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## A New Species of Gekkonid Lizard (Sphaerodactylinae: *Gonatodes*) from Guyana, South America

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### ABSTRACT

A new species of *Gonatodes* from central Guyana is described, illustrated, and named in honor of one of Guyana's outstanding citizens, Mr. Alexander Mendes. To date, the species is known only from rain forest habitat at two localities. One (the type locality) is in the drainage system of the Konawaruk River, a western tributary of the Essequibo River, with its confluence to the south of the Potaro River confluence. The other locality is Kaieteur National Park, on the Potaro River.

### DEDICATION

This report is dedicated to Mr. Gerald King (deceased), an American Indian from Wiruni, on the lower Berbice River, Guyana. Like other native Americans and Guyanese of his time, Mr. King lived in close association with the rain forest, and he knew its plants and animals well, particularly the larger species that were useful for various purposes. Carol R. Townsend and C.J.C. had great pleasure working with Mr. King and his teenage son, Wesley, for two years, during which they built our comfortable remote camps out of local forest resources. The Kings eagerly assisted with our fieldwork, anxious to learn more about their native amphibians and reptiles and to travel and explore in parts of their country they had never seen.

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## INTRODUCTION

During the 1990s Carol R. Townsend and C.J.C. participated in the herpetological research of the Biological Diversity of the Guiana Shield Program (BDG), a collaboration between the University of Guyana and the U.S. National Museum of Natural History, Smithsonian Institution. Our goals were to conduct research on the unisexual species of lizards, to develop a checklist of the herpetofauna of Guyana as part of the larger program of the BDG to improve knowledge of the biological resources, and to contribute to the education of Guyanese students with relevant interests. Our approach was to conduct annual field trips to localities within Guyana that had not previously been studied herpetologically, and to assemble a collection of scientific specimens that represent the local species, focusing primarily on one locality each year. Meanwhile, in 2004–2005, P.J.R.K., in collaboration with Georges Lenglet (Royal Belgian Institute of Natural Sciences [IRSNB]), Godfrey Bourne (University of Missouri, Saint Louis [UMSL]), and a team of local counterparts and trainees, made three field trips to Kaieteur National Park, central western Guyana, with the aim of contributing to conservation planning and management while studying amphibians and reptiles (e.g., Kok, 2005).

In 1998, C.J.C. and Townsend obtained a series of six geckos of a species they had never seen on previous trips to Guyana or to neighboring countries. Furthermore, this species was not represented in any of the literature relevant to Guyana or the broader Guianan Region (Peters and Donoso-Barros, 1970; Hoogmoed, 1973; Avila-Pires, 1995, 2005; Gorzula and Senaris, “1998” [1999]; Reynolds et al., 2001–present; Donnelly et al., 2005, and personal commun.). The team with P.J.R.K. collected 10 specimens of the same taxon in Kaieteur National Park in 2004–2005.

The following list of characters possessed by our combined collections of 16 specimens of these lizards identify them as representatives of the gekkonid genus *Gonatodes* (Sphaerodactylinae), which currently has 18 recognized species (Kluge, 1993; Esqueda, 2004), most of which occur in northern

South America: limbs four; ventral surface covered with small, flat, smooth, rounded, imbricate scales; top of head covered with minute granular scales; eyelids absent or rudimentary; pupil round (except elliptical in *Gonatodes antillensis*); digits not dilated, or only slightly so proximally, slender throughout their length, with single row of subdigital lamellae; digits not straight, distal phalanges at angle between second and third phalanges; claws not retractile, usually with two scales at base (one dorsal, one ventral); adult males with escutcheon scales on belly and ventral surfaces of thighs; femoral pores absent; dorsal scales basically homogeneous, granular, juxtaposed; tongue fleshy (Peters and Donoso-Barros, 1970; Hoogmoed, 1973; Rivero-Blanco, 1979; Avila-Pires, 1995).

