A NEW GEKKO FROM SIBUYAN ISLAND, CENTRAL PHILIPPINES

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ABSTRACT: We describe a new species of lizard in the genus Gekko from Sibuyan Island in the Romblon Island group of the central Philippines. Although the new species is diagnosed from other Philippine Gekko by body size and shape, coloration, and multiple characteristics of external morphology, additional support for the recognition of the Sibuyan Gekko population as a distinct evolutionary lineage is garnered from DNA sequence data and biogeographical inference. The new species has been collected on trunks of trees or on granitic rocks along rivers in mature, lowland forest, and on vegetation at forest edges bordering agricultural areas. It is known only from Sibuyan Island and is undoubtedly endemic to this single small, isolated landmass. Although the larger, topographically complex islands of the Philippines have been the targets of numerous recent efforts to estimate vertebrate species diversity, smaller islands of the archipelago have received comparatively less attention and may support significant levels of underappreciated vertebrate diversity.

Key words: Gekkonidae; New species; Philippines; Romblon Island Group; Sibuyan Island

Recently, enhanced survey efforts, careful scrutiny of widespread species, and use of molecular sequence data in combination with traditional morphological characters, have resulted in a dramatic increase in the diversity of gekkonid lizards in the Philippines. The archipelago is now known to support 10 genera and at least 48 gekkonid species assigned to the genera Cyrtodactylus (9 species), Gekko (12–13), Gehyra (1), Hemidactylus (5; including platyurus, a species formerly assigned to Cosymbotus), Hemiphylodactylus (2), Lepidodactylus (6), Luperosaurus (8), Pseudogekko (4), and Ptychozoon (1) (Brown, 1999; Brown and Alcala, 1978; Brown and Diesmos, 2000; Brown et al., 1997, 2007, 2008, 2009, 2011; Gaulke et al., 2007; Linkem et al., 2010; Taylor, 1922a,b; Welton et al., 2009, 2010a,b; Zug, 2010).

Ten species of Gekko are considered endemic to the archipelago (Brown et al., 2009; Linkem et al., 2010) and two additional species with broad geographic distributions (G. gecko, G. monarchus) are also known from the country (Brown and Alcala, 1978; Ota et al., 1989; Taylor, 1922a,b). Although past treatments have included G. hokouensis as part of the Philippine gekkonid fauna (Brown and Alcala, 1978), Ota et al. (1989) demonstrated that this taxon’s inclusion in Philippine faunal accounts is likely in error. Similarly, the single Mindanao Island record for Perorchirus aedes (Boulenger, 1885; Brown and Alcala, 1978; Duméril, 1856; Taylor, 1922a) has not been confirmed in the last 150 yr despite our recent field surveys in and around the type locality (Zamboanga), suggesting that it too may be in error (Bauer and Henle, 1994; Brown, 1976; Welton et al., 2010a).

The 10 endemic Philippine species of Gekko are G. athymus (Brown and Alcala, 1962), G. carusadensis (Linkem et al., 2010), G. crombota (Brown et al., 2008), G. erustkelleri (Rösl er et al., 2006), G. gigante (Brown and Alcala, 1978), G. mindorensis (Taylor, 1919), G. palawanensis (Taylor, 1925), G. porosus (Taylor, 1922b), G. romblon (Brown and Alcala, 1978), and G. rossi (Brown et al., 2009). These species represent a considerable range in body size, general appearance, and ecological attributes, but all possess the following combination of morphological traits: (1) body size moderate, with relatively long, slender limbs; (2) near complete absence of interdigital webbing or cutaneous body expansions; (3) dorsal tubercles arranged in longitudinal rows (except for G. athymus,
in which dorsal tuberculation is absent); (4) scales of dorsum between tubercle rows minute, nonimbricate; (5) scales of venter enlarged, imbricate, flat; (6) differentiated postmentals longitudinally elongate; and (7) subcaudals transversely enlarged, platelike (Brown and Alcala, 1978; Brown et al., 2007, 2008, 2009).

Our survey work in the Romblon Island Group of central Philippines has resulted in the discovery of a new species of morphologically and genetically distinct Gekko related to G. romblon. In this article we use a combination of body size and shape information, meristic data of external morphology (scale counts), genetic sequence data, and inferences from the geological history of the archipelago to demonstrate that the Sibuyan Island Gekko population represents a distinct evolutionary lineage (de Queiroz, 1998, 1999; Wiley, 1978), worthy of specific rank.

**MATERIALS AND METHODS**

**Morphology**

We (RMB and CO) collected data from fluid-preserved specimens deposited in US and Philippine collections (see Appendix; institutional abbreviations follow Leviton et al., 1985). Sex was determined by inspection of gonads or by scoring of prominent secondary sexual characteristics (Brown, 1999; Brown et al., 1997, 2008, 2009, 2010) when dissection was not possible. Measurements (to the nearest 0.1 mm) were taken with digital calipers following character definitions by Brown (1999), and Brown et al. (2008, 2009). Characters include: snout–vent length, tail length, head length; head width, head depth, snout length, eye diameter, eye–narial distance, internarial distance, interorbital distance, axilla–groin distance, femur length, tibia length, upper arm length, forearm length, Toe I length, Toe IV length, tail width, tail depth, number of supralabials and infralabials posteriorly to the point at which point labials are no longer differentiated, enlarged pectoral–furca–porcine–bearing (males) or dimpled (females) scales, differentiated subdigital scanners beneath Finger III and Toe IV, midbody dorsal and ventral transverse scale rows between lateral body folds, midbody dorsal transverse tubercle rows between dorsalateral body folds, undifferentiated paravertebrals and tubercle rows between midpoints of limb insertions, and midventrals between limb insertion.

**Molecular Data**

Because our primary goal was to estimate phylogenetic relationships among the island populations of Gekko in the Romblon Island group, we sequenced only 2–4 exemplars per species and selected only three outgroup taxa (G. gecko, G. mindorensis, and G. monarchus) based on relationships presented in a recent phylogenetic analysis of northern Philippine gekkonid lizards (Brown et al., 2009). A total of seven ingroup samples were used to estimate phylogenetic relationships of the Romblon Province Gekko populations.

