

Two New Gecko Species Allied to *Bavayia sauvagii* and *Bavayia cyclura* (Reptilia: Squamata: Diplodactylidae) from New Caledonia¹

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ABSTRACT: Two new species of the diplodactylid gecko *Bavayia* are described from Mt. Koghis, Province Sud, New Caledonia. One species is a large, characteristically colored representative of the *B. sauvagii* complex. It is sympatric with *B. sauvagii* itself, for which a neotype is here designated. The second new taxon is a large member of the *Bavayia cyclura* group. Selection of a neotype of *B. sauvagii* and designation of a lectotype of *B. cyclura* facilitate future evaluation of intra- and interspecific variation within these two species groups. Although restricted in apparent range, both new species are relatively common where they occur.

Bavayia IS THE MOST SPECIOSE of the three genera of carphodactyline geckos that are endemic to the New Caledonian region, with nine species currently recognized (Bauer et al. 1998). The four most recently described taxa, *B. septuiclavis* Sadlier, *B. validiclavis* Sadlier, *B. exsuccida* Bauer, Whitaker & Sadlier, and *B. pulchella* Bauer, Whitaker & Sadlier, are distinctive small species (45–50 mm maximum snout-vent length), each with diagnostic dorsal color patterns. The remaining five taxa are more uniform in color pattern, being characterized by a series of alternating dark bands and paler patches on a brownish dorsum. The superficial similarity of these taxa has led to some confusion in the recognition of species within the genus.

In the first revision of the group based on adequate samples, Roux (1913) recognized two species, *B. sauvagii* (Boulenger), characterized by the claw of digit I being bordered by a single, medial apical scansor, and *B. cyclura* (Günther), with the claw of digit I

lying between a small lateral and a larger medial apical scansor. The former species was also characterized by a single row of preanal pores in males, versus two rows in the latter species. Roux further described one subspecies of *B. sauvagii*, *B. s. ornata*, and two subspecies of *B. cyclura*, *B. c. montana* and *B. c. crassicollis*. All subsequent revisors (Sadlier 1989, Bauer 1990) have continued to recognize both Roux's species groupings and his individual taxa, assigning specific rank to all five members of the *B. sauvagii* and *B. cyclura* complexes.

Recent collections made throughout the New Caledonian mainland have revealed substantial variation in size, color pattern, and, to a lesser extent, features of scalation in members of both the *B. cyclura* and *B. sauvagii* groups. As suggested by Bauer (1990), the names currently employed appear to be inadequate to explain the patterns of variation suggested by both intensive and extensive sampling of the genus. In particular, *B. cyclura* and *B. sauvagii* as currently recognized each appear to encompass more than one biological entity. In this paper we set the stage for a more complete revision of these taxa by restricting an existing name to a specific population (the associated types are without specific locality) and describing two new species, each of which is diagnosable with respect to the restricted nominate forms.

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MATERIALS AND METHODS

Specimens from the collections of the Australian Museum (AMS), California Academy of Sciences (CAS), and Muséum National d'Histoire Naturelle, Paris (MNHN), were examined under a dissecting microscope (Nikon SMZ-10) and measurements were taken with digital calipers (Brown and Sharpe Digit-cal Plus). Radiographs were prepared using a cabinet X-ray system (Faxitron) with exposures of 40 sec at 40 kV. Clearing and staining using a modification of Wassersung (1976) was also used to observe skeletal elements. The following measurements were recorded for each specimen: snout-vent length (SVL); tail length (TL); tail width at base (TW); axilla-groin length (AG); head length from retroarticular process of mandible to snout tip (HL); maximal head width (HW); maximal head depth (HD); eye diameter (ED); distance from posterior border of orbit to anterior margin of ear (EE); and distance from anterior border of orbit to tip of snout (ES). Subdigital lamellae (SDL) were counted from the proximalmost enlarged setae-bearing lamellae to the distal tip of the digits. In the case of digit I, the paired apical plates were included in lamellar counts. Vertebral and tooth counts as well as phalangeal formulas were derived from X rays and cleared and stained specimens.

Mensural and meristic data were combined in a morphometric analysis. Two types of comparisons were used to determine if species were distinguishable in multivariate space. Using the statistical package Systat 6.1 (Systat 1996), principal components and discriminant analysis were applied to the samples. Tail length was eliminated from the analysis because of the large percentage of missing or regenerated tails among the specimens.

SYSTEMATICS

Bavayia sauvagii was initially described as *Lepidodactylus sauvagii* by Boulenger (1883: 122). The description was brief and is today

inadequate to unambiguously distinguish the species intended. In its entirety it reads: "resembles the preceding [*B. cyclura*] in the proportions, scutellation, size, and color, but differs in the much narrower digits, and the presence of a single series of preanal pores; this series is composed of 23 pores." Although the description of a specimen with a single row of preanal pores is consistent with a member of the *B. sauvagii* complex, the specimen that has been regarded as the holotype (Guibé 1954, Brygoo 1991), MNHN 5790, is actually referable to *B. cyclura* (Bauer 1990, Bauer and Henle 1994). That Boulenger's type, now assumed lost, was referable to *B. sauvagii* as opposed to *B. ornata*, the only other species with a single row of preanal pores, a *B. cyclura*-like dorsal pattern, and slender digits, is almost certain because no collecting activity is believed to have taken place in the restricted range of *B. ornata* (Mt. Panié) before the Sarasin and Roux expedition of 1911–1912. Despite the discrepancy between the type description and the specimen regarded as the type, Boulenger's name has been consistently applied to a small species of lowland to middle elevation *Bavayia* characterized by a single row of preanal pores, a dorsal pattern of more or less distinct, bilaterally symmetrical dark cross bands, and the claw of digit I (manus and pes) adjacent to a single medial apical scissor. Unfortunately, no locality other than New Caledonia was given for the type, and Boulenger's description is not accurate enough to pinpoint the population from which the holotype may have been derived. However, it is likely that the specimen would have come from a low or middle elevation, near-coastal locality that would have been accessible to collectors in the third quarter of the nineteenth century.

Recent investigations based on allozyme electrophoresis have revealed hitherto unappreciated variation within recognized taxa of *Bavayia*, especially *B. sauvagii* (Bauer and Good, unpubl. data; Sadlier and Colgan, unpubl. data), and it appears likely that several genetically distinct *sauvagii*-like species occur in New Caledonia. To adequately diagnose such new taxa it is necessary that

Bavayia sauvagii sensu stricto itself be unambiguously distinguishable. To stabilize the name *Bavayia sauvagii*, we here designate a neotype specimen for the taxon. We have chosen the neotype from the population of *B. sauvagii* occurring at Mt. Koghis, Province Sud. This locality is close to Nouméa, the capital and largest settlement on the island, and members of the Koghis population appear to be typical of the geckos that have consistently been associated with this name since Roux's (1913) revision.

REDESCRIPTION OF *B. sauvagii* (based on neotype [MNHN 1998.0605 (formerly AMS R146526)], an adult male): SVL 55.9 mm; body long (AG = 52% SVL), slender, weakly depressed. Head oblong, large (HL = 27% SVL), moderately wide (HW = 70% HL), depressed (HD = 39% HL), distinct from neck; interorbital/frontal region somewhat depressed, canthus weakly developed; snout relatively short (ES = 38% HL), longer than eye diameter (ED = 20% HL). Scales on snout approximately twice diameter of those on occipital region. Eye moderate, approximately one-fourth head length; pupil oval, crenelated; posterior supraciliary scales moderately elongate, pointed. Ear opening approximately twice as high as wide, canted posterodorsally to anteroventrally; eye to ear distance greater than diameter of eye (EE = 136% ED). Rostral rectangular, broader than high, divided by a partial groove running downward for a distance of 40% of the rostral height, contacted posteriorly by three internasals, the central of which is enlarged, and two slightly enlarged supranasals, contacted posteroventrally by first supralabial. Nostrils oval and anterolaterally oriented, surrounded by four nasals, one supranasal, and the rostral, very narrowly in contact with first supralabial; ventralmost nasal crescentic and in narrow contact with first supralabial. Three internasals between supranasals. Mental subtriangular, somewhat deeper than wide; a single enlarged, pentagonal, median postmental in broad contact with mental and separating first pair of infralabials from one another; first infralabials each in contact posteriorly with median postmen-

tal and one smaller chin shield. First three rows of chin shields larger than remaining throat scales. Nine or 10 enlarged supralabial scales, of which the sixth through last are beneath the eye; nine infralabial scales; 39 interorbital scale rows between supraciliaries at midpoint of orbit.

