

A New Species of *Goniurosaurus* (Squamata: Eublepharidae) from Hainan Island, China

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ABSTRACT.—A new species of *Goniurosaurus* described from Hainan Island is differentiated from all other species by having a series of enlarged, flat, imbricate scales on the mediolateral portions of the wrist; 37–46 preanal pores as opposed to 18–32 for all other species that have preanal pores; thin as opposed to wide juvenile body bands; faint, whitish colored bands in the caudal interspaces; and caudal bands being incomplete ventrally in adults. A phylogenetic analysis reveals that the new species is the basal member of the *Goniurosaurus luii* group. It differs from the other members of this group, *Goniurosaurus luii* and *Goniurosaurus araneus*, in being less than 107 mm in maximum snout vent length, having a more robust body stature, lacking elongate curved penultimate phalanges, having short robust digits, and having thin dark borders on the body bands. Three species of *Goniurosaurus* occur on Hainan Island.

The eublepharid genus *Goniurosaurus* currently contains nine species (Grismer et al., 1994, 1999; Grismer, 2000) which collectively range throughout northern Vietnam, southern China, islands in the Gulf of Tonkin in the northern portion of the South China Sea, and the Ryukyu Archipelago of Japan. Grismer (1987, 1988) presented phylogenetic evidence for the resurrection of the genus *Goniurosaurus* from within *Eublepharis* and in doing so, noted that *Goniurosaurus* comprises two disjunct monophyletic lineages: the *Goniurosaurus lichtenfelderi* group, containing *G. lichtenfelderi* from northeastern Vietnam and associated islands in the Gulf of Tonkin and *Goniurosaurus hainanensis* from Hainan Island, China (Grismer et al., 1999; Grismer, 2000); and the *Goniurosaurus kuroiwae* group containing *Goniurosaurus kuroiwae*, *Goniurosaurus orientalis*, *Goniurosaurus splendens*, *Goniurosaurus toyamai*, and *Goniurosaurus yamashinae* of the Ryukyu Archipelago, Japan (Grismer et al., 1994, 1999). Recently, Grismer et al. (1999) described two new sister species, *Goniurosaurus luii* and *Goniurosaurus araneus* from southern China and northern Vietnam, respectively. These species, referred to here as the *G. luii* group, formed the sister group to the *G. lichtenfelderi* and *G. kuroiwae* groups (Grismer et al., 1999:fig. 4).

Fieldwork on Hainan Island during July 2000 resulted in the discovery of yet another new species of *Goniurosaurus*. This species is a member of the *G. luii* group based on having the derived character states (Grismer et al., 1999) of

thin, elongate anterolateral processes of the pterygoids; thin, rodlike anteromedial processes of the pterygoids; deep axillary pockets; and a posteriorly protracted nuchal loop, which sits low on the nape of the neck. It is distinct, however, from all other members of the *G. luii* group in a number of characteristics and is described herein as a new species. Specimens examined are listed in Appendix 1 and terminology follows Grismer (1988), Grismer et al. (1994), and Grismer et al. (1999).

Goniurosaurus bawanglingensis sp. nov

Plate 1

Suggested Common Name.—Bawangling
Leopard Gecko

Holotype.—MVZ 230973, adult male from 5.6 km northeast of the town of Bawangling, Hainan Province, Peoples Republic of China, within the Hainan Bawangling National Nature Reserve; collected by L. Lee Grismer on 23 July 2000.

Paratypes.—Ten paratypes: four adult females (R9907001, R9907003–04, MVZ 230975) and two adult males (MVZ 230974, 230977) from same locality as the holotype; one adult male (MVZ 230978) and one juvenile female (R9907002) from 8–9 km northeast of the town of Bawangling; one adult male (MVZ 230976) 9.0–9.5 km northeast of the town of Bawangling; and one hatchling (R9907005) from 19 km northeast of the town of Bawangling.

