

New Loam-Swimming Skink, Genus *Brachymeles* (Reptilia: Squamata: Scincidae) from Luzon and Catanduanes Islands, Philippines

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ABSTRACT.—We describe a new species of scincid lizard of the genus *Brachymeles* from the Luzon Faunal Region of the northern Philippines. We discovered the new species in the Camarines Norte Province of the Bicol Peninsula (Luzon Island) and Catanduanes Island. Until recently, the new species had been mistaken as *Brachymeles talinis*, a distantly allopatric yet morphologically similar, large-bodied congener from the central Philippines. The new species is the second-largest known species of *Brachymeles* and differs from its congeners by numerous external morphological features. It is the eighth known *Brachymeles* from the Luzon Faunal Region and the sixth pentadactyl species in the genus.

Scincid lizards of the genus *Brachymeles* are one of only four lizard genera that possess both fully limbed and limbless species (*Brachymeles*, *Chalcides*, *Lerista*, and *Scelotes*; Lande, 1978; Wiens and Slingsluff, 2001; Brandley et al., 2008). Currently, there are 17 recognized species, all endemic to the Philippines except for *Brachymeles apus* from northern Borneo (Brown and Alcala, 1980; Hikida, 1982; Siler et al., 2009, 2010). Five species are pentadactyl (*bicolor*, *boulengeri*, *gracilis*, *schadenbergi*, and *talinis*); eight are nonpentadactyl, with incompletely developed limbs and reduced numbers of digits (*bonitae*, *cebuensis*, *elerae*, *pathfineri*, *samarensis*, *tridactylus*, *wrighti* and sp. nov. *tridactyl* [Siler et al., 2009]); and four are limbless (*apus*, *minimus*, *vermis*, and sp. nov. [Siler et al., 2010]). Among the nonpentadactyl species (Taylor, 1917, 1918, 1922), there is a full range of limb- and digit-reduced states, including species with minute limbs lacking digits and those with moderately developed tetradactyl limbs (Brown and Alcala, 1980; Hikida, 1982). All species exhibit a semifossorial lifestyle and usually are found in dry rotting loam inside decaying logs or in loose soil and leaf litter.

Members of the genus have similar body plans and external morphology, which has proven problematic for diagnosing species diversity on the basis of external characters alone (Brown and Alcala, 1980). Among the 17 known species, there are three polytypic species (*Brachymeles boulengeri*, *Brachymeles gracilis*, and *Brachymeles schadenbergi*; Brown, 1956; Brown and Rabor, 1967; Brown and Alcala, 1980). Both *B. gracilis* and *B. schadenbergi* contain two recognized subspecies, and *B. boulengeri* contains four subspecies. Several species are widely

distributed across multiple faunal regions of the Philippines. One of these is *Brachymeles talinis*, which exhibits considerable morphological variation among populations (Brown, 1956; Brown and Rabor, 1967; Brown and Alcala, 1980). As currently recognized, *B. talinis* occurs across the northern and central faunal regions of the Philippines (Brown and Diesmos, 2002).

In 2007 and 2008, we conducted two biotic surveys in the Bicol region of the Philippines. The first targeted Catanduanes Island and the second the Bicol Peninsula of Luzon Island (Fig. 1). Eight specimens of a large, undescribed species of *Brachymeles* were collected in 2007 from 200–530-m elevation on Catanduanes Island. The following year, 10 more individuals were collected on Mt. Labo on the Bicol Peninsula of Luzon Island from 200–1,000-m elevation (Fig. 1). The new species is semifossorial, was found in the loam of rotting logs and surrounding forest floor humus, and was captured in pitfall traps. In this paper, we describe the species and report on its natural history, ecology, and habitat.

MATERIALS AND METHODS

We recorded morphometric data from alcohol-preserved specimens (Appendix 1). Sex was determined by gonadal inspection, and measurements were taken with digital calipers to the nearest 0.1 mm. To avoid interobserver bias and other sources of potential error (Lee, 1990), all measurements were scored by CDS. Color descriptions are based on the preserved specimens, field notes, and color digital images in life. Meristic and mensural characters are based on Brown and Alcala (1980), Brown et al. (1995a,b, 1999), and Greer et al. (2006) and

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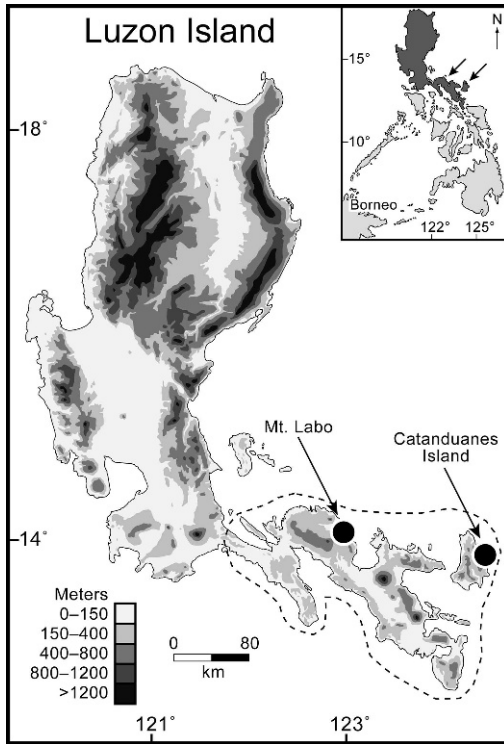


FIG. 1. Known distribution of *Brachymeles makusog* on Mt. Labo in the Bicol Peninsula and on Catanduanes Island, Philippines. The inset shows the location of Luzon and Catanduanes islands (colored in dark grey) within the Philippines. The sampling localities, Sitio Tungaw, Barangay San Pedro, Municipality of Gigmoto, Catanduanes Province, Catanduanes Island (and Mt. Labo, Barangay Tulay Na Lupa, Municipality of Labo, Camarines Norte Province, Luzon Island) are indicated by black dots. The dashed outline shows the hypothesized range of the new species.

include (Fig. 2): snout-vent length (SVL), axilla-groin distance (AGD), total length (TotL), midbody width (MBW), midbody depth (MBD), tail length (TL), tail width (TW), tail depth (TD), head length (HL), head width (HW), head depth (HD), snout-forearm length (SnFa), eye diameter (ED), eye-narial distance (END), snout length (SNL), internarial distance (IND), forelimb length (FLL), hind-limb length (HLL), midbody scale-row count (MBSR), paravertebral scale-row count (PVSR), axilla-groin scale-row count (AGSR), Finger III lamellae count (FinIIIam), Toe IV lamellae count (ToeIVlam), supralabial count (SL), infralabial count (IFL), supraciliary count (SC), and supraocular count (SO). In the following description, ranges are followed by mean \pm standard deviation in parentheses. Character definitions are provided in Appendix 2.

