

REDESCRIPTION OF TETRADACTYL PHILIPPINE SLENDER SKINKS (GENUS *BRACHYMELES*)

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ABSTRACT: We redescribe the exceedingly rare, tetradactyl Philippine scincid lizards of the genus *Brachymeles*. Before the recent discovery of a second museum specimen of *Brachymeles wrighti*, and the rediscovery of *B. elerae* in the wild, these two species were known from a combined three museum specimens, all collected in the early 1900s. Since that time, biotic surveys in the region, including recent efforts focused at the recognized type localities for both species, resulted in the rediscovery of extant populations of *B. elerae*. Based on re-examination of type material, complete mensural and meristic data for a recently recovered museum specimen, as well as our recently collected material, we redescribe these two rare species, providing the first, complete diagnostic illustrations of head scalation and hand and foot morphology, and we comment on their taxonomic and phenotypic affinities, and conservation status.

Key words: Biodiversity; Endemism; Faunal region; Limb reduction; Philippines; Taxonomy

FEW GENERA of scincid lizards are known to possess both fully limbed and limbless species (e.g., *Brachymeles*, *Chalcides*, *Lerista*, and *Scelotes*; Brandley et al., 2008; Lande, 1978; Siler and Brown, 2011; Siler et al., 2011; Wiens and Slingluff, 2001). Of these, the genus *Brachymeles* has arguably been the least understood, and until recently, was recognized only as a small radiation of species, primarily endemic to the Philippines. However, within the past 2 yr, as our understanding of the species diversity has improved, the number of recognized species within the genus has nearly doubled (for review, see Siler et al., 2011). Within *Brachymeles*, all but two of the 26 recognized species are endemic to the Philippines. The exceptions are *B. apus* from northern Borneo and *B. miriamae* from Thailand (Brown and Alcala, 1980; Hikida, 1982; Siler, 2010; Siler and Brown, 2010; Siler et al., 2009, 2010a,b, 2011, in press). Thirteen species are pentadactyl (*B. bicolor*, *B. bohollensis*, *B. boulengeri*, *B. gracilis*, *B. kadwa*, *B. makusog*, *B. mindorensis*, *B. orientalis*, *B. schadenbergi*, *B. talinis*, *B. taylora*, *B. tungaoi*, and *B. vindumi*) and eight are nonpentadactyl, with incompletely developed limbs and reduced numbers of digits (*B. bonitae*, *B. cebuensis*, *B. elerae*, *B. muntingkamay*, *B. pathfinderi*, *B. samarensis*, *B. tridactylus*, and *B. wrighti*), and five are limbless (*B. apus*, *B.*

miriamae, *B. minimus*, *B. lukbani*, and *B. vermis*). Within the nonpentadactyl species a wide range of limb- and digit-reduced states have evolved, from minute limbs with reduced digits (*B. bonitae*, *B. cebuensis*, *B. muntingkamay*, *B. samarensis*, and *B. tridactylus*), to moderately developed limbs with four to five digits on the hands and feet (*B. elerae*, *B. pathfinderi*, and *B. wrighti*; for review, see Siler and Brown, 2010; Siler et al., 2011, in press). All species in the genus *Brachymeles* are semifossorial and typically found in dry, rotting, woody material inside or beneath decaying logs, piles of rotting coconut husks, or in loose soil or leaf litter.

Pleisiomorphic morphology, conserved body plans, and repeated instances of miniaturization have contributed to a situation in which diagnosing species boundaries has been historically problematic (Brown and Alcala, 1980; Siler et al., 2009, 2010a, b). Several compelling taxonomic challenges remain to be addressed with respect to *Brachymeles* species diversity. One species, *B. gracilis* is still recognized as polytypic, containing two subspecies (Brown, 1956; Brown and Alcala, 1980; Brown and Rabor, 1967; Siler and Brown, 2010). Several other species are recognized as having problematic distributions that span established biogeographic boundaries (Brown and Diesmos, 2002; Brown and Guttman, 2002; Heaney, 1985; Voris, 2000), including *B. samarensis* and *B.*

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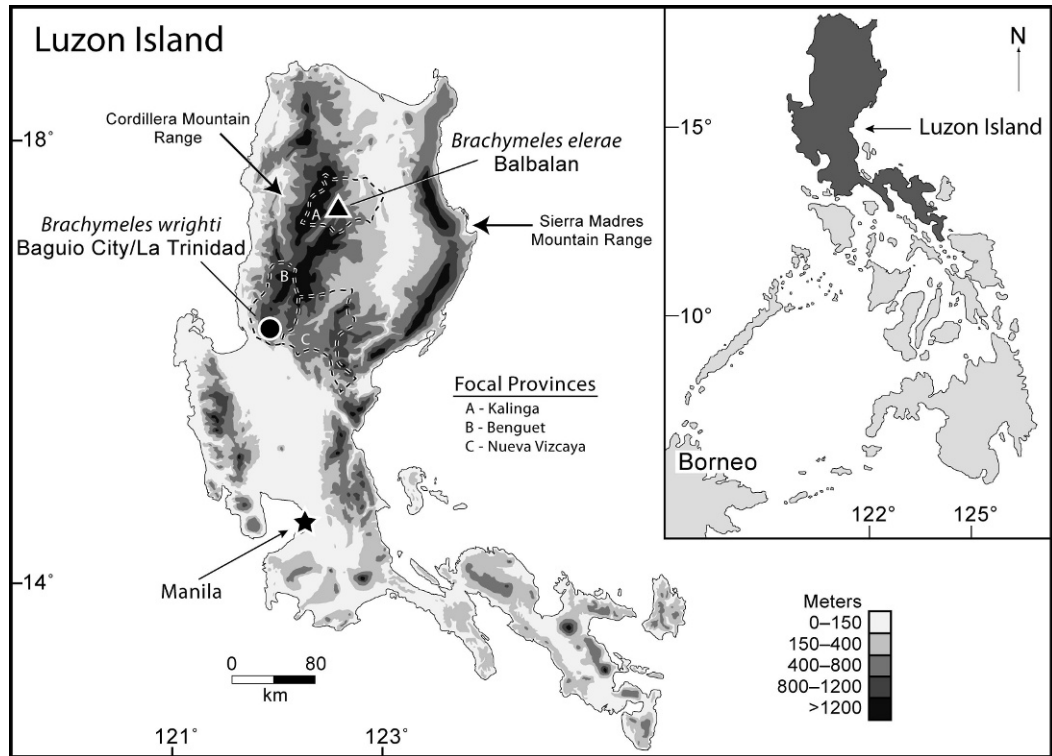


FIG. 1.—Map showing the type localities with provincial boundaries for the two known, tetradactyl species of *Brachymeles* on Luzon Island in the Philippines. The location of Nueva Vizcaya Province is outlined for reference.

bonitae (Brown, 1956; Brown and Alcala, 1980; Brown and Rabor, 1967). Finally, several rare, montane forest species have been chronically underrepresented by only a few specimens, in some cases without knowledge of their exact type locality (e.g., *Brachymeles bicolor*, *B. elerae*, *B. wrighti*, and *B. pathfinderi*).

Recent survey efforts have led to the rediscovery of several of these rare species, and in a recent paper (Siler et al., in press), we provided the first complete descriptions of two of these rare species, *B. bicolor* and *B. pathfinderi*. Here, we review and redescribe the remaining two species, *B. elerae* and *B. wrighti*, based on all available museum specimens and recently collected material.

TAXONOMIC HISTORY

Brachymeles elerae and *B. wrighti* are the only two species within the genus with four digits on the fore- and hind limbs (Taylor, 1917, 1925). Taylor (1917) described *Brachymeles*

elerae, in honor of Father Casto de Elera, based on two specimens housed in the natural history museum of the University of Santo Tomas (MST), Manila, Philippines. The specimens were in a jar labeled “*Lygosoma lineatum*,” without collector information, and locality data only listing “Philippines” (Taylor, 1917). At the time, Taylor reported the new species to resemble *Lygosoma lineatum* “superficially,” due to both species having tetradactyl body plans with similar body coloring and markings (Taylor, 1917). In Taylor’s description, he indicates that the director of MST assured him that the specimens were from Nueva Vizcaya Province, Luzon Island (Taylor, 1917); however, we believe this Province to be in error, because it is significantly further south on Luzon Island from Kalinga Province, where all subsequent documented observations of this species have been made (Siler, 2010; Fig. 1). The two specimens were referred to as “type” and “cotype,” and

Taylor provided two small illustrations of the ventral surface of the head of the two specimens, and included a photograph of the "type" in a comparative plate (Taylor, 1917: Figs. 4–5, Plate 1.4). Visits to the University of Santo Tomas collections in attempts to locate important Taylor and Casto De Elera collections suggest that these specimens have been lost or discarded, including the holotype (RMB, personal communication with R. Crombie, A. C. Diemsos, and M. L. Diesmos). However, the subadult paratype ("cotype"; Taylor, 1917) was deposited in the Carnegie Museum (CM 1717).