Dorsal scales small, homogeneous, very slightly conical, granular; ventral scales slightly larger than dorsals, subimbricate, enlarged posteriorly on the body. Mid-abdominal scales rounded, posterior abdominal scales elongate, with protracted posterior margins. Approximately 110 scale rows around midbody. Scales of the limbs not differing from dorsals. Scales on palms and soles smooth, flattened. Preanal pores in a single row of 22, forming a chevron. Forelimbs relatively short (28% of SVL), hindlimbs long (42% of SVL), axillary pockets moderately well developed. Digits short, all bearing claws, those on digit I of both manus and pes greatly reduced and partially sheathed; relative length of digits of manus: IV ~ III > II ~ V > I, and of pes: IV ~ V > III > II > I; digits weakly webbed; digits III and IV of pes tightly bound along length of elongate metatarsals. Subdigital lamellae typically paired, except variably single at base of digits and completely undivided on digit I. Distalmost lamella of digits II–V, manus and pes, undivided. Claw of digit I, manus and pes, positioned next to a large medial plate. Lamellar counts from right side of holotype 6-8-9-9-7 (manus) and 5-8-10-11-9 (pes).

Original tail 102% of SVL, tapered, stout, roughly oval in cross section; tail base at cloacal spurs distinctly swollen. Caudal scales small, flat, rectangular, arranged in regular rows. Surface of tail weakly segmented, caudal scale rows forming whorls, each whorl 6 dorsal scale rows and 5–6 ventral scale rows long; midventral caudal scales not enlarged. A distinct fold of skin separating pygal and postpygal region of tail. Pygal region with much smaller (1/2 to 1/3) scales than postpygal portion of tail. Cloacal spurs consisting of two radiating sets of conical scales directed posterodorsally and borne on a raised mound adjacent to cloaca; much

larger medial set with three scales. A small terminal adhesive subcaudal pad present.

Color in preservative: Dorsal pattern consisting of wavy dark brown cross bands, each preceded by a diffuse beige band, on a mottled light brown background. One band on neck and five between axilla and groin. Each band lighter and more diffuse along vertebral axis. All cross bands highly bilaterally symmetrical and at right angles to body axis. A faint cross band across occipital intersecting with apex of a "V"-shaped marking, the arms of which extend across the parietal region to the posterodorsal edge of orbit. Faint light brown canthal stripes extend from internasal region to margin of eye and continue as darker stripes from posterior border of orbit to the cross band on the nape. Labial scales light brown with cream anterior margins. A thick, dark cross band on the sacral-pygal region forms a chevron. Venter beige, with tiny darker speckles evenly distributed, lighter beneath throat. Dorsum of limbs and digits marbled, joints of manus and pes cream. Original tail with alternating dark brown and cream markings on a mottled light to mid-brown background. Tail venter mottled mid-brown and cream.

VARIATION ($n = 85$, from Mt. Koghis): Labial scale numbers vary, supralabials 8–9 and infralabials 7–10. Extent of infralabial separation by enlarged median postmental scale variable: in five specimens there was narrow contact anteriorly between the first infralabials, with each infralabial contacted posteriorly by an enlarged median postmental scale and one or two slightly enlarged chin shields, left and right sides symmetrical in some cases; eight specimens with narrow contact between first infralabials. First supralabial narrowly contacting nostril in most specimens in which labials were examined ($n = 15$).

Preanal pores 7–23 (mean = 15.2, SD = 3.0, $n = 32$). Pores absent in all female specimens ($n = 53$). Cloacal spurs of males with a single row of two enlarged conical scales ($n = 3$), three conical scales ($n = 9$), four conical scales ($n = 14$), five conical scales ($n = 3$), or six conical scales ($n = 1$); the re-

maining three male specimens have no data. Cloacal spurs of females much reduced. Midbody scale rows from 81 to 135 (mean = 115.9, SD = 15.4, $n = 50$).

Mensural and proportional characteristics of typical *B. sauvagii* from Mt. Koghis are presented in Table 1; variation in subdigital lamellae number is presented in Table 2.

Specimens putatively assignable to *B. sauvagii* were also examined from other localities (Poindimié, Goro, Yahoué, and Isle of Pines [$n = 36$]); however, in the absence of a detailed morphological and molecular analysis of these populations it is not possible to verify these as conspecific with specimens from the neotype locality. Specimens from these populations are superficially similar to one another and to individuals from the neotype population, but are somewhat smaller (SVL 44.6 ± 4.0 versus 51.5 ± 6.1) and have lower mean midbody scale counts (100.0 ± 14.0 versus 115.9 ± 15.4) than those from Mt. Koghis. No other significant scalation differences were noted.

A large, gracile *Bavayia* with a single row of preanal pores occurs in sympatry with typical *B. sauvagii* at middle elevations of Mt. Koghis. This species is here described as:

Bavayia geitaina Wright, Bauer & Sadlier, n. sp.

Figures 1–3

TYPE MATERIAL: Holotype: CAS 202733, adult male, Mt. Koghis forest (approximately 500 m elevation), Province Sud, New Caledonia, 22° 10' S, 166° 30' E, collected by A. M. Bauer, R. A. Sadlier, and S. Smith, 14 February 1997. Paratypes: AMS R144314, R147843, R148084, R150752–54, R150760, CAS 202726, 202730, 202734–35, 202762–63, 202850 (cleared and stained) (same data as holotype); AMS R152661–63, CAS 250848, MNHN 1997-6570 (same locality as holotype), collected by R. A. Sadlier, A. M. Bauer, and J. L. Wright, 23 May 1998.

ADDITIONAL MATERIAL EXAMINED: AMS R148084, Mt. Koghis, 22° 10' 18" S, 166° 30' 58" E, 950 m, collected 30 September 1995 by R. A. Sadlier and G. Shea

TABLE 1

SUMMARY OF MENSURAL AND PROPORTIONAL MEASUREMENTS OF *Bavayia geitaina*, *B. sauvagii*, *B. robusta*, AND *B. cyclura*