Further investigation of the 16 specimens in the C.J.C. and P.J.R.K. collections and detailed comparisons with other specimens of the genus *Gonatodes* (see appendix) and relevant literature indicated that we had found an undescribed species, which both authors realized independently. Consequently, we brought our data together, and here we describe, illustrate, and name the species.

## METHODS

We followed the methods and illustrations of Rivero-Blanco (1979) and Avila-Pires (1995). Most of the characters are standard, but a few require comment here. In counting subdigital lamellae, only those that were seen to be literally on the ventral surface of the finger or toe were counted, not including the claw. The number of scales around midbody was counted on a line at the midpoint between the axilla and groin. The number of ventrals along the midventral line of the body was determined by starting at an imaginary line between the anterior part of the arm insertions with the body and counting posteriorly to the vent, not including minute granules lining the edge of the cloaca. The number of lateral rows of scales distally on fingers and toes was counted on the fourth digit. The number of ventrals across the abdomen at midbody and the numbers of enlarged supralabials and infralabials, although used by specialists, are not really discrete characters, because the

scales change in size in graded series, so the cutoff points for the counts are somewhat subjective.

Specimens were initially fixed in 10% formalin and later transferred to 70% ethanol. For specimen catalog numbers, AMNH refers to the American Museum of Natural History, New York, New York; IRSNB refers to the Royal Belgian Institute of Natural Sciences, Brussels; and RMNH refers to the Nationaal Natuurhistorisch Museum, Leiden, the Netherlands.

### THE NEW TAXON

#### *Gonatodes alexandermendesi*, new species

Figures 1, 2, 3

**HOLOTYPE:** AMNH R-151805 (field number JC 7802), an adult male collected on 8–9 March 1998 by C.J.C., Carol R. Townsend, Deokie (Jackie) Arjoon, Gerald King, and Wesley King at the following site in GUYANA: Magdalen's Creek Camp, near (ca. 275 m north) the northwest bank of the Konawaruk River (ca. 40 km [linear] WSW Mabura Hill), 120 m elevation, 5°13'07"N, 59°02'43"W, in WGS 84. The Konawaruk River flows into the western side of the Essequibo River to the south of the Potaro River confluence. Alexander Mendes trucked us to the site, reached by crossing the Essequibo River on a pontoon boat about 0.8 km downriver (N) of the mouth of the Konawaruk River, then continuing WSW from gravel road mileage marker number 19 (just west of the Essequibo River) to about midway between mileage markers 37 and 38 on the Mazda Mine concession (now Mekdeci Mining Company), where the road crossed Magdalen's Creek.

**PARATYPES:** Specimens from the type locality are AMNH R-151804 and R-151806–R-151809 (JC 7749, 7885, 7897, 7936, and 7992), three males and two females that were collected 3–19 March 1998. The following 10 specimens are from another locality: GUYANA: Potaro-Siparuni District; Kaieteur National Park, along Tukeit Trail (ca. 3 km from the Kaieteur airstrip), ca. 420 m elevation (IRSNB 2630, 2631); along Tukeit Trail (ca. 2.3 km from the Kaieteur airstrip), ca. 410 m elevation (IRSNB 2632–2636); along Tukeit

Trail (ca. 1.2 km from the Kaieteur airstrip), ca. 400 m elevation, at 5°11'13"N, 59°28'54"W, in WGS 84 (IRSNB 2637–2639).

**ETYMOLOGY:** The specific epithet, a noun in the genitive singular case, honors Mr. Alexander Mendes, a third-generation Guyanese from the capital city, Georgetown, who also manages Dubulay Ranch on the Berbice River. Mr. Mendes is an important member of the business community of Guyana and, among other things, an active conservationist, explorer, and adventurer, who is keenly interested in ethical and responsible nation-building. For the last five field trips of C.J.C. and Carol R. Townsend to Guyana, Mr. Mendes provided invaluable advice, logistical support, and security, with consistent reliability, while being ever anxious himself to learn about new discoveries.