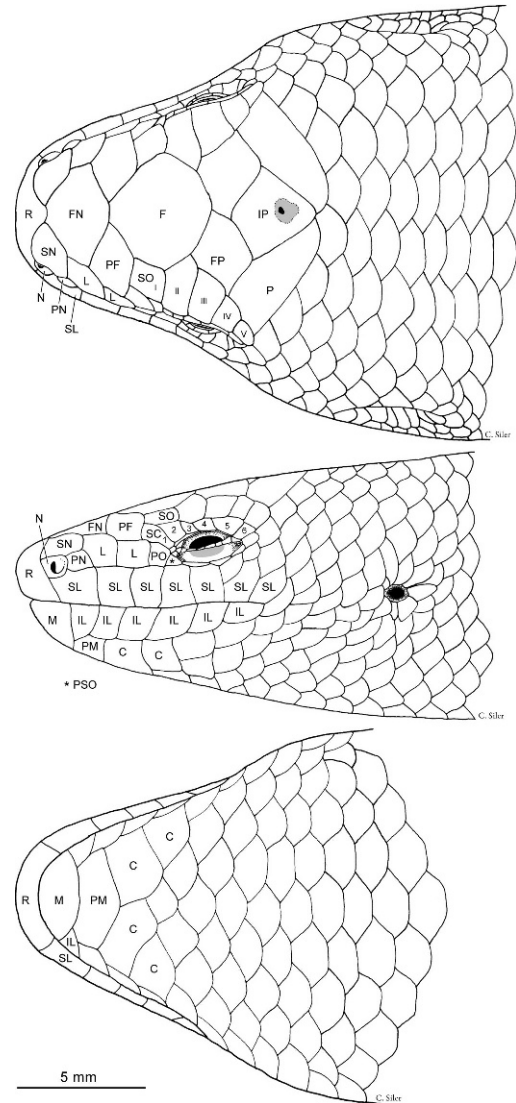


FIG. 2. Illustration of head of male holotype of *Brachymeles makusog* (PNM 9565) in dorsal, lateral, and ventral views. Taxonomically diagnostic head scales are labeled as follows: C, chin shield; F, frontal; FN, frontonasal; FP, frontoparietal; IL, infralabial; IP, interparietal; L, loreal; M, mental; N, nasal; P, parietal; PF, prefrontal; PM, postmental; PN, postnasal; PO, preocular; PSO, presubocular; R, rostral; SC, supraciliary; SL, supralabial; SN, supranasal; and SO, supraocular. Roman numerals indicate scales in the supraocular series, with Arabic numbers indicating scales in the supraciliary series.

Brachymeles makusog sp. nov.

Figures 2-3

Holotype.—PNM 9565 (field number CDS 2379, formerly KU 308135; Fig. 3), an adult male collected at 1030 h on 1 March 2007 at 2-1 m

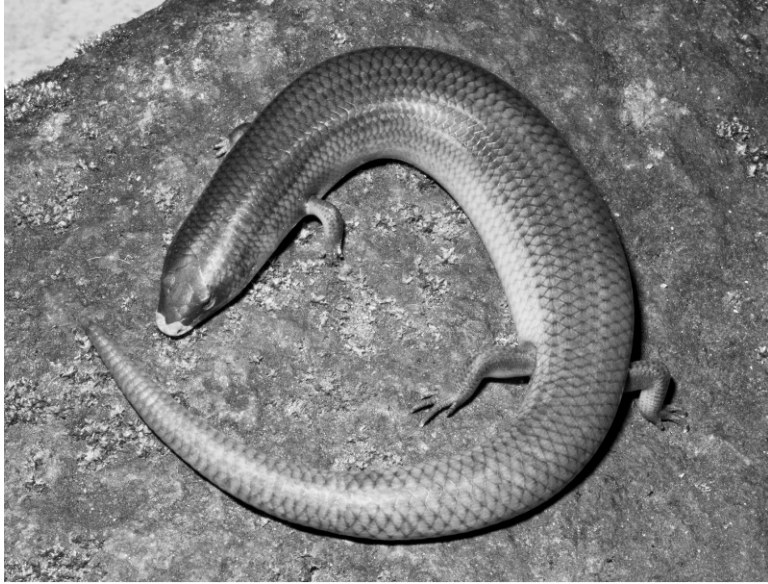


FIG. 3. Photograph in life of *Brachymeles makusog* paratype (KU 313616), female, SVL = 110.7 mm. Photograph by CDS.

elevation (13°47'19.3492"N, 124°21'17.712"E; WGS-84) Sitio Tungaw, Barangay San Pedro, Municipality of Gigmoto, Catanduanes Province, Catanduanes Island, Philippines, by Cameron D. Siler and Jason B. Fernandez.

Paratopotypes.—KU 308126, 308128, 308136, 308208, PNM 9583–9584, three adult females, two adult males, and two juvenile males collected between 27 February and 3 March 2007 from 200–530-m elevation.

Paratypes.—KU 313612–313614, 313616, 313617, PNM 9585–9588 (formerly KU 313610, 313616, 313609, and 313611, respectively), five adult males, two adult females, and two juvenile females collected between 21 June and 4 July 2008 from 200–1,000-m elevation (14°02'35.52"N, 122°47'12.48"E; WGS-84) Mt. Labo, Barangay Tulay Na Lupa, Municipality of Labo, Camarines Norte Province, Luzon Island, Philippines, by Cameron D. Siler, Rafe M. Brown, John Phenix, Luke Welton, Jason B. Fernandez, Vicente Yngente, and Mavic Yngente; FMNH 270200, adult male, collected between on 21 April, 2006 at 1,115-m elevation at the same locality by Danny S. Balete.

Diagnosis.—*Brachymeles makusog* can be distinguished from congeners by the following combination of characters: (1) body size large; (2) pentadactyl; (3) maximum relative tail length large; (4) limbs long; (5) midbody scale rows 25–28; (6) axilla–groin scale rows 42–47; (7) paravertebral scale rows 85–90; (8) supraciliaries six; (9) supraoculars five; (10) pineal eye spot present; (11) supranasals not in contact; (12)

prefrontals not in contact; (13) parietals not in contact; (14) postmental wider than mental; (15) first pair of chin shields not in contact; (16) third pair of enlarged chin shields absent; (17) nuchal scales undifferentiated; (18) dorsolateral stripes absent; and (19) continuous dorsal longitudinal rows absent (Tables 1, 2).

Comparisons.—The new species differs from all nonpentadactyl species of *Brachymeles* (*apus*, *bonitae*, *cebuensis*, *elerae*, *minimus*, *pathfinderi*, *samarensis*, *tridactylus*, *vermis*, *wrighti*, sp. nov. limbless [Siler et al., 2010], and sp. nov. tridactyl [Siler et al., 2009]) by having fully developed limbs (vs. incompletely developed limbs); longer hind limbs (maximum HLL 25.3 mm for *B. makusog* vs. shorter than, or equal to, 12.2 mm [*Brachymeles wrighti*; Brown and Alcalá, 1980]); five fore- and hind-limb digits (vs. fewer than 5); ToeIVlam eight or nine (vs. fewer than or equal to 5); and lacking a third pair of enlarged chin shields (vs. presence). The new species can be distinguished from all non-pentadactyl species of *Brachymeles* except *Brachymeles pathfinderi* in having auricular openings (Taylor, 1925; Brown and Alcalá, 1980); from all nonpentadactyl species except *B. wrighti* in having 25–28 midbody scale rows (vs. 20–24 for all nonpentadactyl species, 28 for *B. wrighti*; Brown and Alcalá, 1980); and from all nonpentadactyl species except *B. pathfinderi* in having 60–69 paravertebral scale rows (vs. 84 or more, Brown and Alcalá, 1980). It differs from *Brachymeles elerae* in having a pineal eyespot (vs. absence), and from *B. tridactylus*, *B. bonitae*, *B. samarensis*,

TABLE 1. Summary of meristic and mensural characters in *Brachymyles makusog* and all other known pentadactyl species of *Brachymyles*. Sample size, body length, and total length among males and females and general geographical distribution (PAIC = Pleistocene Aggregate Island Complexes, sensu Brown and Diesmos, 2002) are included for reference (SVL, TotL, MBW, FLL, and HLL given as range over mean \pm standard deviation; TL/SVL given as percentage over mean \pm standard deviation). In cases of scale count variation within species, numbers of individuals showing specific counts are given in parentheses.