Genomic DNA was extracted from liver tissues stored in 95–100% ethanol following the guanidine thiocyanate protocol of Esselstyn et al. (2008). For all 12 samples, the mitochondrial gene NADH Dehydrogenase Subunit 2 (ND2) and components of three flanking transfer RNA genes (tRNA<sub>trp</sub>, tRNA<sub>ala</sub>, tRNA<sub>asn</sub>) were sequenced by the primers, thermal profiles, and purification and sequencing protocols of Brown et al. (2009) and Macey et al. (1999). Purified product was analyzed with an ABI Prism 3130xl Genetic Analyzer (Applied Biosystems). Newly sequenced data were deposited in GenBank under accession numbers JN710488–506. Gene sequence contigs were assembled and edited with the use of Sequencher 4.8 (Gene Codes Corp., Ann Arbor, MI). Initial sequence alignments were produced in Muscle (Edgar, 2004), and manual adjustments were made in MacClade 4.08 (Maddison and Maddison, 2005).

**Phylogenetic Analysis**

Partitioned Bayesian analyses were conducted in MrBayes v3.1.2 (Ronquist and Huelsenbeck, 2003) for the combined data set. The mitochondrial data set was partitioned by codon position for the protein-coding region of ND2, and the three flanking tRNAs (tRNA<sub>trp</sub>, tRNA<sub>ala</sub>, tRNA<sub>asn</sub>) were analyzed as a single subset. The Akaike Information Criterion (AIC), as implemented in jModeltest v0.1.1 (Guindon and Gascuel, 2003; Posada, 2008), was used to select the best model of nucleotide substitution for each
The best-fit models for each codon position of ND2, and for the combined tRNA data, were the general time reversible (GTR) model with a gamma-distributed rate variation among sites ($\Gamma$) and the Hasegawa, Kishino, and Yano (HKY) model with a gamma-distributed rate variation among sites ($\Gamma$), respectively. A rate multiplier model was used to allow substitution rates to vary among subsets, and default priors were used for all model parameters. We ran four independent Metropolis-coupled MCMC analyses, each with four chains and an incremental heating temperature of 0.05, and an unconstrained branch length prior with an exponential distribution of 25 (Marshall, 2010; Marshall et al., 2006; Siler et al. 2010, 2011). All analyses were run for 25 million generations, sampling every 5000 generations. To assess stationarity, all sampled parameter values and log-likelihood scores from the cold Markov chain were plotted against generation time and compared among independent runs using Tracer v1.4 (Rambaut and Drummond, 2007). Finally, we plotted the cumulative and nonoverlapping split frequencies of the 20 most variable nodes, and compared split frequencies among independent runs with the use of Are We There Yet? (AWTY; Wilgenbusch et al., 2004). Although all samples showed patterns consistent with stationarity after 2.5 million generations (i.e., the first 10.0%), we conservatively discarded the first 20% of samples as burn-in.

Partitioned maximum-likelihood (ML) analyses were conducted in RAxMLHPC v7.0 (Stamatakis, 2006) for all three data sets under the same partitioning strategy as for Bayesian analysis. The more complex model (GTR + $\Gamma$) was used for all subsets, and 100 replicate ML inferences were performed for each analysis. Each inference was initiated with a random starting tree, and employed a rapid hill-climbing algorithm (Stamatakis et al., 2007). Clade support was assessed with 1000 bootstrap pseudoreplicates, employing a rapid bootstrapping algorithm (Stamatakis et al., 2008).

**Species Concept**

For the recognition of the new species, we adopted the general lineage species concept of de Queiroz (1998, 1999) as the natural extension of the evolutionary species concept (Wiley, 1978). Application of lineage-based species concepts to central Philippine island endemics is nonproblematic (Brown and Diesmos, 2002; Brown and Guttman, 2002) because of the known history of isolation of island populations (Hall, 1998, 2002; Voris, 2000; Yumul et al., 2003, 2009). We consider as new species morphologically diagnosable lineage segments (either in isolation or sympatry) in which the hypothesis of conspecificity can be confidently rejected by

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**Table 1.** Models of evolution selected by Akaike Information Criterion for partitioned, model-based phylogenetic analyses. General time reversible (GTR) model with a gamma-distributed rate variation among sites ($\Gamma$) was applied for all data partitions in partitioned maximum-likelihood analyses.

<table>
<thead>
<tr>
<th>Partition</th>
<th>AIC model</th>
<th>Number of characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>NADH 2, first codon position</td>
<td>GTR + $\Gamma$</td>
<td>346</td>
</tr>
<tr>
<td>NADH 2, second codon position</td>
<td>GTR + $\Gamma$</td>
<td>346</td>
</tr>
<tr>
<td>NADH 2, third codon position</td>
<td>GTR + $\Gamma$</td>
<td>346</td>
</tr>
<tr>
<td>tRNAs Trp, Ala, Asn</td>
<td>HKY + $\Gamma$</td>
<td>223</td>
</tr>
</tbody>
</table>

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**Table 2.** Uncorrected pairwise sequence divergence (%) for molecular data for Gekko coi, G. romblon, G. mindorensis, G. monarchus, and G. gecko (Fig. 1). Percentages on the diagonal represent intraspecific genetic diversity (bolded for emphasis).

<table>
<thead>
<tr>
<th></th>
<th>Gekko coi</th>
<th>G. romblon</th>
<th>G. mindorensis</th>
<th>G. monarchus</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. romblon</td>
<td>70.0–7.4</td>
<td>0.0–3.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. mindorensis</td>
<td>19.1</td>
<td>19.1–19.3</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>G. monarchus</td>
<td>19.0</td>
<td>18.8–19.1</td>
<td>14.7–14.8</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Results

Morphology

Our surveys of mensural and meristic data recover instances of discrete, nonoverlapping ranges of variation in multiple characters of external morphology (Table 3) between Romblon + Tablas island populations (G. romblon) and the population of Gekko from Sibuyan Island (Gekko sp. nov.). The putative new species from Sibuyan is readily diagnosed from all Philippine congeners (see below) on the basis of body size and shape, coloration, and numerous characteristics of external morphology. The new species is easily diagnosed from its closest relative G. romblon on the basis of body shape, coloration, and discrete, diagnostic, characteristics of scalation (Table 3).

