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REVIEW OF THE GENUS *BRACHYMELES*
(SCINCIDAE), WITH DESCRIPTIONS OF
NEW SPECIES AND SUBSPECIES

By

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INTRODUCTION

The genus *Brachymeles* occurs throughout the Philippine archipelago with the probable exception of the Palawan group in the west. The only record known to us for Palawan Island, noted by Brown (1956), is a single example of *Brachymeles schadenbergi*. This specimen from the E. H. Taylor collections at the California Academy of Science, San Francisco, California, (CAS 15571) has a registry entry indicating that it was collected on Palawan Island. However, Taylor does not include Palawan in the range of this species, or the genus, in his volume on the lizards of the Philippine Islands (1922), or in his later paper on additions to the herpetofauna of Palawan (1925). Also no specimens were obtained during our intensive exploration of central Palawan in 1961. It therefore seems probable that an error exists in the locality data for this CAS specimen. The genus is otherwise represented by populations of three or four different species on most of the larger islands or island groups.

Populations of those species which are least highly evolved toward the burrowing habit, retaining five digits on each limb, exhibiting only moderate shortening of the limbs, little elongation of the body, and little fusion or loss of head shields, have usually been referred to *B. gracilis* and *B. schadenbergi*. These species have been assumed to be widely distributed throughout the archipelago. Brown (1956), in a revision of the genus, recognized two geographic subspecies of *B. schadenbergi* and three of *B. gracilis*. The more highly evolved species, those exhibiting great reduction of limbs and a loss of some digits, have limited distribution, usually only one or two or a closely associated group of islands. Distribution patterns are shown in figures 1-3.

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Recent collections from the large island of Leyte in the eastern part of the archipelago, and more adequate samples from several widely separated populations on some of the other large islands, Mindanao in the south, Negros and Cebu in the center, and Mindoro and southern Luzon in the north, indicate that our concepts of the less highly evolved and widely distributed species complexes should be re-examined. Also, larger samples for some of the more highly evolved forms make possible more adequate descriptions of these species, and necessitates the recognition of one new species from Cebu Island. Species for which no additional information is available, relative to description or range, are included only in the key and tables. For a diagnosis of these species see Brown (1956). In this paper the species are arbitrarily divided into two groups; those exhibiting some reduction of digits and those which are pentadactyl. A key to the species is included at the close of the paper.

SPECIES WITH REDUCED NUMBER OF DIGITS

***Brachymeles vermis* Taylor.**

Brachymeles vermis TAYLOR, 1918, Philip. Jour. Sci., vol. 13, p. 255; Bubuan Island, Sulu Archipelago; holotype probably destroyed.

No new data available.

***Brachymeles bonitae* Duméril and Bibron.**

Brachymeles bonitae DUMÉRIL and BIBRON, 1839, Erpet. Gen., vol. 5, p. 777; Manila, Luzon Island; holotype in the Paris Museum of Natural History.

Brachymeles burksi TAYLOR, 1917, Philip. Jour. Sci., vol. 12, p. 275; Sumagui, Mindoro Island; holotype in the Museum of Comparative Zoology, Harvard University.

A larger series of this species complex from Mindoro Island makes possible a more adequate definition of the complex.

DEFINITION. A moderate-sized, slender form of *Brachymeles*, mature specimens measure about 58 to 79 mm. in snout-vent length; breadth of head about equal to the diameter of body; ratio of head breadth to snout-vent length about 0.059 to 0.077 for 20 specimens; limbs much reduced, length of hind limb about $2\frac{1}{2}$ to 5 percent of snout-vent length for 30 specimens; digits usually absent, or one very short stub may be present (populations of the Polillo Islands); frontal large; supranasals and prefrontals not in contact; frontoparietals only rarely so; no postnasal; two frenals; four supraoculars; usually one pair of nuchals; 22 to 24 midbody scale rows and 99 to 113 (mean 102.2 for 23 specimens) mid-dorsal scale rows between parietals and base of tail (table 1); venter brownish, scarcely lighter than the dorsum.

RANGE. This species complex is known from Luzon, Polillo and Mindoro Islands.

TABLE 1. Pertinent measurements and scale and digital counts for species of *Brachymeles* exhibiting loss of digits. (Numbers in parentheses = number of individuals from sample.)

	Snout-vent length at maturity (in mm.)	Midbody scale rows	Mid-dorsal scale rows between parietals and base of tail	Number of digits on fore limbs	Number of digits on hind limbs	Length of hind limb Snout-vent length
<i>B. pathfinderi</i> (Mindanao Island)	R = 58-61 (3)	22 (2) 23 (1)	59-67 (3)	5 (3)	4 (3)	R = 0.136-0.172 (3)
<i>B. elerae</i> (Luzon Island)	R = 69-71 (2)	22 (22)	83 (1)	4 (2)	4 (2)	R = 0.072-0.093 (2)
<i>B. wrighti</i> (Luzon Island)	R = -130 (1)	28 (1)	102 (1)	4 (1)	4 (1)	R = -0.075 (1)
<i>B. tridactylus</i> (Negros Island)	R = 68.8-79.9 (20)	22 (16) 23 (1) 24 (3)	93 (1) 94 (1) 95 (2) 96 (5) 97 (4) 98 (6) 99 (1)	3 (20)	3 (20)	R = 0.041-0.062 (20)
<i>B. cebuensis</i> (Cebu Island)	R = 55.0-74.4 (6)	22 (11) 24 (1)	85 (1) 86 (5) 87 (3) 88 (2) 89 (1)	3 (12)	2 (12)	R = 0.039-0.049 (6)
<i>B. samarensis</i> (Leyte Island)	R = 56.5-62.5 (8)	22 (9) 24 (1)	90 (1) 91 (1) 92 (1) 93 (3) 94 (2) 95 (2)	1 (1) 2 (6) 3 (4)	2 (7) 3 (4)	R = 0.046-0.067 (11)
<i>B. samarensis</i> (Samar Island)	R = -64.5 (1)	22 (2)	86 (1) 90 (1)	2 (2)	2 (2)	R = 0.066-0.069 (2)
<i>B. samarensis</i> (Luzon Island)	R = 60.0-65.2 (5)	22 (5) 24 (1)	90 (1) 93 (1) 94 (3) 96 (1)	1 (1) 2 (5)	2 (6)	R = 0.040-0.053 (2)
<i>B. bonitae</i> (Luzon Island)	R = 58.6-79.0 (3)	22 (2) 23 (1) 24 (1)	100 (2) 101 (1) 113 (1)	0 (4)	0 (4)	R = 0.029-0.032 (3)
<i>B. bonitae</i> (Polillo Island)	R = 69.0-71.0 (3)	22 (3)	104 (2)	0 (3)	0 (3)	R = 0.027-0.032 (3)
<i>B. bonitae</i> (Kalotkot Island)		22 (1) 23 (1)	104 (1) 106 (1)	2 (2)	1 (2)	R = 0.047-0.049 (2)
<i>B. bonitae</i> (Mindoro Island)	R = 63.0-78.2 (2)	22 (15) 23 (1)	97 (1) 99 (1) 100 (4) 101 (7) 103 (1) 104 (1) 105 (1)	0 (16)	0 (16)	R = 0.022-0.027 (14)
<i>B. vermis</i> (Jolo Island)	R = 61.0-76.0	22 (5) 24 (1)	104 (1) 105 (1) 106 (2) 108 (1) 109 (1)			

Brachymeles samarensis Brown.

