Journal of Herpetology, Vol. 44, No. 1, pp. 37–48, 2010
Copyright 2010 Society for the Study of Amphibians and Reptiles

New Forest Gecko (Squamata; Gekkonidae; Genus *Luperosaurus*) from Mt. Mantalingajan, Southern Palawan Island, Philippines

RAFE M. BROWN,[1,2] ARVIN C. DIESMOS,[3] MELIZAR V. DUYA,[4] HARVEY J. D. GARCIA,[5] AND EDMUND LEO B. RICO[6]

[1]*Natural History Museum and Biodiversity Institute, 1345 Jayhawk Boulevard, Dyche Hall, University of Kansas, Lawrence, Kansas 66045; E-mail: rafe@ku.edu*
[3]*Herpetology Section, Zoology Division, National Museum of the Philippines, Padre Burgos Avenue, Ermita 1000, Manila, Philippines; E-mail: arvincdiesmos@i-manila.com.ph*
[4]*Conservation International Philippines, Number 6 Maalalahangin Street, Teachers Village, Diliman 1101, Quezon City, Philippines; E-mail: mvduya@conservation.org*
[5]*Conservation International Philippines, Room 207 Pacific Plaza, Rizal Avenue, Puerto Princesa City, Palawan 5300, Philippines; E-mail: hjdgarcia@yahoo.com*
[6]*Wildlife Conservation Society of the Philippines, Diliman, Quezon City, Philippines; E-mail: edmundleorico@yahoo.com*

ABSTRACT.—**We describe a new species of *Luperosaurus* from Mt. Mantalingajan, southern Palawan Island, Philippines. The new species is distinguished from all other species of *Luperosaurus* by the combination of its large body size (81.3 mm for the single male specimen), near complete absence of interdigital webbing, absence of cutaneous expansions on limbs except for a minute flap on the posterior margins of the hind limbs, the presence of differentiated, moderately enlarged chin shields, 40 precloacofemoral pore-bearing scales, the limitation of scattered flattened dorsal tubercles to only the posterior portions of the torso, absence of spinose or recurved ornamental tubercles on the head and nuchal region, and convex to posteriorly raised tubercles clustered at the posterior margins of caudal tail annuli. Because the new species shares features with species in both species of *Luperosaurus* and *Gekko*, we compare the new species to (and distinguish it from) both genera. The new species is distinguished from all Southeast Asian *Gekko* by the combination of its smaller body size, relatively short, stout limbs, presence of only moderately enlarged, slightly imbricate ventral body scales, differentiated postmentals not highly elongate, dorsal body tubercles limited to posterior trunk and not arranged in rows, absence of enlarged, spinose tubercles on the limbs and tail, and tail encircled by small scales (enlarged subcaudals absent). The new species further emphasizes the biogeographic distinctiveness (from Sundaland fauna) and level of vertebrate endemism of Palawan Island and underscores the degree to which the biodiversity of the Philippines is not fully understood.**

Philippine gekkonid species include 40 species in nine genera (Taylor, 1922; Brown and Alcala, 1978): *Cyrtodactylus* (5), *Gekko* (11; Ota et al., 1989; Röesler et al., 2006; Brown et al., 2008), *Gehyra* (1), *Hemidactylus* (5), *Hemiphyllodactylus* (1), *Lepidodactylus* (6), *Luperosaurus* (6; Gaulke et al., 2007; Brown et al., 2007), *Pseudogekko* (4), and *Ptychozoon* (1; Brown et al., 2009). Brown and Alcala (1978), Russell (1979), and Brown et al. (2000, 2007) commented on variation in the characters distinguishing the genera *Luperosaurus* and *Gekko*, and recent studies have commented on the phenotypic dissimilarity and possible nonmonophyly of the genus *Luperosaurus* (Brown and Diesmos, 2000; Brown et al., 2000, 2007).

Currently, we refer species to *Luperosaurus* on the basis of (1) small to moderate body size; (2) limbs short and stout; (3) presence in most species of at least some interdigital webbing; (4) pronounced cutaneous expansions bordering the edges of the limbs in most species; (5) enlarged, irregular, spinose, or recurved ornamental tubercles on dorsolateral portions of the body and tail; (6) small, cycloid, juxtaposed scales completely encircling the tail (enlarged subcaudals absent); (7) chin shields moderate to small (differentiated postmentals absent or reduced); (8) body scales generally cycloid, juxtaposed, nonimbricate, and minimally differentiated between dorsal and ventral surfaces (Brown et al., 2000, 2007).

There are nine endemic species of Philippine *Gekko* (*Gekko athymus*, *Gekko crombota*, *Gekko ernstkelleri*, *Gekko gigante*, *Gekko mindorensis*, *Gekko palawanensis*, *Gekko porosus*, *Gekko romblon*, and *Gekko* n. sp.; Brown and Alcala, 1978; Brown et al., 2008, 2009), two species shared with other Southeast Asian countries (*Gekko gecko* and *Gekko monarchus*; Taylor, 1922; Manthey and Grossman, 1997), and one species (*Gekko hokouensis*) represented by a single specimen of doubtful origin (Ota et al., 1989) that may have

[2]Corresponding Author.

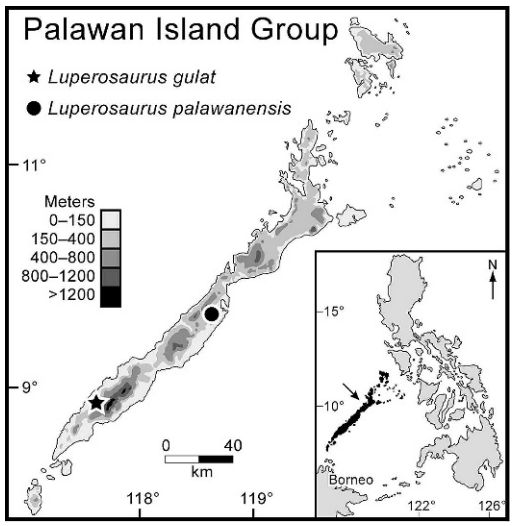

FIG. 1. Map of Palawan Island in relation to the Philippines (inset) with the type locality of *Luperosaurus gulat* (Municipality of Rizal, Mt. Mantalingajan) indicated with a shaded star. The type locality of *Luperosaurus palawanensis* (Municipality of Puerto Princesa, Thumb Peak [local name = ''Salakot'']) is indicated by a shaded circle.

been included in the Philippines' gekkonid fauna in error (Taylor, 1962; Brown and Alcala, 1978; Toda et al., 2008).

Numerous additional Philippine gekkonids await description, including a species represented so far by only a single, highly distinct specimen from the forests of the southern Palawan Island (Fig. 1). Although the new species has characteristics typical of both *Luperosaurus* and *Gekko*, we assign it to the former genus on the basis of the number of character states shared with other members of the genus *Luperosaurus* (Brown et al., 2000, 2007) and pronounced phenotypic dissimilarity to members of the genus *Gekko*.