Phylogeny and Genetic Divergence

The ML analysis resulted in a single optimal tree (−ln L = 4129.152041; Fig. 1). Trees estimated from ML and Bayesian analyses are consistent with respect to support for two unique species of Gekko distributed in the Romblon Island group. All analyses recover the Sibuyan Island population of Gekko as a lineage distinct from (but sister to) a clade consisting of the Tablas and Romblon island populations (e.g., G. romblon sensu stricto; Fig. 1). Uncorrected pairwise sequence divergences are low within G. romblon and include a moderately shallow (≤ 3.9%) genetic divergence between Romblon and Tablas island populations. In contrast, these island populations exhibit relatively higher genetic divergence (7.0–7.4%) from the Sibuyan Island lineage (Table 2; Fig. 1).

Systematics

Gekko coi sp. nov.

Holotype.—PNM 9765 (Field no. RMB 2961; formerly KU 326208), an adult male collected by ACD at 2330 h on 2 January 2001 on a large stream-side boulder near sea level in mixed second growth and primary forest at Barangay Tampayan, Municipality of Magdiwang, Romblon Province, northeast coast of Sibuyan Island, Philippines (12.486°N, 122.516°E; datum = WGS84).

Paratypes.—FMNH 251114–15, adult females, collected 17 and 18 March, 1992, by N. Ingle and S. Goodman on Mt. Guiting-guiting, Barangay Tampayan, Municipality of Magdiwang; CAS 139180, adult male collected by L. C. Alcala and party on 9 May 1972 at Taclob Barrio, Municipality of San Fernando (paratype of G. romblon); CAS 139181, a juvenile, same collection data, but 12 May 1972 (paratype of G. romblon); CAS139182 (paratype of G. romblon) and CAS 155896, adult male, collected by L. C. Alcala and party on 13 May 1972, at Cansampay River, Taclob Barrio, Municipality of San Fernando.

Diagnosis.—Gekko coi differs from all other species of Philippine Gekko (i.e., G. athymus, G. carusadensis, G. crombota, G. ernstkelleri, G. gecko, G. gigante, G. mindorensis, G. monarchus, G. palawanensis, G. porosus, G. romblon, and G. rossi) in having the following combination of diagnostic traits: (1) moderately large body size (snout–vent length [SVL] 65.2–84.0 for adult males, 72.1–77.1 mm for females); (2) dorsum medium brown to gray, with single row of alternating light (cream) and dark (dark brown) vertebral blotches; (3) high numbers of dorsal body scales (107–132 transverse midbody scales, 192–226 paravertebrals); (4) relatively few rows of conical body tubercles (13–15 midbody, 25–28 paravertebrally; (5) precloacal and femoral pore-bearing scale series distinctly differentiated but abutting with no undifferentiated scales interrupting the two series) of 86–92 differentiated, greatly enlarged (precloacals) to only slightly enlarged (femorals) scales.

Comparison with similar species.—Gekko coi differs from its phenotypically most similar and geographically most proximate Philippine congener (G. romblon) by its relatively elongate, slender body, and narrow head (versus more robust body, wide head, characterized by distinctly hypertrophied adductor musculature; Fig. 2), possession of 86–92 (versus 64–79 in G. romblon) differentiated precloacofemoral pore-bearing scales, 34–43 (versus 43–53) midbody ventrals, and by...
Table 3.—Distribution of selected diagnostic characters in *Gekko coi* and other Philippine species of *Gekko*. Entries are presented in millimeters; all specimens are considered adults (data from juveniles excluded). Characters (following Linkem et al., 2010, and Brown et al., 2009) include (1) dorsal body coloration, (2) dorsal tail coloration, the numbers of (3) supralabials, (4) differentiated precloacal-femoral pore-bearing scales, (5) scansors below Toe IV, (6) white postorbital spots (+, present; −, absent), (7) midbody dorsals, (8) midbody ventrals, (9) midbody dorsal tubercle rows, (10) paravertebral tubercle rows, (11) ventrals, and (12) paravertebrals.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Male snout–vent length</th>
<th>Female snout–vent length</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. romblon</td>
<td>8 males; 4 females</td>
<td>78.7–87.1</td>
<td>71.0–81.0</td>
<td>Light and dark vertebral blottches</td>
<td>Gray–brown with thin white bands</td>
<td>12–14</td>
<td>66–79</td>
<td>14–18</td>
<td>+</td>
<td>102–129</td>
<td>43–53</td>
<td>12–16</td>
<td>22–34</td>
<td>84–94</td>
<td>193–231</td>
</tr>
<tr>
<td>G. gigante</td>
<td>5 males; 3 females</td>
<td>89.7–104.7</td>
<td>79.7–87.9</td>
<td>Dark paired blottches</td>
<td>Light brown with white bands</td>
<td>11–13</td>
<td>52–66</td>
<td>16–19</td>
<td>–</td>
<td>123–135</td>
<td>41–50</td>
<td>12–18</td>
<td>19–28</td>
<td>65–74</td>
<td>175–207</td>
</tr>
<tr>
<td>G. palawanensis</td>
<td>3 males; 4 females</td>
<td>57.2–65.7</td>
<td>44.5–61.8</td>
<td>Dark paired spots</td>
<td>Alternating light and dark bands</td>
<td>12–14</td>
<td>64–70</td>
<td>16–19</td>
<td>–</td>
<td>114–121</td>
<td>38–43</td>
<td>10–20</td>
<td>21–27</td>
<td>54–58</td>
<td>155–170</td>
</tr>
<tr>
<td>G. rossi</td>
<td>8 males; 8 females</td>
<td>95.5–108.2</td>
<td>86.8–100.0</td>
<td>Dark transverse bars and light spots</td>
<td>Alternating light and dark bands</td>
<td>13–16</td>
<td>77–88</td>
<td>10–16</td>
<td>–</td>
<td>125–170</td>
<td>33–41</td>
<td>16–18</td>
<td>31–37</td>
<td>74–104</td>
<td>251–281</td>
</tr>
</tbody>
</table>
178–185 (versus 193–231) paravertebrals. Enlarged rows of chin shields ventral to the infralabials are smaller on *G. coi* such that three enlarged subinfralabials contact infralabials 2–4 (versus only two scales contacting infralabials 2–4 in most specimens of *G. romblon*). Additionally, dorsal tail coloration of the *G. romblon* holotype (CAS 139190) and 70% of the remaining specimens from Romblon and Tablas islands is flat gray with thin white transverse lines (versus 100% of specimens with thick caudal bars of contrasting light and dark in *G. coi*). Finally, *G. coi* is distinguished from *G. romblon* by the presence (versus absence) of distinct, bold, black, irregularly shaped markings throughout the dorsal surfaces of the body, limbs, and head (Fig. 2).