	<i>schadenbergi orientalis</i>		<i>schadenbergi schadenbergi</i>		<i>schadenbergi schadenbergi</i>		<i>gracilis gracilis</i>		<i>gracilis hilong</i>		<i>bicolor</i>		<i>bolotensis bolotensis</i>		<i>bolotensis bolotensis</i>		<i>bolotensis bolotensis</i>		<i>bolotensis bolotensis</i>			
	Luzon PAIC	Mindanao PAIC	Mindanao PAIC	Visayan PAIC	Mindanao PAIC	Mindanao PAIC	Mindanao PAIC	PAIC	PAIC	Luzon Island	Luzon Island	Bohol Island	Luzon PAIC	Mindoro Island	Mindoro Island	Mindoro Island	Mindoro Island	Mindoro Island	Mindoro Island	Mindoro Island	Negros & Cebu Island	
SVL (f)	98.6-118.0 (108.8 \pm 8.0)	97.6-100.5 (99.0 \pm 1.0)	98.8-113.3 (106.1 \pm 6.1)	78.1-126.7 (113.0 \pm 13.3)	62.8-75.8 (67.6 \pm 3.7)	59.9-81.5 (71.8 \pm 7.0)	111.4-143.5 (131.0 \pm 12.8)	83.8-94.0 (88.4 \pm 3.1)	60.5-95.5 (84.0 \pm 11.2)	90.0-106.8 (98.8 \pm 5.3)	65.8-93.2 (83.9 \pm 7.4)	60.5-95.5 (84.0 \pm 11.2)	90.0-106.8 (98.8 \pm 5.3)	65.8-93.2 (83.9 \pm 7.4)	60.5-95.5 (84.0 \pm 11.2)	90.0-106.8 (98.8 \pm 5.3)	65.8-93.2 (83.9 \pm 7.4)	60.5-95.5 (84.0 \pm 11.2)	90.0-106.8 (98.8 \pm 5.3)	65.8-93.2 (83.9 \pm 7.4)	60.5-95.5 (84.0 \pm 11.2)	90.0-106.8 (98.8 \pm 5.3)
SVL (m)	82.5-123.5 (110.9 \pm 13.7)	84.7-102.3 (95.1 \pm 6.3)	94.4-115.8 (103.8 \pm 7.9)	103.1-123.1 (112.9 \pm 7.1)	60.1-82.3 (67.5 \pm 7.6)	61.5-78.5 (70.5 \pm 5.1)	128.7-139.7 (136.6 \pm 5.3)	84.1-93.6 (89.1 \pm 4.1)	72.3-93.1 (82.5 \pm 6.7)	93.9-104.2 (100.2 \pm 4.1)	87.0-99.2 (93.0 \pm 5.2)	72.3-93.1 (82.5 \pm 6.7)	93.9-104.2 (100.2 \pm 4.1)	87.0-99.2 (93.0 \pm 5.2)	72.3-93.1 (82.5 \pm 6.7)	93.9-104.2 (100.2 \pm 4.1)	87.0-99.2 (93.0 \pm 5.2)	72.3-93.1 (82.5 \pm 6.7)	93.9-104.2 (100.2 \pm 4.1)	87.0-99.2 (93.0 \pm 5.2)	72.3-93.1 (82.5 \pm 6.7)	93.9-104.2 (100.2 \pm 4.1)
TotL (f)	183.8-217.3 (201.5 \pm 17.7)	159.7-205.9 (175.8 \pm 18.3)	179.3-217.4 (202.0 \pm 18.2)	157.3-236.2 (202.9 \pm 24.9)	116.4-134.4 (126.3 \pm 5.5)	94.3-159.2 (126.4 \pm 17.1)	215.2-290.7 (250.5 \pm 36.4)	129.6-174.8 (154.1 \pm 14.7)	129.7-167.4 (159.3 \pm 13.1)	162.5-206.7 (180.2 \pm 14.2)	130.3-168.5 (149.9 \pm 13.0)	129.7-167.4 (159.3 \pm 13.1)	162.5-206.7 (180.2 \pm 14.2)	130.3-168.5 (149.9 \pm 13.0)	129.7-167.4 (159.3 \pm 13.1)	162.5-206.7 (180.2 \pm 14.2)	130.3-168.5 (149.9 \pm 13.0)	129.7-167.4 (159.3 \pm 13.1)	162.5-206.7 (180.2 \pm 14.2)	130.3-168.5 (149.9 \pm 13.0)	129.7-167.4 (159.3 \pm 13.1)	162.5-206.7 (180.2 \pm 14.2)
TotL (m)	162.3-241.3 (201.5 \pm 25.1)	136.0-184.0 (164.6 \pm 14.3)	156.1-219.7 (208.2 \pm 22.1)	191.7-238.4 (208.2 \pm 12.9)	113.9-133.7 (123.2 \pm 8.8)	116.7-139.4 (127.4 \pm 7.8)	233.4-301.4 (275.7 \pm 30.4)	154.5-166.2 (160.7 \pm 5.9)	124.3-173.1 (151.4 \pm 19.4)	165.3-197.0 (184.9 \pm 11.5)	149.6-176.7 (164.3 \pm 11.3)	124.3-173.1 (151.4 \pm 19.4)	165.3-197.0 (184.9 \pm 11.5)	149.6-176.7 (164.3 \pm 11.3)	124.3-173.1 (151.4 \pm 19.4)	165.3-197.0 (184.9 \pm 11.5)	149.6-176.7 (164.3 \pm 11.3)	124.3-173.1 (151.4 \pm 19.4)	165.3-197.0 (184.9 \pm 11.5)	149.6-176.7 (164.3 \pm 11.3)	124.3-173.1 (151.4 \pm 19.4)	165.3-197.0 (184.9 \pm 11.5)
BW	13.0-19.9 (17.5 \pm 2.1)	11.0-17.1 (14.1 \pm 1.6)	13.5-19.1 (15.2 \pm 1.7)	15.7-20.9 (18.3 \pm 1.6)	8.1-11.6 (9.5 \pm 0.9)	7.9-12.1 (10.1 \pm 1.2)	12.6-15.3 (14.1 \pm 0.8)	11.9-15.0 (13.4 \pm 1.0)	9.9-14.7 (12.4 \pm 1.7)	12.8-20.8 (16.0 \pm 1.8)	11.0-16.8 (13.8 \pm 1.7)	9.9-14.7 (12.4 \pm 1.7)	12.8-20.8 (16.0 \pm 1.8)	11.0-16.8 (13.8 \pm 1.7)	9.9-14.7 (12.4 \pm 1.7)	12.8-20.8 (16.0 \pm 1.8)	11.0-16.8 (13.8 \pm 1.7)	9.9-14.7 (12.4 \pm 1.7)	12.8-20.8 (16.0 \pm 1.8)	11.0-16.8 (13.8 \pm 1.7)	9.9-14.7 (12.4 \pm 1.7)	12.8-20.8 (16.0 \pm 1.8)
