) 464 mm, (♀) 431 mm; tail length: (♂) 39 mm, (♀) 28 mm.

Sexual dimorphism.—The small size of the available sample does not lend itself to adequate statistical analysis. Casual

³ Boulenger [(1896) 404] and Taylor [(1922a) 27] include Mindanao in the range of *M. i. bilineata*. Taylor's record is based on that of Boulenger. The latter had before him four specimens of this subspecies, one from Palawan, one from Balabac, and two said to have come from Mindanao. I doubt that *M. i. bilineata* occurs in Mindanao and suspect that the specimens from Mindanao which Boulenger had before him belong to *M. i. philippina*.

examination of the data suggests the sexes do differ in ventral counts, but not in subcaudal counts or point of reduction of the dorsal caudal scales from 6 to 4. This last point is of interest for it suggests that the tails of males and females are essentially of the same shape despite the presence of the paired copulatory organs in the tails of the former.

In the tail length/standard length ratio the differences between sexes are very marked, females have proportionately shorter tails and longer bodies than the males (see Table 4).

TABLE 4.—Summary of variation between sexes in the ratio of the tail length/standard length in *Maticora intestinalis bilineata*.

Sex	N	Mean	Range
Male.....	13	0.092	0.084-0.097
Female.....	4	0.067	0.065-0.071

MATICORA INTESTINALIS PHILIPPINA (Günther).

Elaps intestinalis var. GÜNTHER (1858) 230 (Philippines; color pattern).

Callophis intestinalis GÜNTHER (1859) 82, pl. 16, figs. A. & a (Philippine Islands; descriptions).

Callophis intestinalis var. *Philippina* GÜNTHER (1864) 349 (Type loc: Philippine Islands; type in British Museum; original description; MEYER (1870) 368 (notes presence of elongate venom glands).

Adeniophis philippinus MEYER (1886) 614 (south Mindanao; remarks; on venom gland and relationships); BOETTGER (1886) 117 (listed); Casto de Elera (1895) 441 (listed).

Doliophis philippinus BOULENGER (1896) 404 (redescription of type specimen); BOETTGER (1898) 124 (Mindanao; listed); GRIFFIN (1911) 266 (Luzon [Manila]; listed in key); TAYLOR (1918) 261 Mindano [Zamboanga City]; listed); (1922a) 277, pl. 35, figs. 1-2 (Luzon [Manila]), Mindanao [Bunawan; Zamboanga]; synonymy, description, measurements and counts of material examined, variation; habits); (1922b) 301 (Mindanao [Zamboanga]; notes on specimen).

Maticora philippina LOVERIDGE (1944) 106 (listed in key).

Maticora intestinalis philippina LEVITON (1961) 102 (Mindanao, Samar; listed in key).

Range.⁴—LUZON: Rizal Province (Manila). MINDANAO: Agusan Province (Bunawan *); Davao Province (Todaya *): Lanao Province (Lake Lanao*); Misamis Occidental Province

⁴I suspect that the specimens of *Doliophis bilineata* recorded by Boulenger [(1896) 404] from Mindanao belong here.

(Misamis *); Zamboanga Province (Miatan *; Zamboanga City *). SAMAR: without exact locality *.

Material examined (12).—Mindanao: Agusan Province. Bunawan (CM 2579 and 2580). Davao Province: Todaya (CNHM 53557 and 53558). Lanao Province: Lake Lanao CAS 15349). Misamis Occidental Province: Misamis (SU 15984). Zamboanga Province: Miatan, Katipunan (CNHM 68918); Zamboanga City (CAS 62031); without exact locality (CAS 15348). SAMAR: without exact locality (USNM 53536). PHILIPPINES: without exact locality (MCZ 25842 and 25843).

Taxonomic notes.—The type specimen of this subspecies was collected at an unknown locality within the Philippines. Boulenger's description of the specimen suggests it is most similar to a single specimen I have seen from Samar Island. However, the ventral count is very low (three are 18 shields less than the minimum number of shields counted among specimens examined here). The count seems to be closer to specimens from the Sulu Archipelago. In view of the doubtful origin and equally doubtful association of the specimen, I am reluctant to select a type locality at this time. Should an examination of the type specimen indicate that it belongs to the Sulu Archipelago population, then the nominal subspecies, or variety of Günther, *Callophis* [*sic*] *intestinalis philippinus*, would be conspecific with *Callophis* [*sic*] *intestinalis suluensis* Steindachner, and a new name would have to be proposed for the population inhabiting the main islands of the Philippine group.