Body size separates *G. coi* from the larger species *G. athymus*, *G. gecko*, *G. crombota*, *G. porosus*, and *G. rossi*, and the smaller species *G. palawanensis* (Table 3); dark reddish-brown dorsum with light and dark vertebral spots and a large, prominent, postorbital spot distinguishes *G. coi* from all Philippine congeners except *G. romblon*; the number of precloacofemorals distinguishes *G. coi* from *G. athymus*, *G. carusadensis*, *G. crombota*, *G. ernstkelleri*, *G. gecko*, *G. gigante*, *G. mindorensis*, *G. monarchus*, *G. palawanensis*, and *G. porosus*. Midbody ventrals distinguish *G. coi* from *G. athymus*, *G. carusadensis*, *G. crombota*, *G. ernstkelleri*, *G. gecko*, *G. gigante*. Midbody dorsal tubercle rows distinguish *G. coi* from *G. crombota*, *G. mindorensis*, *G. monarchus*, and *G. rossi*, and paravertebral tubercle rows distinguish *G. coi* from *G. ernstkelleri*, *G. crombota*, *G. gecko*, *G. monarchus*, *G. porosus*, and *G. rossi*. Finally, the number of ventrals distinguishes *G. coi* from *G. athymus*, *G. ernstkelleri*, *G. gecko*, *G. gigante*, *G. mindorensis*, *G. monarchus*, *G. palawanensis*, and *G. porosus*.
and *G. rossi*. These and other differences among Philippine *Gekko* species are summarized in Table 3.

**Description of holotype.**—Adult male in excellent condition (Figs. 2A,B, 3A,B), with a small incision in the sternal region (portion of liver removed for genetic sample), and hemipenes fully everted. SVL 84.1 mm; habitus slender, limbs well developed, relatively slender; tail relatively long; margins of limbs smooth, lacking cutaneous flaps or dermal folds; a thin adipose line (cutaneous fold) running along ventrolateral margin of trunk.

Head moderate, differentiated from neck, characterized by only slightly hypertrophied temporal and adductor musculature; noticeably broader (1.2 times) body at widest point; snout subtriangular, rounded at tip in dorsal and lateral aspect (Fig. 4A); head width 76.3% head length, 18.8% snout–vent length; snout length 63.3% head width and 48.3% head length; dorsal surfaces of head relatively

![Figure 2](image2.png)

**Fig. 2.**—*Gekko coi* male holotype (PNM 9765; A, B) in life; adult male *G. romblon* (KU 303978) from Romblon Island (C, D). (For interpretation color in this figure, see the online version of this article.)

![Figure 3](image3.png)

**Fig. 3.**—Dorsal (A) and ventral (B) view of the adult male *Gekko coi* holotype (PNM 9765; snout–vent length 84.0 mm). Scale bar = 10 mm.
homogeneous, with only slightly pronounced concave postnasal, prefrontal, and interorbital concavities; auricular opening large, ovoid, angled slightly anteroposteriorly from beneath temporal swellings on either side of head; tympanum deeply sunken; orbit large, bordered by only moderately distinct supraorbital crest and sharply prominent preorbital crest; eye large, pupil vertical, margin wavy (Fig. 4A); auricular opening 50.5% eye diameter; limbs and digits relatively long and slender; femoral segments of hind limbs thick, bulky compared to humeral segments of forelimbs; tibia length 15.2% SVL, 76.6% femur length.

Rostral large, rectangular in anterior view, twice as broad as high, with two dorsomedial fissures between raised posterodorsal projections that form the anteriormost projecting edge of the nares, and sutured anteriorly with the supranasals; nostril surrounded by rostral, first labial, an enlarged lower postnasal, a smaller upper postnasal, and an enlarged, round to octagonal, convex supranasal; supranasals separated by a single enlarged, elongate internasal; supranasals and internasal followed posteriorly by a pair of slightly enlarged posterosupranasals, separated by three slightly enlarged median scales; scales immediately posterior to posterosupranasals only slightly enlarged.

Total number of differentiated supralabials 15/15 (L/R; 11/10 to center of eye), bordered dorsally by several rows of nondifferentiated,
nonenlarged snout scales; total number of differentiated infralabials 13/12 (L/R; 9/9 to center of eye), bordered ventrally by two rows of enlarged scales and three rows of only slightly differentiated chin scales; mental triangular; mental and first four infralabials greatly enlarged and wrapping onto ventral surfaces of chin, nearly twice the size of individual infralabials 4–12; mental followed posteriorly by a pair of slender, highly elongate medial postmentals; postmentals bordered posterolaterally by a secondary pair, approximately one-sixth or one-seventh the length of first pair; postmental scale series bordered posteriorly by a single series of only slightly enlarged scales; followed immediately by a sharp transition to undifferentiated chin and gular scales; postrictal scales undifferentiated; remaining undifferentiated gulars very small, round, nonimbricate, juxtaposed (Fig. 4A).