**DIAGNOSIS:** This species differs from all known species of *Gonatodes* by the following combination of characters: very elongate spine on supraciliary flap over eye; 4 lateral rows of scales distally on fingers and toes; beneath tail a row of enlarged hexagonal midventral subcaudal scales distinctly wider than adjacent scales; with or without a few tiny, inconspicuous clusters (about 4 granules) of pale scales on neck and/or body, sometimes containing somewhat enlarged granules; scales on dorsal base of tail suddenly becoming flat, smooth, rounded, imbricate (rather than conical).

According to Rivero-Blanco (1979), only one species, *Gonatodes hasemani*, among the 18 currently recognized species of *Gonatodes* (Kluge, 1993; Esqueda, 2004), has a very elongate spine on the supraciliary flap over the eye, which is also found in all specimens of *G. alexandermendesi* (fig. 2). In addition, until now, only *G. hasemani* was known to have elongate granules in small white patches on the body and base of the tail, as seen, but much less extensively developed, in some specimens (not all) of *G. alexandermendesi*. In some *G. alexandermendesi* there are inconspicuous spots with somewhat enlarged granules; other specimens have inconspicuous tiny pale spots without enlarged granules; and others have neither pale spots nor enlarged granules. However, *G. hasemani* also has the following characters that distinguish it from



Fig. 1. Dorsolateral and ventral views of a paratype of *Gonatodes alexandermendesi*, AMNH R-151804, adult male, SVL 43 mm. Throat color varies from yellow to bright orange, but here was perhaps distorted by nembutal injection and/or photography done under the protection of a blue rain tarp. Photographs by C.J.C.

*G. alexandermendesi*: midventral subcaudals that are neither widened nor significantly different from adjacent scales; usually 3 lateral rows of scales distally on fingers and toes; and usually 4 scales at the end of the toe surrounding the claw.

Also, among the 18 previously recognized species of *Gonatodes*, only one, *Gonatodes annularis*, often has 4 lateral rows of scales distally on fingers and toes, as in *G. alexandermendesi*. However, *G. annularis* lacks the elongate spine on the supraciliary flap found in *alexandermendesi* and has significantly different subcaudal scutellation. In *annularis*, moderately enlarged midventral subcaudals tend to have “a repetitive sequence of two single midventrals (one after the other) ...

followed by a divided midventral” (Avila-Pires, 1995: 258, 262, fig. 84).

Finally, 12 species of *Gonatodes* have a row of significantly widened, hexagonal, midventral subcaudal scales, as found in *G. alexandermendesi*: *G. albogularis* (certain populations), *G. atricucullaris*, *G. caudiscutatus*, *G. ceciliae*, *G. concinnatus*, *G. falconensis*, *G. humeralis*, *G. ocellatus*, *G. petersi*, *G. purpurogularis*, *G. taniae*, and *G. vittatus*. However, none of these species has the elongate spine found on the supraciliary flap of *G. alexandermendesi*, and all 12 of them have usually 2 or 3 lateral rows of scales distally on the fingers and toes, not 4 as in *G. alexandermendesi*.