TL/SVL	61-117 (84 \pm 16)	53-106 (75 \pm 16)	65-103 (88 \pm 13)	61-107 (85 \pm 13)	69-100 (88 \pm 10)	57-98 (78 \pm 14)	62-116 (96 \pm 21)	53-90 (76 \pm 13)	67-114 (89 \pm 16)	60-99 (85 \pm 11)	69-103 (83 \pm 10)	67-114 (89 \pm 16)	60-99 (85 \pm 11)	69-103 (83 \pm 10)	67-114 (89 \pm 16)	60-99 (85 \pm 11)	69-103 (83 \pm 10)	67-114 (89 \pm 16)	60-99 (85 \pm 11)	69-103 (83 \pm 10)	67-114 (89 \pm 16)	60-99 (85 \pm 11)
FLL	12.8-17.0 (14.5 \pm 1.1)	10.4-13.7 (12.0 \pm 0.8)	11.1-13.5 (12.6 \pm 0.8)	11.3-17.7 (14.1 \pm 1.5)	5.9-7.9 (6.9 \pm 0.6)	7.1-9.3 (8.3 \pm 0.6)	9.0-11.7 (10.2 \pm 1.1)	9.0-11.2 (10.1 \pm 0.7)	8.2-11.7 (10.5 \pm 0.8)	10.0-13.0 (11.4 \pm 0.8)	9.0-10.4 (9.8 \pm 0.4)	8.2-11.7 (10.5 \pm 0.8)	10.0-13.0 (11.4 \pm 0.8)	9.0-10.4 (9.8 \pm 0.4)	8.2-11.7 (10.5 \pm 0.8)	10.0-13.0 (11.4 \pm 0.8)	9.0-10.4 (9.8 \pm 0.4)	8.2-11.7 (10.5 \pm 0.8)	10.0-13.0 (11.4 \pm 0.8)	9.0-10.4 (9.8 \pm 0.4)	8.2-11.7 (10.5 \pm 0.8)	10.0-13.0 (11.4 \pm 0.8)
HLL	19.4-25.3 (22.1 \pm 1.9)	18.6-21.8 (20.0 \pm 1.1)	18.8-21.9 (20.8 \pm 1.0)	20.5-27.9 (23.6 \pm 2.2)	10.3-13.6 (12.0 \pm 0.7)	12.2-16.0 (14.3 \pm 1.0)	15.9-20.5 (17.4 \pm 1.4)	15.4-18.7 (17.2 \pm 1.0)	14.3-18.7 (17.2 \pm 1.1)	18.8-23.1 (20.6 \pm 1.2)	15.6-18.7 (17.0 \pm 1.0)	14.3-18.7 (17.2 \pm 1.1)	18.8-23.1 (20.6 \pm 1.2)	15.6-18.7 (17.0 \pm 1.0)	14.3-18.7 (17.2 \pm 1.1)	18.8-23.1 (20.6 \pm 1.2)	15.6-18.7 (17.0 \pm 1.0)	14.3-18.7 (17.2 \pm 1.1)	18.8-23.1 (20.6 \pm 1.2)	15.6-18.7 (17.0 \pm 1.0)	14.3-18.7 (17.2 \pm 1.1)	18.8-23.1 (20.6 \pm 1.2)
FinIIIam	5 (6)	6 (15)	5 (2)	5 (19)	4 (8)	5 (20)	4 (7)	6 (19)	5 (14)	5 (16)	5 (12)	4 (7)	6 (19)	5 (14)	5 (16)	5 (12)	5 (12)	4 (7)	6 (19)	5 (14)	5 (16)	5 (12)
ToetIVlam	6 (5)	7 (1)	6 (10)	6 (2)	5 (10)	8 (13)	5 (2)	6 (2)	6 (1)	6 (2)	6 (9)	5 (2)	9 (7)	6 (1)	6 (2)	6 (2)	6 (9)	6 (1)	6 (2)	6 (9)	6 (9)	6 (9)
	9 (6)	8 (3)	8 (3)	8 (1)	7 (4)	8 (13)	6 (2)	8 (1)	9 (13)	6 (2)	9 (10)	6 (2)	9 (7)	9 (13)	8 (14)	6 (2)	9 (10)	9 (13)	8 (14)	9 (10)	9 (10)	9 (10)
	10 (5)	9 (13)	9 (9)	9 (12)	8 (14)	9 (7)	7 (7)	10 (12)	10 (2)	9 (4)	10 (11)	7 (7)	10 (12)	10 (2)	9 (4)	10 (11)	10 (11)	10 (2)	9 (4)	10 (11)	10 (11)	10 (11)
MBSR	25-28	26-28	26-30	26-30	24-26	27-30	28-29	26-28	26-27	26-28	26-28	28-29	26-28	26-27	26-28	26-28	26-28	26-27	26-28	26-28	26-28	26-28
AGSR	42-47	46-49	45-50	43-48	46-49	44-50	64-72	42-46	42-46	42-46	42-47	64-72	42-46	42-46	42-46	42-46	42-47	42-46	42-46	42-46	42-47	42-47
PVSR	60-69	69-72	67-72	67-72	67-70	66-73	88-92	63-66	63-66	63-66	62-69	88-92	63-66	63-66	63-66	63-66	62-69	63-66	63-66	63-66	62-69	62-69
SL	6 (7)	6 (15)	6 (2)	6 (1)	6 (18)	6 (20)	6 (9)	7 (19)	6 (12)	6 (18)	6 (21)	6 (9)	7 (19)	6 (12)	6 (18)	6 (21)	6 (21)	6 (12)	6 (18)	6 (21)	6 (21)	6 (21)
	7 (4)	7 (1)	7 (10)	7 (20)	7 (18)	6 (20)	6 (9)	7 (19)	7 (3)	7 (18)	7 (21)	6 (9)	7 (19)	7 (3)	7 (18)	7 (21)	7 (21)	7 (3)	7 (18)	7 (21)	7 (21)	7 (21)
IFL	6 (10)	6 (1)	7 (12)	7 (21)	7 (18)	6 (20)	6 (9)	6 (18)	7 (15)	7 (18)	7 (21)	6 (9)	6 (18)	7 (15)	6 (18)	7 (21)	7 (21)	7 (15)	6 (18)	7 (21)	7 (21)	7 (21)
	7 (1)	7 (15)	6 (12)	6 (21)	6 (18)	6 (20)	6 (9)	6 (18)	6 (18)	6 (18)	6 (21)	6 (9)	6 (18)	6 (18)	6 (18)	6 (21)	6 (21)	6 (18)	6 (18)	6 (21)	6 (21)	6 (21)
SC	6 (11)	6 (16)	6 (12)	6 (21)	6 (18)	6 (20)	6 (9)	6 (18)	6 (18)	6 (18)	6 (21)	6 (9)	6 (18)	6 (18)	6 (18)	6 (21)	6 (21)	6 (18)	6 (18)	6 (21)	6 (21)	6 (21)
SO	5 (11)	5 (16)	5 (12)	5 (21)	5 (18)	5 (20)	5 (9)	5 (19)	5 (15)	5 (18)	5 (20)	5 (9)	5 (19)	5 (15)	5 (18)	5 (20)	5 (20)	5 (15)	5 (18)	5 (20)	5 (20)	5 (20)