Brachymeles samarensis BROWN, 1956, *Breviora*, Mus. Comp. Zool., no. 54, pp. 6, 7; Guisian, Samar Island; holotype in Chicago Natural History Museum.

This species was described on the basis of a single specimen. An additional specimen from Samar and a series from Leyte and Becol Peninsula, Luzon, makes possible a more adequate definition of this species complex.

DEFINITION. A small species; snout-vent length about 56 to 65 mm. for 13 adult specimens; breadth of head about equal to diameter of body; ratio of head breadth to snout-vent length about 0.065 to 0.083 for 17 specimens; limbs much reduced, length of hind limb about 4 to 7 percent of snout-vent length for 18 specimens; usually two very short digits on both fore and hind limbs, occasionally only one or as many as three may be evident; frontal shield is small; supranasals separate; frontoparietals in contact; prefrontals in contact for the Leyte and Samar examples but slightly separated in Luzon examples; two frenals; five supraoculars; usually one pair of nuchals; 22 to 24 midbody scale rows and 86 to 96 (mean 92.6 for 18 specimens) mid-dorsal scale rows between parietals and base of tail (table 1); venter brownish, scarcely lighter than the dorsum.

RANGE. This species complex is known from Leyte, Samar, and the Becol Peninsula of Luzon just north of Samar.

Brachymeles tridactylus Brown.

Brachymeles tridactylus BROWN, 1956, *Breviora*, Mus. Comp. Zool., no. 54, pp. 7, 8; Mayaposi area, southcentral Negros Island; holotype in Division of Systematic Biology, Stanford University.

The original description of this species was based on a series of four specimens; a large series now makes possible a more adequate definition.

DEFINITION. A moderate-sized, slender species of *Brachymeles*, 68 to 80 mm. in snout-vent length for 30 mature specimens; breadth of head about equal to diameter of body; ratio of head-breadth to snout-vent length about 0.065 to 0.080 for 20 specimens; limbs much reduced, length of hind limb about 4 to 6 percent of snout-vent length for 20 specimens; three short digits present on both fore and hind limbs; frontal large; supranasals, prefrontals and frontoparietals not in contact; no postnasal; two frenals; four supraoculars; usually one pair of nuchals; 22 to 24 midbody scale rows and 93 to 103 (mean 96.9 for 21 specimens) mid-dorsal scale rows between parietals and base of tail (table 1); venter brownish in color, scarcely lighter than the dorsum.

RANGE. This species is known only from Negros Island north of about 9°30'N. latitude.

Brachymeles cebuensis Brown and Rabor, new species.

HOLOTYPE. Stanford University no. 24400, a mature female, collected about 40 km. southwest of Cebu City, Cebu Island, Philippine Islands, January, 1964, by Filemeno Empeso.

PARATYPES. SU 24396-97, 24399, 24401, 24403; BM 1966.188; CAS 102405; FMNH 154810; MCZ 85758; USNM 159757. From same locality as holotype.

DIAGNOSIS. A small, slender *Brachymeles*, snout-vent length 55.0 to 74.0 mm. for 12 mature specimens; limbs much reduced, length of hind limb about 4 to 5 percent of snout-vent length; frontoparietals usually in contact, separating frontal from interparietals; no postnasal; five supraoculars.

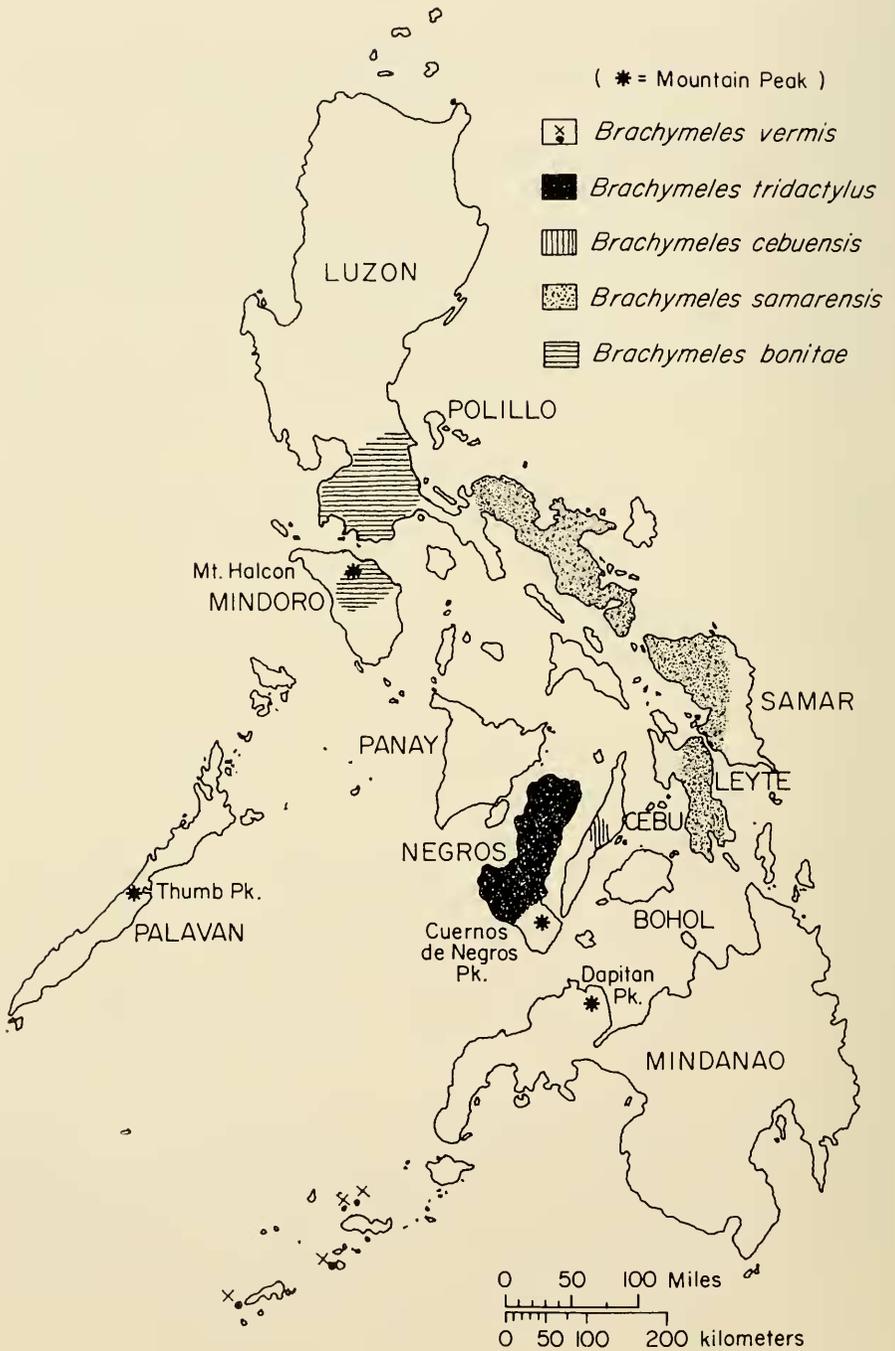
DESCRIPTION. A small, very slender species of *Brachymeles*; snout-vent length 59.8 to 62.1 mm. for four mature males and 55.0 to 74.4 mm. for eight mature females; breadth of head about equal to diameter of body, ratio of head breadth to snout-vent length 0.066 to 0.080 for 11 specimens; snout rounded; rostral large, tapering posteriorly in contact with the frontonasal; nostril in a small nasal surrounded by the rostral, first upper labial and a large supranasal; no postnasal; two frenals; fourth upper labial beneath the eye; frontal short; prefrontals in contact or barely separate; frontoparietals in contact; five supraoculars; interparietal large but not separating the parietals; usually one pair of nuchals; eye small; no external evidence of ear; number of midbody scale rows 22 to 24; number of scale rows between parietals and base of tail 84 to 89 (mean 86.7 for 12 specimens); limbs much reduced, length of hind limb about 4 to 5 percent of snout-vent length; digits reduced, two on hind limb and three on fore limb (table 1).