Philippine members of the genus *Luperosaurus* include six endemic species: *Luperosaurus corfieldi*, *Luperosaurus cumingii*, *Luperosaurus joloensis*, *Luperosaurus kubli*, *Luperosaurus macgregori*, and *Luperosaurus palawanensis* (Brown et al., 2000, 2007; Gaulke et al., 2007). These robust-bodied taxa are phenotypically quite different from the slender, elongate-bodied non-Philippine species *Luperosaurus browni* (Peninsular Malaysia and Borneo), *Luperosaurus brooksii* (Sumatra), *Luperosaurus iskandari* (Sulawesi; Brown et al., 2000), and small-bodied Bornean taxa characterized by ornamental scalation and dermal expansions bordering the limbs and tail (*Luperosaurus yasumai* and *Luperosaurus sorok*; Ota et al., 1996; Das et al., 2008). The latter two species possess distinctive, serrated, denticulate lateral dermal expansions on either side of the tail (reminiscent of the genus *Ptychozoon*; Brown et al., 1997, 2000). Most Philippine species demonstrate a tendency toward island or Pleistocene Aggregate Island Complex endemism (Brown and Diesmos, 2000, 2002) although two species (*L. kubli* and *L. cumingii*) may co-occur on different parts of Luzon Island (Brown et al., 2007; Gaulke et al., 2007). Only on Borneo are multiple species of *Luperosaurus* actually known to coexist in sympatry (*L. yasumai* and *L. browni*); *L. sorok* may occur in sympatry with these species as well.

Palawan Island (considered by mammalogists to be a biogeographic extension of Borneo; Heaney 1985; Esselstyn et al., 2004) has a single endemic species, *L. palawanensis*. The type specimens (two mature males) were collected from north-central Palawan in 1961 and described in 1978 (Brown and Alcala, 1978). No further reports of this species have been forthcoming in the intervening years, and the species bears some resemblance to the stout-bodied, ornate species from Borneo (*L. yasumai* and *L. sorok*; Ota et al., 1996; Das et al., 2008) and the southern Philippines (*L. joloensis*; Taylor, 1918; Brown and Diesmos, 2000; Brown et al., 2000).

In 2007, two major biodiversity inventory efforts (one conducted by Conservation International, Philippines, and another led by researchers at the University of Kansas and the National Museum of the Philippines) targeted Mt. Mantalingajan, southern Palawan—an area only surveyed for herpetofauna previously by E. H. Taylor in 1923 and by members of the Field Museum Philippine Zoological Expedition in 1947 (Hoogstral, 1951; Inger, 1954). Among the collections resulting from nearly four continuous months of fieldwork is a single specimen of a highly distinctive undescribed species of *Luperosaurus* that cannot possibly be confused with any other species of *Luperosaurus* or any Southeast Asian species of *Gekko*. Considering the low probability of obtaining further specimens, and because ignorance of regional biodiversity resources is associated with (or perhaps indirectly contributes to) destruction of forested areas, we are compelled to describe the new species on the basis of the single highly distinctive specimen.

MATERIALS AND METHODS

We scored data from fluid-preserved specimens (Appendix 1) deposited in several institutional collections (Acknowledgments). Sex was determined by presence of eggs in females, the collector's ability to evert hemipenes of males, and gonadal inspection when possible.

Prominent secondary sexual characteristics confirmed (cloacal spurs and presence of precloacofemoral pores in males vs. pores absent in females; Brown et al., 1997, 2000; Brown, 1999) the determination of sex when dissection was not possible. Measurements (taken to the nearest 0.1 mm) were obtained with digital calipers following character definitions by Brown et al. (1997) and Brown (1999). Measurements included snout–vent length, tail length, head length, head width, head depth, snout length, eye diameter, eye–narial distance, tympanic annulus diameter, internarial distance, interorbital distance, axilla–groin distance, femur length, tibia length, Toe I length, Toe IV length, tail width, and tail height. Meristic characters included the number of differentiated precloacofemoral pore-bearing scales, supralabials, infralabials, circumorbitals, transverse midbody scales, paravertebrals and ventrals (both counted between midpoints of limb insertions), number of tail annuli, and subcaudals.

TAXONOMY

Luperosaurus gulat, sp. nov.
Figures 2–4

Holotype.—PNM 9282 (Field Collection number ELR 1579), adult male; 1300 m above sea level, 3.4 km west, 0.60 km south of Mt. Mantalingajan peak, Barangay Ransang, area known locally as ''Gunob,'' Municipality of Rizal, Palawan Province, Palawan Island, Philippines (8°48′48.7″N; 117°38′59.1″E) by Uldarico Dodong Carestia and H. J. D. Garcia, 5 July 2007.

Diagnosis.—Although the new species further blurs the distinction between the genera *Luperosaurus* and *Gekko* (as defined by Brown et al., 2000, 2007), we refer it to *Luperosaurus* by virtue of (1) its possession of a robust body and stout limbs; (2) vestiges of interdigital webbing between some fingers and toes; (3) minute cutaneous folds bordering the posterior edge of the hind limb; (4) small scales encircling the tail (enlarged, strongly differentiated subcaudals absent); (5) scattered, irregular flat, convex, to slightly spinose dorsal tubercles on dorsolateral portions of body and tail (trunk tubercles not arranged in rows); (6) minimal differentiation between dorsal and ventral body scales; and (7) postmentals not slender and elongate as in most members of genus *Gekko* (Brown et al., 2000, 2007, 2008, 2009). We acknowledge the phenotypic similarity between selected members of the genus *Luperosaurus* (*L. kubli, L. macgregori*, *L. gulat*) and members of the genus *Gekko*. Therefore, to be clear that this new taxon cannot be confused with any known species of Southeast Asian *Gekko*, we also diagnose it from these species (below).

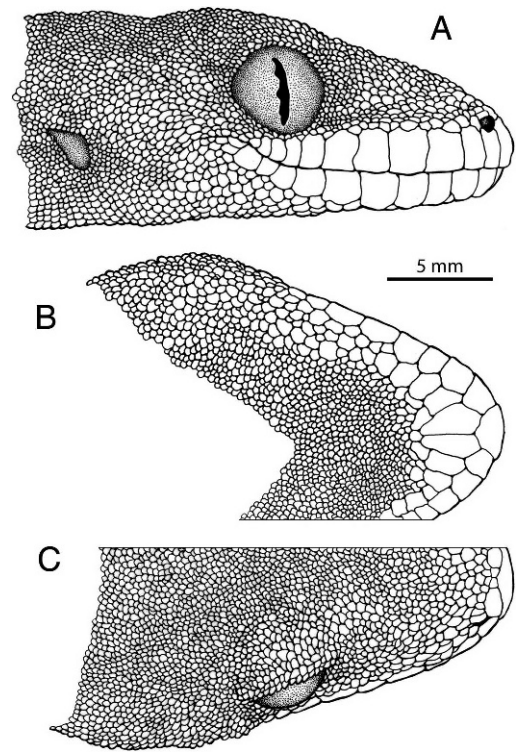

FIG. 2. Lateral (A) ventral (B) and dorsal (C; with snout tilted forward 10° to emphasize internasals) views of the head of the holotype of *Luperosaurus gulat* (PNM 9282).

The new species is readily differentiated from all species of *Luperosaurus* on the basis of (1) its relatively large body size, (2) the near complete absence of interdigital webbing (vs. greater extent of webbing present in all other species), (3) the reduction of cutaneous expansions bordering the limbs (vs. more extensive in all other species except *L. kubli*), (4) the presence of moderately enlarged postmentals (vs. more reduced or undifferentiated in other species), (5) the presence of flat to convex tail tubercles limited to dorsolateral portions of body and tail, and (6) high numbers of precloacofemorals. A summary of the distribution of diagnostic character states in Philippine *Luperosaurus* is presented in Table 1; for extensive comparisons between all *Luperosaurus* species, see Brown et al., 2007:table 1.