In 1920, two additional specimens were collected from the Municipality of Balbalan, Luzon Island, Philippines (Taylor, 1923), and were deposited at the California Academy of Sciences (CAS 61499–500). This species remained elusive and has gone undocumented in the literature for the past 90 yr (Brown, 1956; Brown and Alcala, 1980; Brown and Rabor, 1967), until it was recently rediscovered in the mid- to high-elevation (>600-m) pine (*Pinus* spp.) forests of northern Luzon Island (Siler, 2010).

In the original description of *Brachymeles wrighti*, Taylor (1925) reported on two specimens, both collected in 1923. The only specimen that made it into a museum collection (MCZ 26589) was discovered by students at a La Trinidad (Luzon Island) farm school. Taylor (1925) reported that the second specimen was discovered by a priest in Baguio, Luzon Island, during construction excavations. The holotype has significant damage to the head, which has prevented the evaluation of character states for important morphological features used for diagnosing species boundaries in the genus. Since the original description, no new collections have been made of *B. wrighti*, and focused survey efforts in and around La Trinidad over the past 3 yr have failed to observe this species in the wild. Fortunately, previous work with the collections at the Smithsonian Institution National Museum of Natural History (USNM) by Ronald I. Crombie led to the rediscovery of a second museum specimen of *B. wrighti*. The adult female specimen (USNM 140756) was collected by H. Alfred Shields in Baguio City in 1958.

Here, we provide a thorough redescription of *B. elerae* and *B. wrighti* based on type materials (*B. elerae*), newly collected specimens (*B. elerae*), and a previously undocumented museum specimen (*B. wrighti*). We also provide an evaluation of their conservation status and the first diagnostic illustrations of head, hand, and foot scalation.

MATERIALS AND METHODS

Fieldwork was conducted in the municipalities of Baguio and La Trinidad, Luzon Island, Philippines (Fig. 1) once in 2008 and twice in 2009. Fluid-preserved specimens (Appendix I) were examined by CDS for variation in qualitative and mensural characters. Sex was determined by gonadal inspection, and measurements were taken to the nearest 0.1 mm with digital calipers. Museum abbreviations for specimens examined follow Leviton et al. (1985).

Meristic and mensural characters were chosen based on Siler et al. (2009, 2010*a, b*): snout–vent length (SVL), axilla–groin distance, total length, midbody width, midbody height, tail length, tail width, tail height, head length, head width, head height, snout–forearm length, eye diameter, eye–narial distance, snout length, internarial distance, forelimb length, hind limb length, midbody scale-row count, paravertebral scale-row count, axilla–groin scale-row count, Finger-III lamellae count, Toe-IV lamellae count, supralabial count, infralabial count, supraciliary count, and supraocular count.

RESULTS

Brachymeles elerae Taylor 1917:273 (Figs. 1–3, 5)

Brachymeles elerae, Taylor, 1917, type locality: Municipality of Balbalan, Kalinga Province, northern Luzon Island, Philippines; type reported to be in the Santo Tomas Museum, Manila, Philippines (Brown and Alcala, 1970; Brown and Alcala, 1980; Brown and Rabor, 1967; Siler, 2010).

Designation of a neotype for B. elerae.—Taylor (1917) described *B. elerae* based on two uncataloged specimens housed in MST. The

Brachymeles elerae

Brachymeles wrighti

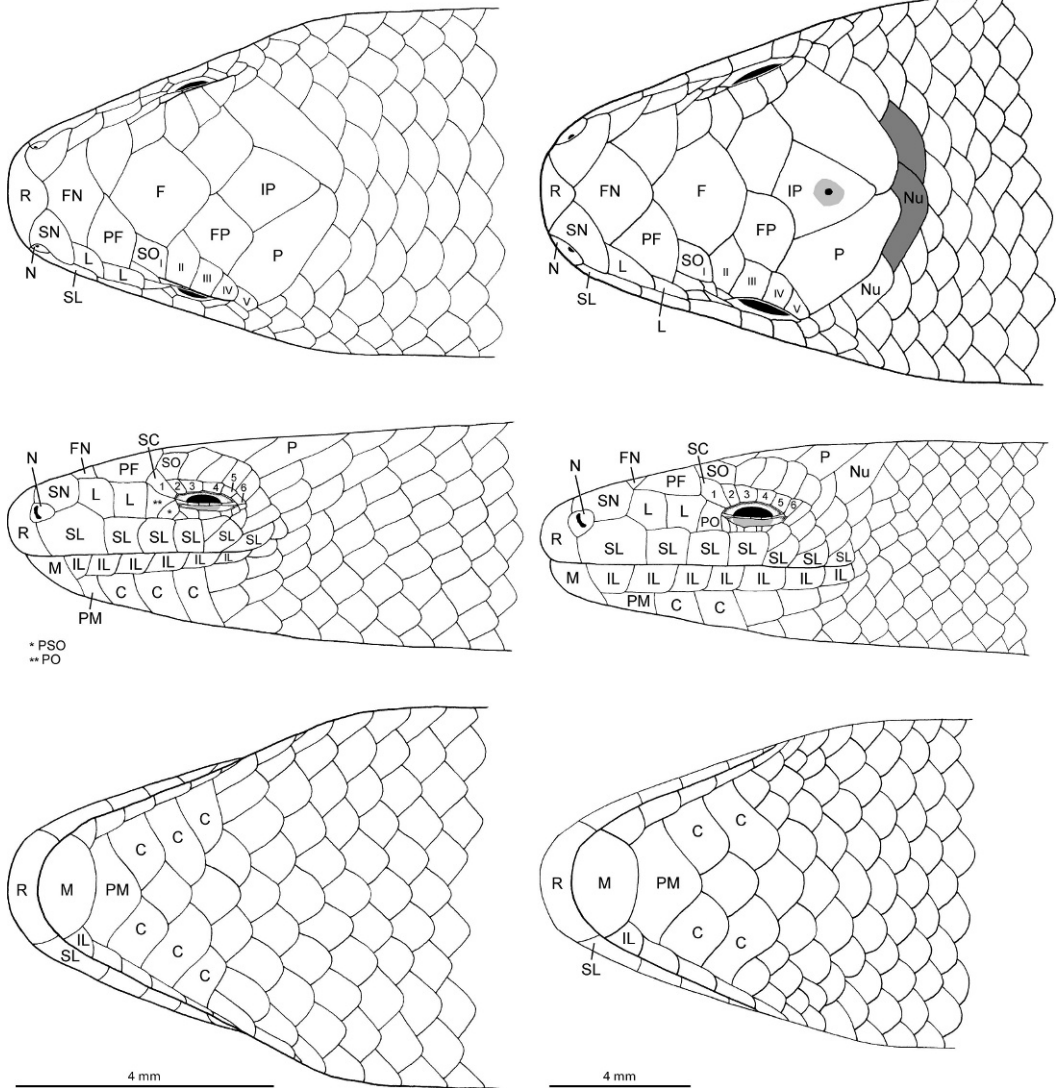


FIG. 2.—Head illustration of subadult female *Brachymeles wrighti* (USNM 140756) and adult male neotype of *B. elerae* (PNM 9563) in dorsal, lateral, and ventral views. Taxonomically diagnostic head scales are labeled as follows: C, chin shield; F, frontal; FN, frontonasal; FP, frontoparietal; IL, infralabial; IP, interparietal; L, loreal; M, mental; N, nasal; Nu, nuchal; 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. Dark gray-shaded scales indicate the inferred presence of enlarged, differentiated medial nuchals, inferred from observations of damaged specimen. Illustrations by CDS and RMJ.

specimens were without collector information or specific locality data (Taylor, 1917). Although the director of MST assured Taylor that the specimens were from Nueva Vizcaya Province, Luzon Island (Taylor, 1917), we

believe this locality to be in error, because all subsequent observations of the species have been in Kalinga Province, northern Luzon Island (Siler, 2010; Taylor, 1923; Fig. 1). The subadult paratype (“cototype”; Taylor, 1917) was