Diagnosis.—*Goniurosaurus bawanglingensis* differs from all other species of *Goniurosaurus* in having a series of enlarged, flat, imbricate scales on the mediolateral portions of the wrist; 37–46

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Plate 1. *Goniurosaurus* from Hainan Island, China. (Upper Left) Holotype; adult male *Goniurosaurus bawanglingensis* (MVZ 230973) from 5.6 km northeast of the town of Bawangling. Middle Left. Adult male *G. bawanglingensis* (MVZ 23097) from 5.6 km northeast of the town of Bawangling. (Lower Left) Adult male *G. bawanglingensis* (MVZ 230974) from 5.6 km northeast of the town of Bawangling. (Upper Right) Hatchling of *G. bawanglingensis* from 8–9 km northeast of the town of Bawangling. (Middle Right) Adult male *Goniurosaurus luii* (UMMZ 222686) from between Tunchang and Yiggen. (Lower Right) *Goniurosaurus hainanensis* (MVZ 230615) from 5 km west of Walin.

preanal pores as opposed to 18–32 collectively for all other species which have preanal pores; thin as opposed to wide juvenile body bands; faint, whitish colored bands in the caudal interspaces; and caudal bands being incomplete ventrally in adults. It differs further from the *G. lichtenfelderi* and *G. kuroiwae* groups in having teeth without expanded and ridged occlusal margins; upper eyelid scales being smaller than the granular scales on the top of the head; deep axillary pockets (although present in some individuals of *G. lichtenfelderi*); elongate and thin anterolateral pterygoid processes; thin and rod-like anteromedial pterygoid processes; posteriorly protracted nuchal loop which sits low on the nape of the neck; and a boldly mottled dorsal ground color. It is distinguished from the *G. lichtenfelderi* and the *G. luii* groups in having thin (eight or less transverse caudal scale rows) as opposed to wide (10 or more scale rows) white caudal bands. It is separated from the *G. luii* and the *G. kuroiwae* groups in having enlarged pos-

terior ventral scales. It differs further from the *G. kuroiwae* group in having smooth as opposed to tuberculate gular scales; claws sheathed by scales; and preanal pores. It is distinguished from the *G. lichtenfelderi* group by having four instead of three body bands between the nuchal loop and the caudal constriction. It differs from the *G. luii* group in having a more robust body stature; smaller maximum SVL (< 107 mm); lacking long, curved penultimate phalanges; having short, robust digits as opposed to long, thin digits; lateral scale of the claw sheath square as opposed to rectangular; dark spotting in the body bands as opposed to immaculate body bands; and thin (less than or equal to band width) as opposed to wide, dark, anterior and posterior borders of the body bands. It is distinguished from *G. araneus* and the *G. lichtenfelderi* group in having tubercles between the orbits. It is separated from *G. araneus* and *G. lichtenfelderi* in having 2–3 postmental scales as opposed to 4–6. It differs further from *G. araneus* in having

TABLE 1. Range, mean, and standard deviation (SD) of selected scale counts of *Goniurosaurus bawanglingensis*, *Goniurosaurus luii*, *Goniurosaurus araneus*, *Goniurosaurus lichtenfelderi*, and *Goniurosaurus hainanensis*. Those of the *Goniurosaurus kuroiwae* group are listed in Grismer et al. (1994:321). Scale counts of *G. lichtenfelderi* were calculated from Orlov and Darevsky (1999: table 1) and Grismer et al. (1999: table 1). SL = supralabials; IL = infralabials; PM = postmentals; PO = preorbital scales; EF = eyelid fringe scales; TU = number of paravertebral tubercles; BO = scales around body; ST = granular scales surrounding tubercles; 4T = subdigital lamellae; PP = preanal pores.

	SL	IL	PM	PO	EF	TU	BO	ST	4T	PP
<i>bawanglingensis</i> (N = 11)										
mean	8.6	8.6	2.6	15.8	62.3	34.2	116.6	10.0	19.5	43.8
range	8–10	7–11	2–3	12–18	56–67	32–36	104–133	9–13	18–22	37–46
± 1 SD	0.71	0.55	0.85	1.35	1.94	1.98	10.01	2.21	0.98	3.71
<i>luii</i> (N = 6)										
mean	9.5	10.0	3.0	15.8	59.5	33.8	134.5	12.2	23.5	26.0
range	9–12	9–11	2–4	14–17	57–61	33–34	119–144	9–14	21–24	23–29
± 1 SD	0.55	0.63	0.89	1.17	1.87	0.75	12.00	1.34	1.38	2.58
<i>araneus</i> (N = 6)										
mean	8.8	8.7	5.3	16.7	64.0	35.8	135.7	9.8	23.5	19.8
range	8–10	8–9	4–6	13–18	61–67	32–38	129–147	10–14	23–24	18–22
± 1 SD	0.98	0.52	0.82	1.86	2.19	2.71	7.26	4.33	0.55	1.71
<i>hainanensis</i> (N = 4)										
mean	9.3	8.5	3.5	13.7	63.8	27.0	115.8	12.9	20.5	29.3
range	8–10	7–10	3–4	16–19	55–68	26–29	102–133	11–15	18–23	26–32
± 1 SD	0.96	1.29	0.58	4.04	6.40	1.41	12.82	0.12	2.08	3.06
<i>lichtenfelteri</i> (N = 14)										
mean	9.3	8.2	4.4	16.3	48.0	—	122.8	—	—	27.6
range	7–10	7–9	3–6	14–19	43–56	24	118–131	12	21	21–31
± 1 SD	0.99	0.41	0.77	2.21	3.94	—	8.09	—	—	2.79