Luperosaurus gulat differs from all known Philippine species of *Gekko* by (1) minimal differentiation between dorsal and ventral body scales (vs. scales on dorsum small, juxtaposed, scales on venter strongly imbricate and greatly enlarged), (2) the presence of only moderately

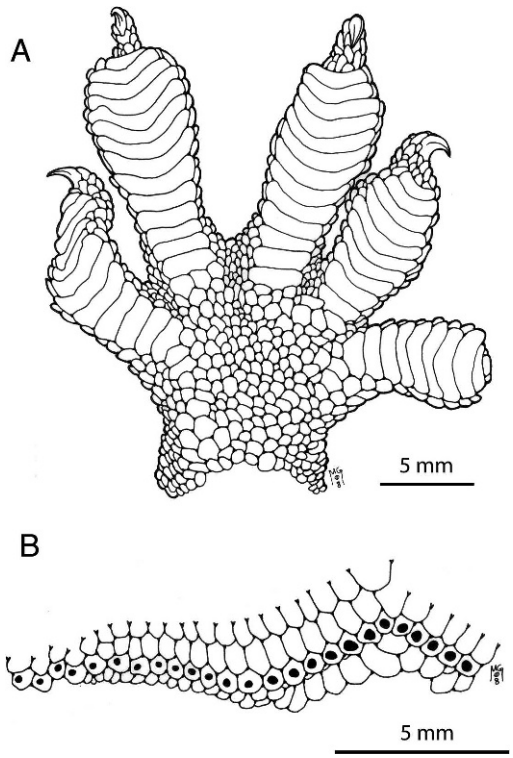

FIG. 3. Palmar surface of right manus (A) and right side of precloacofemoral region (B) showing 13 pore-bearing scales in the right femoral series (slightly smaller pores), 12 pore-bearing scales in the precloacal series (slightly larger pores), and a lack of a disruption (nonpored scaled) between the regions. Fifteen pore-bearing scales in the left femoral region not illustrated for simplicity.

enlarged postmentals (vs. greatly enlarged, elongate, and slender in all Philippine species except *G. gecko*), and (3) the absence of enlarged subcaudals (present in all Philippine *Gekko*). *Luperosaurus gulat* and *G. athymus* lack dorsal tubercles on anterior portions of the body; in all other Philippine *Gekko*, dorsal tubercles are present and arranged in longitudinal rows of varying regularity. Additionally, *L. gulat* has a lower precloacofemoral pore-bearing scale count than *G. mindorensis* (46–60), *G. gigante* (54–66), *G. palawanensis* (65–72), *G. romblon* (69–80), and *G. porosus* (74–82). See Brown et al. (2008, 2009) for recent summaries of the distribution of diagnostic morphology in Philippine members of the genus *Gekko*.

Comparisons.—For the recognition of the new species, the critical comparisons are *L. palawanensis* (the only species previously recorded from the Palawan faunal region), the phenotypically most similar species *L. kubli*, and, to a lesser extent, *L. macgregori*. Other species (Philippine *L. corfieldi*, *L. cumingii*, and *L. joloensis*; Indonesian *L. brooksii* and *L. iskandari*, and Malaysian *L. browni* and *L. yasumai*) are distantly allopatric and morphologically quite dissimilar from *L. gulat* (Table 1).

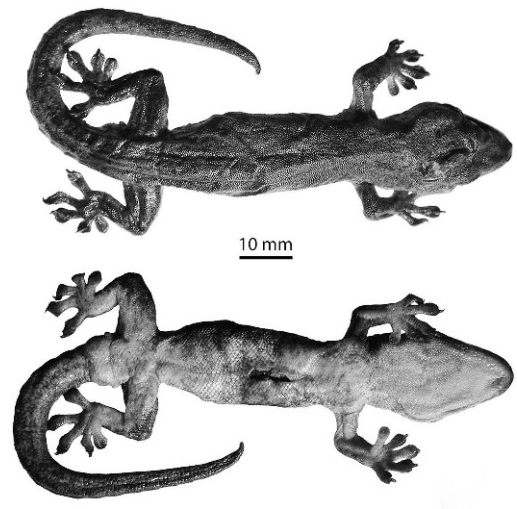

FIG. 4. Dorsal and ventral views of the body of the holotype of *Luperosaurus gulat* (PNM 9282; adult male, SVL = 81.3 mm).

Luperosaurus gulat cannot be confused with *L. palawanensis*, a species that has (1) more extensive cutaneous folds bordering the limbs, (2) more extensive interdigital webbing, (3) fewer precloacofemorals, (4) spinose and recurved dorsolateral trunk and tail tubercles (5), undifferentiated postmentals, (6) more midbody scales, and (7) a much smaller body size (Table 1).

Luperosaurus gulat is readily distinguished from *L. macgregori* (Babuyan Islands) and *L. joloensis* (Mindanao and Sulu archipelago), two species that have (1) fewer precloacofemorals, (2) fewer Toe I and III scansors, (3) more extensive interdigital webbing, (4) more midbody scales, (5) undifferentiated postmentals, (6) more extensive cutaneous folds bordering the limbs, and (8) much smaller body size (Table 1). Additionally, *L. joloensis* has highly spinose and recurved dorsolateral trunk and tail tubercles, and *L. macgregori* lacks dorsolateral tubercles.

Luperosaurus gulat is diagnosed from the phenotypically similar *L. kubli* (Sierra Madre mountains of Luzon) by *L. kubli*'s possession of (1) fewer precloacofemorals, (2) more extensive interdigital webbing, (3) no body tubercles, (4) undifferentiated postmentals, (5) slightly more extensive cutaneous flaps bordering the limbs, and (6) a larger apparent body size (Table 1).

Luperosaurus cumingii (Luzon and Camiguin Norte Islands) and *L. corfieldi* (Panay and Negros Islands) can be distinguished from *L. gulat* by (1) more supralabials and infralabials,

TABLE 1. Distribution of selected diagnostic characters (+, present; −, absent) in *Luperosaurus gulat* and the remaining Philippine species of *Luperosaurus*. See Brown et al. (2007:table 1) for distribution of character states distinguishing the morphologically similar group of Philippine species from the remaining, phenotypically divergent non-Philippine species (*Luperosaurus iskandari*, *Luperosaurus browni*, *Luperosaurus brooksi*, and *Luperosaurus yasumai*). Bilaterally symmetrical characters are presented for the right side of all specimens. Measurements are presented in millimeters and all specimens (with the exception of the *Luperosaurus joloensis* paratype) were mature adults. Sources of data (all confirmed by examination of specimens) include (1) Brown et al., 2000; (2) Ota et al., 1996; (3) Russell, 1979a; (4) Brown and Alcala, 1978; (5) Brown et al., 2007; (6) Gaulke et al., 2007; and (7) this study.