		<i>B. geitaina</i> (n = 19)		<i>B. sauvagii</i> (n = 85)		<i>B. robusta</i> (n = 8)		<i>B. cyclura</i> (n = 58)	
		Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)
Mensural values	SVL	56.4–71.6	65.5 (4.8)	33.1–59.7	51.5 (6.1)	70.8–83.0	76.5 (5.0)	43.0–70.8	55.7 (5.6)
	TL ^a	17.6–68.3	56.1 (13.8)	20.5–62.1	42.6 (8.8)	52.1–80.7	65.2 (10.0)	25.5–62.8	44.5 (8.5)
	TW	6.0–7.5	7.0 (0.5)	2.9–7.2	5.5 (0.9)	7.7–10.7	9.1 (1.1)	4.5–8.9	6.3 (1.1)
	AG	27.3–38.6	34.8 (2.9)	14.5–34.3	26.6 (3.8)	35.4–45.8	40.8 (3.9)	21.0–37.4	28.1 (4.3)
	HL	14.9–20.1	18.5 (1.2)	9.8–17.7	14.8 (1.5)	19.1–23.5	21.0 (1.7)	11.8–20.3	15.5 (2.1)
	HW	10.3–13.5	12.0 (0.7)	6.2–11.5	9.5 (1.1)	13.5–18.7	15.4 (2.0)	8.1–14.7	10.7 (1.6)
	HD	5.3–7.9	6.7 (0.7)	3.8–7.0	5.4 (0.7)	6.5–10.9	8.3 (1.4)	3.6–8.5	5.5 (1.1)
	ED	3.3–5.2	4.1 (0.3)	1.9–4.2	3.3 (0.4)	3.6–5.0	4.3 (0.5)	2.1–3.9	3.0 (0.5)
	EE	4.3–5.2	4.8 (0.3)	2.3–5.3	3.9 (0.6)	4.6–7.3	6.1 (1.0)	2.9–6.2	4.5 (0.8)
	ES	5.8–7.4	6.8 (0.5)	3.0–6.8	5.5 (0.7)	6.2–7.9	7.0 (0.7)	3.5–6.6	5.2 (0.8)
Proportional values	TL/SVL	0.65–1.04	0.88 (0.13)	0.47–1.12	0.85 (0.15)	0.62–0.98	0.85 (0.12)	0.34–0.98	0.79 (0.14)
	AG/SVL	0.48–0.57	0.53 (0.02)	0.42–0.59	0.52 (0.03)	0.49–0.57	0.53 (0.03)	0.13–0.56	0.50 (0.03)
	HL/SVL	0.26–0.31	0.28 (0.01)	0.24–0.34	0.29 (0.02)	0.26–0.29	0.27 (0.01)	0.25–0.35	0.28 (0.02)
	HW/HL	0.61–0.70	0.65 (0.03)	0.54–0.78	0.64 (0.04)	0.67–0.79	0.73 (0.04)	0.56–0.84	0.69 (0.06)
	HD/HL	0.29–0.42	0.36 (0.04)	0.30–0.49	0.37 (0.04)	0.33–0.46	0.39 (0.04)	0.26–0.48	0.35 (0.04)
	ED/HL	0.19–0.24	0.22 (0.02)	0.17–0.27	0.22 (0.02)	0.16–0.23	0.20 (0.02)	0.14–0.24	0.19 (0.02)
	EE/HL	0.23–0.31	0.26 (0.02)	0.19–0.36	0.26 (0.03)	0.23–0.33	0.29 (0.03)	0.21–0.34	0.29 (0.03)
	ES/HL	0.33–0.40	0.37 (0.02)	0.18–0.48	0.37 (0.04)	0.28–0.38	0.33 (0.03)	0.26–0.40	0.34 (0.03)

Note: See Materials and Methods for abbreviations.

^aIncludes original and regenerated, but not broken tails; samples sizes therefore reduced.

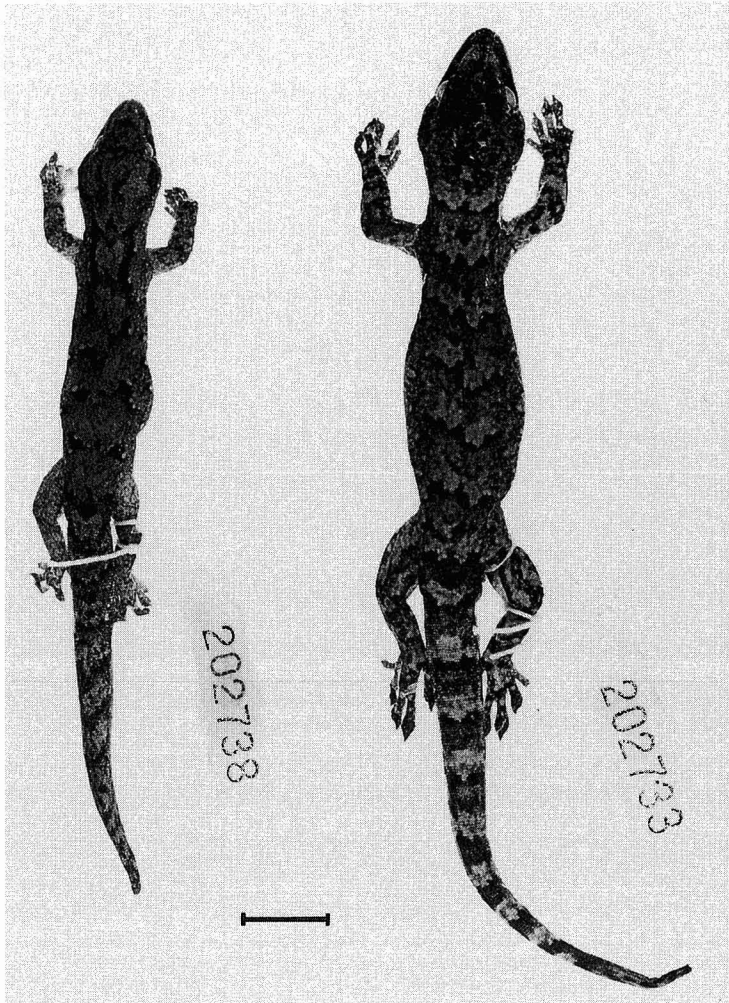


FIGURE 1. Holotype of *Bavayia geitaina* (CAS 202733) (right) with sympatric adult *B. sauvagii* (CAS 202738). Note the difference in size, build, and color pattern. Scale bar = 10 mm.

(from beneath a large rock in an extensive rock outcrop on ridgeline).

ETYMOLOGY: The species name *geitaina* is the Greek word for neighbor. It refers to the fact that this species is sympatric with four congeners in the Mt. Koghis region, including the closely related *B. sauvagii*.

DIAGNOSIS: A large species of the *B. sauvagii* complex (maximum SVL 71.6 mm) distinguished from its congeners by the following combination of characteristics: claw of digit I (manus and pes) positioned asymmetrically

between a larger medial and smaller lateral apical scansor; body long, gracile, preanal pores 18–24 (mean = 21.9, SD = 2.5, $n = 8$), in a single row; first supralabial in narrow contact with nostril; internasal scales somewhat reduced; dorsal chevrons 5–8 between axilla and groin, bilaterally asymmetrical, distinct dorsal patches highly contrasting brown and cream, lateral surface of hindlimbs without pale spots.

DESCRIPTION (based on holotype [CAS 202733], an adult male): SVL 66.6 mm; body long (AG = 56% SVL), robust, weakly

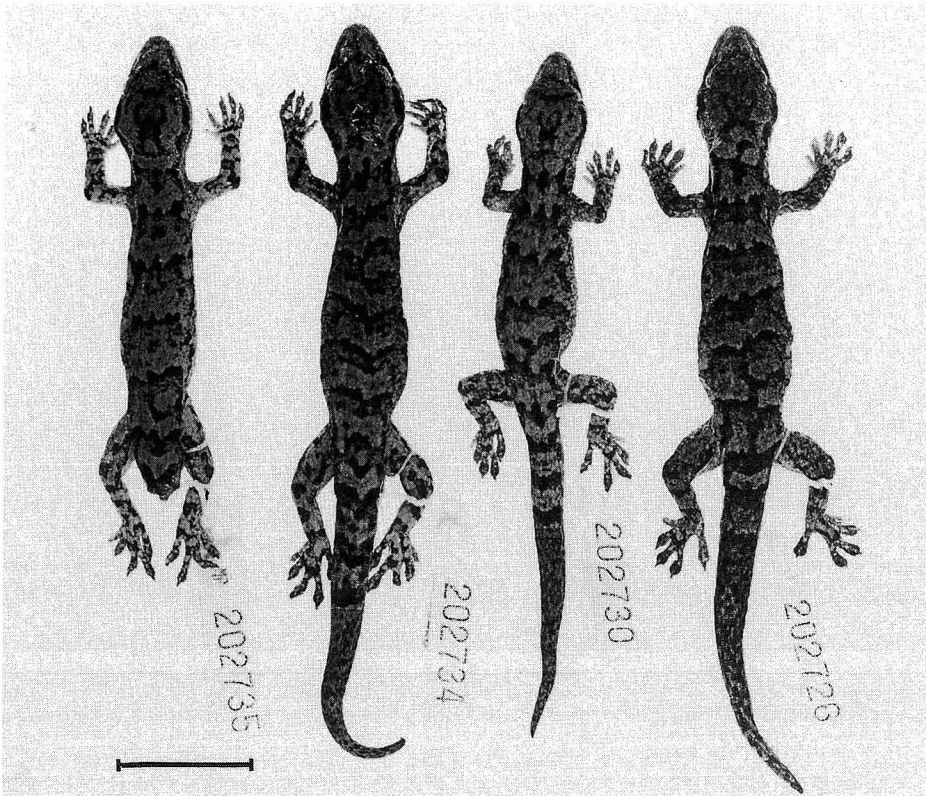


FIGURE 2. Representative paratypes of *B. geitaina* (CAS 202735, 202734, 202730, 202726), illustrating the variation in dorsal color pattern. Scale bar = 20 mm.