granular as opposed to elongate dorsal body scales; narrow as opposed to wide body bands; and a mottled as opposed to unicolor ground color. It is distinguished further from *G. luii* in lacking greatly enlarged supraorbital tubercles; lacking dark mottling on the infralabials and sublabials in adults; lacking lateral spotting on the belly; and having dark spots in the body bands. It differs from *G. luii* and the *G. lichtenfelderi* and *G. kuroiwae* groups in having immaculate, cream-colored infralabials and sublabials as opposed to the supralabials being mottled or dark brown, respectively. It is separated from *G. lichtenfelderi* in having 56–67 eyelid fringe scales as opposed to 43–51 (see Tables 1–2).

Description of Holotype.—Adult male; SVL 104 mm; head triangular, wider than neck, top covered with uniform granular scales interspersed with tubercles posterior to orbits; scales of rostrum slightly larger; slightly larger row of supraorbital tubercles; rostral convex and squarish, 1.5 times as wide as high, middorsal portion partially sutured dorsomedially, bordered laterally by first supralabial and prenasal, dorso-laterally by supranasal, and dorsally by one postrostral; external nares elliptical with long axis sloping slightly forward, bordered anteriorly by prenasal and supranasal, dorsally by suprana-

sal, posteriorly by five granular scales of rostrum, and ventrally by the prenasal and a rostral granule; prenasals with long recurved ventral portion; supranasals triangular, separated by one granular scale; supralabials 8 (R and L), first of series square; remaining scales rectangular, grading into granular scales posteriorly; rostrals equal in size, weakly keeled; preorbitals 17 (R) - 19 (L); eyes relatively large, pupils vertical; eyelid fringe scales 64 (R) - 63 (L), triangular; outer surface of upper eyelid composed of small granular scales equal in size to those on top of head; 74 scales across top of head between posterior corners of eyes; a fold of skin originating in the suborbital region extends posteroventrally across the angle of the jaw; external auditory meatus elliptical with long axis directed obliquely dorsoventrally; tympanum deeply recessed; mental triangular, bordered laterally by first infralabial and posteriorly by two postmentals; infralabials 9 (R) - 8 (L), first of series rectangular, 1.5 times size of second in series, twice as large as remaining scales, grading posteriorly into smaller scales; ventral margin of infralabials slightly elevated above sublabials; gular scales juxtaposed and granular, abruptly grading posteriorly into flat hexagonal pectoral scales and even larger ventral scales;

TABLE 2. Diagnostic characters separating *Goniurosaurus bawanglingensis*, *Goniurosaurus araneus*, *Goniurosaurus lichtenfelderi*, *Goniurosaurus hainanensis*, and the *Goniurosaurus kuroiwae* group.