TABLE 2. Summary of qualitative diagnostic characters (present, absent) in *Brachymeles makusog* and all other known pentadactyl species of *Brachymeles*. The pairs of enlarged scales posterior to the postmental scale are abbreviated as chin shield pairs with reference to the 1st, 2nd, and 3rd pairs (when present).

	<i>makusog</i> (7 m, 4 f)	<i>schaedenbergi orientalis</i> (10 m, 6 f)	<i>schaedenbergi</i> (8 m, 4 f)	<i>taitimis</i> (10 m, 11 f)	<i>gracilis</i> (7 m, 11 f)	<i>gracilis nilong</i> (8 m, 12 f)	<i>bicolor</i> (4 m, 5 f)	<i>boulengeri boliolepis</i> (5 m, 14 f)	<i>boulengeri</i> (7 m, 8 f)	<i>boulengeri mindorensis</i> (6 m, 12 f)	<i>boulengeri taylori</i> (8 m, 13 f)
Pineal eyespot	+	+	-	+	-	+	+	+	+	+	+
Supranasal contact	-	-	+	+	-	-	+	-	-	- or +	-
Prefrontal contact	-	-	-	-	+	-	-	-	-	+	-
Parietals contact	-	-	+	+	+	+	+	+	+	- or +	+
Postmental vs. mental width	PMW > MW	Equal	Equal	PMW > MW	PMW > MW	PMW > MW	PMW > MW	PMW > MW	PMW > MW	Equal	PMW > MW
1st chin shield pair contact	- or +	- or +	- or +	+	-	- or +	+	+	- or +	+	+
3rd chin shield pair contact	-	-	-	+	+	+	-	+	-	-	-
Chin shield pair size	2 < 1	2 < 1	2 < 1	3 < 2 = 1	3 < 1 < 2	3 < 1 < 2	2 < 1	1 < 3 < 2	1 < 2	1 < 2	1 < 2
Chin shield pair separation ^a	1(1); 2(3)	1(0/1); 2(3)	1(0/1); 2(3)	1(0); 2(1); 3(3)	1(1); 2(1); 3(3)	1 (0/1); 2(1); 3(3/5)	1(0); 2(3)	1(0); 2(1); 3(3)	1(0/1); 2(1)	1(0); 2(1)	1(0); 2(1)
Subocular	4th or 5th	4th	5th	5th	4th	4th	4th	5th	4th	5th	4th
Differentiated supralabial nuchals	-	-	-	-	-	-	+	-	-	-	-
Uniform body color	-	-	-	-	+	+	-	-	-	-	-
Dorsolateral stripes	-	-	-	+, wide	+	+	-	+	+	+	-
Continuous dorsal longitudinal rows	-	-	+, 10 rows	+, 8 rows	+, 6 rows	+/-, vaguely defined	-	+, 8	-	+, 8 rows	+, 8 rows

^a Parentheses show the number of small ventral scale rows separating each enlarged pair of chin shields.

B. cebuensis, *B. minimus*, and *B. vermis* in lacking enlarged, differentiated nuchal scales (vs. presence).

In the following section, *B. makusog* is compared with all pentadactyl species of the genus; the character states for congeners can be found in Tables 1 and 2. It differs from the polytypic species *B. boulengeri* (including all subspecies) by having a larger maximum body size, longer forelimbs, the second pair of enlarged chin shields smaller than the first pair, and the fourth or fifth supralabial beneath the center of the eye. *Brachymeles makusog* further differs from *Brachymeles boulengeri boholensis*, *Brachymeles boulengeri boulengeri*, and *Brachymeles boulengeri taylori* by having longer hind limbs, lacking contact between parietal scales, and lacking continuous dorsal longitudinal rows of pigmented scales; from *B. b. boholensis*, *B. b. boulengeri*, and *Brachymeles boulengeri mindorensis* by the absence of dorsolateral stripes; from *B. b. boholensis* and *B. b. boulengeri* by lacking contact between supranasal scales; from *B. b. boholensis* by lacking contact between prefrontals, and having a third pair of enlarged chin shields; and from *B. b. mindorensis* by having the postmental wider than the mental.

Brachymeles makusog differs from the polytypic species *B. gracilis* (including all subspecies) by having a larger body, larger midbody width, longer limbs, five or six FinIIIam, six or seven supralabials, second pair of enlarged chin shields smaller than the first pair, and fourth or fifth supralabial beneath the center of the eye and by lacking contact between supranasal and parietal scales and by lacking a third pair of enlarged chin shields, a uniform body color, and dorsolateral stripes. The new species further differs from *Brachymeles gracilis hilong* by having six or seven infralabials and from *Brachymeles gracilis gracilis* by having nine or 10 ToeIVlam.

From the polytypic species *B. schadenbergi* (including all subspecies), the new species can be differentiated by having longer forelimbs, nine or 10 ToeIVlam, no contact between prefrontal scales, postmental scale wider than mental, and the fourth or fifth supralabial beneath the center of the eye. The new species further differs from *Brachymeles schadenbergi orientalis* by having five or six FinIIIam and from *Brachymeles schadenbergi schadenbergi* by the absence of continuous dorsal longitudinal rows and the presence of a pineal eyespot.

Brachymeles makusog can be distinguished from *B. talinis* by having six or seven infralabials; having the fourth or fifth supralabial beneath the center of the eye; lacking contact between supranasals, prefrontals, and parietals;

and lacking a third pair of enlarged chin shields, dorsolateral stripes, and continuous dorsal longitudinal rows.

The new species differs from *Brachymeles bicolor* by having a smaller body; longer forelimbs; five or six FinIIIam; nine or 10 ToeIVlam; fewer midbody scale rows; fewer axilla-groin scale rows; fewer paravertebral scale rows; six or seven supralabials; six or seven infralabials; the fourth or fifth supralabial beneath the center of the eye; lacking contact between supranasals, prefrontals, and parietals; and lacking enlarged, differentiated nuchal scales.

Description of Holotype.—Mature male, hemipenes everted; SVL 108.0 mm; body robust; head weakly differentiated from neck, nearly as wide as body, HW 11.5% SVL, 98.7% HL; HL 46.4% SnFa; SnFa 25.1% SVL; snout moderately long, broadly rounded in dorsal and lateral profile, SNL 34.3% HL; auricular opening present; eyes moderate, ED 2.1% SVL, 17.7% HL, 63.1% END, pupil nearly round; body slightly depressed, MBD 73.5% MBW; body scales smooth, glossy, imbricate; longitudinal scale rows at midbody 26; paravertebral scale rows 65; axilla-groin scale rows 47; limbs well developed, pentadactyl; FinIIIam 6; ToeIVlam 9; FLL 20.6% AGD, 13.4% SVL; HLL 29.4% AGD, 19.1% SVL; order of digits from shortest to longest for hand: I < V < IV < II = III, for foot: I < V = II < III < IV; tail not as wide as body, sharply tapered toward end, TW 71.1% MBW, TL 84.9% SVL.

Rostral projecting onto dorsal snout to point in line with center of nasal, broader than high, forming a short suture with frontonasal; frontonasal wider than long; nostril ovoid, in center of single quadrilateral nasal, longer axis directed anteroventrally and posterodorsally; nasals well separated; supranasals present, large, moderately separated; postnasals present; prefrontals moderately separated; frontal shaped as nine-sided polygon, its anterior margin in moderate contact with prefrontal, in contact with first two anterior supraoculars, 4 times wider than anteriormost supraocular; supraoculars five; frontoparietals moderate, contact mesially, each frontoparietal in contact with interior three supraoculars; interparietal large, its length 1.5 times longer than midline length of frontoparietal; interparietal longer than wide, diamond shaped, wider anteriorly, its length nearly equal to one half of frontal length; parietal eyespot present in posterior third of scale; parietals as broad as frontoparietals laterally, narrower mesially, narrowly separated behind interparietal; enlarged, differentiated nuchals absent; loreals two, decreasing in size from anterior to posterior, anterior loreal about as long as and

TABLE 3. Summary of univariate morphological variation among mensural characters in the type series of *Brachymeles makusog*.