Diagnosis.—Black crossbars on venter contact black on sides; dorsolateral stripe broad, tan or reddish brown; no distinct white line on sides along outer scale row; prefrontals colored as rest of head; cream crossbars on venter extend onto side of body, often to fourth scale row; ventrals 232 to 285. Standard length: (♂) 578 mm, (♀) 505 mm; tail length (♂) 47 mm, (♀) 40 mm.

Descriptive notes.—Diameter of eye/vertical distance to mouth 0.65 to 1.00 (mean = 0.88); frontal about as long as its distance from rostral; ventrals and subcaudals see Tables 2 and 3; dorsal scales reduce 17 (-2 [3-5]) 15 (-2 [6-9]) 13; caudodorsal scales reduce 6 (2 + 3 [5-20]) 4 (1 + 2 [19-28]) 2.

Cream colored crossbars on venter extend onto sides and on occasion touch dorsolateral stripe; 29 to 45 black crossbars on venter, 1 to 3 under tail.

Color (in life) "... above a dark yellowish brown, each scale edged with darker; a median darker line, beginning on neck, continuing the length of body, broken occasionally by a yellowish spot; on either side of this darker median line are 2 lighter stripes, below which the ground color breaks into bands which encircle belly; these narrow ventrally and number 43 on body, with 2 on tail; below, they are dark brown to black, covering 4 or 5 ventral scales, and are separated by orange colored bands, which cover 2 or 3 ventral scales but narrow on sides; they extend usually to fourth row of scales; the irregular series of dim light spots on the median dorsal dark line are between the ends of the light abdominal bands; head brown, with indistinct darker shading; darker between eyes and on tip of snout; a black spot in the middle of sixth labial; chin variously mottled with brown and light; first labials with light spots; a white line crosses sixth labial; chin spotted with dark; bands under tail a brilliant scarlet, much wider than those on belly, almost surrounding tail." [Taylor (1922a) 278.]

Sexual dimorphism.—The most striking differences between males and females of this subspecies lie in the subcaudal counts and in the tail length/standard length ratio. As expected, females have fewer subcaudals and shorter tails (see Tables 3 and 5).

TABLE 5.—Summary of variation between sexes in the ratio of tail length/standard length in *Maticora intestinalis philippina*.

Sex	N	Mean	Range
Male.....	5	0.093	0.084-1.10
Female.....	4	0.068	0.059-0.073

There is no clear difference between sexes in ventral counts; there is an extensive overlap in the range of ventral counts. The mean number of ventrals is slightly lower in males, however, and more adequate sampling will probably demonstrate that the number of ventrals is subject to sexual dimorphism.

Although it was thought that the number of black crossbars on the body might differ between sexes, such has not proved to be the case. In three females the number of crossbars range from 29 to 45; two females from Davao Province range from 29 to 36. The number of crossbars in four males range from 31 to 40 (mean = 38.3).

MATICORA INTESTINALIS SULUENSIS (Steindachner).

Callophis intestinalis suluensis STEINDACHNER (1891) 295 (type loc: Sulu Archipelago; type in Vienna Museum; original description).

Range⁵—SULU ARCHIPELAGO: Jolo*.

Material examined (1).—JOLO: without exact locality (SU 15983).

Diagnosis.—Black crossbars on venter contact black on side; dorsolateral stripe broad, tan or reddish brown; no distinct white line on sides along outer scale row; prefrontals cream colored (specimen in alcohol), or at least lighter than rest of head; cream colored crossbars on venter do not extend onto side of body above first scale row, ventrals 197 to 218. Standard length: (♂) 372 mm; tail length: (♂) 33 mm.

Descriptive notes.—Diameter of eye/distance to mouth 0.75; frontal equal to length of snout; ventrals 197 to 218; subcaudals 24 to 33; dorsal scales reduce 17 (–2[4–5]) 15 (–2[9]) 13; caudodorsal scales reduce 6 (2 + 3 [17]) 4 (at tip) 2; 39 black crossbars on venter, 3 on underside of tail.

Genus CALLIOPHIS Gray

Calliophis GRAY (1834) pl. 86, fig. 1 (type species *Calliophis gracilis* Gray, by monotypy).