COLOR (in preservative). Dorsum and upper lateral surfaces brownish; the basal part of each scale with three or four small blackish spots extending out from which are numerous brown lines more-or-less fused. The distal part of each scale is usually almost without pigment; venter about the same shade of brown but each scale usually more uniformly pigmented.

MEASUREMENTS OF HOLOTYPE. Snout-vent length 55.0 mm.; axilla-groin 41.8 mm.; head breadth 4.2 mm.; length of snout 2.2 mm.; length of hind limb 2.2 mm.

COMPARISONS. This is a member of that group of species in which the habitus is very slender and the limbs much reduced or absent. The number of mid-dorsal scale rows between the parietals and the tail is usually lower than is characteristic of *B. tridactylus*, *B. samarensis*, and *B. bonita*. It also differs from these species in that the frontoparietals are usually in contact. The number of digits on hind limbs is fewer than for *B. tridactylus* and on the fore limb greater than is usually true for *B. samarensis*.

RANGE. Known only from the type locality on Cebu Island.



Brachymeles elerae Taylor.

Brachymeles elerae TAYLOR, 1917, Philip. Jour. Sci., vol. 12, p. 273; Philippine Islands; holotype probably in the Museum of Santo Tomas, Manila, Philippine Islands.

No new data is available.

Brachymeles pathfinderi Taylor.

Brachymeles pathfinderi TAYLOR, 1925, Philip. Jour. Sci., vol. 26, p. 104; Glan, Cotabato Province, Mindanao Island; holotype in Museum of Comparative Zoology, Harvard University.

No new data is available.

Brachymeles wrighti Taylor.

Brachymeles wrighti TAYLOR, 1925, Philip. Jour. Sci., vol. 26, p. 106; Trinidad, Northern Luzon Island; holotype in Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

No new data is available.

PENTADACTYL SPECIES

Taylor (1922) in his monograph on the lizards of the Philippine Islands included four pentadactyl species. Brown (1956) recognized three species of this group. These were: *B. bicolor* (Gray), *B. gracilis* (Fischer), and *B. schadenbergi* (Fischer). *Brachymeles boulengeri* Taylor was regarded as a subspecies of *B. gracilis* by Brown.

Our present series indicate that there are at least five species complexes, but these differ in part in their systematic relationships from the earlier concepts of both Taylor and Brown. These complexes may be referred to as *Brachymeles bicolor*, *Brachymeles hilong*, new species, *Brachymeles gracilis*, *Brachymeles schadenbergi*, and *Brachymeles talinis*.

Fischer (1885), in describing *B. gracilis* and *B. schadenbergi*, had only single examples from Mindanao Island. He distinguished *B. gracilis* from the latter on the basis of a number of characteristics. These included more slender habitus, fewer midbody scale rows, separation of the supranasals, shorter fore limb, and possession of a narrow, dorsolateral, light stripe. These differences hold for all examples from the populations from southcentral Mindanao. Also individuals of *B. gracilis* from southern Mindanao are consistently smaller, as measured by snout-vent length at maturity, and exhibit a lower scale count along the mid-dorsal line between the parietals and the base of the tail than individuals of *B. schadenbergi* (tables 2-4). When all of the populations of

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FIGURE 1. Distribution of known populations of nonpentadactyl species of the genus *Brachymeles*.

TABLE 2. Pertinent measurements and scale and digital counts for populations of *Brachymeles schadenbergi*.
(Numbers in parentheses = number of individuals from sample.)

	Snout-vent length ♂♂ (m. mm.)	Snout-vent length ♀♀ (m. mm.)	Midbody scale rostrum	Mid-dorsal scale rows between parietals and base of tail	Number of 4th toe lamellae	Supranasals		Anterior upper labial entering orbit	
						Contact	Separate	4th	5th
<i>B. s. schadenbergi</i> holotype (after Fischer)	/	/	28			✓			
Davao area, southcentral Mindanao Island	R = 114.0-119.0 (3)	R = 110.2-114.0 (3)	26 (4) 28 (4)	68 (1) 69 (3) 70 (2) 71 (2)	8 (5) 9 (3)		(barely) (8)	(2)	(6)
Basilan Island, Sulu Archipelago	R = 86.0-93.8 (4)	R = 80.2-106.8 (5)	26 (13) 28 (1)	67 (2) 68 (4) 69 (4) 70 (4)	7 (3) 8 (11)	(13)	(1)	(4)	(10)
Zamboanga Peninsula, Mindanao Island	R = 96.8-118.2 (9)	R = 96.4-117.2 (6)	26 (5) 27 (3) 28 (8) 29 (1)	67 (1) 68 (4) 69 (6) 70 (1) 71 (2)	7 (3) 8 (3) 9 (1)	(17)			(20)
<i>B. s. orientalis</i> Bohol Island	R = 91.5-103.0 (8)	R = 89.4-104.0 (7)	26 (2) 28 (19)	68 (2) 69 (4) 70 (8) 71 (4) 72 (3)	7 (2) 8 (6) 9 (12) 10 (1)	(19)	(15)	(33)	(1)
Leyte Island	R = 83.7-112.0 (8)	R = 93.3-107.5 (7)	26 (3) 28 (17)	68 (1) 69 (5) 70 (8) 71 (4) 72 (2)	8 (6) 9 (14)	(6)	(14)	(17)	(3)
Agusan Valley, northeastern Mindanao Island (after Taylor)	/	/	26 (3) 28 (17)		8 (?)	(13)	(7)		(18)

both species are considered the most consistent differentiating characteristics are: (1) the general differences in size at maturity for the two species on islands where both species occur; (2) the differences in number of mid-dorsal scale rows between the parietals and the base of the tail; (3) the differences in the size of the supranasals; (4) the differences in proportions.

***Brachymeles schadenbergi* Fischer.**

Fischer (1885, p. 88) gives southern Mindanao Island as the type locality of this species. An examination of several specimens from the populations of the Davao Province area in southcentral Mindanao, which have the same midbody scale-count as Fischer's type, reveals that the type does indeed fit well within the range for most scale characters and proportions exhibited by our Davao sample (table 2). Only in the separation of the rostral from the prefrontal and possibly a darker venter is there closer agreement of the type with our population sample from Zamboanga Peninsula in western Mindanao. However, other populations from eastern Mindanao, Bohol, and Leyte exhibit variation especially in the first character, and it may be that a larger sample from various areas in southcentral Mindanao will prove to be less constant. In view of this, and Fischer's statement that the type came from southern Mindanao, we propose that the type locality for *B. schadenbergi* be restricted to southcentral Mindanao.