	gulat	*corfieldi*	*cumingii*	*macgregori*	*palawanensis*	*joloensis*	*kubli*
	N = 1	*N* = 4	*N* = 4	*N* = 3	*N* = 2	*N* = 2	*N* = 1
Snout–vent length	81.3	70.0–95.0	61.0–82.7	57.4–58.9	43.7–52.0	27.5–32.4	105.4
Precloaco-femorals	40	11–19	15–20	16–18	28–32	30–31	16
Internasals contacting rostral	2	1–2	1–3	1–3	1–3	1	1
Scales contacting nostril	5	4	5–6	5	5	5	5
Head length/head width	1.3	1.2	1.2–1.3	1.4	1.2	1.3–1.4	1.2
Supralabials	11	16	15–17	13–15	11–13	11–13	13
Infralabials	11	13–14	13–15	14–16	10–11	10–12	12
Subrictal tubercles	−	−	+, −	−	+, −	−, a few	−
Tail height/tail width	0.82	0.82–0.95	0.90	0.75–0.87	0.80	0.50	0.76
Number scansors on toe I	9	10–14	11–14	10–11	9–11	8–9	12
Number scansors on toe III	13	14–20	13–16	12–14	12–13	9–13	16
Extent web between digits III and IV of pes	1/10–1/8	1/3–1/2	1/2–3/4	1/5–1/3	1/5–1/4	1/5–2/3	1/6–1/4
Auricular opening	suboval oblique	large subcircular	oval, moderate small	oval, oblique	large subcircular	narrow oblique	oval oblique
Penultimate scansors	bowed	deeply notched	deeply notched	few, divided	bowed	deeply notched	deeply notched
Dorsal tubercles	flat to convex	convex	spinose	−	spinose, recurved	strongly spinose	−
Ventrolateral body tubercles	few, flat to convex	few, convex to conical	few, convex	few, convex	few, spinose	many, spinose	−
Lateral tail tubercles	+	−	+	+	+	+	−
Ventrals	large, flat, subimbricate	small, granular, juxtaposed	small, granular, juxtaposed	small, granular, juxtaposed	large, flat, subimbricate	small, flat, subimbricate	large, flat, subimbricate
Midbody Scales	82	164–194	159–171	135–146	99–106	128–133	157
Anteriormost chin scales	moderately enlarged	small	small	small	slightly enlarged	slightly enlarged	slightly enlarged
Anterior forelimb expansions	−	wide flaps	wide flaps	narrow folds	−	moderate folds	−
Posterior forelimb expansions	−	wide flaps	wide flaps	moderate flaps	−	moderate folds	minute folds
Anterior hind-limb expansions	−	wide flaps	narrow folds	−	−	narrow folds	−
Posterior hind-limb expansions	minute folds	wide flaps	wide flaps	moderate flaps	wide flaps	wide flaps	moderate flaps
Source	(7)	(6)	(1,4,6)	(4,5,7)	(1,4,7)	(1,4,7)	(5)

(2) fewer precloacofemorals, (3) much more extensive interdigital webbing, (4) much greater extent of cutaneous flaps bordering the limbs, and (5) undifferentiated postmentals. *Luperosaurus corfieldi* is further distinguished from the new species by the presence of lateral tail tubercles; *L. cumingii* is further distinguished by the presence of highly spinose tubercles throughout the anterior portions of the body.

The non-Philippine species *L. brooksii* (Sumatra), *L. browni* (Malaysian Peninsula and Borneo), and *L. iskandari* (Sulawesi) can be distinguished from the new species by their (1) slender body, (2) single internasal contacting the rostral, (3) presence of interstitial granules between dorsals, (4) fewer precloacofemorals, (5) undifferentiated postmentals, (5) extensive cutaneous flaps bordering the limbs, and (6) smaller body sizes (Table 1). *Luperoraurus iskandari* further differs from the new species by the presence of subrictal tubercles and presence of denticulate tail lobes.

The Bornean endemic *L. yasumai* can be easily distinguished from *L. gulat* by (1) a greater number of internasals contacting the rostral, (2) fewer supralabials, (3) absence of precloacofemorals, (4) fewer subdigital scansors under Toes I and III, (5) greater extent of interdigital webbing, (6) extensive cutaneous flaps bordering the limbs, (7) smaller body size, and (8) presence of denticulate tail lobes.

Finally, the new species cannot be confused with Bornean *L. sorok* (Das et al., 2008) because of that species' (1) extensive interdigital webbing, (2) undifferentiated postmentals, (3) extensive cutaneous flaps bordering the limbs, (4) spinose head and subrictal tubercles, (5) denticulate tail lobes, and (6) its much smaller body size (Table 1).

Description of Holotype.—Adult male in excellent condition; hemipenes not everted (Figs. 2–4). Habitus robust, limbs stout, tail original, relatively short; head at widest point (Figs. 2C and 4A) slightly wider than body (1.1 times) at widest point (Fig. 4); anterior margins of all limbs and posterior margins of forelimbs smooth, lacking cutaneous flaps or dermal folds; posterior margins of proximal (femoral) segment of hind limbs with minute, 1.0–1.5 mm wide cutaneous expansion; distal (tibial) half of posterior margins of hind limbs with no cutaneous flaps; cutaneous expansions with undifferentiated, minute scales on dorsal and lateral surfaces.

Head large, with hypertrophied temporal and adductor musculature; snout subelliptical, rounded at tip in dorsal and lateral aspect (Fig. 2A, C); head width 76.8% of head length and 22.5% of snout–vent length; snout length 54.6% of head width and 42.0% of head length; dorsal surfaces of head smooth, homogenous, with relatively indistinct postnasal, prefrontal, interoribital, and parietal concavities; transverse parietal crest absent; auricular opening an elongate, subelliptical, obliquely oriented slit, partially concealed by temporal swellings of jaw closure musculature; tympanum deeply sunken; orbits moderate, lacking dorsally pronounced supraorbital crests; palpebra only slightly raised above parietal surface; eye moderate, pupil vertical, its posterior margin wavy (Fig. 2A); tympanic annulus diameter 45.6% of eye diameter; limbs stout and relatively short, femoral segments of hind limbs hypertrophied; tibia length 14.3% of snout–vent length, 75.8% of femur length.

Rostral large, subrectangular, 1.5 times as broad as high, with only slight dorsomedial depression (groove absent); nostril surrounded by rostral, the first labial, an enlarged ovoid supranasal, and moderately enlarged ovoid postnasals, each smaller than supranasals; supranasals separated by two internasals, slightly larger than surrounding snout scales; internasals pentagonal, flat, followed posteriorly by four rows of similarly enlarged, convex, cycloid snout scales (Fig. 2A, C); on both lateral sides of snout, the second row of snout scales following postnasals (i.e., postnasal–preloreal region concavity) are distinctively enlarged.

Supralabials 13/11 (L/R; 7–11/9 subocular), bordered dorsally by one row of very slightly differentiated, similarly flattened snout scales and anteriorly (loreal region) by a second incomplete row of elongate, flattened scales; infralabials 11/11 (last 1–2 infralabials concealed in postrictal pocket), bordered anteroventrally by a single row of moderately differentiated chin scales (>5 times the size of undifferentiated, minute gular scales) and posteroventrally by 2–3 rows of slightly enlarged, irregular scale rows (Fig. 2B); postrictal scales slightly enlarged, approximately 2 times the size of scales of temporal region; postrictal tubercles absent; mental very small, semicircular; postmental scales moderately enlarged, followed by one pair of only slightly enlarged secondary postmentals, undifferentiated gular scales thereafter; remainder of undifferentiated throat scales very small, round, nonimbricate, juxtaposed (Fig. 2B).