Brachyrhynchus (nec Laport (1832) Hemiptera) FITZINGER (1843) 28 (type species *Elaps calligaster* Wiegmann, by original designation).

Callophis GÜNTHER (1859) 79 (erroneous subsequent spelling).

Hemibungarus PETERS (1862) 638 (type species *Elaps calligaster* Wiegmann, by monotypy).

Definition.—Maxilla extends forward beyond palatine; venom fangs followed by a diastema and then by from 1 to 5 small, solid teeth; head not distinct from neck; loreal absent; eye small, pupil round; body cylindrical, elongate; tail short; scales smooth, in 13 or 15 longitudinal rows throughout; subcaudals paired (rarely single in *C. maccelelandi*; hypapophyses developed throughout vertebral column; venom glands confined to head region (compare definition of genus *Maticora*).

Remarks.—Smith [(1943) 419] united *Calliophis* and *Hemibungarus* having shown that maxillary teeth are present in species of *Calliophis* said to have none. According to Smith only *C. gracilis* and *C. maccelelandi* lack solid maxillary teeth

⁵ This subspecies is known with certainty only from Jolo Island in the Sulu Archipelago. According to Steindachner, his specimens were collected in the "Sulu Inseln." It is not known whether Steindachner was referring to the whole of the Sulu Archipelago or to Jolo Island, whose old name was Sulu Island. In any event, this subspecies is known with certainty only from Jolo, which island I hereby select as type locality of Steindachner's subspecies.

behind the anterior fangs. I have examined specimens of *C. gracilis* from Kelantan, Malaya, and *C. maccellelandi* from Sikkim, India and Kosempo, Formosa. In each case a very small, solid maxillary tooth was found a short distance behind the grooved front fang.

Smith [(1943) 418], Boulenger [(1896) 396], and others have used Günther's amended spelling *Callophis* for Gray's nominal genus *Calliophis*. Günther's name by reason of its status as an erroneous subsequent spelling and a junior synonym, does not have any separate status in nomenclature from *Calliophis* Gray, and it must be replaced by Gray's spelling.

Taylor [(1922a) 268-273] included three species of *Hemibungarus* (= *Calliophis*) in the Philippine herpetofauna. Of these, *Hemibungarus collaris* (= *Elaps collaris* Schlegel) was shown by Schmidt [(1937) 362] to belong to genus of South American elapid snakes [see also Thompson (1913)]. He transferred *E. collaris* Schlegel, together with its total synonymy, including *Elaps gastrodelus* Duméril, Bibron, and Duméril (which he did not see), to *Leptomicrurus*. At my request Dr. Jean Guibé of the Museum d'Histoire Naturelle, Paris, re-examined the type of *Elaps gastrodelus* and concluded that it must be placed in the synonymy of *E. collaris* Schlegel (= *Leptomicrurus collaris*) as suggested by Schmidt. *Elaps calligaster* Wiegmann and *Hemibungarus mcclungi* Taylor, the two remaining species recognized by Taylor, and the nominal species *Hemibungarus gemianulis* Peters, which has usually been placed in the synonymy of *Elaps calligaster*, are properly included in the Philippine fauna.

The three nominal species of *Calliophis* from the Philippines are considered to be conspecific and are treated herein as a single species. However, insular isolation has resulted in the differentiation of the species into three geographically distinct populations; these are accorded subspecific rank.

Key to the subspecies of Calliophis calligaster

- 1a. Black rings on dorsum of body not divided by narrow white annuli; temporal region heavily pigmented with melanin; white annuli on dorsum usually less than 60.
- 2a. Ventrals: ♂, 223 to 233; ♀, 252 to 259 *C. c. calligaster*
- 2b. Ventrals: ♂, 206 (2 specimens) *C. c. mcclungi*
- 1b. Black rings on dorsum of body divided by narrow white annuli; temporal region not heavily pigmented with melanin; white annuli on dorsum usually more than 60; ventral; ♂, 197 to 216; ♀, 218 to 227 *C. c. gemianulis*

CALLIOPHIS CALLIGASTER (Wiegmann).

Elaps calligaster WIEGMANN (1834) 253, pl. 20, fig. 2.