Brown (1956, p. 16) described *B. schadenbergi talinis* from southern Negros Island, noting that samples from Jolo Island and from Mountain Province, Luzon Island, were more similar to the Negros population than to populations of Basilan, Mindanao, Bohol, and Leyte islands which were referred to *B. s. schadenbergi*. This distributional pattern, at least as far as Negros and northern Luzon are concerned, is parallel to that exhibited by populations of *Lygosoma (Leiolopisma) pulchellum* (Brown and Alcala, 1963, p. 77). As pointed out by Brown (1956, p. 15), the distribution pattern of these populations suggested three possible interpretations: (1) chance colonization of widely separated islands, across intervening sea barriers, by two distinct subspecies; (2) more or less isolated populations of a polytypic species exhibiting chance convergence with respect to the presence or absence of a dorsolateral stripe; (3) two groups of populations of sibling species, similar morphologically, which have maintained disjunct distributions within this archipelago. On the basis of the larger samples now available from Mindanao and the associated southeastern islands, and our present knowledge of their consistent differences when compared to the southern Negros population, it now seems more logical to accept the third interpretation rather than the first. Consequently we now regard *B. talinis* as a distinct but sibling species. The specimens from northern Luzon Island (CAS 61378-79) and Jolo Island (CAS 60723-25) are tentatively referred to this species complex (table 4).

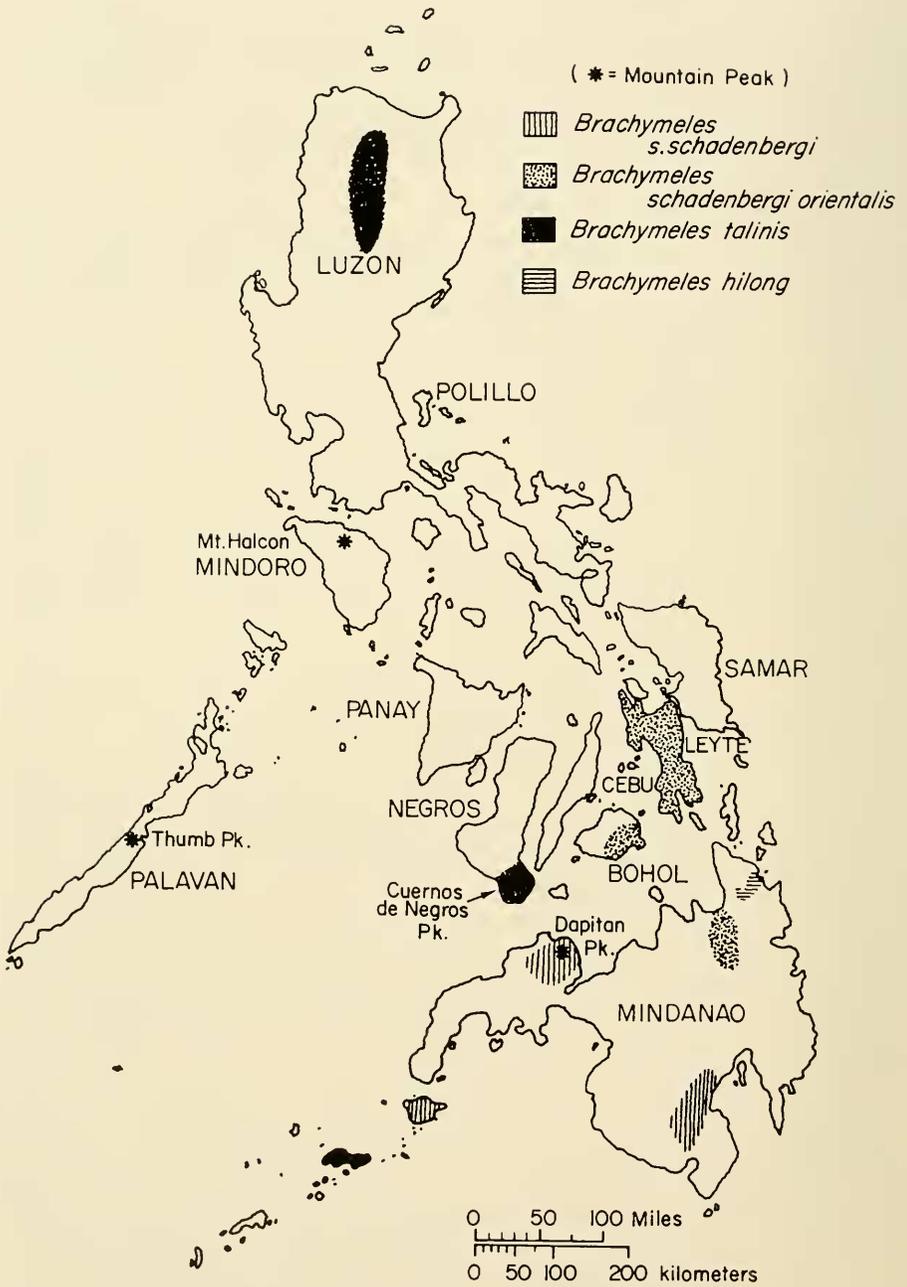


FIGURE 2. Distribution of known populations of *Brachymeles schadenbergi*, *B. hilong*, and *B. talinis*.

Thus the range of *B. schadenbergi*, as we recognize it at this time, includes the Sulu Archipelago, Mindanao, Leyte, and Bohol islands. These populations fall into two zoogeographically logical groups which we have chosen to regard as different subspecies. On the basis of a combination of characters, primarily (1) the most anterior labial entering the orbit; (2) the modal number of midbody scale rows; (3) the modal number of fourth toe lamellae (table 2), two subspecies are recognized.

KEY TO THE SUBSPECIES OF *BRACHYMELES SCHADENBERGI*.

- Fifth upper labial (rarely the fourth) the most anterior to enter the eye; usually 28 or more midbody scale rows (53 of a sample of 61); usually nine or more lamellae beneath the fourth toe of the hind limb (27 of a sample of 41); known from north-eastern Mindanao, Leyte, and Bohol islands *B. schadenbergi orientalis*
- Fourth upper labial (rarely the fifth) the most anterior to enter the orbit; usually 26 midbody scale rows (25 of a sample of 39); usually eight or fewer lamellae beneath the fourth toe of the hind limb (25 of a sample of 29); known from southcentral and western Mindanao and the Sulus *B. schadenbergi schadenbergi*

Brachymeles schadenbergi schadenbergi (Fischer).

Eumeces (Riopa) schadenbergi FISCHER, 1885, Jahrb. Wiss. Anst. Hamburg, vol. 2, p. 87; southern Mindanao Island; holotype probably in the Dresden Museum.

DEFINITION. A large form of *Brachymeles*, snout-vent length about 85.0 or 90.0 to 119.0 mm. (a male with a snout-vent length of 85.4 mm. is possibly mature) for 30 mature specimens; limbs well developed; length of hind limb about 16 to 24 percent of the snout-vent length for 40 specimens; length of fore limb about 10 to 14 percent of the snout-vent length for 24 specimens; supranasals in contact for 30 of 39 specimens; anterior loreal separated from the first upper labial by the postnasal in 23 out of 50 examples. Fifth upper labial most anterior one to enter the orbit in 36 out of 42 examples; 8 or fewer lamellae beneath the fourth toe of the hind foot in 25 of 29 examples. Fewer than 28 midbody scale rows for 25 of 39 examples; 67 to 72 mid-dorsal scale rows between the parietals and the base of the tail for 39 examples (table 2).

RANGE. Sulu Archipelago, Zamboanga Peninsula and southcentral Mindanao.

Brachymeles schadenbergi orientalis Brown and Rabor, new subspecies.

The locality of the type series is Bohol Island and the definition is based on this series.

HOLOTYPE. Stanford University no. 24436, a mature male, collected about 11 km. southeast of Sierra Bullones, Bohol Island, Philippine Islands, April 21, 1962, by A. C. Alcala and party.