Dorsal cephalic scales round, nonimbricate, convex to granular, remarkably homogenous save for enlargement on snout, lateral temporal regions, and palpebra (slightly larger than scales in adjacent frontal region); preorbital region lacking differentiated scales; temporal region tubercles absent; nuchals granular, strongly convex, continuously grading into slightly larger dorsals; dorsals enlarged, cycloid, lacking well-

developed interstitial granules; throat and chin scales homogenous, round, convex, granular; sharply transitioning and greatly increasing in size in gular region; becoming imbricate in gular and pectoral regions, and continuing to increase in size through ventral abdomen where imbrication further increases.

Ornamental cephalic scalation absent; 33/36 circumorbitals, undifferentiated except for very slight dorsolateral transverse elongation and modification into slight, fringe-like points, projecting into orbit in posterodorsal corner of orbit; true spiny ciliaries absent; 27 interorbital scales transversely at palpebral midpoints.

Axilla–groin distance 44.7% of snout–vent length; undifferentiated dorsal body scales round, convex, nonimbricate, transversely undifferentiated; granular dorsal trunk scales lack well-developed interstitial granules; 82 transverse midbody scales (enlarged ventrals in 23 rows across ventral surfaces of trunk); paravertebrals between limb insertion midpoints 124; ventrals between limb insertion midpoints 62; dorsal body tuberculation moderate, with flat to convex enlarged scales extending over posterior two-thirds of body trunk, not arranged in rows. Dorsal tubercles slightly more dense in vertebral region, becoming most dense at posterior end of dorsum and above hind limb insertions.

Scales on dorsal surfaces of limbs flat, enlarged and imbricate on pre-brachial surfaces; small (similar to adjacent trunk scales), increasingly granular, and convex on antebrachial surfaces; forelimb scalation otherwise homogenous, completely lacking tuberculation; scalation of ventral surfaces of forelimbs with homogenous, round, granular, minute scales that extend onto the palmar surfaces of the manus; scales on dorsal surfaces of femoral segment of hind limbs similarly enlarged, flat, and imbricate on prebrachial surfaces and granular, round, and minute on antebrachial surface (and on cutaneous expansion posteriorly bordering the hind limb); tibial segment of hind limb with small, granular, convex scales on dorsal surfaces, and enlarged, imbricate scales on ventral surfaces; scales of heel greatly enlarged and flat; knee with scattered enlarged scales similar in appearance to tuberculation of dorsal trunk. Scales on dorsal surfaces of manus and pes similar to dorsal limb scales; ventral surfaces with minute, round, convex, granular scales; digits with only a minute vestige of interdigital webbing, strongest between Toes III and IV.

Precloacofemoral pore-bearing scales, arranged in a slightly bowed configuration, pierced by 40 pores; precloacal and femoral pore-bearing scales in continuous contact; 13 femoral pore-bearing scales on right, 12 precloacals (slightly larger than femorals on either side), 15 femorals on left; precloacofemorals preceded by two similarly enlarged but nonpored and non-dimpled scale rows; followed by similarly sized scales posterior to precloacals; scales posterior to femorals undifferentiated; scales posterolateral to precloacofemoral series (i.e., along ventroposterior surfaces of hind limb) reduce in size sharply to minute scales under the slight cutaneous expansion of the posterior edge of the hind limb; a single, greatly enlarged cloacal spur follows the vent on either side of hemipenal bulges.

Digits widely dilated and covered on palmar/plantar surfaces by wide, bowed scansors (Fig. 3A); penultimate 2 or 3 scansors moderately notched (not divided); digits only very slightly webbed, with web extending 1/10–1/8 the length of digit from base, and ending well below the dilated hyperextensible portions of digits; vestige of webbing only ascertainable between fingers III and IV and IV and V; subdigital scansors of manus: 10/9, 11/11, 13/13, 15/14, and 12/13 on left/right digits I–V, respectively; pes: 12/13, 11/12, 13/13, 14/14, and 14/15 on left/right digits I–V, respectively; all digits but first (inner) clawed; inner digits of both manus and pes with enlarged pair of elongate scales in claw; remaining terminal claw-bearing phalanges compressed, with large recurved claws (claws sheathed), rising free at distal end, extending well beyond dilated distal portion of digit.

Tail relatively long, 94.6% of snout–vent length; tail height (not including basal denticulate lobes) 76.9% of tail width; tail not depressed, cylindrical, adorned throughout its entire length with enlarged flat to convex tubercle rows at the posterior margins of each caudal annulation (Fig. 5); 21 fracture planes/autotomy grooves (= whorls or annuli), with 7–11 undifferentiated dorsal caudal scales per annulation; dorsal caudal scales 149, granular, convex, subcircular; subcaudals 88, small to moderate, slightly larger than dorsal caudal scales, squarish, flat, subimbricate.

Measurements of Holotype.—Measurements in millimeters. Snout–vent length 81.3; tail length 76.9; head length 23.8; head width 18.3; head depth 9.8; snout length 10.0; eye diameter 4.6; eye–narial distance 7.3; tympanic annulus diameter 2.1; internarial distance 4.2; interorbital distance 5.4; axilla–groin distance 36.4; femur length 15.3; tibia length 11.6; Toe I length 4.4; Toe IV length 8.7; tail width 7.2; tail height 5.9.

Coloration in Preservative.—Dorsum dark grey, with indistinct slightly darker grey blotches, lacking any trace of transverse banding; dorsal nuchal region and head slightly darker grey than body; lateral portions of head and labial scales flat grey; postrictal region pale grey; dorsal surfaces of limbs dark grey, lacking

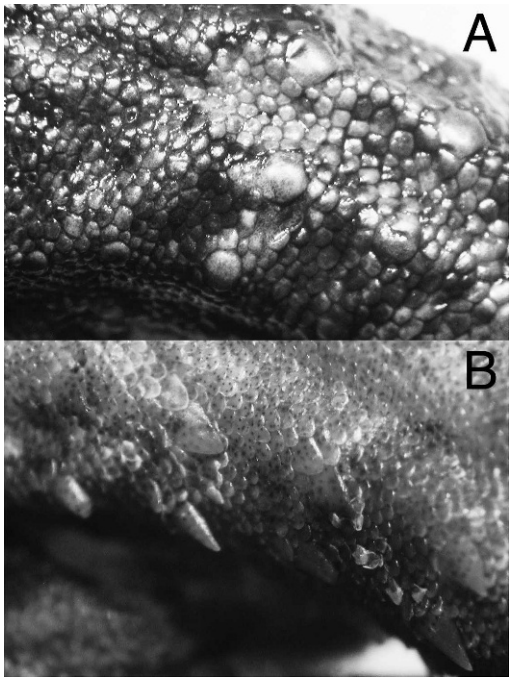

FIG. 5. Dorsolateral tail whorl scalation in (A) *Luperosaurus gulat* (PNM 9282; note convex tubercles) and (B) *Luperosaurus palawanensis* (holotype: CAS 134207; note highly spinose tubercles).

transverse banding; dorsal surfaces of digits dark grey with slightly lighter innermost digits; dorsal and lateral portions of tail banded, alternating dark and very dark grey (not corresponding to tail annuli); distal portions of tail with lighter blotches.