Taxonomic notes.—*C. calligaster* is endemic to the Philippines; at least it has not yet been taken outside of the political boundaries of the Archipelago. It has been recorded from many of the larger islands in the Philippines, and it may be presumed that future collecting will demonstrate its presence on others as well. At present specimens have been collected on Luzon, Polillo, Panay, Negros, Cebu, and have been reported from Mindanao and elsewhere (see footnote 6.)

Specimens of *C. calligaster* from Luzon are characterized by high ventral counts and a color pattern in which the black rings are not divided by narrow white bands on the dorsum, though on the venter these black rings are occasionally divided by white crossbars. The lower portions of the temporal region are heavily pigmented with melanin (absent in young specimens). These characters agree in detail with Wiegmann's description and color plate of *E. calligaster*, based on a specimen said to have come from Manila. The Luzon population, therefore, must be regarded as the typical population.

Panay, Negros, and Cebu specimens have fewer ventrals than those from Luzon; furthermore, the black rings are divided on the dorsum by narrow white annuli which extend onto the venter; and the lower portions of the temporal region tend to lack the concentration of melanin pigment characteristic of the Luzon population. The lack of differentiation among specimens from Negros, Panay, and Cebu permits their grouping into a single "Visayan sample." Peters' nominal species *Hemibungarus gemianulis*, characterized as having black rings and half-rings more numerous than in *H. calligaster* and a whitish temporal region, appears to be based upon a specimen taken from one of these western Visayan Islands.

In 1922a, Taylor described *Hemibungarus mcclungi* from Polillo Island. This species was separated from *H. calligaster* because of its lower ventral count, absence of a black interocular bar, and proportional measurements. Taylor's specimen was a juvenile. Unfortunately, it was destroyed in 1942. A second specimen obtained by Taylor, in 1922, on Polillo Island and still in existence bears out some, but not all his conclusions. The existing specimen differs from Luzon individuals in its lower ventral count. It does not differ in proportional measurements or in color pattern. The single character serving

to differentiate *H. macleungi* from typical *H. calligaster* certainly does not suggest specific separation.

It should be noted that Taylor's description of *C. calligaster* is based upon an individual from Panay Island; his illustrations (Plate 33, figs. 1 and 2, and Plate 34, figs. 1 and 2) are obviously of Luzon specimens.

Diagnosis—Scales in 15 longitudinal rows throughout; 6 supralabials (rarely 7); anterior temporal in contact with 2 upper labials; preocular in contact with nasal; color pattern consists of an alternating series of broad black and red rings which are separated by narrow white annuli (in the adult the dorsal and lateral portions of the red rings become heavily suffused with black pigment. Standard length: (♂) 519 mm, (♀) 476 mm; tail length: (♂) 32 mm, (♀) 28 mm.

Descriptive notes.—One large venom fang followed after a considerable diastema by a small, solid tooth; rostral broader than deep; internasals smaller than prefrontals; frontal longer than broad, equal to or slightly longer than its distance from snout, 1.5 times as broad as supraocular, shorter than parietals; latter shields in contact with upper postocular only; nasal large, divided, in contact with at least 2, but more frequently 3 upper labials and with preocular; nostril large, between two nasals; 1 real absent; 1 preocular; 2 postoculars; 2 anterior temporals, the upper shield in contact with both postoculars, the lower with 2 upper labials; 6 upper labials, rarely 7, the third and fourth bordering orbit; 7 lower labials, the first pair usually in contact behind mental, the first four in contact with large anterior chin shields; scales in 15 longitudinal rows throughout; caudodorsal scales reduced from 6 to 4 near tip of tail; ventrals and subcaudals see Table 6 or account of subspecies; anal plate single.

Hemipenes extend to the seventh or eighth subcaudal plate, forked near tip; proximal two-thirds spinose, the spines of moderate and subequal size throughout; distal third calyculate, with minute spines set into margins of calyces.

Color (in alcohol); snout, nasal, and first 2 upper labials creamy yellow; dorsum of head (in adults) reddish brown to black, this color extending onto the third and fourth upper labials and may extend onto the temporal shields; a white postocular bar almost reaches the frontal, and a white stripe, originating at the angle of the jaws, passes forward and upward and ends either at or on the parietals. In the young

the dorsum of the head is cream, with a black interocular bar (very rarely absent), and occasionally a black median longitudinal stripe on the parietals present; the black rings on the body, which may or may not be divided by narrow white annuli, alternate with an equal number of black crossbars (red or cream in young specimens, and red or cream on the venter in adults) and are separated from the crossbars by narrow white annuli.