	<i>bawangling-</i> <i>ensis</i>	<i>luui</i>	<i>araneus</i>	<i>hainan-</i> <i>ensis</i>	<i>lichten-</i> <i>felderi</i>	<i>kuroiwae</i> group
Enlarged row of supraorbital tubercles present (+) or absent (0)	0	+	0	0	0	0
Scales of upper eyelid ½ the size of those on the top of the head (+) or equal in size (0)	+	+	+	0	0	0
< 52 (+) or > 54 (0) eyelid fringe scales	0	0	0	0	+	0
Tubercles between orbits (+) or not (0)	+	+	0	0	0	+, 0
Dorsal scales granular (+) or elongate (0)	+	+	0	+	+	+
Deep axillary pockets present (+) or absent (0)	+	+	+	0	+ / 0	0
Enlarged scales on wrist present (+) or absent (0)	+	0	0	0	0	0
Claws sheathed by scales (+) or not (0)	+	+	+	+	+	0
Lateral scales of claw sheaths square (+) or rectangular (0)	+	0	0	+	+	—
Posterior abdominal scales large (+) or small (0)	+	0	0	+	+	0
Preal anal pores present (+) or absent (0)	+	+	+	+	+	0
> 36 (+) or < 33 preanal pores	+	0	0	0	0	0
Body and limb stature splayed and gracile (+) or more compact and robust (0)	0	+	+	0	0	0
SVL > 107 mm (+) or SVL < 107 mm (0)	0	+	+	0	0	0
Anterolateral process of pterygoid elongate and thin (+) or not (0)	+	+	+	0	0	0
Anteromedial process of the pterygoid rod-like (+) or not (0)	+	+	+	0	0	0
Penultimate phalanx long and curved downward (+) or short and straight (0)	0	+	+	0	0	0
Occlusal tooth margins expanded (+) or not (0)	0	0	0	+	+	+
Infralabials and sublabials mottled (M), immaculate (I), or unicolor brown (B)	I	M	I	B	B	B
Nuchal loop posteriorly protracted (+) or rounded posteriorly (0)	+	+	+	0	0	0
Three (+) or four (0) body bands	0	0	0	+	+	+, 0
Body bands wide (+) or narrow (0)	0	0	+	0	0	0
Dark spotting in body bands present (+) or absent (0)	+	0	0	+	0, +	0, +
Dark borders of body bands wide (+) or narrow (0)	0, +	+	+	0	0	+, 0
White caudal bands thin (+) or wide (0)	+	0	0	0	0	+, 0
Faint white banding in caudal interspaces present (+) or absent (0)	+	0	0	0	0	0
White caudal bands incomplete (+) or complete ventrally (0) in adults	+	0	0	0	0	0
Digits short and robust (+) or long and gracile (0)	+	0	0	+	+	+
Adult ground color mottled (+), immaculate (0), or darkly unicolor (U)	+	+	0	+	+	U
Lateral spotting on belly present (+) or absent (0)	0	+	0	0	0	0
Iris brown (B), bright-orange (O), or blood-red (R)	O, B	O, B	B	B	B	B, R

posteriormost ventral scales nearly twice the size of pectoral scales.

Neck slightly narrower than body, covered with uniform granular scales interspersed with several conical tubercles on nape; tubercles on flanks flattened, those of vertebral region weakly conical; body tubercles slightly increasing in size posteriorly, grading smoothly into larger, conical caudal tubercles; dorsal body tubercles surrounded by 11–13 granular scales; 33 paravertebral tubercles between limb insertions, distinct vertebral row of scales absent.

Limbs relatively short and robust, covered dorsally with granular scales interspersed with several tubercles and ventrally with flat juxtaposed to subimbricate scales; dorsal granular scales grade into slightly flattened subimbricate scales on top of pes; an enlarged series of flattened imbricate scales present on the mediolateral portion of wrist; hind limbs slightly larger and more robust than forelimbs; large granular scales on ventral surfaces of pes and manus; deep axillary pockets present; subdigital lamellae wide, 21 (R) and 20 (L) on fourth toe; digits laterally compressed, increasing in length from first to fourth, fifth shorter than fourth.

Body moderately robust, covered with granular scales grading ventrally into larger hexagonal flattened subimbricate ventral scales; 119 scales around midbody; larger ventral scales grade abruptly into smaller, flattened imbricate scales immediately anterior to the vent at the level of the preanal pores; 44 preanal pores in a transverse continuous series beginning and ending nearly two-thirds the distance toward the knees between the knees and hind-limb insertions; region posterior to vent covered with flat slightly imbricate scales and greatly swollen, containing a large tubercle laterally on each side at the level of the vent.

Tail conical, thickest at base, not composed of distinct annuli; caudal tubercles occur in hemi-whorls, being present only dorsally and fading laterally and posteriorly; ventral caudals much larger and more nearly square than dorsal caudals.