PARATYPES. SU 18702-06, 24428, 24430, 24432-35, 24437, 24440-44, 24446-56, 24458-60; BM 1966.191; CAS 102403-04; FMNH 154811; MCZ

85759; SMF 59898; USNM 159758. From same general area as holotype, 6–15 km. southeast of Sierra Bullones, Bohol Island.

DEFINITION. A large form of *Brachymeles*, snout–vent length 89.0 to 104.0 mm. for 15 mature specimens (a female measuring 85.2 mm. from snout to vent is immature); limbs well developed; length of hind limb about 17 to 23 percent of the snout–vent length for 20 specimens; length of fore limb about 10 to 14 percent of the snout–vent length for 20 specimens; supranasals in contact for 12 out of 20 specimens; anterior loreal separated from the first upper labial by the postnasal in 9 of 34 specimens; fourth upper labial most anterior one to enter the orbit in 33 of 34 specimens; 9 lamellae beneath the fourth toe of the hind foot in 13 of 21 specimens; 28 or more midbody scale rows for 25 of 32 specimens; 68 to 72 mid-dorsal scale rows between the parietals and the base of the tail for 21 specimens (table 2).

RANGE. In addition to the population from Bohol Island, the populations of the Agusan Valley in northeastern Mindanao and Leyte Island are referred to this subspecies (table 2).

Brachymeles gracilis Fischer.

Fischer (1885, p. 85) gave the type locality as Mindanao Island. In terms of scale characteristics and proportions, Fischer's type falls within the ranges exhibited for these characteristics by our sample from Davao Province in south-central Mindanao (table 3). We, therefore, propose that the type locality, as in the instance of *B. schadenbergi*, be restricted to southcentral Mindanao. This species complex is more widely distributed and exhibits greater variation between populations than is known for the other pentadactyl species. Consequently the known island populations have been assigned to five subspecies on the basis of combinations of morphological characters. This includes size at which maturity is attained for some of the subspecies (table 3). The fact remains, however, that we know nothing of their interbreeding potential. Also, in view of their limitation to forest habitats and secretive habits, any actual gene flow between island populations would probably, in recent times at least, have been very low or nonexistent. The distribution of recognized subspecies is shown on the map of the Archipelago (fig. 3).

KEY TO THE SUBSPECIES OF *BRACHYMELES GRACILIS*

1. Usually fourth upper labial most anterior one to enter the eye 3
 Usually fifth upper labial most anterior one to enter the eye 2
2. Dorsolateral light stripe usually prominent; supranasals small, widely to moderately separated; (known from Bohol Island) *B. gracilis boholensis*
 Dorsolateral light stripe absent or only moderately distinct; supranasals large, narrowly separated or in contact; (known from Mindoro Island)..... *B. gracilis mindorensis*
3. Dorsolateral light stripe prominent 4
 Dorsolateral light stripe absent or rarely very faintly indicated; (known from Negros

- and Cebu islands) *B. gracilis taylori*
4. Anterior loreal and first upper labial in contact; diameter of eye usually less than 40 percent of length of snout, except for Leyte population; (known from Sulu Archipelago, Mindanao and Leyte islands) *B. gracilis gracilis*
- Anterior loreal and first upper labial not in contact; diameter of eye usually more than 40 percent of length of snout; (known from Luzon and Polillo islands)
- *B. gracilis boulengeri*

Brachymeles gracilis gracilis (Fischer).

Eumeces (Riopa) gracilis FISCHER, 1885, Jahrb. Wiss. Anst., Hamburg, vol. 2, p. 85; Mindanao Island; holotype probably in the Dresden Museum.

Brachymeles sulnensis TAYLOR, 1915, Philip. Jour. Sci., Manila, vol. 13, p. 254; Buban Island, Tapiatan Group, Sulus, Philippine Islands; holotype probably not extant.

DEFINITION. (based on sample from the southcentral Mindanao area) A moderate-sized form of *Brachymeles*, snout-vent length 57.2 to 86.0 mm. for 21 mature specimens (a female measuring 54.0 mm. in snout-vent length is apparently not yet mature); limbs moderate, length of hind limb about 14 to 20 percent of the snout-vent length and length of fore limb 8 to 13 percent of the snout-vent length for 20 specimens; eye small, its diameter about 30 to 42 percent of the length of the snout for 20 specimens; supranasals rather widely separated for sample of 22 specimens; usually fourth labial the most anterior one to enter the orbit; postnasal absent in about 60 percent of the sample; anterior loreal in contact with first upper labial for sample of 27 specimens; 24 to 26 midbody scale rows; 64 to 68 mid-dorsal scale rows between the parietals and the base of the tail (table 3); dorsolateral stripe present; upper lateral surfaces usually appear darker than dorsum; ventral scales usually with some dark spots or blotches.

RANGE. The type locality has been designated as southcentral Mindanao Island; the known populations from the Sulu Archipelago and other areas of Mindanao are in sufficiently close agreement for characters studied (table 3) that they are also referred to this subspecies. The Leyte Island population, which differs primarily in the less distinct dorsolateral light stripe is also assigned to this subspecies.

VARIATION. The postnasal shield is absent in a number of specimens from the southcentral Mindanao population.

Brachymeles gracilis boulengeri Taylor.

Brachymeles boulengeri TAYLOR, 1922, Philip. Bur. Sci. Pub. no. 17, p. 246; Polillo Island; holotype probably not in existence (Taylor, 1944, p. 143, does not give a repository for the holotype).

Taylor (1922, pp. 247, 249) differentiated *B. boulengeri* from *B. gracilis* primarily on the basis of the smaller eye, shorter limbs, and smaller ear of the latter. He also (1922, pp. 247, 249) refers specimens from southern

TABLE 3. Pertinent measurements and scale and digital counts for populations of *Brachymeles gracilis* (Numbers in parentheses = number of individuals from sample.)

	Snout-vent length ♀♀ (in mm.)	Snout-vent length ♂♂ (in mm.)	Midbody scale rows	Mid-dorsal scale rows between parietals and base of tail	Anterior upper labial entering orbit		Anterior dorsal and first labial		Dorsolateral light stripe	
					4th	5th	Contact	Separate	Present	Absent
<i>B. g. gracilis</i> holotype (after Fischer)										
Davao area southcentral Mindanao Island	R = 59.4-86.0 (11)	R = 57.2-78.0 (10)	24 24 (5) 26 (15)	64 (1) 65 (2) 66 (3) 67 (4) 68 (5) 69 (4)	7 (16) 8 (1)	√ (18)	(2)	(25)	(25)	(25)
Basilan Island, Sulu Archipelago	R = -71.7- (1)	/	24 (2)	68 (2)	6 (2)	(2)	(2)	(2)	(2)	(2)
Northcentral Mindanao Island	/	/	26 (1)	66 (1)	8 (1)	(1)	(1)	(1)	(1)	(1)
Leyte Island	R = 65.0-81.6 (6)	R = 65.5-79.6 (7)	26 (14) 28 (2)	63 (2) 64 (3) 65 (4) 66 (7)	8 (14) 9 (2)	(16)	(15)	(15)	(9)	(7)
<i>B. g. bohokensis</i> Bohol Island	R = 66.5-94.1 (20)	R = 68.5-93.5 (10)	26 (13) 28 (7)	62 (3) 63 (1) 64 (4) 65 (5) 66 (3) 67 (1)	7 (1) 8 (5) 9 (8) 10 (3)	(3)	(17)	(5)	(20)	(20)
<i>B. g. bouleengeri</i> Polillo Island	R = -81.1- (1)	R = 62.2-89.0 (3)	25 (1) 26 (5)	64 (2) 65 (1) 66 (3)	8 (2) 9 (4)	(6)	(6)	(6)	(6)	(6)

TABLE 3. (Continued.)