Ontogenetic variation.—Most pronounced in this species is the notable change in coloration which occurs during development of the individual from juvenile to adult. In young specimens, arbitrarily considered as individuals less than 270 mm in standard length, there is an alternating series of black and cream (in alcohol specimens, red in life) rings. These rings lack melanin pigment which invades the area in the adults. There is little melanin in the frontal, parietal, and temporal regions of the head, other than the concentration in the form of an interocular bar and nuchal chevron. The adults contrast sharply with the young for the dorsal portions of the red or cream rings become heavily infused with melanin as do also the shields of the posterior portion of the head.

TABLE 6.—Summary of the variation in the number of ventral shields in *Calliophis calligaster*.¹

Island	Female			Male		
	N	Mean \pm S.D.	Range	N	Mean \pm S.D.	Range
Luzon	9	254.3 \pm 2.27	249-259	15	227.5 \pm 3.11	223-233
Polillo				1	206	
Mindoro				1	231	
Negros	8	223.4 \pm 2.85	218-227	8	208.8 \pm 4.33	202-216
Panay	1	224		3	197.3	196-199
Cebu				1	201	

¹Includes data only from specimens examined. Literature records are excluded.

Inter-island variation.—Specimens from Panay, Negros, and Cebu islands appear to form a homogeneous group and are treated as a single sample. Specimens from Luzon, and a single recorded individual from Samar Island, reported by Peters [(1861) 689], constitute a second sample. The Polillo Island sample is based upon two specimens, one of which is no longer in existence.

Variations occurs in the amount of pigmentation in the temporal region and in the tendency for the black rings to be divided on the dorsum by narrow white annuli. Specimens

from Luzon, Polillo, and Samar do not have the black rings paired on the dorsum, though a short white crossbar may divide these rings on the venter. Specimens from Negros, Panay, and Cebu, on the other hand, have paired black rings, though the white annuli which divide the black rings may become somewhat obscure in large adults. As a result there is marked difference in the number of white rings present in the dorsal color pattern between the Visayan sample and those from other islands (see Table 7). The number of white rings for the entire sample of *C. calligaster* averages 63.6. If the Luzon and the Visayan samples are treated in a 2×2 contingency table, i. e., the number of specimens having more than 65 white annuli and the number having less than this number from each sample, the differences between the Visayan and Luzon samples prove to be statistically significant (see Table 8).

TABLE 7.—Summary of variation in the number of white annuli on the dorsum of the body in *Calliophis calligaster*.

Island	N	Mean \pm S.D.	Range
Luzon	12	51.0 \pm 5.33	44-75
Polillo	1		46
Visaya (Negros, Panay, Cebu)	15	75.8 \pm 2.32	60-83

TABLE 8.—Analysis of variance in the number of white annuli on the dorsum of body in two samples in *Calliophis calligaster*.

	Luzon	Visaya
White annuli > 65	1	14
White annuli < 65	11	1

Chi-square = 12.7 (Yates' correction)
P = < 0.01

No significant differences could be detected in the number of black rings in the samples being compared providing the paired rings in specimens of the Visayan sample are treated as if they were undivided.

As previously noted the amount of melanin pigment present in the temporal region also varies. Excluding young specimens, of 16 Visayan specimens exhibiting the adult color pattern, only 2 showed a tendency to darkening in this area. Of fourteen Luzon specimens having adult coloration, all were heavily pigmented in this region. This was also true for the single Polillo specimen available for study.

TABLE 9.—*Determination of sex of specimens examined by Boulenger in Calliophis calligaster.*

Specimen number ¹	Boulenger		Battersby ²	
	Sex	Ventrals	Sex	Ventrals
a'-----	♀	219	♂	222-1
'b-d'-----	♀	235	♂	234-1
	♀	229	♂	229-1
	♀	260	♀	257-1
e'-----	♀	221	♀	223-1

¹ After Boulenger [(1896) 393].

² Data kindly supplied by Mr. James C. Battersby who re-examined the specimens for me.