	Males <i>N</i> = 7	Females <i>N</i> = 4
SVL	82.5–123.5 (110.9 ± 13.7)	98.6–118.0 (108.8 ± 8.0)
AGD	51.8–79.3 (71.7 ± 9.5)	63.7–78.2 (70.7 ± 6.2)
TotL	162.3–241.3 (201.5 ± 25.1)	183.8–217.3 (201.5 ± 17.7)
MBW	13.0–19.9 (17.2 ± 2.3)	16.2–19.6 (18.0 ± 1.7)
MBD	10.0–15.6 (12.3 ± 1.8)	12.1–14.5 (12.9 ± 1.1)
TL	67.9–130.3 (90.6 ± 19.5)	78.0–108.1 (92.7 ± 13.6)
TW	10.8–14.5 (13.0 ± 1.5)	12.2–13.9 (13.0 ± 0.8)
TD	8.2–12.4 (11.0 ± 1.4)	9.0–11.3 (10.0 ± 1.0)
HL	10.4–12.6 (11.5 ± 0.7)	10.2–12.7 (12.0 ± 1.2)
HW	10.6–15.9 (13.1 ± 1.7)	11.1–13.3 (11.9 ± 1.0)
HD	6.7–11.3 (10.0 ± 1.7)	7.5–10.2 (8.9 ± 1.3)
SnFa	24.8–35.0 (30.1 ± 3.5)	25.4–31.5 (28.4 ± 3.5)
ED	1.8–2.5 (2.2 ± 0.3)	2.1–2.7 (2.3 ± 0.3)
END	3.3–4.8 (4.2 ± 0.6)	3.3–4.4 (4.0 ± 0.5)
SNL	4.3–6.9 (5.8 ± 1.0)	4.6–6.1 (5.5 ± 0.8)
IND	2.8–3.8 (3.4 ± 0.3)	2.9–3.5 (3.2 ± 0.3)
FLL	13.8–17.0 (15.0 ± 1.0)	12.8–14.7 (13.7 ± 0.8)
HLL	20.4–24.4 (22.4 ± 1.4)	19.4–25.3 (21.4 ± 2.6)

1.5 times higher than posterior loreal, in contact with frontal, supranasal, postnasal, first and second supralabials, second loreal and prefrontal; preoculars two, dorsal larger than ventral, nearly as high as second loreal; supraciliaries six, the anteriormost contacting frontal and separating posterior loreal from first supraocular, posteriormost extending to midline of last supraocular; single subocular row complete, in contact with supralabials; lower eyelid with one row of scales; supralabials seven, first 1.5 times the size of other supralabials, fifth beneath center of eye; infralabials six.

Mental wider than long, in contact with first infralabial on both sides; single enlarged postmental, slightly wider than mental; followed by two pairs of enlarged chin shields, scales of first pair in broad contact, widest, 1.5 times the width of second chin shield scales; second pair separated by three rows of undifferentiated scales.

Scales on limbs smaller than body scales; scales on dorsal surfaces of digits large, wrapping around lateral edges of digits; lamellae undivided to bases of digits; palmar surfaces of hands and plantar surfaces of feet covered by small, irregular scales, each with raised anterior edges; scales on dorsal surface of hands and feet smaller than limb scales, lacking raised edges.

Coloration of Holotype in Preservative.—Ground color of body light brown; lateral and ventral surface of body without dark pigment; dorsal surface of body with discontinuous, irregular streaks of medium-brown pigment, spanning eight scale rows, extending from posterior edge of parietals to tail tip; pigmentation covering zero to three fourths of dorsal scales; head scales with solid, brown pigment. Limbs mottled light

and medium brown dorsally, yellowish-brown ventrally; dorsal and ventral surface of digits dark brown. Head scales uniform medium brown, darker brown than ventral scales; rostral, nasal, postnasal, supranasal, and first supralabial dark grey, lacking brown coloration; pineal eyespot light cream.

Coloration of Holotype in Life.—(Differences from preserved specimens). Body ground color light orange-brown; discontinuous, irregular streaks of medium-brown pigment on dorsal surface extending from posterior edge of rostral to tail tip; pigmentation dark brown across dorsal head scales. Limbs mottled orange-brown ventrally. Head scales uniform dark brown.

Measurements of Holotype.—Measurements in millimeters SVL 108.0; AGD 70.4; TotL 199.7; MBW 16.6; MBD 12.2; TL 91.7; TW 11.8; TD 10.6; HL 12.6; HW 12.4; HD 9.0; SnFa 27.1; ED 2.2; END 3.5; SNL 4.3; IND 3.2; FLL 14.5; HLL 20.7; MBSR 26; PVSr 65; AGSR 47; FinIIIam 6; ToeIVlam 9; SL 7; IFL 6; SC 6; SO 5.

Variation.—Variation in mensural characters measured in the series are presented in Table 3. The supralabial scale located beneath the center of the eye varies between the Catanduanes Island and Mt. Labo populations of *B. makusog*. The fifth supralabial is beneath the center of the eye for specimens from Catanduanes Island (KU 308126, 308128, 308136, 308208, PNM 9565, 9583–9584), whereas the fourth supralabial is beneath the center of the eye for specimens from Mt. Labo in the Bicol Peninsula (KU 313612–313614, 313616, 313617, PNM 9585–9588, FMNH 270200).

Distribution.—*Brachymeles makusog* is known from Catanduanes Island and from Mt. Labo in

the Camarines Norte Province of Luzon Island (Fig. 1). The new species has been collected from 200–1,000 m above sea level. We suspect that this species is distributed across much of the Bicol Peninsula on Luzon Island; however, additional survey work in this region is necessary before this can be confirmed.

Etymology.—The name of the new species is derived from the local dialect of the Bicol Peninsula. The word “makusog” is the Bicolano term for strong, robust, or brave, in reference to the large and distinctive body form of the new species. Suggested common name: Bicol Loam Swimming Skink.

Ecology and Natural History.—*Brachymeles makusog* occurs in primary- and secondary-growth forest. Individuals were found in the humus material within rotting logs and were captured in pitfall traps placed around rotting logs.

When first observed, *B. makusog* was well camouflaged within soil and humus on the forest floor. Individuals were only detected after the rotting logs and soil habitats were disturbed. When disturbed, individuals immediately moved in a rapid serpentine manner and attempted to burrow back into loose soil or humus.

Sympatric lizard species occurring in the Bicol Peninsula include *Brachymeles samarensis*, *B. boulengeri boulengeri*, *B. sp. nov.* limbless (Siler et al., 2010), *Bronchocela cristatella*, *Cyrtodactylus philippinicus*, *Dasia atrocostata*, *Draco spilopterus*, *Eutropis multicarinata borealis*, *Eutropis multifasciata*, *Gonocephalus sophiae*, *Hemidactylus frenatus*, *Hemidactylus platyurus*, *Gekko gekko*, *Gekko mindorensis*, *Gekko mutilata*, *Hydrosaurus pustulatus*, *Lamprolepis smaragdina*, *Lipinia pulchella pulchella*, *Luperosaurus cumingii*, *Pseudogekko smaragdina*, *Pseudogekko compressicorpus*, *Sphenomorphus abdictus*, *Sphenomorphus decipiens*, *Sphenomorphus cumingi*, *Sphenomorphus jagori*, *Sphenomorphus laterimaculatus*, *Sphenomorphus leucospilos*, *Sphenomorphus steerei*, *Tropidophorus grayi*, *Varanus marmoratus*, and *Varanus olivaceus*. *Brachymeles minimus* is known to occur on Catanduanes Island where *Eutropis indepressa*, and *Sphenomorphus lawtoni* also have been reported (Ross and Gonzales, 1992; Brown and Alcala, 1995).

DISCUSSION

The new species brings the total of known *Brachymeles* species to 18, all but one of which are endemic to the Philippines. The species total for the country has remained nearly constant during the last 30 years, which is a testament to the high degree of morphological similarity within the genus. Until recently, one species of *Brachymeles* had been described since Brown and Alcala's 1980 revision of the genus (Brown

and Alcala, 1995; Siler et al., 2009, 2010). In retrospect, it is not surprising that allopatric populations of “*B. talinis*” from the Luzon and Visayan Pleistocene Aggregate Island Complexes would be morphologically diagnosable and eventually recognized as distinct species. Few species spanning these zoogeographic boundaries actually have turned out to constitute single evolutionary lineages (McGuire and Alcala, 2000; Brown and Diesmos, 2002; Gaulke et al., 2007).