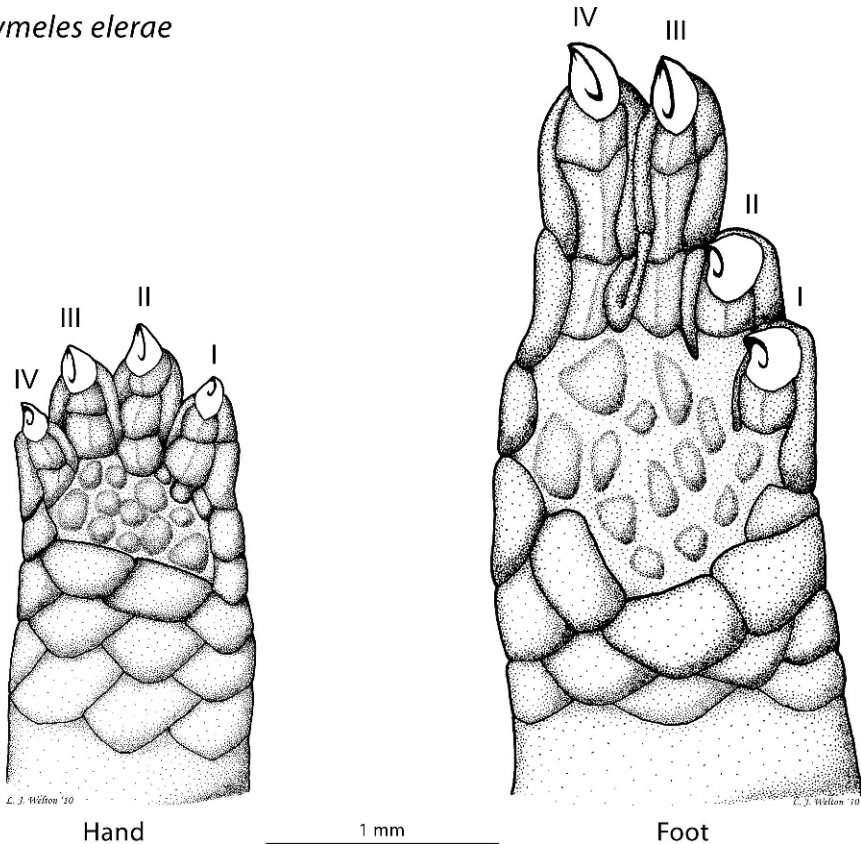
Brachymeles elerae

FIG. 3.—Illustration of right hand and foot of adult male *Brachymeles elerae* (PNM 9563). Digits labeled with roman numerals.

subsequently deposited in the Carnegie Museum (CM 1717); however, visits to the University of Santo Tomas collections in attempts to locate the holotype (“type”; Taylor, 1917) suggest that this specimen has been lost or discarded (RMB, personal communication with R. Crombie, A. C. Diemsos, and M. L. Diesmos).

In the absence of an existing holotype and in accordance with article no. 75 of the International Code of Zoological Nomenclature (ICZN, 1999), we designate a neotype for this species. Accordingly, we choose an adult male specimen from the type locality (PNM 9563; Fig. 1).

Neotype.—PNM 9563 (field no. CDS 3481; Figs. 2 and 3), an adult male collected at 1500 h on 8 June 2008 at 860-m elevation (17°27'22.51"N, 121°12'52.52"E; datum = WGS84) in Barangay Balbalan Proper “Old

Balbalan,” Municipality of Balbalan, Kalinga Province, Luzon Island, Philippines, by Cameron D. Siler and Jason B. Fernandez.

Specimens examined.—CAS 61499 and 61500, one adult male, one adult female, collected on 29 April 1920 at the same locality as the neotype; PNM 9564, a juvenile of undetermined sex collected on 8 June 2008 at 860-m elevation at the same locality as the neotype; CM 1717 (Paratype), a subadult female, reported from the “Filipinas” (Taylor, 1917).

Diagnosis.—*Brachymeles elerae* can be distinguished from all congeners by the following combination of characters: (1) body size small (SVL 68.2–71.9 mm), (2) limbs tetradactyl, (3) limb length reduced, (4) supralabials six, (5) infralabials six, (6) mid-body scale rows 22–24, (7) axilla–groin scale rows 63–67, (8) paravertebral scale rows

TABLE 1.—Summary of mensural characters in all known limbed, nonpentadactyl species of *Brachymelas*. Sample size, body length, and total length among males (m) and females (f), and general geographical distribution (PAIC = Pleistocene Aggregate Island Complex, sensu Brown and Diesmos, 2002) are included for reference (SVL: TL, total length; FLL, forelimb length; and HLL, hind limb length are given as range over mean \pm SD; all body proportions given as percentage over mean \pm SD). Two juvenile *B. elerae* specimens (CM 1717 and PNM 9564) were excluded from mensural comparisons.

Range	<i>wrighti</i> (1 m, 1 f)		<i>elerae</i> (2 m, 1 f)		<i>pathfinderi</i> (14 m, 23 f)		<i>mauntingsamay</i> (12 f)		<i>trilactylus</i> (9 m, 11 f)		<i>cebuensis</i> (8 f)		<i>bonitae</i> (6 m, 7 f)		<i>samarensis</i> (1 m, 5 f)	
	Luzon Island		Luzon Island		Mindanao Island		Luzon Island		Visayan PAIC		Cebu Island		Mindoro and Luzon PAICs		Samar Island	
SVL (f)	113.0	71.5			55.8–68.3 (62.0 \pm 3.4)		61.8–81.3 (73.6 \pm 5.9)		45.5–59.1 (52.1 \pm 5.0)		51.5–67.9 (61.8 \pm 5.3)		49.7–59.8 (56.4 \pm 3.9)		62.4–66.1 (63.4 \pm 1.5)	
SVL (m)	125.8	68.2, 71.9			54.5–65.1 (59.4 \pm 3.8)		N/A ^a		55.7–78.3 (68.5 \pm 7.4)		N/A		65.1–80.0 (73.5 \pm 6.4)		57.9	
TL (f)	205.6	109.9, 131.9			111.1–133.2 (119.7 \pm 8.2)		107.4–136.0 (124.0 \pm 8.6)		102.6–154.1 (132.6 \pm 14.0)		104.3–128.0 (119.0 \pm 8.5)		93.4–150.4 (126.7 \pm 19.9)		97.7–112.9 (107.3 \pm 8.3)	
TL (m)	216.4	N/A			101.4–107.0 (104.2 \pm 4.0)		N/A		105.3–133.67 (115.9 \pm 15.4)		N/A		102.6–144.5 (121.3 \pm 15.6)		93.0	
TL/SVL	72, 82	3.3–3.5 (3.4 \pm 0.1)			4.4–6.9 (5.8 \pm 0.5)		2.4–3.0 (2.7 \pm 0.2)		1.5–2.5 (2.0 \pm 0.3)		1.1–1.8 (1.5 \pm 0.3)		1.0–1.5 (1.3 \pm 0.1)		1.1–2.6 (1.8 \pm 0.5)	
FLL/SVL	6, 7	5 (5 \pm 0)			8–11 (10 \pm 1)		3–4 (4 \pm 0)		2–3 (3 \pm 0)		2–3 (2 \pm 0)		1–2 (2 \pm 0)		2–4 (3 \pm 1)	
HLL	13.9, 10.9	6–8 (7 \pm 1)			15–21 (18 \pm 1)		7–9 (8 \pm 1)		3–6 (5 \pm 1)		3–5 (4 \pm 0)		2–3 (2 \pm 0)		4–5 (5 \pm 0)	

^a N/A = not applicable.

TABLE 2.—Summary of selected meristic and qualitative diagnostic characters (present, absent) in all known limbed, nonpentadactyl species of male (m) and female (f) *Brachymeles*. The pairs of enlarged scales posterior to the postmental scale are abbreviated as chin shield pairs with reference to the first, second, and third pairs (when present).

	<i>wrighti</i> (1 m, 1 f)	<i>elene</i> (2 m, 2 f, 1 ♀?)	<i>pallifiderti</i> (14 m, 23 f)	<i>munthangkanyai</i> (12 f)	<i>tridactylus</i> (9 m, 11 f)	<i>cebucensis</i> (8 f)	<i>bonitae</i> (6 m, 7 f)	<i>samarensis</i> (1 m, 5 f)
No. of digits (fore/hind)	4/4	4/4	5/4	3/3	3/3	3/2	0-2/0-2	2/2
Toe-IV lamellae	4, 5	3	5-8	0	0	0	0	0
Presacral vertebrae	—	43	34	42, 44	47	45	47-57	45
Midbody scale	28, 28	22-24	23-25	22-24	22-24	22-24	21-23	19-22
ROWS								
Axilla-groin scale	85, 85	63-67	44-48	65-70	70-79	65-69	73-90	66-69
ROWS								
Paravertebral scale	106, 108	84-87	64-67	85-90	88-98	84-88	90-109	86-88
ROWS								
Supralabials	6 (1) 7 (1)	6 (5)	6 (37)	6 (12)	6 (12) 7 (8)	6 (8)	6 (12) 7 (1)	6 (6)
Infralabials	7 (2)	6 (5)	6 (37)	6 (12)	6 (12) 7 (8)	6 (5) 7 (3)	5 (1) 6 (10) 7 (2)	6 (6)
Supraciliaries	6	5 (2) 6 (3)	5 (17) 6 (19)	6 (10) 7 (2)	5 (20)	6 (8)	5 (12) 6 (1)	6 (6)
Supraoculars	5	4 (2) 5 (3)	5 (37)	5 (11) 6 (1)	4 (20)	5 (8)	4 (13)	5 (6)
Pineal eyespot	Present	Absent	Present	Absent	Present	Present	Present	Present
Prefrontal contact	Present or absent	Present or absent	Absent	Present	Absent	Present or absent	Absent	Absent
Frontoparietal contact	Present	Present or absent	Present or absent	Absent	Absent	Present	Absent	Present
First chin shield pair contact	Absent	Absent	Absent	Absent	Present or absent	Present	Absent	Present
Third chin shield pair	Present	Present	Absent	Present	Present	Present	Present	Present
Chin shield pair size	2 < 1	1 < 3 < 2	1 < 2	3 < 1 < 2	3 < 1 < 2	1 = 3 < 2	3 < 2 < 1	3 < 1 ≤ 2
Chin shield pair separation ^a	1(1); 2(3)	1(1); 2(1); 3(3)	1(1); 2(1)	1(1); 2(1); 3(3)	1(0/1); 2(1); 3(3)	1(0); 2(1); 3(3)	1(1); 2(1); 3(3)	1(0); 2(1); 3(3)
First/second loreal fusion	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Present or absent
Mental/first IFL fusion	Absent	Absent	Absent	Absent	Absent	Absent	Present or absent	Absent
Differentiated nuchals	Present ^b	Absent	Absent	Absent	Present	Present	Present	Present

TABLE 2.—Continued.