depressed. Head oblong, large (HL = 28% SVL), moderately wide (HW = 69% HL), depressed (HD = 38% HL), distinct from neck; interorbital/frontal region somewhat depressed, canthus weakly developed; snout relatively short (ES = 35% HL), longer than eye diameter (ED = 20% HL). Scales on snout approximately twice diameter of those on occipital region. Eye moderate, approximately one-fourth head length; pupil oval, crenelated; posterior supraciliary scales moderately elongate, pointed. Ear opening approximately twice as high as wide, canted posterodorsally to anteroventrally; eye to ear distance greater than diameter of eye (EE = 134% ED). Rostral rectangular, broader than high, divided by a partial groove running downward for a distance of 40% of the rostral height, contacted posteriorly by three reduced internasals and two

slightly enlarged supranasals, contacted posteroventrally by first supralabial. Nostrils oval and anterolaterally oriented, surrounded by three nasals, one supranasal, and the rostral, very narrowly in contact with first supralabial; ventralmost nasal crescentic and in moderate contact with first supralabial. Four similarly sized internasal scales between supranasals. Mental subtriangular, somewhat deeper than wide; a single enlarged, pentagonal, median postmental excluded from contact with apex of mental by first infralabials, which are in narrow contact with one another; first infralabials each in contact posteriorly with median postmental and two smaller chin shields. First three rows of chin shields larger than remaining throat scales. Ten enlarged supralabial scales, of which the sixth through tenth are beneath the eye; eight infralabial scales; 43 inter-

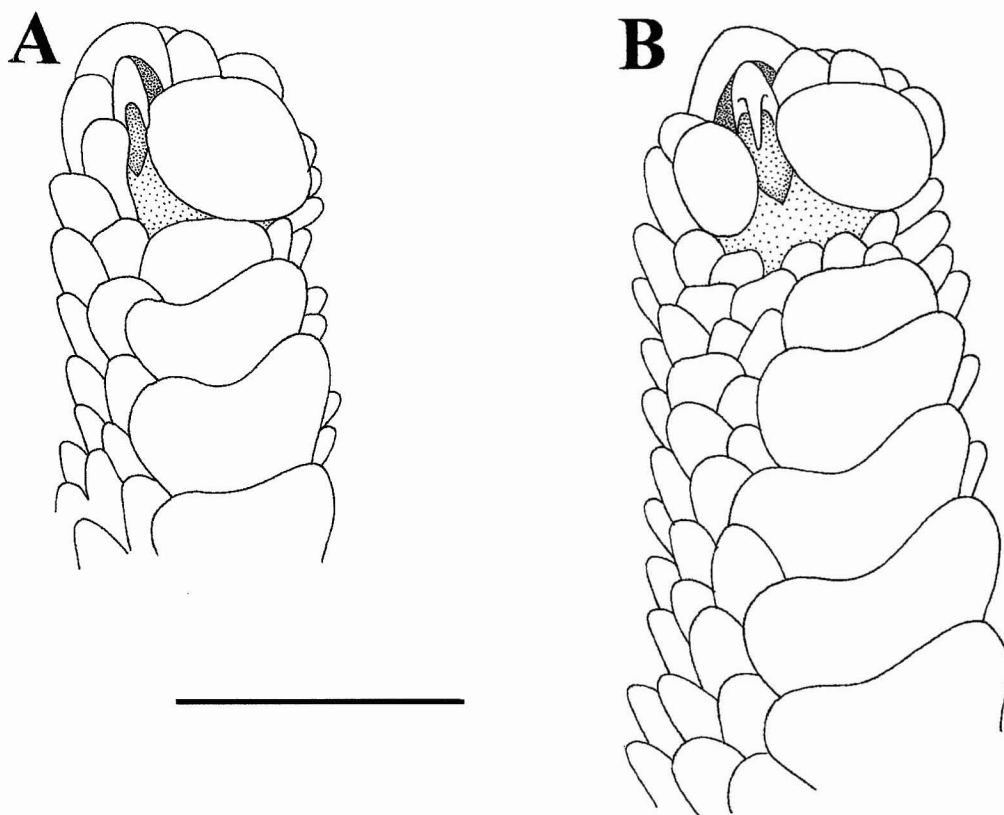


FIGURE 3. Ventral view of digit I of pes: A, *Bavayia sauvagii* (AMS R146526); B, *B. geitaina* (AMS R150759), illustrating the differences in apical scissor morphology. Scale bar = 1 mm.

orbital scale rows between supraciliaries at midpoint of orbit.

Dorsal scales small, homogeneous, very slightly conical, granular; ventral scales slightly larger than dorsals, subimbricate, enlarged posteriorly on the body. Posterior abdominal scales rounded, midabdominal scales elongate, with protracted posterior margins. Approximately 144 scale rows around midbody. Scales of limbs not differing from dorsals. Scales on palms and soles smooth, flattened. Preanal pores in a single row, 10 pores on either side of a single poreless scale. Forelimbs and hindlimbs relatively short (29% and 28% of SVL, respectively), axillary pockets moderately well developed. Digits short, all bearing claws, those on digit I of both manus and pes greatly reduced and partially sheathed; relative length of digits of

manus: $IV \sim III > II \sim V > I$, and of pes: $IV \sim V > III > II > I$; digits weakly webbed; digits III and IV of pes tightly bound along length of elongate metatarsals. Subdigital lamellae typically paired, except variably single at base of digits and on digit I. Distal-most lamella of digits II–V, manus and pes, undivided. Apical plates of digit I, manus and pes, asymmetrical, with claw positioned between a larger medial and smaller lateral plate. Lamellar counts from right side of holotype 6-10-11-11-9 (manus) and 7-10-10-11-11 (pes).

Tail (original with regenerated tip) 69.5 mm, approximately 104% of SVL, tapered, stout, roughly oval in cross section; tail base at cloacal spurs distinctly swollen. Caudal scales small, flat, rectangular, arranged in regular rows. Surface of tail weakly

segmented, caudal scale rows forming whorls, each whorl 9 dorsal scale rows and 5–6 ventral scale rows long; midventral caudal scales not enlarged. Scales on pygal portion of tail much smaller (1/2 to 1/3) than size of postpygal scales. Cloacal spurs consisting of two radiating sets of conical scales directed posterodorsally and borne on a raised mound adjacent to cloaca; larger, medial set with four scales. No grossly visible adhesive tail pad, although setal fields at the tail tip are visible microscopically.

Color in preservative: Dorsum mottled brown, with a pattern consisting of highly contrasting dark and light markings. Seven asymmetrical cream crossbars between nape and sacrum (5 from axilla to groin) each bordered posteriorly by a well-defined, thin dark brown line grading into a lighter brown mottled band with a moderately strong demarcation separating it from the next posterior cream band. Another cream patch on pygal portion of tail. Dark brown canthal stripes extend from internarial region across loreals to anterior margin of eye and under eye almost to anterior margin of ear, with a break at the anterior third of the lower orbital rim. "X"-shaped brown marks across frontal, supraorbital, and parietal regions. Labial scales primarily dark brown with white spotting. Posterior to axilla thin dark bands alternate with larger speckled light patches. Another set of dark transverse markings on sacrum and base of postpygal portion of tail, defining a bold, pale chevron. Venter mottled brown, with darker speckles evenly distributed, base color cream and chocolate, lighter beneath throat and limbs, and darker beneath hemipenial bulge. Dorsum of limbs and digits marbled with a more or less continuous dark stripe from limb insertion, across posterior margin of propodium and onto postaxial margin of epipodium. Region of joints of manus and pes cream. Original tail with alternating brown and cream markings. Posterior margin of cream bands delineated by narrow, dark brown band. Regenerated portion of tail brown with irregular longitudinally oriented darker dashes. Tail venter mottled mid-brown and cream.