Dorsal cephalic scales fairly homogeneous in size, shape, disposition, and distribution; cephalic scalation varies from large, convex, round to oval scales of rostrum to minute (approximately one-third to one-fifth size of rostrals), granular scales of posterior regions of head and neck; postnasal, prefrontal, and interorbital depressions with slightly smaller scales; palpebral scales heterogeneous, with some scales as small as adjacent interorbital region and others as large and raised as rostral scales; undifferentiated posterior head scales granular, convex, reducing in size posteriorly, interspersed with increasingly dense enlarged rounded to slightly conical tubercules; throat and chin scales small, juxtaposed and nonimbricate, making a sharp transition to gular and pectoral region scalation, with enlarged cyloid, imbricate scales continuing to increase in size through abdomen, becoming very enlarged and strongly imbricate.

Ornamental cephalic scalation limited to convex tubercles on posterolateral portions of head (temporal, supratympanic, and postrictal regions) and a slightly differentiated series of 2–3 enlarged, weakly conical unkeeled preorbital scales (Fig. 4A); 27/25 circumorbitals in total, differentiated into the following distinct regions: (1) several minute precircumboritals, (2) enlarged, flat, squarelike circumorbital dorsoanterior to orbit (13/11), (3) several smaller, undifferentiated supraorbital scaled (4/6), (4) transverse elongation and modification into fringe-like points (spiny ciliaria, 10/8) across dorsoposterior margin of orbit, gradually reducing to (5) several smaller to minute postcircumboritals, a total of 47 interorbital scales (straight line distance from center of each eye, across both eyelids).

Axilla–groin distance 44.0% SVL; undifferentiated dorsal body scales round, convex, juxtaposed, relatively homogeneous in size; each dorsal scale surrounded by six interstitial granules, giving the appearance of a “Star of David” configuration under high magnification; dorsals interspersed with 15 irregularly transverse rows (25 paravertebral rows) of enlarged, slightly conical dorsal body tubercles; tubercles surrounded by undifferentiated adjacent dorsal scalation; dorsals sharply transition to imbricate ventrals along the ventrolateral adipose fold; transverse midbody dorsals 109; paravertebrals between midpoints of limb insertions 185; midbody dorsals in 106 rows; midbody ventrals in 43 transverse rows; scales on dorsal surfaces of limbs larger and more imbricate than dorsals, interspersed.

Fig. 5.—Inferior view of the precloacofemoral region of the male *Gekko coi* holotype (A: PNM 9765) and a specimen of *G. romblon* from type locality on Tablas Island (B: KU 315347). Scale bars = 5 mm.
with enlarged, flat to slightly conical tubercles on the radioulnar segment of the limb but absent on the humeral segment, and terminating at the dorsal surfaces of hands and feet; enlarged patches of distinct imbricate scales present on wrist, anterior (preaxial) surface of upper arm and thigh, on knee, and on distal ventral surface of hind limb; scales on dorsal surfaces of hands and feet similar to dorsal limb scales (but lacking tubercles); ventral body scales flat, cycloid, strongly imbricate, much larger than lateral or dorsal body scales, largest at midventral line.

Seventy-four pore-bearing or dimpled scales (Fig. 5A) in continuous precloacofemoral series, each punctured by pore bearing dark orange exudate, arranged in a wavy, widely obtuse, inverted-V formation and continuing to just beyond the patellar region; precloacal pores 3–4 times diameter of femoral pores; precloacals (14/14) situated atop a substantial precloacal bulge that is folded over into the precloacal region in preserved type but was erect and protuberant in life; precloacals preceded by five similarly enlarged but nondimpled scale rows; precloacals followed by a gap of undifferentiated scales, followed by five enlarged-scales rows, forming a triangular patch of scales anterior to the vent; femoral series lacks preceding or following enlarged scale rows; scales latero-posterior to precloacofemoral series (i.e., along ventroposterior surfaces of hind limb) reduce in size sharply to minute scales of the posterior edge of the hind limb.

Digits moderately expanded and covered on palmar/plantar surfaces by bowed, unnotched, undivided scanners (Fig. 4A); digits with minute vestiges of interdigital webbing; subdigital scanners of manus: 9/10, 11/12, 13/14, 15/16, and 11/12 on left/right digits I–V respectively; pes: 11/11, 12/12, 15/15, 17/16, and 14/13 on left/right digits I–V respectively; subdigital scanners of manus and pes bordered proximally (on palmar and plantar surfaces) by 1–4 slightly enlarged scales that form a near-continuous series with enlarged scanners; all digits clawed, but first (inner) claw greatly reduced; remaining terminal claw-bearing phalanges compressed, with large recurved claws, not rising free at distal end until they extend beyond dilated hyperextensible portion of digit.

Tail base bordered by a pair of moderately enlarged conical postcloacal spurs on each side of vent; postcloacal swellings pronounced; hemipenes completely everted; tail long, 105 mm, 1.25% snout–vent length; tail not depressed, subcylindrical, divided into indistinct fracture planes/autotomy grooves, with whorls (or annulations) clearly visible in basal portions of the tail (with slightly enlarged scales along the caudal margin of each annulation) but becoming less distinct toward distal portion; an estimated 25–27 annuli total; tail depth (not including basal postcloacal swelling) 60.6% tail width; dorsal tail with only a few enlarged caudal tubercles; caudals similar in size to dorsals; subcaudals a single enlarged medial row of platelike scales, flanked laterally by one slightly enlarged row; subcaudals widely expanded to cover majority of ventral surface of tail.