TABLE 10.—*Determination of sex of specimens examined by Taylor in Calliophis calligaster.*

Specimen number *	Locality *	Stated * sex	Ventrals *	Sub- caudals *	Sex should be
21-----	Luzon	♂	228	21	♂
22-----	do	♀	236	23	?
23-----	do	♂	233	19	♂
25-----	do	♂	250	23	♀
26-----		♀	216	29	?
27-----	do	♀	251	20	♀
28 **-----	do	♂	257	19	♀
	do	♀	222	19	♂
40 **-----	do	♀	256	12	♀
41 **-----	do	♀	228	20	♂
54 **-----	do	♀	224	20	♂
231 **-----	Panay	♂	197	20	♂

* After Taylor [(1922a) 270 and (1922c) 300].

** I have examined these specimens. Specimen 28 is at the Chicago Natural History Museum; specimens 40, 41, and 54 are in the California Academy of Sciences; and Number 231 at the Carnegie Museum, Pittsburg.

There is, in addition, a marked inter-island variation in ventral counts. Overlap in counts between Luzon females and Visayan males necessitated treating the sexes separately. It is evident from a cursory inspection of the data summarized in Table 6 that the differences in ventral counts between Luzon, Visayan, and Polillo Island populations are pronounced.

To avoid future controversy, it must be pointed out that previously published data on ventral counts for this species are confused. This results from the fact that many of the specimens were incorrectly sexed. For example, comparison of

my results correlating sex with ventral counts led me to suspect both Boulenger [(1896) 393] and Taylor [(1922a) 270 and (1922b) 300] incorrectly sexed their specimens. At my request, Mr. J. C. Battersby of the British Museum (Natural History) kindly re-examined the specimens reported on by Boulenger. His findings and those of Boulenger are compared in Table 9. It is evident that Battersby's data agree closely with those obtained by me, with one exception. Specimen 'e', a young female, 340 mm in total length, said to have been collected at Albay, southeastern Luzon, appears to be abnormal, assuming the locality datum is correct.

In regard to the data given by Taylor [(1922a) 270 and (1922c) 300] it is also obvious that the stated sex of several of his specimens are questionable (assuming his locality data are correct). I have had the opportunity of seeing several of his specimens and can confirm that they were incorrectly sexed. In Table 10, I have summarized Taylor's data and have indicated where there is disagreement as to the sex of individual specimens.

CALLIOPHIS CALLIGASTER CALLIGASTER (Wiegmann).

Elaps calligaster WIEGMANN (1834) 253, pl. 20, fig. 2 (type loc: Manila, Luzon Island; type in Berlin (?): original description; colored figure); GÜNTHER (1858) 231 ("Philippine Ids.": synonymy, color pattern); JAN (1859a) 6 ("Carthagene N.-Grenade" [in error]; pattern); PETERS (1861) 689 (Luzon [Daraga; Vulkan Ysarog; Albay]: listed); JAN (1873) Livr. 43, pl. 2, fig. 2.

Brachyrhynchus calligaster FITZINGER (1843) 28 (listed).

Elaps collaris var. *calligaster* DUMÉRIL, BIBRON, and DUMÉRIL (1854) 1226 (Luzon [Manila]: synonymy, diagnosis, description, color pattern: considers *E. collaris* Schlegel conspecific with *E. calligaster* Wiegmann).

Elaps calligaster JAN (1859b) 5-6 [LUZON (Manila): correction of locality error in (1859a) 6].

Callophis calligaster GÜNTHER (1859) 84 ("Philippine Ids.": listed); FISCHER (1885) 81 ("Süd-Mindanao": listed).

Hemibungarus calligaster MEYER (1869) 213 (not seen); BOETTGER, (1886) 117 (distribution compiled); CASTO DE ELERA (1895) 440 (Luzon [Bataan; Manila; Camarines Sur; Daraga] Mindanao, Paragua, Balabac); BOULENGER (1896) 393 (in part: Luzon [Albay]: synonymy, description, color pattern; counts; material examined); BOETTGER (1898) 122 (Luzon; listed); GRIFFIN (1911) 266 (distribution compiled; adds Luzon [Rizal; Laguna], Polillo; listed in key); TAYLOR (1922a) 269, pl. 33, figs. 1-2; pl. 34, figs. 1-2 (in part: distribution compiled: synonymy, measurements and counts, variation, material examined; description and color pattern based upon specimen of *C. calligaster gemianulis*); TAYLOR (1922b) 300 (Luzon [Los Baños]: measurements and counts for three specimens).