VARIATION (based on entire type series, $n = 20$): Labial scale numbers (supralabials/infralabials) variable: 9/8 (40%), 10/9 (20%) 8/8 (20%), 9/9 (20%). Extent of infralabial separation by enlarged median postmental scale variable. In seven specimens there was narrow to broad contact anteriorly between the first infralabials, with each infralabial contacted posteriorly by enlarged median postmental scale and one or two slightly enlarged chin shields. Thirteen specimens with narrow separation of the first infralabials. First supralabial narrowly contacting nostril in most specimens ($n = 17$).

Preanal pores 18–24 (mean = 21.9, SD = 2.5, $n = 8$) divided by 1–3 poreless scales ($n = 3$) or in continuous row ($n = 5$). Pores absent in all female specimens. Cloacal spurs of males with a single row of three enlarged conical scales ($n = 1$), four conical scales ($n = 5$), five conical scales ($n = 1$), or with two rows of four medial and two lateral scales ($n = 1$). Cloacal spurs of females much reduced. Midbody scale rows 114–144 (mean = 133.8, SD = 8.0, $n = 18$). Only one specimen has a complete original tail (TL = 102% SVL).

Mensural and proportional characteristics of paratypes are presented in Table 1; variation in subdigital lamellae number is presented in Table 2.

Coloration highly variable. The number of transverse bands between the axilla and groin varies from five to eight. Left and right sides of bands may be phase-shifted along the vertebral axis. The relative area of light and dark patches in the dorsal pattern is highly variable, with lighter (cream) patches usually dominant. Interorbital patterns also vary between specimens; nine specimens show a darkened "H" shape, whereas another has two lines parallel to the postorbital markings. The remaining specimens have an "X" shape across the parietal region, as in holotype.

OSTEOLOGY: The holotype possesses 26 presacral, 2 sacral, and 23 caudal vertebrae (5 pygal, 18 postpygal anterior to regenerate). Among the paratypes the only vertebral variation was in postpygal vertebral number: 26 in the one specimen with an original tail.

TABLE 2

SUMMARY OF SUBDIGITAL LAMELLAE COUNTS (RIGHT SIDE) FOR THE TYPE SERIES OF *Bavayia geitaina* AND *B. robusta* AND REPRESENTATIVE *B. sauvagii* AND *B. cyclura*

	<i>B. geitaina</i> (n = 19)		<i>B. sauvagii</i> (n = 85)		<i>B. robusta</i> (n = 8)		<i>B. cyclura</i> (n = 58)	
	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)
Manus I	5-7	5.9 (0.6)	3-7	4.7 (0.8)	5-10	6.7 (1.8)	4-10	5.9 (0.9)
Manus II	7-12	9.3 (1.0)	5-11	7.8 (1.2)	10-11	10.3 (0.5)	7-12	9.5 (1.0)
Manus III	9-12	10.3 (0.9)	6-11	8.6 (1.1)	10-12	10.4 (0.8)	9-14	10.3 (1.2)
Manus IV	7-13	10.8 (1.3)	5-12	8.9 (1.3)	11-13	11.6 (0.8)	8-17	11.0 (1.7)
Manus V	7-11	9.2 (1.2)	5-10	8.1 (1.1)	7-11	9.6 (1.6)	8-14	9.6 (1.3)
Pes I	5-7	6.4 (0.7)	3-7	4.7 (0.8)	6-8	6.9 (0.7)	5-9	6.2 (0.9)
Pes II	8-12	9.8 (0.9)	5-10	7.9 (1.1)	10-13	10.7 (1.1)	8-13	9.6 (1.1)
Pes III	9-13	11.1 (1.1)	6-11	8.8 (0.9)	11-13	12.0 (1.0)	8-14	10.5 (1.2)
Pes IV	9-14	11.4 (1.2)	6-12	9.0 (1.4)	11-14	12.6 (1.1)	8-15	11.0 (1.4)
Pes V	8-14	10.4 (1.1)	6-10	7.9 (1.0)	10-12	11.4 (0.8)	7-14	9.7 (1.4)

The phalangeal formulas of the manus and pes are unreduced: 2-3-4-5-3 (manus) and 2-3-4-5-4 (pes). Premaxillary tooth loci 11 ($n = 10$) or 13 ($n = 7$). Maxillary teeth (unilateral counts) 24-37 (mean = 28.1, SD = 3.3, $n = 17$), dentary teeth (unilateral counts) 25-37 (mean = 31.2, SD = 2.8, $n = 17$). A single pair of crescentic cloacal bones is present in all males and absent in females.

COMPARISONS WITH OTHER TAXA: *Bavayia geitaina* is a large species of the *B. sauvagii* complex (maximum SVL 71.6 mm) distinguished from all the members of the *B. cyclura* complex (*B. cyclura*, *B. crassicollis*, *B. montana*, and the new species described later in this paper) by its gracile body and single row of preanal pores in males. Its much larger size and absence of vertebral striping or a distinct "V" on the nape distinguish it from *B. validiclavis*, *B. septuiclavis*, *B. pulchella*, and *B. exsuccida*. It is further distinguished from the first of the these by having one (versus two) rows of preanal pores in males, and from the second by having a large number of pores (≥ 18 versus ≤ 14). *Bavayia geitaina* differs from *B. sauvagii* and *B. ornata* in having the claw of digit I, manus and pes, positioned between a larger medial and smaller lateral apical scansor (versus adjacent to a single enlarged medial scansor). The lack of distinct, pale spots on the lateral surface of the hind limbs further separates *B. geitaina*

from *B. ornata*. Finally, the new species can also be distinguished from *B. sauvagii* by its increased number of preanal pores (mean of 21.9 versus 15.2), large body size, increased number of scansors on digits, smaller and more numerous internasal scales, and highly contrasting and bilaterally asymmetrical dorsal markings.

Mensural and meristic data were combined in a morphometric analysis of *B. geitaina* and *B. sauvagii*. Sixty-two specimens had complete data (20 *B. geitaina*, 29 *B. sauvagii* from Mt. Koghis, and 13 "*B. sauvagii*" from the Isle of Pines) and could be included in the analysis. Principal components analysis (PCA) was used to partition the total variation among specimens without reference to predefined groups. Discriminant function analysis (DFA) was used to determine if predefined groups could be distinguished. Individual discriminant function analyses of males versus females for each species were first conducted to determine if there was any difference between the sexes in any of the characters measured. The sexes were not distinguishable in these analyses, so they were combined for the purposes of subsequent analysis of differentiation between populations. *Bavayia geitaina* was clearly distinguishable from both Mt. Koghis *B. sauvagii* and Isle of Pines "*B. sauvagii*" along principal component 1, with all mensural variables having high (0.83-0.97) loadings.

Because all three groups in this study (*B. geitaina*, Mt. Koghis *B. sauvagii*, Isle of Pines *B. sauvagii*) are morphologically (*B. geitaina*) or geographically discrete entities, it is appropriate to conduct discriminant function analysis to determine if those entities are distinguishable. A posteriori classification of individuals into groups based on DFA resulted in no misclassified *B. geitaina*, although three Isle of Pines *B. sauvagii* (10%) were misclassified as members of the Mt. Koghis population and one Mt. Koghis specimen (7%) was clustered with the Isle of Pines specimens.