Along with having a conserved body plan, species within the genus possess a semifossorial, loam-swimming lifestyle, specialized exclusively on rotting logs, loose soil, and leaf litter. This highly specialized habitat preference (and the targeted effort it takes to collect specimens) may be responsible for the relatively modest numbers of *Brachymeles* specimens in museum collections. The secretive lifestyle of *Brachymeles* may also contribute to the low current estimates of species diversity within the genus.

Previous taxonomic reviews of *Brachymeles* have focused solely on morphological variation (Brown and Rabor, 1967; Brown and Alcala, 1980, 1995). The potential for undocumented cryptic diversity within the genus has been mentioned only in passing by these authors as an ancillary possibility, not an expectation. A number of studies have shown that the evolution of a burrowing lifestyle is correlated with decreasing dispersal abilities (Selander et al., 1974; Patton and Yang, 1977; Patton and Feder, 1978). Many *Brachymeles* lineages have experienced reduction or loss of limbs, which may further reduce a species' vagility (Daniels et al., 2005; Mulvaney et al., 2005). Over time, reduced dispersal abilities may lead to an increasingly patchy distribution, reduction in gene flow among populations, and the accumulation of interpopulation genetic differences (Nevo, 1979). This process also could be amplified within an island archipelago or a geographically complex island such as Luzon. Regardless of what processes produce species diversity, we suspect that additional species await discovery if herpetologists can adequately sample semifossorial faunas and compare slight morphological variation of *Brachymeles* populations to independent molecular estimates of species boundaries. It is clear that a comprehensive phylogenetic analysis of the genus will be required to assess thoroughly the actual species diversity within *Brachymeles* (C. Siler, R. Brown, and A. Diesmos, unpubl. data).

Brachymeles makusog is the tenth species of *Brachymeles* known from Luzon Island and the eleventh species within the Luzon Faunal Region (Brown and Alcala, 1980; Brown and Diesmos, 2002; Siler et al., 2009, 2010). Previ-

ously, the only two large-bodied pentadactyl species of *Brachymeles* known from Luzon Island were *B. bicolor* and *B. talinis*. New species of amphibians and reptiles (Brown et al., 1999, 2000a, 2007) have been discovered regularly on Luzon Island and the island's complex mountain ranges (Sierra Madres, Cordillera, Zambales; Brown et al., 1996, 2000b), and with increased attention to microhabitat diversity, additional cryptic species are likely to be discovered (Ross and Gonzales, 1992; Brown et al., 1995a,b).

Although it is expected that the new species has a geographic distribution spanning much of the Bicol Peninsula, surveys focused on rotting-log and leaf-litter microhabitats need to be conducted throughout the region before a complete assessment of the species' geographic range and appropriate conservation status can be made. At present, the new species is known from a broad elevational range (200–1,000 m) on a massif within the Bicol Region (Mt. Labo) and Catanduanes Island. At both sites, the species was relatively common, and its capture in pitfall traps indicates a moderate level of activity on the surface of the forest floor. Whether the species occurs throughout the Bicol Peninsula and surrounding small islands is unknown. Because of the absence of any data on the distribution and habitat requirements of this unique species, we consider the conservation status of the new species "data deficient," pending the collection of additional information.

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APPENDIX I

Specimens Examined

All specimens examined are from the Philippines with the exception of *Brachymeles apus*. Numbers in parentheses indicate the number of specimens examined for each species. Several sample sizes are greater than those given in the tables because of the examination of subadult specimens, which were excluded in morphometric analyses.

Brachymeles apus.—(1) BORNEO: MALAYSIA: Sabah: Mt. Kinabalu National Park, Sayap Sub-Station: SP 06915.

Brachymeles bicolor.—(11) LUZON ISLAND: CAGAYAN PROVINCE: Municipality of Baggao: Sitio Hot Springs: CAS 186111; Isabela Province, Sierra Madres Mountain Range: PNM 9568–9577.

Brachymeles bonitae.—(13) MASBATE ISLAND: MASBATE PROVINCE: Municipality of Mobo: Tugbo Barrio: CAS 144223; Mapuyo Barrio: Palangkahoy: CAS 144270; MINDORO ISLAND: MINDORO ORIENTAL PROVINCE: Mt Halcon: southeastern slope of Barawan Peak: CAS-SU 25713, 25793, 25886–25888, 25904; Sumagui: CAS 62064 (Paratype); POLILLO ISLAND: QUEZON PROVINCE: Municipality of Polillo: Barangay Pinaglubayan: KU 307747–307749, 307755.

Brachymeles boulengeri bohollensis.—(19) BOHOL ISLAND: BOHOL PROVINCE: 6 km south of Municipality of Sierra Bullones: Teachers Park: CAS-SU (Holotype) 24528; 13 km southeast of Municipality of Sierra Bullones: Dusita Barrio: CAS-SU (Paratypes) 24502–24504, 24518, 24520–24525, 24541, 24543, CAS-SU 25443–25444, 25447; 1 km east of Dusita Barrio: Abacjanan: CAS-SU 24867; Municipality of Sierra Bullones: Sandayong: CAS-SU 18709, 18717.

Brachymeles boulengeri boulengeri.—(15) POLILLO ISLAND: QUEZON PROVINCE: Municipality of Polillo: CAS (Paratypes) 62272–62273, 62276–62277; LUZON ISLAND: LAGUNA PROVINCE: Municipality of Los Banos: CAS 61096; Mt. Maquiling: CAS 61297; POLILLO ISLAND: QUEZON PROVINCE: Municipality of Polillo: Barangay Pinaglubayan: KU 307439, 307750–307754, 307756–307758.

Brachymeles boulengeri mindorensis.—(18) MINDORO ISLAND: MINDORO ORIENTAL PROVINCE: 30 km southeast of Municipality of Calapan: Bank of Tarogin River: CAS-SU (Holotype) 24487; southeastern slope of Mt. Halcon, Tarogin Barrio: CAS-SU (Paratypes) 24549–24554, 24561–24562, 24564; 24566, 24568, 24573–24574, 24577–24579; Mt. Halcon, southeastern slope of Barawan Peak: CAS-SU (Paratype) 24570.

Brachymeles boulengeri taylori.—(21) NEGROS ISLAND: NEGROS ORIENTAL PROVINCE: 3 km west of Municipality of Valencia: Cuernos de Negros Mountain Range: Sitio Lunga: Ridge on North Side of Maiti River: CAS-SU (Holotype) 18615, CAS-SU 21873; Ridge on South Side of Maiti River: CAS-SU (Paratype) 18641, 18656–18657, 18748; Cuernos de Negros Mountain Range: CAS-SU (Paratype) 18649; Top of Dayungan Ridge: CAS-SU 21877, 21880, 21883–21884; 24 km northwest of Bondo Barrio: Bantolinao: CAS-SU 22355–22356; CEBU ISLAND: CEBU PROVINCE: 10 km from Municipality of Carcar: Tapal Barrio: Sitio Mantalongon: CAS 154671, 154673, 154678–154682, 154686.

Brachymeles cebuensis.—(8) CEBU ISLAND: 40 km southwest of Cebu City: Tapal Barrio, Sitio Mantalongon: CAS-SU (Holotype) 24400, (Paratypes) 24396–14397, 24399, 24401, 24403; 10 km from Municipality of Carcar: Tapal Barrio: CAS 102405 (Paratype); 3 km northwest of Cebu City, Buhisan Barrio, Buhisan Reforestation Project: CAS-SU 27537.