	<i>wrighti</i> (1 m, 1 f)	<i>elerae</i> (2 m, 2 f, 1 ♂ ^a)	<i>patifidieri</i> (14 m, 23 f)	<i>mantingkamayi</i> (12 f)	<i>tridactylus</i> (9 m, 11 f)	<i>ebuensis</i> (8 f)	<i>bonitae</i> (6 m, 7 f)	<i>samarensis</i> (1 m, 5 f)
Continuous subocular scale row	Present	Present	Present	Absent	Absent	Present	Present	Present
Auricular opening	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent
Dorsolateral stripes	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent
Longitudinal rows of dark spots	Present	Present, around body	Present, 6 around body	Present, around body	Present, vague to indistinct	Absent	Absent	Absent

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

^b Due to head damage in the nuchal region for both specimens of *B. wrighti*, the presence of differentiated nuchals remains tentative.

^c Meristic characters reported for juvenile *B. elerae* (PNM 9564) of unknown sex.

84–87, (9) pineal eye spot absent, (10) supranasals separated, (11) single preocular, (12) postnasals absent, (13) enlarged chin shields in three pairs, (14) nuchal scales undifferentiated, (15) fourth supralabial subocular, (16) auricular opening covered by undifferentiated scales, (17) Toe-IV lamellae 3, (18) presacral vertebrae 43, and (19) having scale spots covering body (Tables 1 and 2).

Comparisons.—Characters distinguishing *B. elerae* from all nonpentadactyl, limbed species of *Brachymeles* are summarized in Tables 1 and 2. *Brachymeles elerae* most closely resembles *B. wrighti*, the only other known tetradactyl species within the genus, but it differs from *B. wrighti* by having a much smaller body (maximum SVL 71.9 mm vs. >113.0 mm), shorter limbs (relative fore- and hind limb length <5 and 8%, respectively vs. >6 and 10%), six supralabials (vs. six or seven), six infralabials (vs. seven), five or six supraciliaries (vs. six), four or five supraoculars (vs. five), the absence of a pineal eyespot (vs. presence), and fewer Toe-IV lamellae (three vs. four or five), midbody scale rows (22–24 vs. 28), axilla–groin scale rows (63–67 vs. 85), and paravertebral scales rows (84–87 vs. 106, 108; Tables 1 and 2).

Brachymeles elerae can be distinguished from all limbless species of *Brachymeles* (*B. apus*, *B. miriamae*, *B. lukbani*, *B. minimus*, and *B. vermis*) by having well-developed limbs; and from all pentadactyl species of *Brachymeles* (*B. boholensis*, *B. boulengeri*, *B. bicolor*, *B. gracilis*, *B. kadwa*, *B. makusog*, *B. mindorensis*, *B. orientalis*, *B. schadenbergi*, *B. talinis*, *B. taylori*, *B. tungaoi*, and *B. vindumi*) by having fewer than five fingers and toes, the absence (vs. presence) of a postnasal scale, and the presence (vs. absence) of a scale-covered auricular opening.

Description of neotype.—Details of the head scalation of the neotype (PNM 9563) are shown in Fig. 2. Adult male, body small; SVL 71.9 mm; head weakly differentiated from neck, nearly as wide as body, head width 8.2% SVL, 101.4% head length; head length 34.6% snout–forearm length; snout–forearm length 23.4% SVL; snout moderately long, rounded in dorsal and lateral profile, snout length 57.7% head length; auricular opening completely covered by undifferentiated scales;

TABLE 3.—Summary of univariate morphological variation among mensural and meristic characters in the examined series of *Brachymeles elerae* and *B. wrighti*.

Museum no.:	<i>elerae</i> (neotype)	<i>elerae</i>	<i>elerae</i>	<i>elerae</i> (paratype)	<i>elerae</i>	<i>wrighti</i> (holotype)	<i>wrighti</i>
	PNM 9563	CAS 61499	CAS 61500	CM 1717	PNM 9564	MCZ 26589	USNM 140756
Sex:	Male	Male	Female	Female	Juvenile	Male	Female
Snout-vent length	71.9	68.2	71.5	57.1	46.8	125.8	113.0
Axilla-groin distance	51.7	50.7	51.0	35.8	31.2	84.6	87.7
Total length	131.9	109.9	—	101.2	83.5	216.4	205.6
Midbody width	6.5	6.3	6.3	4.7	4.2	9.6	10.5
Midbody height	4.9	4.6	5.3	4.3	3.1	7.8	8.7
Tail length	60.1	41.7	—	44.2	36.8	90.6	92.7
Tail width	4.9	5.0	5.3	3.8	3.0	7.9	7.1
Tail height	4.5	3.8	4.8	3.5	2.8	7.0	6.0
Head length	5.8	5.1	5.6	4.0	4.0	9.0	8.4
Head width	5.9	6.1	6.6	4.8	4.0	9.2	9.1
Head height	3.7	4.4	4.5	3.7	3.1	5.6	7.2
Snout-forearm length	61.8	13.0	14.4	12.4	11.7	28.5	—
Eye diameter	1.1	1.1	0.9	1.1	0.8	1.4	1.7
Eye-narial distance	2.3	2.1	2.3	2.1	1.7	3.7	4.0
Snout length	3.4	3.3	3.1	2.9	2.5	5.2	5.5
Internarial distance	1.5	1.4	1.6	1.5	1.3	2.4	2.7
Forelimb length	3.3	3.5	3.3	3.2	0.9	7.5	7.5
Hind limb length	5.4	4.3	5.3	5.8	1.8	13.9	10.9
Midbody scale rows	22	22	24	24	22	28	28
Axilla-groin scale rows	63	67	64	66	66	85	85
Paravertebral scale rows	84	87	84	87	86	106	112
Finger-III lamellae	2	2	2	2	2	3	3
Toe-IV lamellae	3	3	3	3	3	5	4
Supralabials	6	6	6	6	6	6	7
Infralabials	6	6	6	6	6	7	7
Supraciliaries	6	5	5	6	6	6	6
Supraoculars	5	4	4	5	5	5	5

eyes small, eye diameter 1.5% SVL, 18.1% head length, 45.1% eye-nares distance, pupil subcircular; body slightly depressed, midbody width 133.3% midbody height; scales smooth, glossy, imbricate; longitudinal scale rows at midbody 22; paravertebral scale rows 84; axilla-groin scale rows 63; limbs well developed, tetradactyl, digits small; Finger-III lamellae two; Toe-IV lamellae three; forelimb length 6.5% axilla-groin distance, 4.6% SVL; hind limb length 10.5% axilla-groin distance, 7.6% SVL; order of digits from shortest to longest for hand: I = IV < II = III, for foot: I < II < IV < III; tail not as wide as body, gradually tapered toward end, tail width 75.6% midbody width, tail length 83.6% SVL.

Rostral projecting onto dorsal snout to point in line with center of nasal, broader than tall, forming a moderate suture with frontonasal (Fig. 2); frontonasal wider than long; nostril crescent-shaped, in center of single oblong nasal, longer axis horizontal; supranasals present, large; postnasals absent (Fig. 2); prefrontals in point contact; frontal nearly diamond-shaped, its anterior margin narrowly separated from frontonasal by prefrontals, in contact with first two anterior supraoculars, 4× wider than anterior supraocular; supraoculars five; frontoparietals moderate in size, in narrow medial contact, each in contact with three interior supraoculars; interparietal moderate in size, diamond-shaped, longer than

wide, length nearly two-thirds midline length of frontal; pineal eyespot absent; parietals as broad as frontoparietals laterally, medially narrow, in broad contact behind interparietal; enlarged, differentiated nuchals absent; loreals two, decreasing in size posteriorly, anterior loreal nearly as long as and $1.4\times$ higher than posterior loreal, in contact with prefrontal, supranasal, first and second supralabials, and second loreal; single preocular; supraciliaries six, anterior supraciliary contacting prefrontal and separating posterior loreal from first supraocular; single subocular row complete, in contact with supralabials; lower eyelid with one longitudinal row of scales; supralabials six, first $2\times$ size of other supralabials, fourth beneath center of eye; infralabials six.