Coloration in Life.—Dorsal ground color of head, body and limbs tan (Plate 1); dorsal surfaces of head and body mottled with large irregularly shaped dark brown blotches; dorsal surface of limbs covered with small dark spots; labials cream-colored and immaculate; iris brownish orange; thin posteriorly protracted dull yellow nuchal loop present, anterior ends inserting on corners of mouth, edged dorsally and ventrally by broken dark brown borders; four thin obscure orange bands on body between nuchal loop and caudal constriction, edged anteriorly and posteriorly by incomplete thin dark brown incomplete bands, dark mot-

tling present within bands; ground color of tail nearly solid black; seven thin immaculate white caudal bands not completely encircling tail; faint whitish bands present in the interspaces; ventral surfaces of head, body and limbs dull white and immaculate; subcaudal region heavily mottled.

Variation.—All paratypes approximate the holotype in overall morphology and scalation (Tables 1–2) but vary greatly in many aspects of coloration (see Plate 1). MVZ 230974 and 230977–78 have large dark blotches on the dorsum making them appear more mottled and less speckled than the holotype. The mottling on MVZ 230974 is so prominent that the body bands are almost completely obscured and nearly the same color (tan) as the dorsal ground color. MVZ 230975 has smaller dorsal blotches making it appear almost as if it has a reticulated dorsal pattern and its bands are also greatly obscured. The dorsal body bands are much more prominent in MVZ 230977–78 and R9907004. This is a result of fewer dark markings within the bands and thicker, more complete, prominent anterior and posterior dark borders serving to highlight the bands. Band coloration in MVZ 230977 is more yellow than orange. The irises of MVZ 230976–77 and R9907002 are brown whereas those of MVZ 230978 and R9907003–04 are orange. Specimens with regenerated tails (MVZ 230974–75, 230977, R9907001, R9907003–04) have caudal patterns composed of varying whitish, irregularly shaped markings overlaying a dark gray ground color.

A significant ontogenetic change in color pattern exists. The hatchling R9907005 (SVL = 39.4 mm) has an immaculate, dark brown to black dorsal ground color. The nuchal loop and the four body bands are thin, immaculate and light-orange in life and show no signs of being bordered anteriorly and posteriorly by darker coloration as in adults. The eight immaculate white caudal rings are thin and complete ventrally. The juveniles MVZ 230976 and R9907002 (SVL = 66.4 and 69.5 mm, respectively) show significant degrees of dorsal mottling, especially in the larger R9907002. The nuchal loop and the body bands have prominent anterior and posterior borders as a result of a fading of the dorsal ground color in all areas except those bordering the bands. The bands are bright orange and immaculate. The caudal rings begin to show signs of incompleteness ventrally. R9907001 (SVL = 94.9) has an adult color pattern.

Distribution.—*Goniurosaurus bawanglingensis* is known only from the Hainan Bawangling National Nature Reserve from the southwestern portion of Hainan Island (Fig. 1).

Life History.—The type series was collected between 23 and 29 July 2000 during the evening between 2030 and 2400 h following afternoon

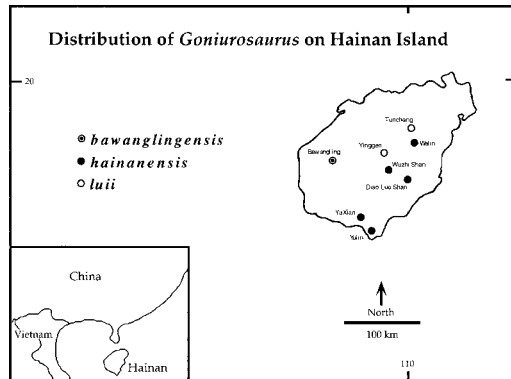


FIG. 1. Distribution of *Goniurosaurus luii*, *Goniurosaurus hainanensis*, and *Goniurosaurus bawanglingensis* on Hainan Island, China.

rain showers. All were found in primary or old secondary forest in the vicinity of granitic or limestone rock. Most were found on the ground although a number were seen climbing the vertical faces of rocks or earthen banks.

Etymology.—This species is named after the Hainan Bawangling National Nature Reserve wherein lies the type locality.

PHYLOGENETIC ANALYSIS

Grismer et al. (1999) presented a phylogeny of the species of *Goniurosaurus* and to this we add *G. bawanglingensis*. All remaining eublepharid taxa are used as sequential outgroups (Maddison et al., 1984) based on the relationships proposed by Grismer (1988:figs. 19, 31, 41; Grismer, 1991:fig. 3) where *Eublepharis* + (*Hemithysconyx* + *Holodactylus*) comprises the first outgroup, *Coleonyx* the second, and *Aeluroscalabotes* the third outgroup. Because of an absence of numerous competing derived character states, the phylogeny was constructed without the aid of tree building programs. To the database of Grismer et al. (1999:table 3), we add the following character state.