DISTRIBUTION, HABITAT, AND NATURAL HISTORY: Thus far *Bavayia geitaina* has been collected only at the middle (approximately 500 m) and high (approximately 950 m) elevations of Mt. Koghis. Mt. Koghis is located approximately 15 km northeast of Nouméa, the capital and largest town in New Caledonia. Koghis is situated at the western edge of the southern mountain block of the island in an area of moderate rainfall (approximately 2000 mm of rain per annum). Like most of the southern third of New Caledonia, Mt. Koghis is characterized by ultrabasic rocks (Sautter 1981). Although the endemic maquis vegetation typical of much of Province Sud occurs elsewhere on Mt. Koghis, the area in which *B. geitaina* has been found supports climax humid forest and has a canopy height to 30–35 m (Virot 1956, Schmid 1981).

The herpetofauna of Mt. Koghis is relatively diverse. Fourteen other species of lizards, including three additional species of *Bavayia*, are known to occur at this site (*Bavayia sauvagii*, *B. septuiclavis*, the new species of *Bavayia* described later in this paper, *Rhacodactylus auriculatus* (Bavay), *R. leachianus* (Cuvier), *R. sarasinorum* Roux, *Caledoniscincus atropunctatus* (Roux), *C. austrocaledonicus* (Bavay), *Graciliscincus shonae* Sadlier, *Marmorosphax tricolor* (Bavay), *Nannoscincus mariei* (Bavay), *Phoboscincus garnieri* (Bavay), *Sigaloseps deplanchei* (Bavay), *Simiscincus aurantiacus* Sadlier & Bauer). An additional species of *Bavayia*, *B. cyclura*, has been collected at Yahoué at the base of the Koghis Massif. Included among species sympatric with *B. geitaina* are several

that have been described only recently (e.g., *Graciliscincus shonae* and *Bavayia septuiclavis*), as well as a genus and species that, so far, is endemic to the middle elevations of Mt. Koghis, *Simiscincus aurantiacus* (Sadlier and Bauer 1997).

All of the types of *Bavayia geitaina* were collected in a small area of closed forest habitat with extensive rock outcropping on the forest floor. No *B. geitaina* were encountered in adjacent forest lacking the rocky substrate of the type locality. Most of the types were collected by hand at night while active approximately 3–6 m high on the branches and twigs of smaller (<15 m high) trees. However, one individual was observed in a rock crevice approximately 1 m above the ground at night. Several specimens were also collected during the day under rocks. *Bavayia geitaina* is relatively fast-moving and agile and some individuals attempted to escape by climbing higher in the tree or by moving around the tree branch so as always to be facing away from the collector.

Two oviductal eggs were present in one of the adult females examined (CAS 202730) collected in February. Trombiculid mites were located on the digits of one specimen (MNHN 1997-6570). Despite the presence of a shallow axillary pocket in this species, no mites were observed in these locations. The stomach contents of one specimen (CAS 202850) revealed one spider, two crickets, one mosquito, a pebble, and part of its own shed skin.

As in the case of *Bavayia sauvagii*, the recognition of putatively new taxa of the *B. cyclura* complex requires the fixation of the name *B. cyclura* itself. The syntype series of *Peripia cyclura* Günther (1872) is composite and consists of five specimens, of which two, BMNH 71.4.16.30 (A–B), are referable to *B. cyclura* and three others (BMNH 71.4.16.31 [A–C]) to *B. sauvagii* (Bauer 1990, Bauer and Henle 1994). Bauer (1990) illustrated BMNH 71.4.16.30B and in light of the apparent presence of multiple species within the *B. cyclura* group we take this opportunity to formally designate that specimen as the lectotype to fix the name to a specimen consistent with the universally employed concept of *B. cyclura*.

Two other names are currently placed in the synonymy of *B. cyclura* (Bauer 1990, Bauer and Henle 1994). The types of *Lepidodactylus neocaledonicus* Bocage (1873) appear to have included specimens in the Lisbon Museum, since destroyed by fire, and three specimens sent to Wilhelm Peters in Berlin by Bocage. The Berlin material was considered to constitute part of the type series, and a male specimen, ZMB 7784A, was designated as a lectotype (Bauer and Günther 1991). A third name, *Hemidactylus (Peripia) Bavayi*, was proposed by Sauvage (1879) based on two syntypes, MNHN 5311–5312. This series is also composite, with the latter specimen referable to *B. sauvagii* and the former to *B. cyclura*. MNHN 5311 is a subadult, originally measuring 43 mm SVL with a tail length of 47 mm (Sauvage 1879), although Brygoo (1991) recorded a somewhat different size. The types of all of these names bore no locality other than New Caledonia.

All of the surviving types that are referable to the *B. cyclura* complex as currently construed appear to be conspecific with one another on morphological grounds and with the moderately small (maximum 72 mm SVL), fairly boldly patterned lowland species to which the name *B. cyclura* is typically applied (e.g., Roux 1913, Sadlier 1989, Bauer 1990, Bauer and Vindum 1990). The largest of the types measured 66 mm SVL at the time of Boulenger's (1883) review of Günther's material of *Peripia cyclura*. We consider populations from Plage de Poé, Yahoué Valley, Pindaï, and the nearshore islands of New Caledonia and the Isle of Pines, among others, to be representative of this taxon. Preliminary genetic data (both allozymes and mt DNA) suggest substantial differences among lowland "*B. cyclura*," and such differences may exist among our *B. cyclura* samples as well. Thus we make no claims as to the unity of those specimens referred to *B. cyclura* but rather seek to distinguish these forms collectively from a distinctive, large-bodied member of the *Bavayia cyclura* complex that occurs in close proximity to the Yahoué population of *B. cyclura*. This form is here described as:

Bavayia robusta Wright, Bauer & Sadlier, n. sp.

Figures 4–5

TYPE MATERIAL: Holotype: MNHN 1998.0604 (formerly AMS R150750), adult male, Mt. Koghis forest (500 m elevation), Province Sud, New Caledonia, 22° 10' S, 166° 30' E, collected by R. Sadlier, A. M. Bauer, and S. Smith, 14 February 1997. Paratypes: AMS R150751, CAS 202741–43 (same data as holotype); AMS R152659–60, CAS 205423 (same locality as holotype), collected by R. Sadlier, A. M. Bauer, and J. L. Wright, 23 May 1998.

ADDITIONAL MATERIAL EXAMINED: Several specimens (AMS R78340–1, 144357–59) from sea level near Mt. Dore are very similar to both *B. robusta* and *B. crassicollis*. At present we refrain from assigning these to either taxon until a more thorough revision of *B. crassicollis* has been completed.

ETYMOLOGY: The species name *robusta* is Latin for strong or powerful and refers to the large, heavy-bodied form typical of this species.

DIAGNOSIS: A very large species of the *Bavayia cyclura* complex (maximum SVL 82.9 mm) that can be distinguished from its congeners by the following combination of characteristics: claw of digit I positioned asymmetrically between a larger medial and smaller lateral portion of a cleft apical scissor; two or more rows of preanal pores, anteriormost complete row 19–21 pores (mean = 20.0, SD = 1.0, $n = 3$), posterior complete row 11–13 (mean = 12.3, SD = 1.2, $n = 3$); venter yellow in life; dorsal pattern distinct of dark cross bands contrasting with lighter patches; body large; bulging adductor muscles of jaw; first pair of infralabials typically separated; midbody scale rows 129–140 (mean = 134.8, SD = 3.9, $n = 8$); 10–14 lamellae (mean = 11.6, SD = 0.8, $n = 8$) under digit IV of pes.