Mental wider than long, in contact with first infralabials and supralabials on both sides; single enlarged postmental, equal in width to mental; followed by three pairs of enlarged chin shields, scales of first two pairs narrowly separated by single row of undifferentiated scales, third pair broadly separated by three rows of undifferentiated scales (Fig. 2).

Scales on limbs smaller than body scales; scales on dorsal surfaces of digits large, wrapping around lateral edges of digits; lamellae undivided to base of digits; ventral surfaces of hands and plantar surfaces of feet covered by small, irregular scales, each with irregular raised anterior edges; scales on dorsal surface of hands and feet smaller than limb scales, lacking raised edges (Fig. 3).

Coloration of neotype preservative.—The ground color of the body is light to medium brown, with each dorsal scale having a dark, chocolate-brown blotch on the posterior two-thirds of the scale. Blotches do not correspond to scale boundaries but extend to the anterior edge of the next most posterior scale. The blotches are present around the entire body, and gradually reduce in size laterally. Ventral scales have smaller blotches restricted to the posterior third of each scale. Caudals and subcaudals have blotches nearly homogeneous in size, and only slightly reduced ventrally, conveying the appearance of a darker tail color. Limb scales are medium brown. Head scales lack spotting but have mottled light and medium brown coloration consistent with the

background body color. The rostral, nasal, supranasal, mental, and first supralabial scales have a medium gray coloration, lacking any brown color.

Coloration in life.—Body coloration in life is consistent with coloration in preservative; however, the ground color of the body appears orange-brown, and tail appears dark brown (Siler, 2010; Fig. 2).

Variation.—Variation in meristic and mensural characters is summarized in Table 3. We observed variation in the degree of contact between prefrontal and frontoparietal scales. Two specimens (CAS 61499 and PNM 9564) were observed to have prefrontals separated, compared with three specimens observed to have prefrontals in point contact (CAS 61500, CM 1717, and PNM 9563). One specimen was observed to have frontoparietals in moderate medial contact (PNM 9563), compared with four specimens observed to have frontoparietals separated (CAS 61499–500, CM 1717, and PNM 9564). In addition, variation was observed in the number of supraciliaries and supraoculars. Two specimens were observed to have five supraciliaries and four supraoculars (CAS 61499–500), and three specimens were observed to have six supraciliaries and five supraoculars (CM 1717, PNM 9563–4).

Distribution.—*Brachymeles elerae* is known only from its type locality in Barangay Balbalan Proper “Old Balbalan,” Municipality of Balbalan, Kalinga Province, Luzon Island (see Specimens examined; Fig. 1). The species has been documented at 860-m elevation. We believe this species is a mid- to high-elevation species, possibly occurring between 600- and 1200-m elevation at the type locality.

Ecology and natural history.—*Brachymeles elerae* occurs in primary- and secondary-growth forest (Fig. 5), and whether this species possesses a wider geographical distribution in northern Luzon Island is unknown. Although the specific type locality remains unknown, this species has only been observed in the Municipality of Balbalan and may possess a small geographic range. Both newly collected individuals were observed within small, rotting logs on the floor of pine forest (Siler, 2010). As is typical for species in the genus, individuals immediately moved in a rapid serpentine manner and attempted to

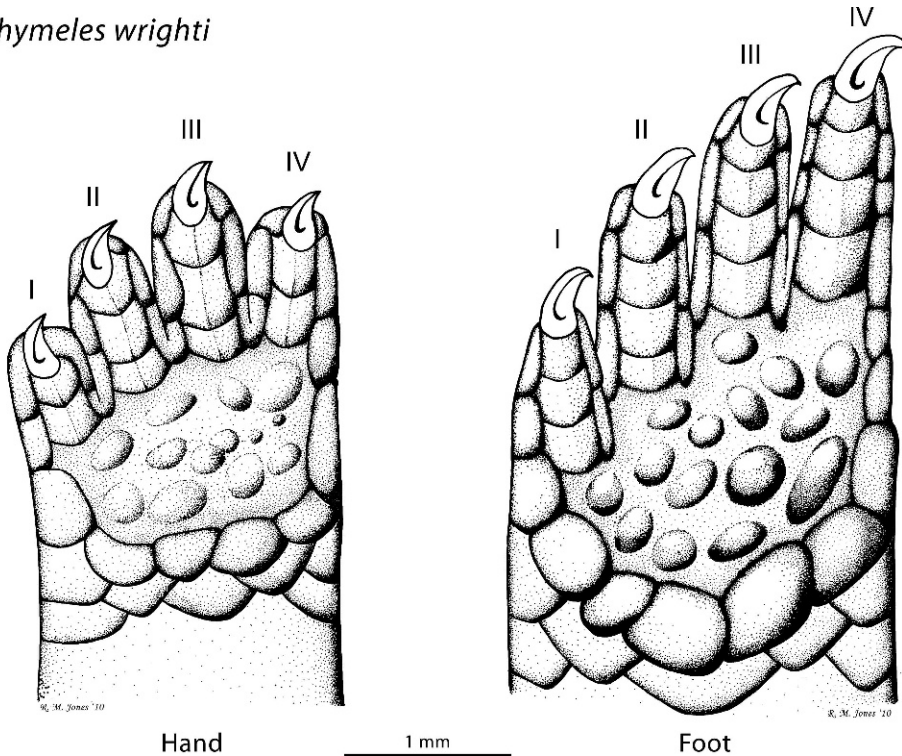
Brachymeles wrighti

FIG. 4.—Illustration of left hand and foot of subadult female *Brachymeles wrighti* (USNM 140756). Digits labeled with roman numerals.

burrow back into loose soil or rotting substrate when disturbed. *Brachymeles elerae* is one of six species within the genus that have been documented to occur at relatively high elevations >600 m (including *B. apus*, *B. bicolor*, *B. lukbani*, *B. muntingkamay*, and *B. wrighti*). Given what little we know about this species, *B. elerae* cannot be directly, or indirectly, assessed for risk of extinction based on the IUCN criteria. Therefore, we classify this species as Data Deficient, pending the collection of additional information (IUCN, 2010).

Brachymeles wrighti Taylor 1925:106
(Figs. 1, 2, 4)

Brachymeles wrighti, Taylor, 1925, type locality: Municipality of La Trinidad, Benguet Province, northern Luzon Island, Philippines (MCZ 26589; Brown and Alcalá, 1970; Brown and Alcalá, 1980; Brown and Rabor, 1967).

Specimens examined.—MCZ 26589 (holotype), an adult male collected in 1923 at 1230-

m elevation (16°28'37.51"N, 120°35'13.88"E) in the Municipality of La Trinidad, Benguet Province, Luzon Island, Philippines, by students at a school (Taylor, 1925); USNM 140756, an adult female collected in 1958 at 1460-m elevation (16°24'59.71"N, 120°35'59.85"E) in Baguio City, Benguet Province, Luzon Island, Philippines, by H. Alfred Shields.

Diagnosis.—*Brachymeles wrighti* can be distinguished from all congeners by the following combination of characters: (1) body size moderately robust, long; (2) limbs tetradactyl; (3) limb length moderate; (4) supralabials six or seven; (5) infralabials seven; (6) midbody scale rows 28; (7) axilla-groin scale rows 85; (8) paravertebral scale rows 106 to 112; (9) pineal eye spot present; (10) supranasals separated; (11) prefrontals in contact or separated; (12) frontoparietals in contact; (13) single preocular; (14) postnasals absent; (15) enlarged chin shields in two pairs; (16) nuchal scales differentiated; (17) fourth and fifth supralabial subocular; (18) auricular opening completely covered by undifferentiated scales;

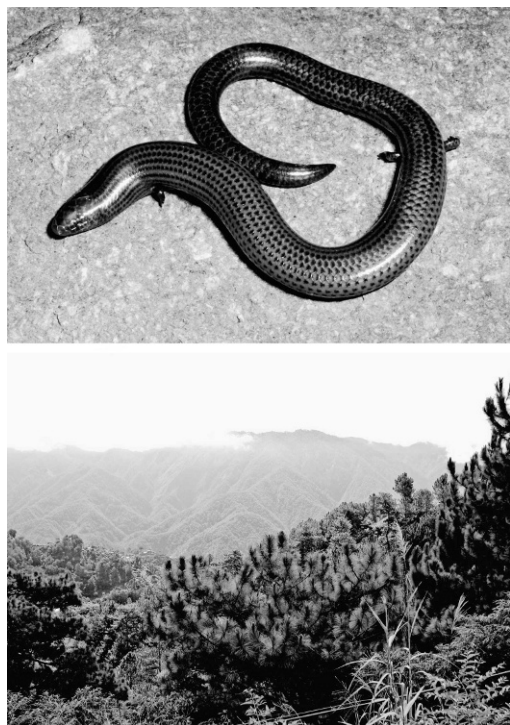


FIG. 5.—Photograph in life of *Brachymeles elerae* (PNM 9563), male, SVL = 71.9 mm, and typical conifer forest habitat at the type locality (17°27'22.51"N, 121°12'52.52"E; Barangay Balbalan Proper "Old Balbalan", Municipality of Balbalan, Kalinga Province, Luzon Island). Photographs by CDS.