**DESCRIPTION OF HOLOTYPE:** For the following description, we have followed the format

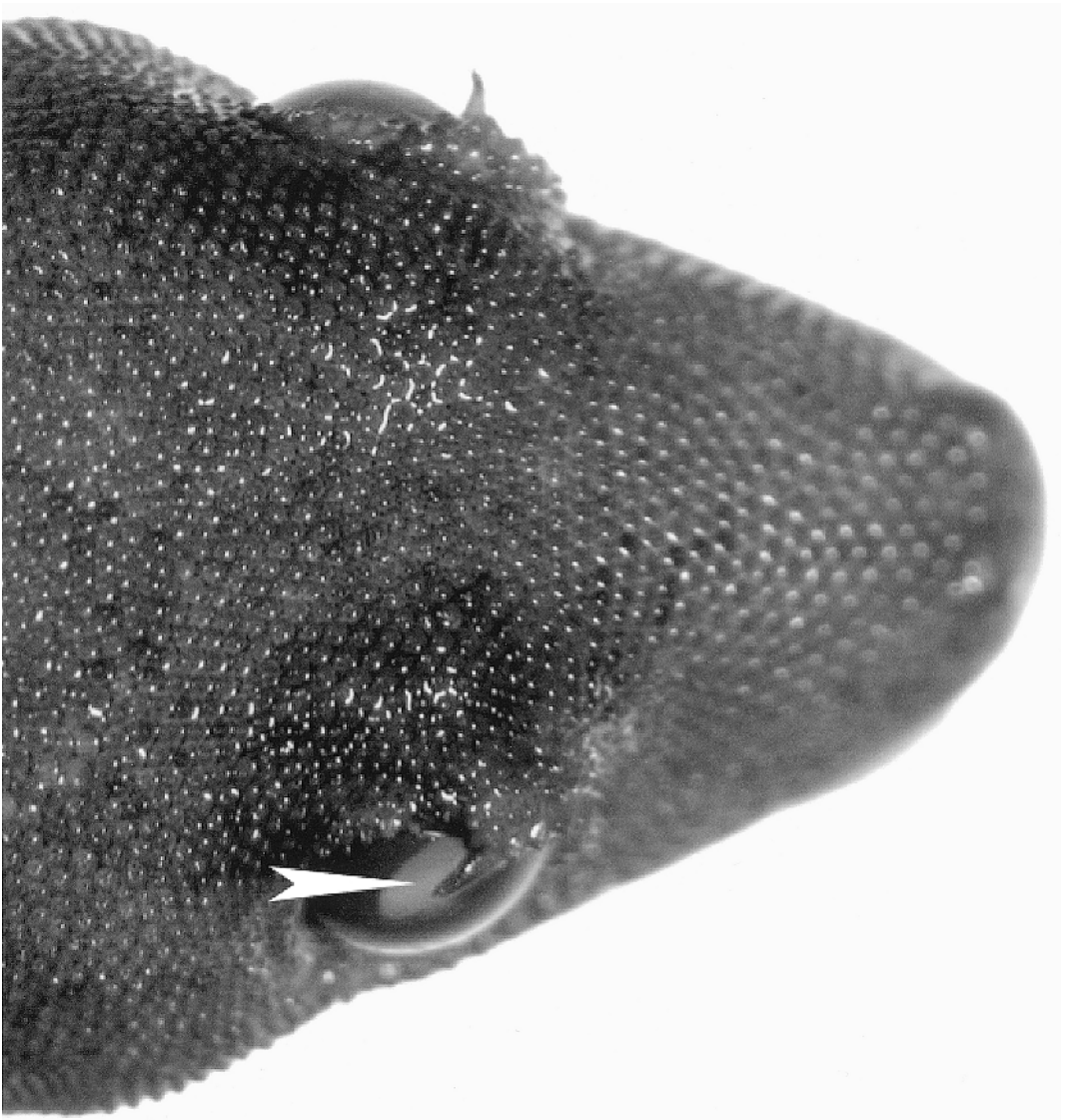


Fig. 2. Dorsal view of head of *Gonatodes alexandermendesi*, AMNH R-151804, paratype, showing elongate supraciliary spine over each eye (white arrowhead indicates right one on dark background). Photograph by Carol R. Townsend.

and methods of Avila-Pires (1995: 269–270) for *Gonatodes*. Sphaerodactyline gecko, male, with snout–vent length (SVL) of 40 mm. Tail length 22 mm, tip broken off, but distalmost 8 mm regenerated. Snout round, relatively wide, gently sloping toward top of head. Neck slightly narrower than head and body. Body nearly cylindrical but wider than high.

Limbs well developed. Tail round in cross section, tapering toward tip.