Infralabial region and chin flat light gray; gular region pale cream, flanked by slightly darker grey ventrolateral jaw coloration; sternal region light cream with indistinct grey flecks; ventral body light grey with dark grey blotches wrapping on to ventrum from flanks; ventral surfaces of limbs light cream with grey borders; ventral surfaces of scansors of fingers and toes dark grey; precloacofemoral pore-bearing scale series white with pale orange pores; ventral tail dark grey with indistinct white flecks and no transverse bands. Coloration in life was not recorded, but our experience with numerous other species of *Luperosaurus* suggests that little fading occurs with preservation and that live and preserved colorations usually only differ by the presence of faint yellowish tones on ventral surfaces of body and limbs (Brown et al., 2000, 2007; Gaulke et al., 2007).

Habitat and Natural History.—We have no information on microhabitat preference, abundance and distribution, or reproduction in the new species. The single specimen was captured on the trunk of a large tree. The terrain at Gunob (3.4 km west, 0.60 km south of Mt. Mantalingajan peak, 1,300 m) was a moderate plateau along a ridge. The vegetation was generally a transitional midmontane to upper montane forest. The area is disturbed and currently being used by several indigenous Palawanon tribal families as a refuge for several months after *kaingin* (shifting agriculture) harvest. Canopy cover height was approximately at 15 m and tall bamboo groves were common (indicative of a history of disturbance), and shrublike and climbing bamboos were common on the ridges. Undergrowth plants include ferns, orchids and gingers, and thin blade grasses were common in open areas. Large boulders were conspicuous on the north and south ridges surrounding the approach to Mt. Mantalingajan's peak.

Etymology.—The specific epithet is taken from the Tagalog (Filipino) term *gulat*, meaning something unexpected, a surprise, or an astonishing finding.

DISCUSSION

In their recent description of *L. kubli*, Brown et al. (2007) discussed the full range of morphological variation exhibited by Sundaland members of the genera *Gekko* and *Luperosaurus*; they also provided a revised definition of *Luperosaurus* and expanded on Brown et al.'s (2000) clarification of *Luperosaurus* generic boundaries with respect to the Asian members of the genus *Gekko*. In general, recent discoveries of new species of *Luperosaurus* have forced taxonomists to adopt an expanded definition of the genus that is increasingly *Gekko*-like (Brown et al., 2008, 2009), as evinced by the shared presence of several formerly exclusive *Gekko* characters states (e.g., larger body size, reduced body tuberculation, reduced interdigital webbing, reduced extent of cutaneous expansions bordering the limbs, increased size of postmentals, increased differentiation between dorsal and ventral body scalation; Brown et al., 2000, 2007, Gaulke et al., 2007).

As with other recently described *Luperosaurus* species (Brown et al., 2007; Gaulke et al., 2007), the new species further obfuscates the generic boundaries between *Gekko* and *Luperosaurus* (Brown and Alcala, 1978; Russell, 1979; Brown et al., 2000). Although the preponderance of characters convinces us that the best course of action is to assign the new species to the genus *Luperosaurus*, *L. gulat* further stretches the generic definition by extending the range of variation observed in several *Luperosauus* characters. First, *L. gulat* possesses differentiated and moderately enlarged postmental chin shields, a

markedly *Gekko*-like character state (not exhibited to this extent in the other *Gekko*-like *Luperosaurus* species such as *L. kubli* but present to a lesser degree in the miniaturized species *L. joloensis*). In other respects, *L. gulat* and *L. kubli* both appear more *Gekko*-like by their near complete absence of cutaneous expansions bordering the limbs (Table 1), by increased differentiation between dorsals (minute, juxtaposed, granular) and ventrals (moderately enlarged, imbricate), reduction of interdigital webbing, and large body size (Brown et al., 2007). A superficial similarity of these two species to the highly distinctive and distantly allopatric Taiwan and Ryukyu Archipelago taxa (*Gekko hokouensis*, *Gekko yakuensis*, *Gekko tawaensis*, *Gekko japonicus*, *Gekko shibatae*, *Gekko vertebralis*; Ota, 1989; Toda et al., 2008) is probably indicative of convergence rather than shared ancestry, although a phylogenetic analysis would be required to confirm our assertion, which is admittedly based on morphological gestalt.

The description of *L. gulat* brings the total number of *Luperosaurus* species to 11, with seven taxa now known from the Philippines (Brown and Diesmos, 2000; Brown et al., 2007; Gaulke et al., 2007). Although recent years have seen an increase in the number of species of the genus *Luperosaurus*, we consider 11 taxa to be a certain underestimate of the true diversity of these enigmatic forest geckos. By nearly all accounts, species of *Luperosaurus* are so rare and elusive that any comments concerning total species diversity are undoubtedly premature (Brown et al., 2000, 2007; Gaulke et al., 2007). At present, all 11 species are known from a cumulative total of fewer than 30 specimens that have been reported in the literature. Nearly all new collections of *Luperosaurus* specimens result in new species descriptions, and to date, only a few species are known from more than a single specimen (Brown and Diesmos, 2000; Brown et al., 2000, 2007). All described species except *L. cumingii* (Brown and Diesmos, 2000; Gaulke et al., 2007) and *L. macgregori* (R. M. Brown and C. Oliveros, unpubl. data) are known only from a cumulative total of just a few specimens.

Luperosaurus gulat appears phenotypically most similar to *L. kubli*, and, to a lesser extent, *L. macgregori*, with the principal differences being *L. gulat*'s dense aggregation of flat to convex posterodorsal trunk and tail tubercles (absent in *L. kubli* and *L. macgregori*), reduction in webbing and cutaneous limb flaps, moderately enlarged postmentals, and *L. macgregori*'s much smaller body size (Table 1). *Luperosaurus gulat* appears morphologically quite distinct from the potentially sympatric *L. palawanensis* (and the morphologically similar but allopatric *L. joloensis*), a much smaller species (Table 1), with extensive interdigital webbing (absent in *L. gulat*) and ornate and exceptionally spinose and elongate posteriorly facing posterodorsal and lateral tail tubercles (Fig. 5; described by Brown and Alcala [1978] as ''spear-head-like;'' dorsolateral tail tubercles flat to convex in *L. gulat*), and widely expanded cutaneous flaps bordering the limbs (absent in *L. gulat*). If possession of apparently derived morphological character states is any indication of shared ancestry, it does not appear that *L. palawanensis* and *L. gulat* are sister species.

We expect future phylogenetic analyses to demonstrate that *Gekko* is paraphyletic with respect to *Luperosaurus*, *Ptychozoon*, and possibly *Pseudogekko* and *Lepidodactylus*. Past studies have noted morphological similarities between members of these genera (Brown and Alcala, 1978; Russell, 1979) and a lack of consistent morphological characters distinguishing them (Brown et al., 1997, 2000, 2007), suggesting convergent evolution, common ancestry, or retention of pleisiomorphic character states. The phylogenetic position of the *Gekko*-like *Luperosaurus* species remains for now an enigmatic and interesting systematic problem (Brown et al., 2000).