Penultimate Phalanges.—In *G. luii* and *G. araneus*, the penultimate phalanges (erroneously referred to as the ultimate phalanges by Grismer et al., 1999) of the pes and manus are elongate, being greater than or equal to the length of the remaining phalanges of the respective digits and they are curved downward. In all other eublepharid geckos, the penultimate phalanges are short and straight. Therefore, this character state is considered a synapomorphy for *G. luii* and *G. araneus*.

DISCUSSION

The phylogenetic analysis (Table 3; Fig. 2) indicates that *G. bawanglingensis* is a member of the *G. luii* group. It is the basal member of that

TABLE 3. Distribution of derived (1) and primitive (0) character states among *Goniurosaurus*. Character numbers (1–7) refer to their designation in the text of Grismer et al. (1999); Pen = penultimate phalanges.

Characters	1	2	3	4	5	6	7	Pen
<i>bawanglingensis</i>	1	1	0	1	1	1	0	0
<i>luii</i>	1	1	0	1	0	1	0	1
<i>araneus</i>	1	1	0	1	0	1	0	1
<i>hainanensis</i>	0	0	1	0	1	0	1	0
<i>lichtenfelderi</i>	0	0	1	0	1	0	1	0
<i>kuroiwae</i> group	0	0	1	0	1	0	0	0
outgroup node	0	0	0	0	0	0	0	0

group in that *G. luii* and *G. araneus* share the derived condition of having elongate and curved penultimate phalanges (Fig. 2). *Goniurosaurus bawanglingensis* also has the derived condition of having a SVL less than 107 mm. This character state would place it as the sister species to the *G. lichtenfelderi* and *G. kuroiwae* groups (Grismer et al., 1999). It is more parsimonious, however, to consider it a member of the *G. luii* group based on it having the four derived character states listed above. Therefore, a small SVL either arose independently in *G. bawanglingensis* and the ancestor of the *G. lichtenfelderi* and *G. kuroiwae* groups as it is illustrated on the tree (Fig. 2) or that the large SVL of *G. luii* and *G. araneus* is a reversal to the primitive condition.

Grismer et al. (1999) indicated that the specimen of *G. lichtenfelderi* figured in Zhao and Adler (1993, plate 22) was *G. luii*. The specimen is reported as being a “female from west of Wuzhishan,” which is within the Hainan Bawangling National Nature Reserve and is the same locality as the paratype of *G. bawanglingensis* (R9907005; T. Papenfuss, pers. comm., 2000). The specimen was released after capture (K. Adler, pers. comm., 1999). However, examina-

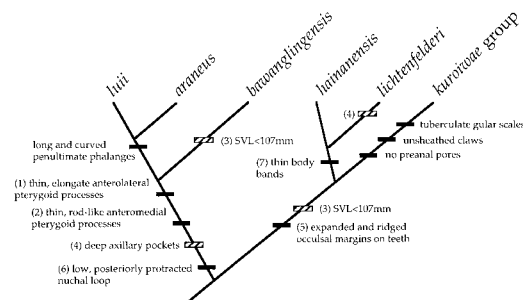


FIG. 2. Cladistic relationships of the taxa of *Goniurosaurus*. Solid bars indicate derived character states and the hashed bar indicates the independent acquisition of the derived character state of small body size as discussed in the text.

tion of plate 22 of Zhao and Adler (1993) and LSUPC-L662-63 (two additional 35 mm color transparencies of the same specimen) reveals that it has a more robust body stature; a series of large, flat, imbricate scales on the medial portions of the wrist (LSUPC-L663); whitish colored bands in the caudal interspaces; thin caudal bands; short robust digits; dark markings in the body bands (LSUPC-L662-63); and immaculate, and cream colored infralabials and sublabials. These are some of the diagnostic characters of *G. bawanglingensis*. Based on the character evidence at hand and the fact that the specimen was collected within the Hainan Bawangling National Nature Reserve, we consider it to be *G. bawanglingensis* rather than *G. luii*.