DESCRIPTION (based on holotype [MHN 1998.0604], an adult male): SVL 82.2 mm; body long (AG = 56% SVL), robust, slightly depressed. Head oblong, large (HL = 28%

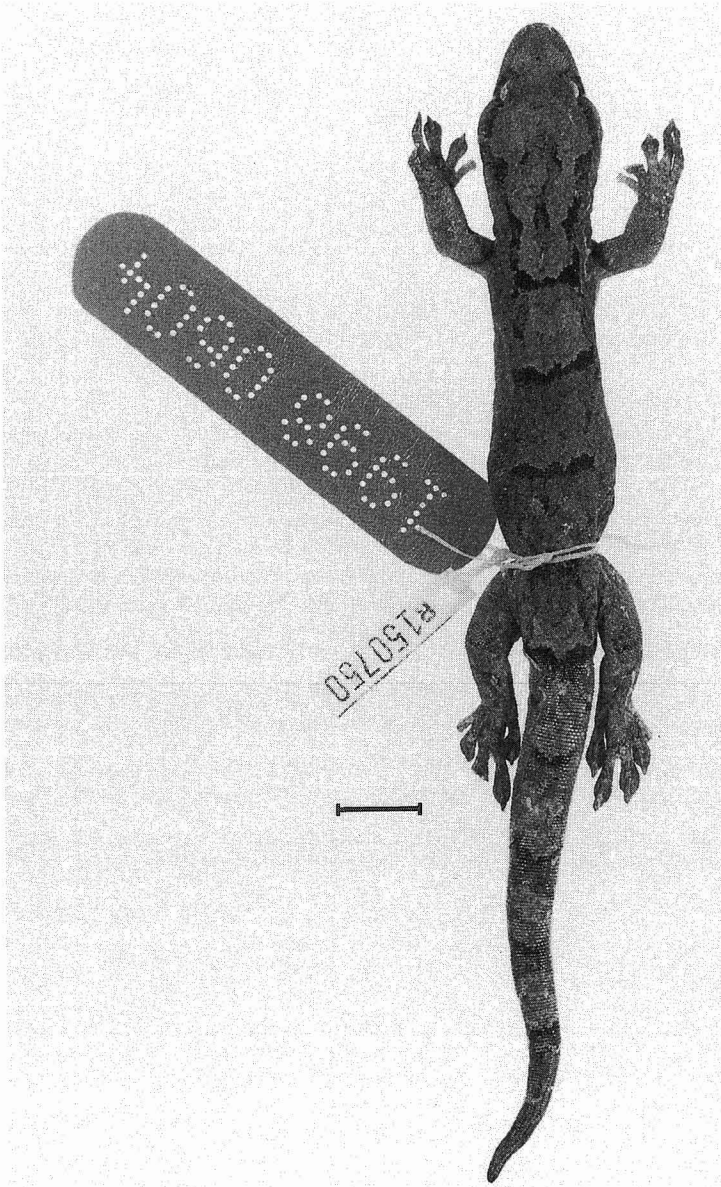


FIGURE 4. Holotype of *Bavayia robusta* (MNHN 1998.0604). Note the inflated adductor musculature, heavy build, and relatively faint dorsal pattern. Scale bar = 10 mm.

SVL), extremely wide ($HW = 74\% HL$), depressed ($HD = 40\% HL$), distinct from neck; interorbital/frontal region somewhat depressed, parietal region weakly depressed, canthus somewhat inflated; snout relatively short ($ES = 34\% HL$), much longer than eye diameter ($ED = 19\% HL$). Scales on snout

approximately two to three times the diameter of those on occipital region. Eye moderately small, approximately one-fifth head length; pupil oval, crenelated. Ear opening approximately 1.5 as high as wide, canted posterodorsally to anteroventrally; eye to ear distance longer than diameter of eye ($EE =$

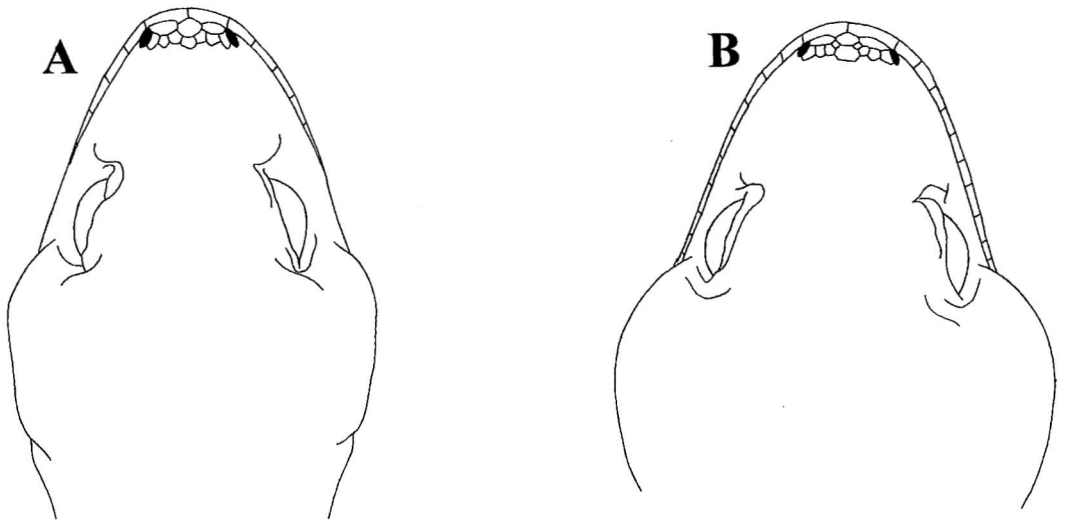


FIGURE 5. Comparative head shape of adult male: *A*, *Bavayia cyclura* (CAS 203028); *B*, *Bavayia robusta* (MNHN 1998.0604), drawn to same size to illustrate the much heavier build of the latter species.

152% ED). Rostral rectangular, broader than high, divided by a partial groove running downward for a distance of 50% of the rostral height, contacted posteriorly by one large internasal and two large supranasals, contacted posteroventrally by first supralabial. Nostrils oval, anterolaterally oriented, surrounded by rostral, three nasals, one supranasal, and the first supralabial; ventralmost crescentic nasal in contact with first supralabial. One large internasal scale between supranasals. Mental triangular, approximately as broad as deep; first infralabials in broad contact with one another posterior to mental scale, each in contact posteriorly with an enlarged median postmental and one (left) or two (right) enlarged chin shields. First three to five rows of chin shields larger than remaining throat scales. Ten enlarged supralabial scales, of which the sixth through last are beneath eye; 10 infralabial scales; 35 interorbital scale rows at midpoint of orbit.

Dorsal scales small, homogeneous, slightly conical, granular; ventral scales twice diameter of dorsals, smooth, flattened, subimbricate, enlarged posteriorly on the body. Posterior abdominal scales rounded, mid-abdominal scales elongate. Approximately 131 scale rows around midbody. Scales of limbs not differing from dorsals. Scales on

palms and soles smooth, flattened. Preanal pores not extending onto thighs, in two complete rows of 20 (anterior) and 12 (posterior) with two additional pores in a third row. Forelimbs and hindlimbs relatively short (23% and 28% of SVL, respectively), axillary pocket weakly developed. Digits short, all bearing claws, those on digit I of both manus and pes greatly reduced and partially sheathed, remaining claws long and strongly recurved; relative length of digits of manus: $IV \sim III > II \sim V > I$, and of pes: $IV \sim V > III > II > I$; digits weakly webbed; digits III and IV of pes tightly bound along length of elongate metatarsals. Subdigital lamellae typically paired, except variably single at base of digits and on digit I, pairs meeting at shallow angle to the transverse axis. Distal-most lamella of digits II-V, manus and pes, undivided. The claw of digit I, manus and pes, lies between the larger medial and smaller lateral apical plates of an asymmetrical cleft scissor. Lamellar counts from right side of holotype 10-11-10-11-11 (manus) and 7-13-13-14-12 (pes).

Tail (approximately 25% regenerated) 98% of SVL, stout, roughly oval in cross section; tail base at cloacal spurs distinctly swollen and rounded. Caudal scales small, flat, rectangular, arranged in regular rows.