(19) Toe-IV lamellae four or five; and (20) scale spots covering body present (Tables 1 and 2).

Comparisons.—Characters distinguishing *B. wrighti* from all nonpentadactyl, limbed species of *Brachymeles* are summarized in Tables 1 and 2. *Brachymeles wrighti* most closely resembles *B. elerae*, the only other known tetradactyl species within the genus, but it differs from *B. elerae* by having a much larger body (SVL >113.0 mm vs. <71.9 mm), longer limbs (relative fore- and hind limb length >6 and 10%, respectively, vs. <5 and 8%), six or seven supralabials (vs. six), seven infralabials (vs. six), six supraciliaries (vs. five or six), five supraoculars (vs. four or five), the presence of a pineal eyespot (vs. absence), and a greater number of Toe-IV lamellae (four or five vs. three), midbody scale rows (28 vs. 22–24), axilla–groin scale rows (85 vs. 63–67), and

paravertebral scales rows (106, 108 vs. 84–87; Tables 1 and 2).

Brachymeles wrighti can be distinguished from all limbless species of *Brachymeles* (*B. apus*, *B. lukbani*, *B. minimus*, *B. miriamae*, and *B. vermis*) by having well-developed limbs; and from all pentadactyl species of *Brachymeles* (*B. bohollensis*, *B. boulengeri*, *B. bicolor*, *B. gracilis*, *B. kadwa*, *B. makusog*, *B. mindorensis*, *B. orientalis*, *B. schadenbergi*, *B. talinis*, *B. taylori*, *B. tungaoi*, and *B. vindumi*) by having fewer than five fingers and toes, a greater number of axilla–groin scale rows (85 vs. <72), a greater number of paravertebral scale rows (106, 112 vs. <92), the absence (vs. presence) of a postnasal scale, and the presence (vs. absence) of a scale-covered auricular opening.

Description (based on holotype and one referred specimen).—Details of the head scalation of an adult female are shown in Fig. 2. Measurements of the adult male holotype are highlighted with brackets. Body moderately large; SVL 113.0 [125.8 mm] (Tables 1 and 2); head weakly differentiated from neck, nearly as wide as body, head width 8.1%, [7.3%] SVL, 108.8%, [102.8%] head length; head length 30.3%, [31.6%] snout–forearm length; snout–forearm length 24.5%, [22.6%] SVL; snout moderately long, broadly rounded in dorsal, rounded in lateral profile, snout length 66.0%, [57.3%] head length; auricular opening completely covered by undifferentiated scales; eyes small, eye diameter 1.5%, [1.1%] SVL, 20.0%, [15.0%] head length, 42.4%, [36.2%] eye–nares distance, pupil subcircular; body slightly depressed, midbody width 121.2%, [123.4%] midbody height; scales smooth, glossy, imbricate; longitudinal scale rows at midbody 28, [28]; paravertebral scale rows 112, [106]; axilla–groin scale rows 85, [85]; limbs well developed, tetradactyl, digits small; Finger-III lamellae three, [three]; Toe-IV lamellae four, [five]; forelimb length 8.6%, [8.8%] axilla–groin distance, 6.6%, [5.9%] SVL; hind limb length 12.4%, [16.4%] axilla–groin distance, 9.7%, [11.0%] SVL; order of digits from shortest to longest for hand: I < II = IV < III, for foot: I < II < III = IV; tail not as wide as body, gradually tapered towards end, tail width 67.8%, [81.5%] midbody width, tail length 82.0%, [72.1%] SVL.

Rostral projecting onto snout dorsally past posterior edge of nasal in line with center of supranasal, as broad as tall, narrowing to rounded point posterodorsally, forming short suture with frontonasal (Fig. 2); frontonasal wider than long; nostril ovoid, in center of single trapezoidal nasal, longer axis directed anteroventrally and posterodorsally; nasals well separated; supranasals present, large; postnasals absent (Fig. 2); prefrontals in contact or moderately separated; frontal octagonal, its anterior margin in contact with frontonasal, $2.5\times$ wider than anterior supraocular; supraoculars five; frontoparietals small, in broad medial contact, each frontoparietal in contact with second, third, and fourth supraocular; interparietal large, its length $2.5\times$ midline length of frontoparietal, longer than wide, diamond-shaped, wider anteriorly; parietals as broad as frontoparietals, in contact behind interparietal; enlarged, differentiated nuchals likely present; two loreals, anterior loreal about as long as and slightly higher than posterior loreal; preocular single; supraciliaries six, the anteriormost contacting frontal and separating posterior loreal from first supraocular, posteriormost extending to middle of last supraocular; single subocular scale row complete, in contact with supralabials; lower eyelid with one row of scales; supralabials seven, first $2\times$ size of other supralabials, fourth beneath center of eye; infralabials seven.

Mental wider than long, contacting first infralabial on both sides; postmental single, enlarged, its width greater than that of mental; followed by two pairs of enlarged chin shields, none in contact; first pair widest, separated by single medial scale, second pair two-thirds as wide as first pair, separated by three medial scales (Fig. 2).

Scales on limbs smaller than body scales; scales on dorsal surfaces of digits large, wrapping around lateral edges of digits; lamellae undivided to base of digits; ventral surfaces of hands and plantar surfaces of feet covered by small, irregular scales, each with irregular raised anterior edges; scales on dorsal surface of hands and feet smaller than limb scales, lacking raised edges (Fig. 4).

Coloration in preservative.—The ground color of the body is medium brown, with each dorsal scale having a dark, chocolate-brown

blotch covering the central one-third of each scale. Each blotch does not correspond to the scale boundary but extends to the anterior edge of the next most posterior scale. The blotches are present around the entire body, and gradually reduce in size laterally. Ventral scales have smaller blotches restricted to the posterior third of each scale. Caudal and subcaudal blotches are less well defined, giving the appearance of a homogeneous, medium brown tail color. Dark brown blotches on the body range from irregular spots (ventrally) to irregular streaks and spots (dorsally), and give the appearance of longitudinal rows of spots that run down the body. Dorsally, these longitudinal rows appear more continuous, with the dark brown streaks and spots creating discontinuous dorsal stripes. Limb scales are mottled light and medium brown and do not possess the spotted pattern observed on the body. Precloacal scales each have a large, dark brown blotch covering most of the scale. Head scales lack spotting, and are nearly homogeneous medium brown. The rostral, nasals, supranasals, first supralabials, first infralabials, and mental scales have a light brown to cream coloration; lighter in color than the body.

Coloration in life.—Coloration in life remains unrecorded; however, because *Brachymeles* specimens do not change significantly during preservation (CDS, personal observation), we suspect that the preserved coloration and patterns are much like those in life.

Variation.—Variation in meristic and mensural characters is summarized in Table 3. Both specimens have head damage, either on the whole head (MCZ 26589) or on the nuchal region of the head (USNM 140756), making it difficult to observe variation in certain head scalation patterns. However, we still observed variation in the degree of contact between head scales. The holotype (MCZ 26589) was observed to have prefrontals and frontoparietals in medial point contact compared with the moderate separation of prefrontals and moderate medial contact between frontoparietals observed for the female specimen (USNM 140756). In addition, variation was observed in the number of toe lamellae and supralabials. The holotype (MCZ 26589) was observed to have Toe-IV lamellae counts of

five and supralabial counts of six, compared with four and seven, respectively, for the female specimen (USNM I40756).

Distribution.—*Brachymeles wrighti* is known only from high-elevation habitat (>1200 m) in Baguio City and the neighboring Municipality of La Trinidad, Benguet Province, Luzon Island (Specimens examined section; Fig. 1). We believe this species is a high-elevation species, occurring at >1200-m elevation at the type locality.

Ecology and natural history.—No original forest remains in the municipalities of Baguio and La Trinidad, Luzon Island, but we assume the species once occurred in primary-growth pine forest at mid- to high-elevations. Three separate focused surveys of the type region have been conducted by CDS over the past 3 yr, all resulting in no new observations of *B. wrighti*. All that remains of potentially suitable habitat are small slivers of hillside designated as community gardens for the distinct barangays of La Trinidad. Although the communities around La Trinidad have maintained and protected these small hillside preserves, the habitat is regenerated at best from complete deforestation (CDS, personal observation). Similar to *B. elerae*, *B. wrighti* is among the few species of *Brachymeles* known to occur at higher elevations.