	Snout-vent length ♀♀ (in mm.)	Snout-vent length ♂♂ (in mm.)	Midbody scale rows	Mid-dorsal scale rows between parietals and base of tail	Anterior upper labial entering orbit		Anterior loreal and first labial		Dorsolateral light stripe	
					4th	5th	Con-tact	Sepe-rate	Present	Absent
Southeastern Luzon Island	R = 75.9-95.6 (2)	/	26 (3)	64 (1) 65 (2)	9 (2) 10 (1)	(3)	(3)	(3)	(3)	
Southwestern Luzon Island	R = -86.0- (1)	R = -75.0- (1)	26 (2)	64 (1) 65 (1)		(1)	(1)	(2)	(2)	
<i>B. g. mindorensis</i> Mindoro Island	R = 82.5-104.5 (12)	R = 79.0-103.0 (12)	26 (12) 27 (1) 28 (7)	62 (4) 63 (1) 64 (7) 65 (8)	7 (1) 8 (8) 9 (11)	(20)	(20)	(14)	(11)	
<i>B. g. taylori</i> Negros Island	R = 62.4-103.0 (15)	R = 64.2-89.6 (10)	24 (1) 26 (15) 28 (4)	63 (2) 64 (0) 65 (6) 66 (4) 67 (2) 68 (4) 69 (2)	8 (4) 9 (7) 10 (2)	(20)	(4)	(21)	(20)	
Cebu Island	R = 73.8-94.5 (5)	R = 66.7-93.6 (8)	26 (7) 27 (3) 28 (10)	61 (4) 62 (7) 63 (4) 64 (4)	8 (9) 9 (11)	(17)	(3)	(1)	(22)	

Luzon, Mindoro, and Negros to this species but does not designate examples as paratypes. Brown (1956, p. 10) regarded *B. boulengeri* as only subspecifically differentiated from *B. gracilis*, noting the smaller ear, smaller postnasal, and the darker ventral color pattern of the monimate form. Brown (1956, p. 10) also included the Bohol Island population in the subspecies *B. g. boulengeri*, noting the disjunct distribution pattern, and placed the Negros population in the subspecies *B. g. taylori*. The present availability of a sample from the Leyte population which spatially separates the Bohol and Polillo-Luzon populations necessitates a re-evaluation of the subspecific assignment of the Bohol population. Adequate samples from Mindoro Island, Cebu Island, and northern Negros Island also makes possible a further subspecific assignment of these populations.

DEFINITION. A moderate-sized form of *Brachymeles*, snout-vent length 62.2 to 95.6 mm. for eight mature specimens; limbs moderate, length of hind limb 17 to 22 percent of snout-vent length for eight specimens, length of fore limb 10 to 13½ percent of snout-vent length for eight specimens; eye moderate, its diameter about 40 to 52 percent of the snout length for eight available specimens; supranasals separated; usually the fourth labial the most anterior one to enter the orbit; postnasal present; anterior loreal separated from the first upper labial; 26 to 28 midbody scale rows; 64 to 66 mid-dorsal scale rows between parietals and base of tail (table 3); dorsolateral stripe present; ventral scales relatively free of dark spots or blotches.

RANGE. Known from Polillo Island and southern Luzon Island.

Brachymeles gracilis boholensis Brown and Rabor, new subspecies.

HOLOTYPE. Stanford University no. 24528, a mature female, collected about 6 km. southeast of Sierra Bullones, Bohol Island, Philippine Islands, April 30, 1962, by A. C. Alcala and party.

PARATYPES. SU 24491-527, 24529-30, 24532-33, 24535, 24537, 24540-41, 24543-44, 24546-47; BM 1966.189; CAS 102401-02; FMNH 154812; MCZ 85760; SMF 59899; USNM159759. From same general locality as holotype.

DEFINITION. A moderate-sized form of *Brachymeles*, 66.5 to 95.5 mm. in snout-vent length at maturity for 30 specimens (a male 63.2 mm. and a female 64.5 mm. in snout-vent length appear to be immature); limbs moderate, length of hind limb 17½ to 21 percent of the snout-vent length; length of fore limb 10 to 13 percent of the snout-vent length for 20 specimens; eye moderate, its diameter about 39 to 51 percent of the snout length; supranasals separated for sample of 20 specimens; usually the fifth (not the fourth, as for *B. g. gracilis* and *B. g. boulengeri*) upper labial the most anterior one to enter orbit; usually the anterior loreal separated from the first upper labial; 26 to 28 midbody scale rows; 62 to 66 mid-dorsal scale rows between parietals and base of tail (table 3); light dorsolateral stripe prominent; ventral scales usually without dark spots or blotches.

MEASUREMENTS OF HOLOTYPE. Snout-vent length 89.6 mm.; axilla-groin 60.0 mm.; head length 12.5 mm.; head breadth 10.0 mm.; length of snout 4.9 mm.; diameter of eye 2.1 mm.; length of hind limb 16.8 mm.; length of fore limb 10.0 mm.

RANGE. Known from southeastern Bohol Island.

***Brachymeles gracilis taylori* Brown.**

Brachymeles gracilis taylori, BROWN, 1956, *Breviora*, Mus. Comp. Zool., Harvard University, no. 54, p. 13; Cuernos de Negros, Negros Oriental; holotype in the Division of Systematic Biology, Stanford University.

Definition (based on sample from the southern Negros population): A moderate-sized form of *Brachymeles*, 62.4 to 103.0 mm. in snout-vent length for 25 mature specimens (a female measuring 62.0 mm. appears to be immature); limbs moderate, length of hind limb about 16 to 22 percent of the snout-vent length for 20 specimens, length of fore limb about 9 to 12½ percent of the snout-vent length; eye moderate, its diameter 43½ to 57 percent of the snout length; the fourth upper labial the most anterior one to enter the orbit; the anterior loreal usually separated from the first upper labial; 24 to 28 midbody scale rows; 8 to 10 lamellae beneath the fourth toe of the hind limb for 20 specimens; 63 to 69 mid-dorsal scale rows between parietals and base of tail; no dorsolateral light stripe; ventral scales usually with some dark spots and blotches.

RANGE. The populations of Negros and Cebu islands are referred to this subspecies.

***Brachymeles gracilis mindorensis* Brown and Rabor, new subspecies.**

HOLOTYPE. Stanford University no. 24487, a mature female, collected about 30 km. southeast of Calapan, Mindoro Island, Philippine Islands, April 21, 1963, by A. C. Alcala and party.

PARATYPES. SU 24464-72, 24474-78, 24480-86, 24490, 24549-79; BM 1966.190; CAS 102399-400; FMNH 154813; MCZ 85761; SMF 59900; USNM 159759. From same general locality as holotype.