Calliophis calligaster calligaster LEVITON (1961) 100 (Luzon; listed in key).

Range.⁶—LUZON: Albay Province (Albay; Daraga); Bataan Province (Bataan); Camarines Sur Province (Mt. Isarog); Laguna Province (Los Baños*; Mt. Makiling*); Quezon Province (Villa Aurora*) Rizal Province (Binanga*; Manila; Montalban*). MINDORO: San José*.

Material examined (18).—LUZON: Laguna Province; Los Baños (CAS 61136 to 61142; CNHM 15050); Mt. Makiling (CAS 61314; CNHM 45751); Quezon (Tayabas) Province: Villa Aurora (USNM 142483); Rizal Province: Binanga (CAS 15343 and 15344); Montalban (CAS 15009; USNM 38663). MINDORO: San José (AMNH 73415). Without exact locality: USNM 37421, 56057 and 56058. PHILIPPINES: without exact locality (CAS 15342).

Diagnosis—Black rings on body not divided by narrow white annuli; narrow white rings on dorsum of body number 44 to 75; temporal region more or less heavily pigmented with melanin, with a distinct light vertical postocular stripe and a diagonal nuchal chevron bordering the area; ventrals 223 to 259; subcaudals 16 to 22. Standard length: (♂) 487 mm, (♀) 476 mm; tail length: (♂) 28 mm, (♀) 28 mm.

Sexual dimorphism—There is marked sexual dimorphism in ventral counts as evidenced in Table 6. The range of ventrals for males is 223 to 233 (mean = 227.7), and for females 252 to 259 (mean = 255.0).⁷

A clear distinction in subcaudal counts between sexes is not evident though females average fewer shields than males suggesting possible sexual dimorphism. Nine males range from 17 to 22 (mean = 19.9); 6 females range from 13 to 30 (mean = 17.6).

Body proportions are also subject to sexual dimorphism. The difference in the tail length/standard length ratio between sexes is obviously significant, although the means are close and there is some overlap in ranges (see Table 11).

⁶ *Calliophis calligaster* has been reported from Balabac, Paragua, and Mindanao by Casto de Elera, and from Mindanao by Fischer. These records need confirmation.

⁷ Previous literature records of ventral counts have been omitted from these ranges for reasons already given (see page 541).

TABLE 11.—Summary of the variation between sexes in the ratio of tail length/standard length in *Calliophis calligaster calligaster*.

Sex	N	Mean \pm S.E.	Range	Difference of means	t	P
Male	8	0.0577 \pm 0.0013	0.0522-0.0633	0.0075	3.47	<0.01
Female	6	0.0502 \pm 0.0018	0.0373-0.0577			

Ecological notes.—Little is known of this animal's habits. A single specimen, CNHM 45751, was found burrowed in the earth in the dipterocarp forest on Mt. Makiling. According to Taylor [(1922c) 300] several specimens were found at low altitudes on Mt. Makiling. Locality data for other specimens suggest the individuals were found principally at or near sea level.

The stomachs of all individuals examined but one (AMNH 73415) were empty. The one contained a single *Calamaria gervaisi*. This is in agreement with observations made on the Visayan sample, and it appears that these animals are ophiophagus.

No data are available on breeding habits.

CALLIOPHIS CALLIGASTER GEMIANULIS (Peters).

Hemibungarus gemianulis PETERS (1872) 587 (type loc: "Philippine Ids.": type in Berlin: original description).

Calliophis (Hemibungarus) gemianulis MÜLLER (1883) 18 (listed).

Hemibungarus gemmiannulis BOETTGER (1886) 117 (listed); CASTRO DE ELERA (1895) 441 (Mindanao).

Calliophis calligaster gemianulis LEVITON (1961) 100 (Cebu, Negros, Panay; listed in key).

Hemibungarus calligaster BOULENGER (1896) 393 (in part; "Philippines"; synonymy, description, counts, material examined); TAYLOR (1922a) 269 (in part; Panay [Iloilo]; synonymy, description, variation, measurements and counts, material examined, distribution).

Range ⁸.—CEBU: Antuwanga area *. NEGROS: Negros Occidental Province (La Carlota *); Negros Oriental Province (Dumaguete *; Batingil *; Silay *). PANAY: Iloilo.