Variation.—The type series consists of three adult males, three adult females, and a single juvenile specimen. Ranges of diagnostic meristic and mensural characters are presented in Table 3. We detected no sexual dimorphism in the type series and ranges of all meristic and mensural measurements broadly overlap between the sexes. With data for males and females combined, mean SVL (±1 SD; range) was 76.0 (±6.76; 65.2–84.0), nonregenerated tail length 81.5 (±8.6; 75.4–81.6), axilla–groin distance 35.5 (±1.9; 32.1–37.0), tail width 6.6 (±0.9; 5.0–7.6), tail depth 5.0 (±1.1; 4.3–6.0), head length 21.4 (±1.4; 19.1–22.7), head width 14.7 (±1.1; 13.3–15.8), head depth 8.1 (±0.6; 6.9–8.6), snout length 9.5 (±1.2; 7.4–10.4), eye–narial distance 7.5 (±1.2; 5.1–8.2), interorbital distance 2.8 (±0.24; 2.5–3.1), interorbital distance 5.6 (±0.7; 4.8–6.6), femur length 15.6 (±1.0; 13.8–16.7), tibia length 13.2 (±1.2; 11.0–14.2), upper arm 8.7 (±0.5; 7.5–9.1), forearm length 9.9 (±0.7; 9.7–10.5), Toe I length 4.0 (±0.2; 3.9–4.4), Toe IV length 8.0 (±0.3; 7.5–8.4), and Finger III length 6.2 (±0.2; 5.9–6.5).

Scalation in the type series is remarkably uniform, with a few exceptions. Dorsal tuberculation ranges from sparse (CAS 139182) to dense (FMNH 251114, CAS 155896), and in relatively more tuberculate individuals, caudal annulations are discernible for nearly the entire length of the tail,
owing to the aggregation of enlarged, posteriorly projecting tubercles along the caudal edge of each tail segment. Intersupranasal configuration varies from a single scale (CAS 139181–82), to two scales equivalent in size (PNM 9765; CAS 139180, FMNH 251114–15) to a minute anterior scale, followed by a greatly enlarged posterior intersupranasal (CAS 155896).

Intersexual variation in scalation appears limited to the presence of pierced pores (with orange exudate) in the precloacofemoral pore-bearing series of males (whereas in females these scales are enlarged and often dimpled, but lack pores) and the presence of two enlarged, protuberant postcloacal spurs in males (only a single enlarge scale present in females), on either side of the vent.

**Coloration of holotype in ethanol.**—Dorsal ground coloration of head, body, tail, and dorsal surfaces of limbs medium brown with irregular tan blotches, darker brown patches, and a vertebral region divided into alternating light and dark bands (Figs. 2A,B and 3A).

Dorsal and lateral surfaces of head similar to dorsal ground coloration; a light cream bar extends posteriorly from the orbit; palpebra dark gray, almost black; rostral and supralabials medium gray with dark gray spots; infralabials immaculate cream.

Limbs colored as torso, but with slightly more contrasting dark (black) and light (cream) patches; dorsal surfaces of hands and feet dark gray with cream spots; digits light gray with cream spots and black claws; tail medium gray with dark gray bands alternating with bold transverse white bands (not prominent distally).

Ventral head, neck, torso, and ventral surfaces of limbs light cream; ventral surfaces of digits (scanners) medium gray; preanofemoral region white with orange pore exudate; ventral surfaces of tail medium gray, fading to alternating blotches of dark gray and cream.

**Coloration of holotype in life.**—(From field notes of RMB and photographs of holotype before preservation; Fig. 2A,B.) Dorsal ground coloration dark purplish-gray to pinkish-brown, with alternating dark gray blotches interspersed broken vertebral stripe of medium cream; dorsum with five light-cream vertebral stripe segments in the axilla–groin region, each alternating with four dark, saddelike blotches; dorsolateral regions (flanks) more even brown, with rows of cream to bluish-white lateral midbody tubercle rows.

Dorsal nuchal region and posterior portions of head very similar to trunk coloration but with denser melanic pigmentation (forming distinct black spots) offset with cream-colored tubercles; postorbital and preorbital white bars radiate out from the orbit; posttrictal region flat gray; labial scales purplish-gray with cream to yellow spots; darker black blotches congregate on snout in loreal, postnasal, interorbital, and parietal regions; infralabial region, chin, and gular regions yellowish white.

Dorsal surfaces of limbs purplish brown with white and dark cross bars; dorsal surfaces of digits purplish brown with white spots on digits; proximal dorsal surfaces of tail brown with dark blotches and thin transverse white lines, transitioning to banded alternating dark gray and cream on more distal portions of tail.

Ventral body and limbs cream, becoming yellowish with scattered dark flecks posteriorly and bright yellow in groin; precloacofemoral region bright yellow with dark orange pores; palmar and plantar surfaces of manus and pes yellowish tan with light gray subdigital scanners; ventral tail light gray with brown transverse bars.

**Color variation.**—Dorsal ground coloration ranges from relatively dark brown (females FMNH 251114–15) to medium orange-brown (juvenile CAS 139181 and adult male holotype PNM 9765) to nearly flat gray (males CAS 139180, 139182, and 155896). The darkest patterned individuals have a highly distinct light tan vertebral stripe, broken periodically by four or five dark brown to black, saddelike blotches (male holotype PNM 9765, and females FMNH 251114–15). More darkly patterned individuals, exhibit a faint, nearly reticulate marbled pattern of dark brown ground color, accentuated with distinct white and black markings on the dorsal surfaces of the head (absent in more pale specimens [CAS 139180, 139182, 155896], possibly due to condition of specimen preservation and/or fading with time). All specimens possess the distinct bold white postorbital spot (most distinct in FMNH 251114–15). The nuchal region is particularly dark in some specimens (FMNH 251114–15, PNM 9765) and traversed...
with bold white dorsal tubercle rows, or with tubercles matching the underlying ground coloration (CAS 139180, 139182, 155896). Ventral coloration is immaculate cream (CAS 139180–82, 155896, PNM 9765) to cream with light brown spots across the chin and throat, pectoral and pelvic regions, and ventral surfaces of hind limbs. The one juvenile (CAS 139181) is more boldly patterned than adults, with a distinctly barred tail with alternating tan and dark brown regions.

Distribution and natural history.—The new species is known only from Sibuyan Island in Romblon Province, central Philippines. Specimens have been collected close to the ground on tree trunks and from granitic rocks and boulders in riparian habitats in low-elevation primary forests along the southern border of Mt. Guiting-guiting Natural Park. Several additional specimens were collected from inside the axis of coconut palms in adjacent agricultural areas. Other than house geckos (Gehyra mutilata, Hemidactylus frenatus, H. platyurus) the new species is only known only to be sympatric with G. gecko and G. mindorensis. Its sister species, G. romblon, co-occurs with G. gecko on the islands of Tablas and Romblon.