DEFINITION. A moderately large form of *Brachymeles*, 79.0 to 104.6 mm. in snout-vent length for 24 mature specimens (a male measuring 75.0 mm. and a female measuring 78.0 mm. in snout-vent length appear immature); limbs moderate, the length of the hind limb about 17½ to 23½ percent of the snout-vent length for 20 specimens, the length of the fore limb about 9½ to 13½ percent of the snout-vent length for 20 specimens; the eye moderate, its diameter about 43 to 54 percent of the snout length; supranasals in contact for 10 specimens, separated for 17; the fifth upper labial the most anterior one to enter the orbit; the anterior loreal separated from the first upper labial; 26 to 28 midbody scale rows; 62 to 65 mid-dorsal scale rows between parietals and base of the tail; a faint to moderate dorsolateral light stripe, evident in

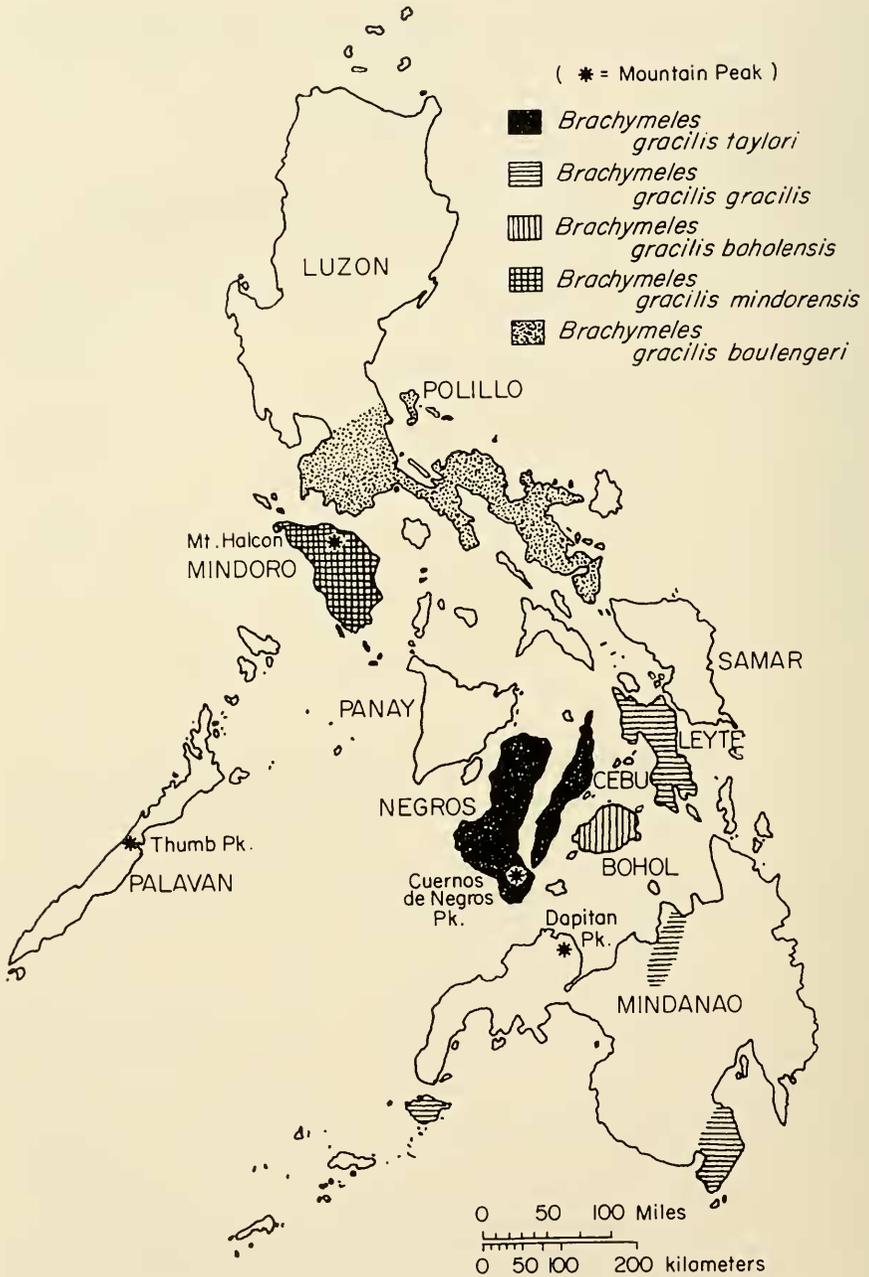


FIGURE 3. Distribution of known populations of *Brachymeles gracilis*.

about half the sample; ventral scales usually with some dark spots or blotches.

MEASUREMENTS OF HOLOTYPE. Snout-vent length 110.0 mm.; axilla-groin 74.7 mm.; head length 13.2 mm.; head breadth 12.0 mm.; length of snout 5.5 mm.; diameter of eye 2.6 mm.; length of hind limb 19.2 mm.; length of fore limb 10.6 mm.

RANGE. KNOWN from northern Mindoro Island.

***Brachymeles talinis* Brown.**

Brachymeles schadenbergi talinis BROWN, 1956, *Breviora*, Mus. Comp. Zool., no. 54, pp. 17, 18; Cuernos de Negros, southern Negros Island, holotype in the Division of Systematic Biology, Stanford University.

DEFINITION. A large species of *Brachymeles*, snout-vent length 109.0 to 140.5 mm. for 13 mature specimens from Negros; limbs pentadactyl; rather well developed, length of hind limb about 19 to 26 percent of the snout-vent length, length of fore limb about 11 to 14 percent of the snout-vent length; supranasals usually in contact (20 out of 23 specimens); five supraoculars; usually 30 to 32 midbody scale rows (23 of 24 southern Negros specimens); 67 to 72 mid-dorsal scale rows between parietals and base of the tail (table 4); one or two (rarely three) scales separating the second pair of chin shields; usually six full and two half dorsal scale rows, are dark brown or reddish brown in color, bordered laterally by a more or less distinct light stripe which is usually one full and two half scale rows in breadth. This stripe is distinct anteriorly, where it is extended forward onto the supraocular region, even when it merges posteriorly into the lighter color of the lower lateral surfaces.

RANGE. The type area of Negros Island and tentatively Luzon and Jolo islands. Larger samples from this last population may, in the future, demonstrate that it is a distinct subspecies or even species. Two specimens from Mountain Province, Luzon Island (CAS 61378-79), exhibit close affinities in most characteristics (table 4). The specimen (FNHM 2257) from Mt. Canlaon in northern Negros, originally assigned to this species is an example of the northern Negros population of *B. gracilis taylori*.

***Brachymeles hilong* Brown and Rabor, new species.**

A population which was discovered by the junior author and his field party in the Diuata Mountains in the extreme northeastern part of Mindanao Island during the 1963 expedition represents a previously undescribed species.

HOLOTYPE. Stanford University no. 24407, a mature male, collected at Hilong-hilong Peak, Agusan Province, Mindanao Island, Philippine Islands, March-May, 1963, by D. S. Rabor and party.

PARATYPES. SU 24408, 24410-11; CAS 102406; FMNH 142461-85 from the same locality as the holotypes; SU 24315-16 collected at Sibuhay, Diuata Mountains, Surigao Province, Mindanao Island, May, 1963, by D. S. Rabor and party.

TABLE 4. *Pertinent measurements and scale and digital counts for Brachymeles hilong, B. bicolor and B. talinis.*

(Number in parentheses = number of individuals from sample.)