Although no observations have been made in the preferred microhabitat of *B. wrighti*, nearly all species of *Brachymeles* are known to live within the rotting material of fallen logs. Recent surveys in the northern Cordilleras resulted in the rediscovery of *B. elerae*, with two specimens found within rotting logs in dry secondary growth forest (Siler, 2010). It is presumed that *B. wrighti* prefers similar habitat. The only other squamate species observed to be sympatric with *B. wrighti* is *Calamaria gervaisi*, *Eutropis bontocensis*, *Ophiophagus hannah*, and *Oxyrhabdium leporinum*. Whether this species possesses a wider geographical distribution on northern Luzon Island is unknown. However, due to nearly complete habitat destruction in and around the type locality, the species is believed to be rare. We have evaluated this species against the IUCN criteria for classification, and we find that it qualifies for the status of Vulnerable based on the following criteria: VU B2ab(iii); D2 (IUCN, 2010).

DISCUSSION

The greatest known species diversity (10 species) of *Brachymeles* from any one island is the assemblage now known from Luzon (Brown and Alcala, 1980; Brown and Diesmos, 2002; Siler, 2010; Siler and Brown, 2010; Siler et al., 2009, 2010a, b, 2011, in press). In addition to the two tetradactyl species (*B. elerae* and *B. wrighti*), two limbless species (*B. lukbani* and *B. minimus*), two species with zero to three claws on each limb (*B. bonitae* and *B. samarensis*), and one tridactyl species (*B. muntingkamay*) occur on Luzon Island. It is interesting that the only two tetradactyl species in the genus, *B. elerae* and *B. wrighti*, both are endemic to the Cordillera Mountain Range of Luzon Island (Fig. 1).

No sympatric species of *Brachymeles* have been recorded from the type localities of either *B. elerae* or *B. wrighti*. In fact, few species of *Brachymeles* have ever been recorded from similar elevations, with the only other species observed to occur in mid- to high-elevation forest being *B. apus*, *B. bicolor*, *B. lukbani*, and *B. muntingkamay* (CDS and RMB, personal observation). This preference for mid-montane closed canopy forests stands in contrast to many of the other Luzon species of *Brachymeles* that are regularly observed to occur in sympatry at low elevations, or those <600 m (e.g., *B. bonitae*, *B. boulengeri*, *B. kadwa*, *B. samarensis*, and *B. makusog*; CDS, personal observation).

Formed by the accretion of several large, isolated paleoislands, Luzon is a diverse island with an ancient and complex geological history (Auffenberg, 1988; Defant et al., 1989; Dickerson, 1928; Hall, 1998, 2002; Hamilton, 1979), with large areas of this accreted landmass remaining inadequately surveyed (Brown et al., 1996, 2000, 2007, Welton et al., 2010). However, preliminary surveys have now been conducted in most of the subregions (Siler, 2010; Siler and Brown, 2010; Siler et al., 2011, in press; Fig. 1), with tetradactyl species having only been observed in the Cordillera Mountain Range.

The results of recent phylogenetic studies on the genus *Brachymeles* indicate that both limb reduction and limb loss have occurred independently multiple times in the genus, with some evidence for digit and limb

re-evolution (Siler and Brown, 2011; Siler et al., 2011). *Brachymeles elerae* and *B. muntingkamay* were shown to be sister species, in a clade representing an independent instance of limb reduction and digit loss on Luzon Island (Siler and Brown, 2011; Siler et al., 2011). In addition to having similar body plans, both *B. elerae* and *B. muntingkamay* share a unique scale pigmentation pattern with *B. wrighti*, where all body scales have a dark brown spot. We hypothesize that if genetic data for *B. wrighti* become available for phylogenetic analysis, it will be found to be most closely related to *B. elerae* and *B. muntingkamay* (Siler and Brown, 2011; Siler et al., 2011).

At present, there remain only two known specimens of *B. wrighti*, and only five specimens of *B. elerae*, in museum collections. *Brachymeles wrighti* has not been seen in >80 yr, and our focused surveys of the type locality have resulted in no new observations. With sparse data on the distribution of these species, a complete assessment of their geographic ranges cannot be made. Recent studies have indicated that many species of *Brachymeles* seem to be resilient to habitat degradation (Siler, 2010; Siler and Brown, 2010; Siler et al., 2009, 2010*a,b*, in press); consequently, we are optimistic that future surveys will result in the rediscovery of *B. wrighti*, and additional observations of *B. elerae* if the appropriate habitat can be located.