Material examined (24).—CEBU: Antuwanga area (SU 18909). NEGROS: Negros Occidental Province: La Carlota

⁸Casto de Elera [(1895) 441] records a specimen from Mindanao, but I doubt his record.

(USNM 80579). Negros Oriental Province: Dumaguete (SU 7243, 12969); Batingil Sitio (SU 19005); Silay (USNM 78136 to 78148). PANAY: Iloilo (SU 12966 to 12968, CM 2581).

Diagnosis.—Black rings on body divided by narrow white annuli; white annuli on dorsum number 60 to 83; temporal region either light (cream or reddish in color) or very lightly spotted with melanin; ventrals 196 to 227; subcaudals 15 to 21. Standard length: (♂) 519 mm, (♀) 451 mm; tail length: (♂) 32 mm, (♀) 28 mm.

Sexual dimorphism.—As already noted in the typical population there is a marked difference between sexes in ventral counts. This is also true for the Visayan population; 12 males range from 196 to 216 (mean = 205.2); 9 females range from 218 to 227 (mean = 223.4). There is in addition a more pronounced difference between sexes in the Visayan sample in subcaudal counts than was evident in the sample from Luzon: 11 males range from 18 to 21 subcaudal plates (mean = 20.4); 9 females range from 15 to 18 plates (mean = 16.8).

The Visayan sample also shows sexual dimorphism in body proportions. The data for tail length/standard length ratios, summarized in Table 12, indicate that males have somewhat longer tails in proportion to body length than do females (the young of both sexes tend to have slightly longer tails in proportion to body length than do the adults).

TABLE 12.—Summary of the variation between sexes in the ratio of tail length/standard length in *Calliophis calligaster gemianulis*.

Sex	N	Mean ± S.E.	Range	Difference of means	t	P
Male	8	0.0679±0.0016	0.0592—0.0707	0.0900		5.57<0.01
Female	8	0.0583±0.0020	0.0465—0.0628			

Ecological notes.—Of the 24 specimens examined, and literature record of one specimen, only two specimens were found to have anything in their stomachs. These individuals, USNM 78139 and 78147, contained partially digested remains of a *Calamaria gervaisi* and a *Typhlops* sp., respectively. Nothing else is known of their food habits, or indeed, of any other aspects of their ecology. They undoubtedly are secretive animals likely to be found beneath the logs and underbrush.

CALLIOPHIS CALLIGASTER MCCLUNGI (Taylor).

Hemibungarus sp. GRIFFIN (1910) 214 (Polillo; listed).

Hemibungarus mcclungi TAYLOR (1922a) 272, pl. 33, pl. 34, figs. 3-4 (type locality: Polillo Island; type formerly in Bureau of Science, Manila, but destroyed during World War II [neotype designated below] original description, relationship to *H. calligaster* discussed); (1922b) 300 (Polillo [on road to Bislian]; scutellation, color in life).

Calliophis calligaster mcclungi LEVITON (1961) 100 (Polillo; listed in key).

Range.—POLILLO*.

Material examined (1).—POLILLO: on road to Bislian (CAS 62431).

Taxonomic notes.—The loss of the holotype of this nominal subspecies means there is no standard available for comparison. To insure stability in the application of Taylor's name to the population for which it was intended, I am selecting the only other specimen of the Polillo population presently in museum collections, California Academy of Sciences 62431, to stand as the neotype. It is eminently suited as a replacement for the lost holotype inasmuch as it comes from the type locality and is identical to the lost type in sex, body proportions, and color pattern. The neotype is described below.

Diagnosis.—Black rings on body not divided above by narrow white annuli; narrow white rings on body number 46 (white tends to be obscured by black); temporal region pigmented; ventrals 206.

Description of neotype (CAS 62431).—Young male; standard length 270 mm; tail length 23 mm. Dorsal scales in 15 longitudinal rows at midbody; ventrals 206; subcaudals 23. Upper labials 6 (on right side; left side damaged), third and fourth bordering eye; 1 preocular; 2 postoculars; temporals 1 + 2. Dorsum with 23 black rings, each ring divided below by a distinct whitish bar, each also narrowly edged anteriorly and posteriorly with whitish (which is sometime obscured by black); black rings separated from each other above by brownish interspaces and below by cream (red in life?) bars. Dark interocular bar, absent in holotype, is present; otherwise head color pattern as in Luzon population.

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