Surface of tail weakly segmented, caudal scale rows forming whorls, each whorl 5–6 dorsal scale rows and 4–5 ventral scale rows long; ventral caudals slightly larger than dorsals, midventral caudal scales not enlarged. Scales of pygal region much smaller than (approximately 1/2) those of postpygal region. This junction also marked by a fold of skin at the lateral margins of the tail base. Cloacal spurs consisting of a larger set of two enlarged domed scales on each side of tail base, borne on a raised mound adjacent to the cloaca. An irregular adhesive subcaudal pad visible distally, with setal fields visible microscopically.

Color in preservative: Dorsum light to mid-brown. Four evenly spaced, dark brown transverse bars with narrow (1–2 scales), white anterior borders between axilla and groin. A dark stripe along the body axis on each side extending along the dorsolateral margin anteriorly from the first dark cross band to the posterior border of the orbit, with an interruption about halfway between the limb insertion and ear. This stripe is present on the lower margin of the posterior two-thirds of the orbit and continues anteriorly to the nostril as an ill-defined streak only somewhat darker than the background color. A diffuse, dark vertebral marking extends from the level of the anterior limb insertion to the parietal region, where it is somewhat expanded. Labial scales mottled light and dark brown with some scales having cream centers. Venter cream with some light brown speckling especially near ventrolateral margin. Forelimbs light brown, speckled with darker brown, dorsum of manus mottled. Hindlimb light brown with irregular, mottled transverse markings extending onto digits. Sacrum and tail base marked with a mottled cream patch bordered anteriorly by the last transverse dark body band and posteriorly by a pair of dark markings meeting in the midline to form a chevron. Pale interrupted dorsolateral stripes enclose the sacral patch laterally. Original postpygal tail marked by a series of four cream saddles or blotches, each bordered posteriorly by a dark brown chevron and separated from one another by narrow mid-brown bands. The 25% of the tail that is re-

generated has an irregular pattern of mid-brown streaks on a light brown background. Tail venter mottled light brown and cream.

VARIATION (based on entire type series, $n = 8$): Labial scale numbers (supralabials/infralabials) highly variable: 9/10 (25%), 9/11 (12.5%), 10/10 (25%), 11/10 (12.5%), 11/11 (12.5%), 12/13 (12.5%). In three specimens (AMS R152659, MHN 1998.0604, CAS 202742) infralabials are in modest to broad contact with each other. In all other specimens, infralabial separation was maintained. Each first infralabial contacted by enlarged median postmental scale and either one or two enlarged chin shields. The first supralabial has moderate to broad contact with the nostril in all specimens, and in all specimens a single internasal scale was present.

Preanal pores in the anterior row 19–21 (mean = 20.0, SD = 1.0, $n = 3$) arranged in a continuous chevron, caudal row 11–13 (mean = 12.3, SD = 2.3, $n = 3$), usually 10–13. One specimen (CAS 202743) has a third row consisting of two pores as in holotype. Pores absent in all female specimens. Cloacal spurs of males with one or two enlarged, rounded, conical scales in a single row. Mid-body scale rows 129–140 (mean = 134.8, SD = 3.9, $n = 8$). Mensural and proportional characteristics of paratypes are presented in Table 1; variation in subdigital lamellae number is presented in Table 2.

Coloration highly variable. In several specimens the general body pattern is similar to the type, but the transverse bars may be mottled in some specimens and range from narrow and wavy to thick and well defined, sometimes forming a bilobed marking. In some individuals a series of small white spots is present on the lateral surface of the neck and body. In some specimens the light markings on the tail are bold and contrast strongly with dark bands and other markings, whereas in others the entire pattern is more diffuse. Two specimens have predominantly cream labial scales. Specimens may vary in background dorsal body color from medium chocolate brown to tan. Other variations include the shape of the sacral marking, which may be oval or chevron-shaped, and the presence of diffuse whitish spots on

the ventral surface of the regenerated tails in a number of the paratypes.

OSTEOLOGY: The holotype possesses 26 presacral, 2 sacral, and 20.5 caudal vertebrae (5 pygal, 14.5 complete postpygals anterior to regenerate). Four specimens show breakage at or near the first postpygal vertebra, whereas the most extensive original tail exhibited 21 complete postpygals anterior to the regenerate. The phalangeal formulas of the manus and pes are unreduced: 2-3-4-5-3 (manus) and 2-3-4-5-4 (pes). Premaxillary tooth loci 11–13 (mean = 11.3, SD = 0.8, $n = 7$). Maxillary teeth (unilateral counts) 25–32 (mean = 26.5, SD = 2.2, $n = 7$), dentary teeth (unilateral counts) 22–32 (mean = 29.2, SD = 1.6, $n = 7$). A single pair of crescentic cloacal bones is present in all males and absent in females.

COMPARISONS WITH OTHER TAXA: *Bavayia robusta* is a large species of the *Bavayia cyclura* complex (maximum SVL 82.9 mm) distinguished from *B. sauvagii*, *B. geitaina*, *B. ornata*, *B. septuiclavis*, *B. pulchella*, and *B. exsuccida* by having a much heavier build, yellowish venter, and two rows of preanal pores in males. It also differs from the last three of these species and from *B. validiclavis* in lacking a vertebral stripe and/or prominent “V” shape on the nape, and from *B. sauvagii* and *B. ornata* in having asymmetrical apical scansors (versus a single medial scansor) on digit I of the manus and pes. Among members of the *B. cyclura* complex, it is most distinct from *B. montana*, from which it differs in lacking a dark dorsal pattern with small white flecks. *Bavayia robusta* is most similar in size, scalation, and color pattern to *B. cyclura* and *B. crassicolis*. It is, however, larger (maximum SVL 83 mm versus 72 mm) than the former species and has a higher midbody scale count (*B. robusta* 129–140, mean = 134.8; *B. cyclura* 81–137, mean = 109.0). Although similar in size to the latter species, *B. robusta* is more strongly patterned and lacks the reddish or salmon tail color of some *B. crassicolis*.

In a principal components analysis *B. robusta* separated from *B. cyclura* along principal component 1, which accounted for 52%

of the explained variance. All mensural variables loaded high in this analysis (0.90–0.99). It was not possible to perform a discriminant function analysis because of the small sample size of *B. robusta*.

DISTRIBUTION, HABITAT, AND NATURAL HISTORY: *Bavayia robusta* is known with certainty only from Mt. Koghis (see *B. geitaina* account for details of holotype locality). All *B. robusta* were collected at night on trees. The types were found at a height of approximately 5–8 m on the trunks of large trees near the trail to the cascade, approximately 0.5–1.0 km from the auberge and trailhead at Mt. Koghis. Typical *B. cyclura* from Yahooé and other nearby localities are generally found much closer to the ground and appear to prefer less mesic microhabitats such as dry standing deadwood. No gravid females were found among the types, which were collected in February and May.

Conservation Status

Bavayia geitaina and *B. robusta* appear to be abundant at Mt. Koghis. *Bavayia robusta* is probably widespread throughout mid-altitude forest on Mt. Koghis, where large trees are a typical component of the forest structure. By contrast, *B. geitaina* is restricted to the area of forest where broken rock or scree is found. It has not been located in adjacent forest habitat that lacks such features. As such, it is likely to be vulnerable to road or extensive track development. Mt. Koghis, which is administered as a park, is very close to the New Caledonian capital of Nouméa, and development and ecotourism, mainly day visits, have an impact on the area. The type locality (like that of *Simiscincus aurantiacus*) lies within a few meters of an easy walking trail used by humans and domestic animals (primarily dogs). Although no direct impact of human activity has been observed on *B. geitaina* or *B. robusta*, the proximity of high levels of disturbance places the species at some potential risk. The extent of the ranges of these species beyond Mt. Koghis is unknown. Neither species has been recorded with certainty from nearby upland areas,

such as Mt. Ouin or Mt. Mou. Because of the restricted distribution of the species, we consider *B. geitaina* and *B. robusta* as vulnerable. The addition of these species to the list of taxa endemic to Mt. Koghis and the high relative lizard diversity of the Koghis Massif lend further emphasis to the need for careful conservation of this area.

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