The discovery of another species of *Luperosaurus* from the largely unexplored forests of southern Palawan Island is surprising. Although this isolated mountain range is expected to harbor undocumented endemic diversity, we did not expect to find a second species of *Luperosaurus* on Palawan. Whether the two endemic Palawan *Luperosaurus* species occur in sympatry has yet to be determined. *Luperosaurus palawanensis* is only known from north-central Palawan (Thumb Peak, known locally as ''Sapucoy''; near the village of Iwahig and Puerto Princesa), whereas *L. gulat* is now known from the southernmost portion of the island (Fig. 1). The recent discovery of new species in this geologically distinct and zoogeographically unique component of Palawan emphasizes the immediate need for a comprehensive herpetological inventory of the Palawan faunal region, particularly its long-neglected southern extremes including Balabac and other islands just north of Borneo.

Why are *Luperosaurus* species so rare? Despite the availability of new data on microhabitat preferences of *Luperosaurus* species, we are unable to definitively answer this question. Having assumed for years that the rarity of these species was explained by a preference for the forest canopy (Brown and Diesmos, 2000; Brown et al., 2000), we have been surprised by recent discovery of two species in lower strata of forests (Brown et al., 2007; Gaulke et al., 2007), by high abundance of another species in shrubby vegetation of mature costal forest fragments (Brown et al., 2007, 2008; R. M.

Brown and C. Oliveros, unpubl. data), and now by the discovery of this new species at relatively high elevations (1,300 m) in moist, montane forests of central Palawan. Brown et al. (2007) surmised that the obligate canopy hypothesis may not suffice as an explanation for *Luperosaurus* rarity. Instead they suggested that *Luperosaurus* species may have evolved to specialize on mature coastal forests in the Philippines (which have been almost entirely removed over the last 400 years; Brown and Diesmos, 2009). This may explain why the somewhat more common *L. cumingii* and *L. corfieldi* are most often encountered at a few hundred meters elevation, in degraded habitat adjacent to intact lower montane forest. This explanation is also consistent with the fact that at least one species is quite common in a small isolated fragment of coastal forests (Brown et al., 2007; R. M. Brown and C. Oliveros, unpubl. data) in the Babuyan Islands and may explain why remaining species of *Luperosaurus* are so rarely encountered and at such low densities.

Finally, as biodiversity information and new data accumulate, the naive characterization of Palawan Island as a simple faunal extension of northern Borneo (Heaney, 1985) with a reduced but nested subset of its fauna and flora, has emerged as an inaccurate, mammal- and bird-biased oversimplification. All available phylogenetic studies involving endemic amphibians and reptiles of Palawan (McGuire and Kiew, 2001; Brown and Guttman, 2002; Evans et al., 2003) have demonstrated affinities to taxa from the truly oceanic portions of the Philippines (Brown and Diesmos, 2000, 2002, 2009). The morphological similarity of *L. gulat* to northern Philippine taxa (*L. kubli* and *L. macgregori*) suggests the new species may be yet another lineage that defies the gross generalization of Palawan as a mere biogeographic peninsula of northern Borneo. The comparative study of the systematic relationships of multiple vertebrate groups that include Palawan endemics is fertile ground for future research (Brown and Diesmos, 2009).

Acknowledgments.—For access to institutional collections, we thank J. Vindum, R. Drewes, and A. Leviton (CAS); J. Rosado, J. Losos, and J. Hanken (MCZ); A. Resetar and H. Voris (FMNH); T. LaDuc and D. Cannatella (TNHC); and R. Sison (PNM; museum codes follow Leviton et al., 1985). We thank the Department of the Environment and Natural Resources (DENR; especially Brooke's Point Municipal authorities), and the Manila-based Protected Areas and Wildlife Bureau, for facilitating research permits for this and related studies. We also thank Provincial DENR authorities of Palawan Province, the Palawan Council for Sustainable Development, the National Commission on Indigenous Peoples, and Panglima Fernandez Gasang for logistical support. Fieldwork was conducted with support from the National Science Foundation (DEB 0743491 to RMB), Conservation International's Critical Ecosystem Partnership Fund, and the University of Kansas Natural History Museum and Biodiversity Institute. Thanks are owed to M. Garfield, J. Weghorst, and C. Siler for assistance with figures and manuscript reviews, and we are grateful to N. Antoque, J. Fernandez, N. Fernandez, B. Fernandez, R. Duya, I. Osbucan, and especially U. Carestia for their assistance in the field.

Literature Cited

Brown, R. M. 1999. New species of parachute gecko (Squamata; Gekkonidae; genus *Ptychozoon*) from northeastern Thailand and Central Vietnam. Copeia 1999:990–1001.

Brown, R. M., and A. C. Diesmos. 2000. The lizard genus *Luperosaurus*: taxonomy, history, and conservation prospects for some of the world's rarest lizards. Sylvatrop: Technical Journal of Philippine Ecosystems and Natural Resources 10:107–124.

———. 2001 (2002). Application of lineage-based species concepts to oceanic island frog populations: the effects of differing taxonomic philosophies on the estimation of Philippine biodiversity. Silliman Journal 42:133–162.

———. 2009. Philippines, Biology. *In* R. Gillespie and D. Clague (eds.), Encyclopedia of Islands, pp. 723–732. University of California Press, Berkeley.

Brown, R. M., and S. I. Guttman. 2002. Phylogenetic systematics of the *Rana signata* complex of Philippine and Bornean stream frogs: reconsideration of Huxley's modification of Wallace's Line at the Oriental-Australian faunal zone interface. Biological Journal of the Linnean Society 76:393–461.

Brown, R. M., J. W. Ferner, and A. C. Diesmos. 1997. Definition of the Philippine Parachute Gecko, *Ptychozoon intermedium* Taylor 1915 (Reptilia: Lacertilia: Gekkonidae): redescription, designation of a neotype, and comparisons with related species. Herpetologica 53:357–373.

Brown, R. M., J. Supriatna, and H. Ota. 2000. Discovery of a new species of *Luperosaurus* (Squamata; Gekkonidae) from Sulawesi, with a phylogenetic analysis of the genus and comments on the status of *L. serraticaudus*. Copeia 2000:191–209.

Brown, R. M., A. C. Diesmos, and M. V. Duya. 2007. A new species of *Luperosaurus* (Squamata: Gekkonidae) from the Sierra Madre mountain range of northern Luzon Island, Philippines. Raffles Bulletin of Zoology 55:153–160.

Brown, R. M., C. Oliveros, C. D. Siler, and A. C. Diesmos. 2008. A new *Gekko* from the Babuyan Islands, northern Philippines. Herpetologica 63:305–320.

———. 2009. Phylogeny of *Gekko* from the northern Philippines, and description of a new species from Calayan Island. Journal of Herpetology 43:620–635.

BROWN, W. C., AND A. C. ALCALA. 1978. Philippine Lizards of the Family Gekkonidae. Silliman University Press, Dumaguete City, Philippines.

DAS, I., M. LAKIN, AND P. KANDAUNG. 2008. New species of *Luperosaurus* (Squamata: Gekkonidae) from the Crocker Range Park, Sabah, Malaysia (Borneo). Zootaxa 1719:53–60.

ESSELSTYN, J. A., P. WIDMAN, AND L. A. HEANEY. 2004. The mammals of Palawan Island, Philippines. Proceedings of the Biological Society of Washington 117:271–302.