Etymology.—We name this distinctive new species for our colleague and friend Leonardo L. Co, a widely respected botanist and conservation biologist who passed away prematurely in November 2010 while conducting fieldwork on Leyte Island. The specific epithet coi is a patronym in the genitive singular. Suggested common name: Leonard’s Forest Gecko.

Discussion

We are especially confident in making the current taxonomic decision because the new species’ status as a cohesive and morphologically distinct evolutionary lineage is bolstered by genetic data (indicating high levels of genetic differentiation from its most closely related congener) and biogeographic information (lineage isolation on an ancient oceanic island), both of which strongly support our conclusions. Geological evidence suggests that Sibuyan Island was never connected to any other landmasses (Dimalanta et al., 2009; Hall, 2002; Yumul et al., 2003) and has remained isolated through Pleistocene climatic oscillations that resulted in the formation of enlarged aggregate island complexes in other parts of the archipelago (Brown and Diesmos, 2002, 2009; Clark and Mix, 2000; Thomas et al., 2009; Voris, 2000). In contrast to Sibuyan Island, which remained isolated, we know that Tablas and Romblon islands became conjoined as a single aggregate island as many as 10 times during the mid- to late-Pleistocene (Brown and Diesmos, 2009; Inger, 1954; Rohling et al., 1998; Voris, 2000), an observation consistent with our consideration of the populations of G. romblon on these two islands as a single evolutionary entity (G. romblon). And although we found some evidence of shallow genetic divergence between Romblon Island and Tablas Island populations of G. romblon (Table 2), we failed to find character differences that would allow us to diagnose these two potentially diverging lineages (currently isolated island populations) as separate species. Thus, genetic and biogeographic data are in perfect accordance with the hypothesis of two evolutionary lineages of geckos in the Romblon Island group: G. romblon (from Tablas and Romblon islands) and G. coi (from Sibuyan Island). The presence of additional species of endemic vertebrates on Sibuyan additionally emphasizes the importance of this island as an important center of biological endemism (Esselstyn and Goodman, 2010; Goodman et al., 1995; Rickart et al., 2005).

The conservation status of G. romblon and G. coi requires comment. Although the IUCN conservation status of G. romblon has recently been formally assessed as “Least Concern” (Brown et al., 2007), part of that decision was based on its relatively wide distribution on three islands (Romblon, Tablas, and Sibuyan). With the current revision in taxonomy, the geographic range of G. romblon in now limited to Romblon and Tablas, whereas that of G. coi is limited to the single landmass of Sibuyan Island. The range-restricted nature of these taxa suggests that future evaluators of their conservation status may wish to consider elevation to a higher threat category if clear threats to their continued survival are identified.

Our subjective impression (bolstered by relative numbers of specimens in museum collections; see Appendix) is that G. romblon is much more common on Tablas and Romblon
Islands than G. coi is on Sibuyan. Although this simplistic observation might suggest that G. coi is less abundant, rare, or in decline, we note that the new species occurs on a large landmass (~460 km²), much of which is protected as part of Mt. Guiting-guiting Natural Park (Goodman and Ingle, 1993; Goodman et al., 1995), where it is sufficiently protected. In contrast, the more abundant, but possibly disturbance-tolerant G. romblon has been collected in a variety of heavily impacted habitats, from tertiary growth scrub on limestone outcrops, to heavily mined (for bat guano) caves, to contour-mined marble quarries (R. Brown and C. Siler, personal observations). Our suspicion is simply that G. coi is a more secretive, rarely encountered species, and that biologists have not yet learned to observe it in its preferred microhabitat or period of activity. For this reason we recommend the conservation status assessment of “Data Deficient” pending actual field-based studies of distribution, abundance, and conservation status of the new species.

The description of G. coi brings the total number of Philippine Gekko to 12 taxa, including 10 endemic species. We are certain that this number continues to represent an underestimate of true species diversity and we would not be surprised if Philippine species numbers in the genus were to substantially increase in coming years. Unexpected and surprisingly distinct species are still being described from the archipelago’s larger islands on isolated karst formations (Linkem et al., 2010; Rösler et al., 2006); accordingly, special attention is being paid to these isolated limestone outcrops. Caves in particular may soon produce additional species discoveries of the kind now commonly observed on the Asian mainland (Grismer et al., 2009; Ngo, 2005; Ngo et al., 2008; Ngo and Grismer, 2010; Ngo and Pauwels, 2010; Nguyen et al., 2006, 2010; Pauwels et al., 2004). Small isolated islands undoubtedly hold additional species diversity in the archipelago; we are aware of at least two morphologically and genetically distinct species in the Babuyan islands that await description (Brown et al., 2009). We suspect that other, smaller landmasses in the Babuyan-Batanes island banks may harbor additional undescribed species (Oliveros et al., 2011). Additionally, isolated mountain ranges on larger islands (Luzon, Mindoro, Samar-Leyte, Palawan, Mindanao) will likely be shown to support additional species diversity. Recent discoveries of distinct gekkonids from the mountains of Luzon (Brown et al., 2007, 2011), Palawan (Brown et al., 2010; Welton et al., 2009) and Mindanao (Welton et al., 2010a,b) suggest that the separate, isolated mountainous regions of the large islands all warrant comprehensive faunal survey efforts if we are to conclude that their biodiversity is reasonably well known.