Rostral large, pentagonal, visible from above, with a median cleft extending forward from the posterior margin. Four postrostrals, lateral ones (supranasals) distinctly larger than median ones, 1 median postrostral slightly larger than adjacent scales on snout. Nostril

bordered by rostral, 4 postnasals, and lateral postrostral (supranasal), separated from first supralabial by contact between rostral and lowermost postnasal. Postnasals as large as, or slightly larger than, adjacent loreals. Scales on snout and on loreal region roughly round, granular, juxtaposed. Loreal scales 11 (right side) or 12 (left) in a line between postnasals and anterior margin of orbit. Scales decrease slightly in size toward posterior part of head. Scales on supraorbital region similar to and continuous with those on top of head. Supraciliary flap on anteriodorsal edge of eye with a series of slightly enlarged scales (larger anteriorly than posteriorly), forming a smooth to somewhat indented margin, with a very elongate spine projecting from middle of upper margin. Pupil round. Supralabials 6 (both sides), decreasing in size posteriorly, suture between numbers 5 and 6 (on right side) or scale number 5 (on left) being below center of eye. Scales on temporal region similar to those on posterior upper part of head. Ear opening much smaller than eye, obliquely oval.

Mental large, roughly trapezoid, with lateral margins slightly concave, anterior and posterior margins having an obtuse angle. Postmentals 2, distinctly larger than adjacent posterior scales. Scales on chin small and polygonal directly behind postmentals, granular posteriorly; a few larger, polygonal scales adjacent to infralabials, juxtaposed. Infralabials 6 (right side) or 5 (left), decreasing in size posteriorly, number 4 (right side) or suture between numbers 4 and 5 (left) being below center of eye.

Scales on nape and sides of neck granular, continuous with those on head and body. Scales on throat smooth, imbricate, with round posterior margin, with short transitional area with granular scales on chin.

Dorsals granular, on vertebral area similar in size to scales on snout; dorsolaterally and on flanks slightly larger and lacking small groups of larger, conical scales along body, including neck. Transition between scales on flanks and ventrals somewhat abrupt but not clearly demarcated. Ventral region with scales distinctly larger than dorsals, smaller on chest than on belly, smooth, hexagonal to rhomboidal but with rounded corners, imbricate; ventrals in oblique rows, on belly also forming

rather regular longitudinal rows, with 41 scales along the midventral line between anterior margin of forelimbs and vent. Scales around midbody 93, of which 14 are ventrals. Scales on preanal plate similar to ventrals, excepting border of vent, which has minute scales. Male with small escutcheon area on posterior abdomen between thighs and on ventral surface of thighs.

Scales dorsally on base of tail suddenly become flat, smooth, rounded in shape, imbricate (rather than conical). Underside of tail with smooth, flat, imbricate scales, increasing in size toward midventral line; first 9 small subcaudals posterior to vent on midventral row undistinguished but followed by 11 significantly widened median subcaudals in a row on original part of tail; on regenerated part, 16 extraordinarily wide median subcaudals in a row (up to 3 times width of adjacent scales).

Scales on limbs granular, excepting anterior and ventral surfaces of thighs and ventral surface of lower legs, where they are smooth, flat, roundish, imbricate. Lamellae under third finger 22 (each side), of which 5 (right) or 6 (left) are slightly enlarged basal ones; under fourth finger 21 (right) or 22 (left), with 6 (each side) slightly enlarged basal ones; under fourth toe 24 (each side), with 7 (each side) somewhat enlarged. Fingers and toes with 4 lateral rows of scales distally. Claws exposed, nonretractile, between two basal scales (1 dorsal, 1 ventral).

Coloration in life, from field notes taken on 9 March 1998: Dorsum dark reddish brown through base of tail; rest of tail gray; dorsum with tiny irregular black markings; orange wash on side of face, around neck dorsally, and on anterior surface of arms; yellowish orange beneath arms; venter gray, but throat bright orange, chest bright yellow.

Coloration in preservative, noted on 11 December 2005: Dorsal surfaces reddish brown, darker above than below, with few small dark brown spots, and, on sides, visible with magnification, very few tiny pale spots comprised of four or fewer granules (not enlarged); chin and throat pale yellow; below original portion of tail, a pale midventral stripe with indistinct, irregular edges; below regenerated portion of tail, gray.