EVANS, B. J., R. M. BROWN, J. A. MCGUIRE, J. SUPRIATNA, N. ANDAYANI, A. C. DIESMOS, D. ISKANDAR, D. J. MELNICK, AND D. C. CANNATELLA. 2003. Phylogenetics of fanged frogs: testing biogeographical hypotheses at the interface of the Asian and Australian faunal zones. Systematic Biology 52:794–819.

GAULKE, M., H. RÖSLER, AND R. M. BROWN. 2007. A new species of *Luperosaurus* (Squamata; Gekkonidae) from Panay Island, Philippines, with comments on the taxonomic status of *Luperosaurus cumingii* (Gray, 1845). Copeia 2007:413–425.

HEANEY, L. R. 1985. Zoogeographic evidence for middle and late Pleistocene land bridges to the Philippines. Modern Quaternary Research of SE Asia 9:127–143.

HOOGSTRAL, H. 1951. Philippine Zoological Expedition, 1946–1947, narrative and itinerary. Fieldiana (Old Series) 33:1–84.

INGER, R. I. 1954. Systematics and zoogeography of Philippine Amphibia. Fieldiana Zoology (Old Series) 33:182–531.

LEVITON, A. E., R. H. GIBBS JR., E. HEAL, AND C. E. DAWSON. 1985. Standards in herpetology and ichthyology. Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. Copeia 1985:802–821.

MANTHEY, U., AND W. GROSSMAN. 1997. Amphibien und Reptilien Südostasiens. Natur und Tier, Berlin, Germany.

MCGUIRE, J. A., AND A. C. ALCALA. 2000. A taxonomic revision of the flying lizards of the Philippine Islands (Iguania: Agamidae: *Draco*), with a description of a new species. Herpetological Monographs 14:92–145,

MCGUIRE, J. A., AND B.-H. KIEW. 2001. Phylogenetic systematics of Southeast Asian flying lizards (Iguania: Agamidae: *Draco*) as inferred from mitochondrial DNA sequence data. Biological Journal of the Linnean Society 72:203–229.

OTA, H. 1989. A review of the geckos (Lacertilia: Reptilia) of the Ryukyu Archipelago and Taiwan. *In* M. Matsui, T. Hikida, and R. C. Goris (eds.), Current Herpetology in East Asia. Proceedings of the Second Japan-China Herpetological Symposium, pp. 222–261. Herpetological Society of Japan, Kyoto.

OTA, H., K.-Y. LUE, S.-H. CHEN, AND W. C. BROWN. 1989. Taxonomic status of the Taiwanese *Gekko*, with comments on the synonymy of *Luperosaurus amissus* Taylor. Journal of Herpetology 23:76–78.

OTA, H., S. SENGOKU, AND T. HIKIDA. 1996. Two new species of *Luperosaurus* (Reptilia: Gekkonidae) from Borneo. Copeia 1996:433–439.

RÖSLER, H., C. D. SILER, R. M. BROWN, A. D. DEMEGILLO, AND M. GAULKE. 2006. *Gekko ernstkelleri* sp. n.—a new gekkonid lizard from Panay Island, Philippines. Salamandra 42:197–211.

RUSSELL, A. P. 1979. A new species of *Luperosaurus* (Gekkonidae) with comments on the genus. Herpetologica 35:282–288.

TAYLOR, E. H. 1918. Reptiles of the Sulu Archipelago. Philippine Journal of Science 13:233–267.

———. 1922. The Lizards of the Philippine Islands. Philippine Bureau of Science, Manila.

———. 1962. New oriental reptiles. University of Kansas Science Bulletin 43:209–263.

TODA, M., S. SENGOKU, T. HIKIDA, AND H. OTA. 2008. Description of two new species of the genus *Gekko* (Squamata: Gekkonidae) from the Tokara and Amami Island groups in the Ryuku Archipelago, Japan. Copeia 2008:452–466.

Accepted: 11 March 2009.

APPENDIX 1

Specimens Examined

Luperosaurus kubli.— Philippines, Quirino Province, Municipality of Nagtipunan, Barangay Disimungal, Sierra Madre Mountain Range, Mt. Lataan (900 m): PNM 9156 (holotype).

Luperosaurus corfieldi.—Philippines, Panay Island, Aklan Province, Municipality of Buruanga, Barangay Tagosip: PNM 7919 (holotype), PNM 7920, 8489 (paratypes); Negros Isl., Negros Oriental Prov., Municipality of Valencia, Lake Balinsasayao: SUR 2211; Saksak Cr., Mt. Cuernos de Negros, ''Camp Lookout'': CAS-SU 24394–24395; Negros Isl., Lake Balinsasayao: CAS 182570.

Luperosaurus cumingii.—Philippines, Luzon Isl., Camarines Sur Province, Municipality of Caramoan, Caramoan Peninsula, Anuling Mountain: UF 77829; Albay Province, Municipality of Tiwi, Barangay Banhaw, Sitio Purok 7, Mt. Malinao, 550 m above sea level: TNHC 61910; Camiguin Norte Island, Cagayan Province, Municipality of Calayan, Barangay Balatubat KU 308023.

Luperosaurus joloensis.—Philippines, Mindanao Isl., ''Cotobato Coast:'' MCZ 26118; Jolo Isl., Siet Lake: CAS 60675 (paratype); Zamboanga Del Sur Province, Barangay Pasonanca, Sitio Canucutan, Pasanonca Natural Park: one uncataloged specimen at KU (RMB 9416).

Luperosaurus macgregori.—Philippines; Babuyan Islands group, Calayan Isl.: CAS-SU 6263 (paratype), USNM 36191 (holotype); Barit Isl. (near Fuga Isl.): USNM 508306, 508308.

Luperosaurus palawanensis.—Philippines, Palawan Isl., Palawan Province, Malatgaw River, southeast of Thumb Peak, approximately 3.5 km west-northwest of Iwahig (9°44′40.27″N; 118°37′48″E): CAS 134207 (holotype); Thumb Peak, approximately 7 km northwest of Iwahig: (9°45′42.98″N; 118°36′18″E): CAS 136740 (paratype).

Luperosaurus browni.—Malaysia, peninsular Malaysia, Selangor, Ulu Gombak forest reserve, 35 km north of Kuala Lumpur: FMNH 185106 (holotype); Malay-

sia, Sarawak (Borneo Isl.), Lambir National Park: KUZ 12835 (*L. serraticaudus* holotype).

Luperosaurus iskandari.—Indonesia, Sulawesi Is., Propinsi Sulawesi Tengah (Central Sulawesi Province), Kabupaten Banggai, Kecamatan Pagimana, Kampung/Desa Siuna, approximately 4 km east of Dusun Satu (Region 1), Mt. Tompotika (0°44.5′S, 123°01.1′E): MZB Lace. 2114.

Luperosaurus yasumai.—Indonesia, Kalimantan (Borneo Isl.), Bukit Soeharto Experimental Forest, 45 km south-southwest of Samarinda: KUZ 30408 (holotype)

Luperosaurus brooksii.—Indonesia, Sumatra Isl., Benkuelen, Lebong Tandai: BMNH 1920.1.16.2 (holotype).

Gekko hokouensis.—''Tablas Island'' (presumably in error) FMNH 17812 (*L. amissus* holotype).