	Snout-vent length ♀♀ (in mm.)	Snout-vent length ♂♂ (in mm.)	Midbody scale rows	Mid-dorsal scale rows between parietals and base of tail	Number of 4th toe lamellae	Supranasals		Anterior upper labial entering orbit	
						Con- tact	Sepa- rate	4th	5th
<i>B. hilong</i>	R = 62.2-	R = 61.9-	26 (4)	67 (4)	7 (12)				
northeastern	68.9	69.8	27 (1)	68 (10)	8 (10)		(20)	(20)	
Mindanao Island	(9)	(11)	28 (15)	69 (5)					
			30 (2)	70 (1)					
				71 (1)					
<i>B. bicolor</i>	R = 151.0—152.0		28 (2)	93	5 (1)	(1)			
	(2)				6 (1)				
	(sex undetermined)								
<i>B. talinis</i>	R = 109.0-	R = 123.0-	30 (18)	67 (4)	8 (16)	(20)	(3)	(2)	(21)
Negros Island	140.5	127.6	31 (1)	68 (9)	9 (9)				
	(8)	(3)	32 (4)	69 (4)	7 (9)				
				70 (2)					
				71 (2)					
				72 (2)					
<i>B. talinis</i> (?)	R = 113.1-	/	30 (1)	73 (1)	8 (1)	(2)			(2)
Jolo Island, Sulu	116.2	/	31 (1)	74 (1)	9 (1)				
Archipelago	(2)								
<i>B. talinis</i> (?)	R = 92.6	/	28 (2)	69 (2)	8 (1)	(2)			(2)
Mountain Prov.,	117.8	/			9 (1)				
Luzon Island	(2)								

DIAGNOSIS. A small *Brachymeles*, snout-vent length 61.9 to 69.8 mm. for 19 mature specimens; limbs well developed, pentadactyl; 26 to 30 midbody scale rows (usually 28); 67 to 71 mid-dorsal scale rows between parietals and base of the tail; supranasals separate; fourth upper labial most anterior one to enter the orbit.

DESCRIPTION. A small, moderately slender *Brachymeles*, snout-vent length 61.9 to 69.8 mm. for 11 mature males and 62.2 to 68.9 mm. for nine mature females; limbs well developed, length of hind limb 17 to 21 percent of snout-vent length, length of fore limb 9 to 13 percent of snout-vent length; breadth of head equal to or slightly less than diameter of body; rostral large, tapering posteriorly, usually rather broadly in contact with the prefrontal; postnasal present; two frenals, fourth upper labial most anterior one to enter the orbit; prefrontals rather narrowly separated; frontoparietals in contact or separate; interparietal large broadly rounded posteriorly; parietals in broad contact; nuchals absent; five supraoculars; ear opening small; 26 to 30 midbody scale rows; 67 to 71 mid-dorsal scale rows between parietals and base of the tail; limbs pentadactyl; seven or eight lamellae beneath the fourth toe and two or three lamellae beneath the first toe of the hind limb (table 4).

COLOR (in preservation). Dorsum and upper lateral surfaces dark brown, usually with a faint, irregular margined dorsolateral stripe evident, at least anteriorly; venter lighter brown, but individual scales, especially beneath the head and along the midventral area, with small blackish spots along the posterior margin.

MEASUREMENTS OF HOLOTYPES. Snout-vent length 69.8 mm.; head length 9.1 mm.; head breadth 7.8 mm.; length of snout 3.9 mm.; length of fore limb 6.8 mm.; length of hind limb 12.8 mm.

COMPARISONS. This species is related to *B. gracilis* and *B. schadenbergi*, differing from each in different characters. In its small size at maturity, it is similar to *B. gracilis* from southern Mindanao and quite distinct from *B. schadenbergi* (tables 2-4). In the indication of a light dorsolateral stripe, the entrance of the fourth labial into the orbit and the narrower supranasals which do not separate the rostral from the prefrontal, this species is also more similar to *B. gracilis* from southern Mindanao. The number of mid-dorsal scale rows between parietals and base of the tail is typically greater than for *B. gracilis* and corresponds to that for *B. schadenbergi*. The number of midbody scale rows is greater than that for *B. gracilis* and also corresponds to that typical for *B. schadenbergi*.

Brachymeles bicolor (Gray)

Senira bicolor (part) GRAY, 1846, Cat. Lizards Brit. Mus., 1845, p. 98. Philippine Islands; holotype in the British Museum (Natural History).

Neither the exact location nor the range of any population of *B. bicolor* is known. The holotype and a second specimen in the British Museum have no more specific locality data than "Philippines." Taylor based his description on a specimen in the Santo Tomas Museum, Manila. The locality data for this specimen was also limited to "Filipinas." Our field work on most of the larger islands of the archipelago during the past 10 years has not produced any further records of this distinctive species.

DEFINITION. A large species of *Brachymeles*, three mature specimens measure 151 to 155 mm. in snout-vent length; head scarcely broader than neck region; limbs much reduced but pentadactyl, length of hind limb 10 to 11 per cent of snout-vent length for two specimens; digits short; five or six lamellae beneath the fourth toe of the hind limb; supranasals and frontoparietals in contact; prefrontals barely to moderately separated; postnasal present; fourth upper labial most anterior one to enter the orbit; five supraoculars; 28 scale rows around middle of body (three specimens); 92 to 94 mid-dorsal scale rows between parietals and base of the tail; dorsal 10 or 10 and 2 half-rows of scales are dark reddish brown; lower lateral surfaces and venter, very light creamy white to yellowish in preservative.

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KEY TO THE SPECIES OF *BRACHYMELES*

1. Limbs pentadactyl 2
Limbs absent or with less than 5 digits on either fore or hind limbs 6
2. Mid-dorsal scale rows between parietals and base of tail more than 90 *B. bicolor*
Mid-dorsal scale rows between parietals and base of tail less than 80 3
3. Midbody scale rows 26-32; scale rows between parietals and base of tail 67-74
(rarely less than 68) 4
Midbody scale rows 24-28; scale rows between parietals and base of tail 61-68
(rarely more than 66) *B. gracilis*
4. Dorsolateral stripe, extending anteriorly through the supraocular region; 28-32
(usually 30) midbody scale rows; usually not attaining maturity until more than
95 mm. in snout-vent length *B. talinis*
Dorsolateral light stripe lacking; 26-28 (very rarely 30) midbody scale rows;
usually attaining maturity between 60.0 mm. and 90.0 mm. in snout-vent length 5
5. Snout-vent length at maturity 60.0 to 70.0 mm.; supranasals small, widely separated;
anterior loreal and first upper labial usually in broad contact *B. hilong*
Snout-vent length at maturity 80.0 mm. or more; supranasals large, in contact or
narrowly separated; anterior loreal separated from or in narrow contact with the
first upper labial *B. schadenbergi*
6. Hind limbs with 4 digits; fore limbs with 5 *B. pathfinderi*
Both fore and hind limbs with fewer than 5 digits 7
7. Fore and hind limbs with 4 digits 8
Either fore or hind limbs with less than 4 digits 9
8. Midbody scale rows 22; mid-dorsal scale rows between parietals and base of tail
less than 90 (83 to 85 for known examples) *B. elerae*
Midbody scale rows 28; mid-dorsal scale rows between parietals and base of tail
greater than 90 (102 for known examples) *B. wrighti*
9. Fore and hind limbs with 3 digits; frontoparietals separate *B. tridactylus*
Either fore or hind limbs or both with less than 3 digits; frontoparietals usually
in contact 10
10. Fore limbs with 3 digits and hind limbs with 2; mid-dorsal scale rows between
parietals and base of tail scale rows usually less than 90 *B. cebuensis*
Both fore and hind limbs with 2 or fewer digits (very rarely 3); midbody scale
rows usually greater than 90 11
11. Both fore and hind limbs usually with 2 digits (rarely 1 or 3, but not on all limbs);

	number of mid-dorsal scale rows between parietals and base of tail less than 100	<i>B. samarensis</i>
	Fore and hind limbs without digits (rarely 1, or limbs absent); number of mid-dorsal scale rows between parietals and base of tail usually more than 100	12
12.	Limbs without digits or rarely 1 digit	<i>B. bonitae</i>
	Limbs absent	<i>B. vermis</i>

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