Brachymeles eleae.—(4) LUZON ISLAND: KALINGA PROVINCE: Municipality of Balbalan: CAS 61499–614500, PNM 9563–9564.

Brachymeles gracilis gracilis.—(18) MINDANAO ISLAND: DAVAO DEL SUR PROVINCE: Municipality of Malalag: Sitio Kibawalan: CAS-SU 24163, 24165, CAS 124811, 139307–139309; Davao City: Buhangin, Kabanti-an: CAS 124803–124804, 139293–139295, 139303–139305; Digos City: Tres de Mayo Barrio: CAS 124806–124808, 139300.

Brachymeles gracilis hilong.—(20) MINDANAO ISLAND: AGUSAN DEL NORTE PROVINCE: Municipality of Cabadbaran: Diuata Mountain Range: Mt. Hilonglong: Balangbalang: CAS-SU (Holotype) 24407, (Paratype) 102406, 133578, CAS-SU 24411, 133577, 133581–133582, 133609, 133612, 133692–133693, 133703–133706, 133743, 133745–133747; SURIGAO DEL SUR PROVINCE: Municipality of Lanuza: Diuata Mountain Range: Sibuhay Barrio: CAS-SU (Paratype) 24315.

Brachymeles minimus.—(6) CATANDUANES ISLAND: CATANDUANES PROVINCE: Municipality of Gigmoto: Barangay San Pedro: KU 308129–308131, 308210–308212.

Brachymeles samarensis.—(7) SAMAR ISLAND: EASTERN SAMAR PROVINCE: Municipality of Taft: Barangay San Rafael: KU 310849–310850, 310852, 311294–311296; LEYTE ISLAND: LEYTE PROVINCE: Municipality of Baybay: Barangay Pilim: Sitio San Vicente: KU 311225.

Brachymeles schadenbergi orientalis.—(21) BOHOL ISLAND: BOHOL PROVINCE: Municipality of Sierra Bullones: Dusita Barrio: CAS-SU (Holotype) 24436, CAS-SU (Paratypes) 24428, 24434, 24437, CAS (Paratype) 102404, CAS-SU 25452; Dusita Barrio: Abacjanan: CAS-SU (Paratypes) 24446–24451, CAS-SU 25460; Cantaub Barrio: CAS-SU (Paratypes) 18702, 24442, 24458; MINDANAO ISLAND: AGUSAN DEL NORTE PROVINCE: Municipality of Cabadbaran: Diuata Moun-

tain Range: Mt. Hilonglong: Kasinganan: CAS-SU 133301, 133616, 133749, 133752, 133754.

Brachymeles schadenbergi schadenbergi.—(20) MINDANAO ISLAND: MISAMIS OCCIDENTAL PROVINCE: 2 km northwest of Masawan: CAS 23468–23469; 4 km northwest of Masawan: CAS 23471; 3 km northwest of Masawan: South Bank of Dapitan River: CAS 23479–23481, 23484–23485; ZAMBOANGA DEL NORTE PROVINCE: Dapitan River: CAS-SU 23494–23496; BASILAN ISLAND: BASILAN PROVINCE: Port Holland: Sawmill: CAS 60493; CAMIGUIN SUR ISLAND: CAMIGUIN PROVINCE: Municipality of Catarman: Mt. Mambajao: Sitio Sangsangan: CAS 110976–110983.

Brachymeles sp. undescribed limbless.—(14) LUZON ISLAND: Camarines Norte Province: Municipality of Labo: Barangay Tulay Na Lupa: Mt. Labo: (Holotype) PNM 9567, (Paratypes) PNM 9589–92, KU 313597–99, 313601, 313603–04, 313606, 313608, FMNH 270191.

Brachymeles sp. undescribed tridactyl.—(17) LUZON ISLAND: Nueva Vizcaya Province: Municipality of Quezon: Barangay Maddiangat: (Holotype) PNM 9566, (Paratypes) PNM 9578–82, KU 308865–66, 308900–06, 308908, 308953.

Brachymeles talinis.—(21) NEGROS ISLAND: NEGROS ORIENTAL PROVINCE: 6 km west of Municipality of Valencia: Cuernos de Negros Mountain Range: Ridge on North Side of Maite River: CAS-SU (Holotype) 18358, (Paratype) 89813; Cuernos de Negros Mountain Range: Dayungan Ridge: CAS 133871; Dumaguete City: CAS-SU (Paratype) 12225; Municipality of Siaton: 20 km north of Bondo Barrio: CAS-SU 22311–22312, 22317, 22323; INAMPULAGAN ISLAND: GUIMARAS PROVINCE: Municipality of Sibunag: 8 km west of Pulpandan Town: CAS-SU 27972, 27996–27997; PANAY ISLAND: ANTIQUE PROVINCE: Municipality of San Remigio: KU 306651, 306756, 306758, 306760, 306765–306766, 306772–306774, 306786.

Brachymeles tridactylus.—(20) NEGROS ISLAND: NEGROS OCCIDENTAL PROVINCE: 16 km east of Municipality of La Castellana: Barrio Cabagna-an: Southern Slope of Mt. Canlaon: CAS-SU 19424, 19426–19427, 19429, 19452, 19458; 20 km east of Municipality of La Castellana: Sitio Kalapnagan: CAS-SU 27082–27083; NEGROS ORIENTAL PROVINCE: Hills North and Northwest of Mayaposi: CAS-SU (Holotype) 18354; PANAY ISLAND: ANTIQUE PROVINCE: Municipality of Culasi: Barangay Alojipan: KU 307726–307736.

Brachymeles vermis.—(5) JOLO ISLAND: SULU PROVINCE: CAS-SU (Paratype) 62489, CAS-SU 60720–60722, 60857.

APPENDIX II

Character Definitions

Snout-vent length, distance from tip of snout to vent.

Axilla-groin distance, distance between posterior edge of forelimb insertion and anterior edge of hindlimb insertion.

Total length, distance from tip of snout to tip of tail.
Midbody width, measured from lateral surface to opposing lateral edge at midpoint of axilla-groin region.

Midbody depth, measured from ventral surface to dorsal surface at midpoint of axilla-groin region.

Tail length, measured from posterior margin of vent to tip of tail.

Tail width, measured at widest section of tail posterior to hemipene bulge.

Tail depth, measured from ventral to dorsal surface of tail at widest section posterior to hemipene bulge.

Head length, measured from tip of snout to posterior margin of jaw articulation.

Head width, widest measure of head width at jaw articulations.

Head depth, measured from ventral to dorsal surface of head at jaw articulations.

Snout-forearm length, measured from tip of snout to anterior margin of forelimb insertion.

Eye diameter, measured at widest point.

Eye-narial distance, from anterior margin of eye to posterior margin of nares.

Snout length, measured from anterior margin of eye to tip of snout.

Internarial distance, measured from dorsal aspect between most laterally distal edges of nares.

Forelimb length, measured from forelimb insertion to tip of Finger III or longest digit.

Hind-limb length, measured from hind-limb insertion to tip of Toe IV or longest digit.

Midbody scale-row count, number of longitudinal scale rows measured around widest point of midbody.

Paravertebral scale-row count, the number of scale rows measured between parietals and the base of the tail opposite the vent.

Axilla-groin scale-row count, the number of scale rows measured between posterior edge of forelimb insertion and anterior edge of hind-limb insertion.

Finger III lamellae count, all enlarged, undivided lamellae beneath Finger III.

Toe IV lamellae count, all enlarged, undivided lamellae beneath Toe IV.