The description of *G. bawanglingensis* brings the total number of *Goniurosaurus* on Hainan Island to three, the other two being *G. luii* and *G. hainanensis* (Grismer et al., 1999). Grismer et al. (1999) indicated that the two specimens of *G. luii* from Hainan were significantly different from the *G. luii* from southern China and that they might represent a different species. We maintain that hypothesis and have ascertained from where on Hainan these specimens were collected (Fig. 2) and will conduct fieldwork there in an effort to secure additional material to more adequately address its taxonomic status.

The three species of *Goniurosaurus* on Hainan Island appear to occur allopatrically in different geographic regions. *G. bawanglingensis* appears to be confined to a mountainous region on the western side of the southern end of the island which runs from the central northeast portion of Hainan to the southern southwest. *Goniurosaurus hainanensis* is known only from a parallel mountain range running along the central and eastern side of the island. These mountain ranges are separated by a low-lying valley in which the two specimens of *G. luii* were collected (Fig. 1).

CONSERVATION

Unfortunately, all species of *Goniurosaurus* have become valuable commodities in the herpetocultural trade. The potentially limited distribution of *G. bawanglingensis* makes it especially susceptible to over collecting by commercial herpetoculture dealers. Such has been the case already for *G. luii* in southern China where it is reported extirpated from the type locality (Grismer et al., 1999). Fortunately, access into the Hainan Bawangling National Nature Reserve requires governmental permission. We encourage the Chinese government to continue this practice to prevent environmental criminals from

profiting in the trafficking of illegally collected reptiles.

Acknowledgments.—For comments on the manuscript, we thank A. Bauer, R. Murphy, and H. Ota. For field assistance, we thank W. Jichao and F. Youli, T. Papenfuss, and A. Kiester. We thank W. Changhe, Director of the Hainan Bawangling National Nature Reserve, for permission to collect. Specimens were donated to the Museum of Vertebrate Zoology through a cooperative agreement with the Chengdu Institute of Biology, Academia Sinica, and from the University Field Research Site of Hainan Normal University as part of a collaborative exchange and cooperation agreement. We especially thank Z. Fuji (CIB) of the Chengdu Institute of Biology, Academia Sinica, A. Kluge (UMMZ) of the University of Michigan Museum of Zoology, D. Wake (MVZ) of the Museum of Vertebrate Zoology, and J. Cadle (MCZ) of the Museum of Comparative Zoology for the loan of material.

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Accepted: 30 August 2001.

APPENDIX 1

The following is a list of the specimens examined. Abbreviations follow Leviton et al. (1985). Nonstandard abbreviations are HLMD = Hessisches Landesmuseum; LSUHC = La Sierra University Herpetological Collection; R = Hainan Normal University; LSUPC = La Sierra University Photographic Collection, and CIBAC = Chengdu Institute of Biology, Academia Sinica.

Preserved Specimens Examined.—*Goniurosaurus bawanglingensis* CHINA: Hainan Province: Hainan Island (MVZ 230973-77, 230978; R9907001-05). *Goniurosaurus araneus* VIETNAM: Cao Bang Province, Cao Bang (HMLD 2572-77). *Goniurosaurus luii* CHINA: Guangxi Province: Longzhou (UMMZ 222683); Pingxiaing (UMMZ 222684, 222687-88) Hainan Province: Hainan

Island (UMMZ 222685-86). *Goniurosaurus hainanensis* CHINA: Hainan Province; Hainan Island (MZC 7104; CIBAC 64III5965, 64III6047, 775020). *Goniurosaurus lichtenfelderi*: VIETNAM: Ilse de Norway (=Kuinong Chao) (MHNP 1897.90-91). See Grismer et al. (1994) for the remaining species of *Goniurosaurus*, *Eublepharis*, *Hemitheconyx*, and *Holodactylus* examined. See Grismer (1988:appendix 3) for the *Coleonyx* and *Aeluroscalabotes* examined.

Skeletal Specimens Examined.—*Goniurosaurus araneus* VIETNAM: Cao Bang Province, Cao Bang (LSUHC 3062-67). *Goniurosaurus luii* CHINA: Guangxi Province: Longzhou (LSUHC 3083, 3091). See Grismer (1988:appendix 1) for the remaining species of *Goniurosaurus*, *Eublepharis*, *Hemitheconyx*, *Holodactylus*, *Coleonyx*, and *Aeluroscalabotes* examined.