More subtle or possibly morphologically cryptic species diversity most likely resides in the widespread species G. mindorensis and G. monarchus. Preliminary molecular sequence data (C. Siler, A. Diesmos, and R. Brown, personal observations) indicate that these taxa contain highly divergent lineages with geographical distributions corresponding to geological components of the archipelago (Brown and Diesmos, 2002, 2009; Hall, 1998; Yumul et al., 2009). Although these populations have not yet been assessed for morphological character differences, we are confident that additional species await description. Finally, many smaller, deep-water islands (e.g., not connected to adjacent islands during the last glaciations; Brown and Diesmos, 2009) and some land-bridge islands (those hypothesized to have been connected to adjacent islands during the last glaciations; Brown and Diesmos, 2009) have not been surveyed adequately for herpetofauna and, as such, are good possibilities for the potential discovery of additional Gekko species. These include the islands of Lubang, Marinduque, Masbate, Siquijor, Dinagat, Siargao, Sarangani, Coron, Busuanga, Burias, Ticao, Semira, Semirara, Maestre de Campo, Cuyo, Basilan, Jolo, Tawi-Tawi, and many other similarly small, isolated landmasses. One such example is the Gigante Island group species, G. gigante (Brown and Alcala, 1978; Brown and Alcala, 2000). The existence of endemic species on these small limestone islands convinces us that isolation on landmasses separated by deep water may not be necessary to promote gekkonid diversification if limestone habitats have been isolated over geological time scales (Hall, 1998, 2002; Yumul et al., 2003, 2009).
Poorly developed knowledge of biodiversity contributes to destructive exploitation of Southeast Asian forests (Clements et al., 2006; Collins et al., 1991; Whitmore and Sayer, 1992) whereas knowledge of endemic biodiversity helps provide fuel for conservation of natural resources (Sodhi and Ehrlich, 2010; Sodhi et al., 2008). As such, it is critical that faunal inventories continue to be undertaken throughout the country in a wide variety of habitats and forest types. We are certain that Philippine gekkonid lizard diversity remains substantially underestimated and that continued biodiversity survey work will continue to provide compelling opportunities for targeted, taxon-specific conservation efforts.

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Literature Cited


CHILTHUIZEN
Cyrtodactylus
Gray, 1827 (Squamata: Gekkonidae)

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APPENDIX I

Comparative Material Examined

All specimens examined are from the Philippines. Numbers in parentheses indicate the number of specimens examined for each species and museum abbreviations follow Leviton et al. (1985).

Gekko athymus (eight specimens): PALAWAN ISLAND, PALAWAN PROVINCE, ca. 10 km WSW of Iwahig; CAS 137677; ca. 8–9 km S of Balico; CAS-SU 23119 (holotype); ca. 20 km SW of Iwahig; CAS-SU 23121 (paratype); Municipality of Brooke’s Point, Barangay Mainit; KU 309335; Barangay Samaritana; Mt. Mantalingahan, 900 m; KU 309331–309334.

Gekko carusadensis (eight specimens): LUZON ISLAND, BULACAN PROVINCE, Municipality of San Miguel and Doña Remedios Trinidad, Barangay Biak na Bato; PNM 9715 (holotype); PNM 9716–18, KU 319985, 320484, 320485, 319970 (paratypes).

Gekko crombota (21 specimens): BABUYAN CLARO ISLAND, CATANES PROVINCE, Municipality of Calayan, Barangay Babuyan Claro; PNM 9369 (holotype); KU 304583–304596, 304598, 304599, 304605–304611, 304617, 304673, 304728–304733, 304745, 304884, 304916–304919, 304923–304924, 304931 (paratopotypes); Barangay Longog: PNM 9091 (paratype).

Gekko ernstkelleri (10 specimens): PANAY ISLAND, ANTIQUE PROVINCE, Municipality of Pandan, Barangay Duyong, Duyong Hillside (= Mt. Lihidian): PNM 9152–54; KU 300196–300202.

Gekko gecko (13 specimens): LUBANG ISLAND, OCCIDENTAL MINDORO PROVINCE, Municipality of Lubang, Barangay Paraiso; KU 303988–303972.


Gekko hokouensis (1 specimen): Tablas, Philippines (presumably in error): FMNH 17812 (Luperosaurus amissus holotype).


Gekko monarchus (23 specimens): PALAWAN ISLAND, PALAWAN PROVINCE, ca. 1.5 km WSW of Iwahig; CAS-SU 28416; ca. 5 km SSW of Iwahig; CAS-SU 28496; ca. 7 km WNW of Iwahig; CAS-SU 28524; Municipality of Brooke’s Point, Mt. Mantalingahan: KU 309362; Barangay Mainit, Mainit Falls: KU 309285–87, 326431–33; Municipality of Nara, Barangay Estrella, Estrella Falls: KU 326425, 326426; Municipality of Quezon, Poblacion Quezon, National Museum Complex: KU 309298–91; Municipality of Puerto Princesa, Barangay Irawan, Irawan Watershed: KU 309048, 309171, 309290–83; INDONE-SIA, SULAWESI ISLAND: BS1 340, 819 (uncatalogued specimens, deposited at Museum Zoologicum Bogoriense, Chibnong, Jakarta, Indonesia).

Gekko palacencensis (7 specimens): PALAWAN ISLAND, PALAWAN PROVINCE, ca. 7 km WNW of Iwahig; CAS 17318; 8 km W of Iwahig: CAS 17319; ca. 9 km W of Iwahig: CAS 17320–17322; Municipality of Puerto Princesa, Barangay Irawan, Irawan Watershed: KU 309279, 309468.


Gekko rossi (19 specimens): CALAYAN ISLAND, CATANES PROVINCE, Municipality of Calayan, Barangay Magsidel, Macara: PNM 9543 (Holotype), 9542, 9537–42, KU 304876, 304885, 304916–304919, 304923–304924, 304927, 304931 (paratopotypes); Barangay Longog: PNM 9091 (paratype).

Gekko sp. A (35 specimens): DALUPIRI ISLAND, CATANES PROVINCE, Municipality of Calayan, Nipa Creek; KU 307022–307039, 307040–307050.

Gekko sp. B (24 specimens): CAMIGUIN NORTE ISLAND, CATANES PROVINCE, Municipality of Calayan, Barangay Balatubat: KU 304583, 304585, 304586, 304588, 304605–304611, 304617, 304673, 304728–304733, 304738, 307990, 308043; Magas-asok: PNM; 909; Pomocan Island (small island adjacent to Camiguin Norte Island): PNM 9100.