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APPENDIX I

Other Specimens Examined

Numbers in parentheses indicate the number of specimens examined. With the exception of *B. apus* and *B. miriamae*, all specimens examined are from the Philippines. Numbers in parentheses indicate the number of specimens examined for each species. Several sample sizes are greater than those observed in the description due to the examination of subadult specimens that were excluded from morphometric analyses. ***Brachymeles apus***.—(1) BORNEO: MALAYSIA: Sabah: Mt. Kinabalu National Park, Sayap Sub-Station: SP 06915. ***Brachymeles bicolor***.—(24) LUZON ISLAND: AURORA PROVINCE: *Municipality of Maria Aurora*: Barangay Villa Aurora, Sitio Dimani, Aurora Memorial National Park: KU 323149–52; CAGAYAN PROVINCE: *Municipality of Baguio*: Sitio Hot Springs: CAS 186111, USNM 140847, 498829, 498830, 498833; ISABELA PROVINCE: Sierra Madres Mountain Range: KU 324097–99, PNM 5785, 9568–77; KALINGA PROVINCE: Balbalasang-Balbalan National Park: FMNH 259438. ***Brachymeles bohollensis***.—(19) BOHOL ISLAND: BOHOL PROVINCE: *Municipality of Sierra Bullones*: Barangay Danicop: KU 323944, 323948–9, 323952–6, 323960, 323962–3, 323966, 323970, 323972, 323975–6, 323981–2, 323990, 324001; BOHOL ISLAND: BOHOL PROVINCE: 6 km S of Municipality of Sierra Bullones: Teachers Park: CAS-SU (holotype) 24528; 13 km SE of Municipality of Sierra Bullones: Dusita Barrio: CAS-SU (paratypes) 24502–04, 24518, 24520–25, 24541, 24543, CAS-SU 25443–44, 25447; 1 km E of Dusita Barrio: Abacjanan: CAS-SU 24867; *Municipality of Sierra Bullones*: Sandayong: CAS-SU 18709, 18717. ***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: SE slope of Barawan Peak: CAS-SU 25713, 25793, 25886-88, 25904; Sumagui: CAS 62064 (paratype); POLILLO ISLAND: QUEZON PROVINCE: *Municipality of Polillo*: Barangay Pinaglubayan: KU 307747-49, 307755. ***Brachymeles boulengeri***.—(26) LUZON ISLAND: AURORA PROVINCE: *Municipality of Baler*: KU 322314-20; LUZON ISLAND: LAGUNA PROVINCE: *Municipality of Los Banos*: Barangay Batong Malake: KU 32058-60; *Municipality of Los Banos*: CAS 61096; Mt. Maquilang: CAS 61297; POLILLO ISLAND: QUEZON PROVINCE: *Municipality of Polillo*: CAS (paratypes) 62272-73, 62276-77; Barangay Pinaglubayan: KU 307438-9, 307750-54, 307756 (neotype), 307757-58. ***Brachymeles cebuensis***.—(8) CEBU ISLAND: 40 km SW of Cebu City: Tapal Barrio, Sitio Mantalungon: CAS-SU (holotype) 24400, (paratypes) 24396-97, 24399, 24401, 24403; 10 km from Municipality of Carcar: Tapal Barrio: CAS 102405 (paratype); 3 km NW of Cebu City, Buhisan Barrio, Buhisan Reforestation Project: CAS-SU 27537. ***Brachymeles gracilis gracilis***.—(18) MINDANAO ISLAND: DAVAO DEL SUR PROVINCE: *Municipality of Malalag*: Sitio Kibawalan: CAS-SU 24163, 24165, CAS 124811, 139307-09; *Davao City*: Buhangin, Kabantian: CAS 124803-04, 139293-95, 139303-05; *Digos City*: Tres de Mayo Barrio: CAS 124806-08, 139300. ***Brachymeles gracilis hilong***.—(20) MINDANAO ISLAND: AGUSAN DEL NORTE PROVINCE: *Municipality of Cabadbaran*: Diuata Mountain Range: Mt. Hilonghilong: Balangbalang: CAS-SU (holotype) 24407, (paratype) 102406, 133578, CAS-SU 24411, 133577, 133581-82, 133609, 133612, 133692-93, 133703-06, 133743, 133745-47; SURIGAO DEL SUR PROVINCE: *Municipality of Lanuza*: Diuata Mountain Range: Sibuhay Barrio: CAS-SU (paratype) 24315. ***Brachymeles kadwa***.—(101) LUZON ISLAND: AURORA PROVINCE: *Municipality of Baler*: Barangay Zabali, Aurora State College of Technology campus: PNM (holotype) 9721, KU (paratopotypes) 232092, 323094-96, 323100, 323104, 323106, KU 323090-91, 323093, 323097-99, 323101-03, 323105, 323107; Municipality of Casiguran, IDC property: KU 323108-48; Municipality of San Luis, Barangay Real, Sitio Minoli: KU 322320; CALAYAN ISLAND: CAGAYAN PROVINCE: *Municipality of Calayan*: Barangay Magsidel: KU (paratypes) 304875, 304897, 304900, 304902-3, 304905-6, 304915, 304929, 304941, KU 304908, 304899, 304907, 304909, 304921, 304941; CAMIGUIN NORTE ISLAND: CAGAYAN PROVINCE: *Municipality of Calayan*: Barangay Balatubat: KU (paratypes) 304559, 304575, 304593, 304708, 304754, 307984, 307996, 307998, 308011, KU 304558, 304562-65, 304569, 304571-74, 304627-30, 304643, 304647, 304696-99, 304704-07, 304709-12, 304714, 304753, 304755-59, 307965-66, 307985-86, 307997, 307999-8003, 308006-10, 308012-15, 308017-18. ***Brachymeles lukbani***.—(14) LUZON ISLAND: CAMARINES NORTE PROVINCE: *Municipality of Labo*: Barangay Tulay Na Lupa, Mt. Labo: PNM (holotype) 9567, (paratopotypes) 9589-92, KU (paratopotypes) 313597-99, 313601, 313603-04, 313606, 313608, FMNH (paratopotype) 270191. ***Brachymeles maku-sog***.—(17) CATANDUANES ISLAND: CATANDUANES PROVINCE: *Municipality of Gigmoto*: Barangay San Pedro, Sitio Tungaw: PNM (holotype) 9565, (paratopotypes) 9583-9584, KU (paratopotypes) 308126, 308128, 308136, 308208; LUZON ISLAND: CAMARINES NORTE PROVINCE: *Municipality of Labo*, Barangay Tulay Na Lupa, Mt. Labo: KU (paratypes) 313612-313614, 313616, 313617, PNM (paratypes) 9585-9588, FMNH (paratype) 270200. ***Brachymeles mindorensis***.—(34) MINDORO ISLAND: MINDORO OCCIDENTAL PROVINCE: KU 304351-5, 304412-3, 304488, 307739-42, 308404, 308447-8, 308534; MINDORO ISLAND: MINDORO ORIENTAL PROVINCE: 30 km SE of Municipality of Calapan, Bank of Tarogin River: CAS-SU (holotype) 24487; SE slope Mt. Halcon, Tarogin Barrio: CAS-SU (paratypes) 24549-54, 24561-62, 24564; 24566, 24568, 24573-74, 24577-79; Mt. Halcon, SE slope Barawan Peak: CAS-SU (paratype) 24570. ***Brachymeles minimus***.—(6) CATANDUANES ISLAND: CATANDUANES PROVINCE: *Municipality of Gigmoto*, Barangay San Pedro: KU 308129-31, 308210-12. ***Brachymeles miriamae***.—(2) THAILAND: NAKHON RATCHASIMA PROVINCE: *Wang Nam Khieo District*: Sakaerat Environmental Research Station: KU 327692, 327693. ***Brachymeles muntingkamay***.—(17) LUZON ISLAND: NUEVA VIZCAYA PROVINCE: *Municipality of Quezon*, Barangay Maddiangat, Mt. Palali: PNM (holotype) 9566, (paratopotypes) 9578-82, KU (paratopotypes) 308865-66, 308900-06, 308908, 308953. ***Brachymeles orientalis***.—(53) 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) 24446-51, CAS-SU 25460; Cantaub Barrio: CAS-SU (paratypes) 18702, 24442, 24458; CAMIGUIN SUR ISLAND: CAMIGUIN PROVINCE: *Municipality of Catarman*, Mt. Mambajao, Sitio Sangsangan: CAS 110976-83; LEYTE ISLAND: LEYTE PROVINCE: *Municipality of Baybay*: KU 311231-5, 311241; MINDANAO ISLAND: AGUSAN DEL NORTE PROVINCE: *Municipality of Cabadbaran*, Diuata Mountain Range, Mt. Hilonghilong, Kasinganan: CAS-SU 133301, 133616, 133749, 133752, 133754; SAMAR ISLAND: EASTERN SAMAR PROVINCE: *Municipality of Taft*: KU 305470, 310734-6, 310739, 310942-6, 310949, 310951, 310955. ***Brachymeles pathfinderi***.—(40) MINDANAO ISLAND: SARANGANI PROVINCE: *Municipality of Glan*: Barangay Tanibulad, Sitio Padido: KU 324057-88; Barangay Taluya: KU 32789-96. ***Brachymeles samarensis***.—(7) SAMAR ISLAND: EASTERN SAMAR PROVINCE: *Municipality of Taft*: Barangay San Rafael: KU 310849-50, 310852, 311294-6; LEYTE ISLAND: LEYTE PROVINCE: *Municipality of Baybay*: Barangay Pilim, Sitio San Vicente: KU 311225. ***Brachymeles schadenbergi***.—(34) BASILAN ISLAND: BASILAN PROVINCE: Port Holland, Sawmill: CAS 60493; MINDANAO ISLAND: MISAMIS OCCIDENTAL PROVINCE: 2 km NW of Masawan: CAS 23468-69; 4 km NW of Masawan: CAS 23471; 3 km NW of Masawan, south bank of Dapitan River: CAS 23479-81, 23484-85; ZAMBOANGA DEL NORTE PROVINCE: Dapitan River: CAS-SU 23494-96; ZAMBOANGA CITY PROVINCE: *Municipality of Pasonanca*: Barangay Baluno, Pasonanca Natural Park: KU 314967, 314969, 314970-8, 314980, 314984-85, 314988-92, 314994, 314996-7. ***Brachymeles talinis***.—(31) NEGROS ISLAND: NEGROS ORIENTAL PROVINCE: 6 km W 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 N of Bondo Barrio: CAS-SU 22311–12; 22317, 22323; INAMPULAGAN ISLAND: GUIMARAS PROVINCE: *Municipality of Sibunag*: 8 km W of Pulupandan Town: CAS-SU 27972, 27996–97; PANAY ISLAND: ANTIQUE PROVINCE: *Municipality of San Remigio*: KU 306756–60, 306762–7, 306769, 306770–6, 306786. ***Brachymeles taylori***.—(34) NEGROS ISLAND: NEGROS OCCIDENTAL PROVINCE: *Municipality of Silay City*: Barangay Patag: KU 324044–56; NEGROS ISLAND: NEGROS ORIENTAL PROVINCE: 3 km W 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, 18656–57, 18748; Cuernos de Negros Mountain Range: CAS-SU (paratype) 18649; top of Dayungan Ridge: CAS-SU 21877, 21880, 21883–84; 24 km NW of Bondo Barrio, Bantolinao: CAS-SU 22355–56; CEBU ISLAND: CEBU PROVINCE: *Municipality of Carcar*: Tapal Barrio, Sitio Mantalongon: CAS 154671, 154673, 154678–82, 154686. ***Brachymeles tridactylus***.—(20) NEGROS ISLAND: NEGROS OCCIDENTAL PROVINCE: 16 km E of Municipality of La Castellana: Barrio Cabagnan, southern slope of Mt. Canlaon: CAS-SU 19424, 19426–27, 19429, 19452, 19458; 20 km E of Municipality of La Castellana: Sitio Kalapnagan: CAS-SU 27082–83; NEGROS ORIENTAL PROVINCE: Hills North and Northwest of Mayaposi: CAS-SU (holotype) 18354; PANAY ISLAND: ANTIQUE PROVINCE: *Municipality of Culasi*: Barangay Alojipan: KU 307726–36. ***Brachymeles tungaoi***.—(12) MASBATE ISLAND: MASBATE PROVINCE: *Municipality of Masbate City*: PNM (holotype) 9722, KU (paratopotypes) 323934–36; *Municipality of Mobo*: Barangay Tugbo: CAS (paratypes) 144229–30, 144290, 144306–7, 144313, 144341–2. ***Brachymeles vermis***.—(5) JOLO ISLAND: SULU PROVINCE: CAS-SU (paratype) 62489, CAS-SU 60720–22, 60857. ***Brachymeles vindumi***.—(4) JOLO ISLAND: SULU PROVINCE: CAS (holotype) 60724, CAS (paratypes) 60723, 60725, MCZ (paratype) 26577).