**VARIATION IN THE PARATYPES FROM THE TYPE LOCALITY:** In comparison with the description above, the five paratypes from the type locality (AMNH R-151804 and R-151806–R-151809) vary as follows: 3 (instead of 4) postrostrals, all larger than adjacent scales on snout (R-151804, R-151806, R-151807); 3 (instead of 4) postnasals (R-151804, R-151806–R-151809); unclear whether nostril contacts first supralabial (R-151807, R-151809); ear opening subtriangular on right side but left side obliquely oval as in holotype (R-151806, R-151808), suggesting shape may not be fixed on individual.

The size of the very elongate supraciliary spine is rather constant among the paratypes and holotype, but there is variation in the extent and direction of its curvature. In comparison with the illustration of *G. hasemani* in Avila-Pires (1995: 271, fig. 87), in AMNH R-151804–R-151806 the spines are straighter yet curved somewhat posteriorly. In R-151807 and R-151809 the spine on each side is nearly straight. In R-151808 only the left spine is nearly straight. The spines on preserved specimens can be flexed with a dissecting tool, and perhaps they are flexible in life also.

Mental with posterior margin slightly concave (AMNH R-151806, R-151807).

Several tiny patches (4 scales or so) of inconspicuous but slightly enlarged, conical scales, often light in color, on sides (AMNH R-151806, R-151809, the second of which has some on base of tail also), visible with magnification.

Additional data vary in the topotypes as follows: SVL 34–44 mm; number of loreals 10–12 each side; number of enlarged supralabials, 4–6 each side, with number 4 to suture between numbers 5 and 6 being below center of eye; number of enlarged infralabials 4–6 each side, with suture between numbers 3 and 4 to number 5 being below center of eye; number of scales around midbody 92–101, of which 11–14 are ventrals; number of scales along midventral line between anterior margin of forelimbs and vent 41–44; after 7–9 small undistinguished subcaudals on midventral line from vent, additional subcaudals on midventral line of original tail usually significantly wider (about 1.3–1.5 times) than adjacent

scales (Type B of Rivero-Blanco, 1979), those on regenerated part of tail usually much wider (2–3 times adjacent scales); number of lamellae under third finger 19–22 each side, with 5 or 6 basal ones enlarged each side; number of lamellae under fourth finger 20–24 each side, with 5–7 basal ones enlarged each side; number of lamellae under fourth toe 21–26 each side, with 5–8 basal ones enlarged each side; fingers and toes with 4 lateral rows of scales distally on all specimens, except AMNH R-151809, which has 3 or 4 (difficult to see on this, the smallest individual).

Coloration in life was noted for two of these individuals in addition to the holotype. For AMNH R-151804 (fig. 1), coloration was as described for the holotype except the dorsum was gray, with base of tail grayish brown, rest of tail gray; yellowish orange was not seen beneath arms. For R-151808, dorsum was dark reddish brown, becoming grayish brown on tail; no tiny irregular black markings seen; orange wash on side of face but yellowish orange around neck dorsally; venter gray but throat yellowish orange; chest orangish yellow; bright yellow beneath arms.

Coloration in preservative was noted for all six of these individuals on 11 December 2005, under magnification, and on most specimens the chin and throat appeared pale yellow; males had no markings here, but the two females (AMNH R-151806, R-151809) had from several to numerous dark brown spots on the chin and throat. Also, on only the two females, there was an inconspicuous thin light crescent dorsally crossing the neck and connecting on each side to the upper postocular edge of the orbit; and on the neck, back, and sides, a few tiny patches (about 4 granules) of very inconspicuous, pale areas in which some pale granules are taller than adjacent ones; this was seen on the base of the tail in AMNH R-151809 also. On all, the dorsum was light brown to dark reddish brown, darker above than below, with or without darker brown spots, smudges, or mottling above; only on one female (R-151809), a broad paler brown or tan vertebral area with a few darker smudges in it. On most specimens, the midventral area of the original tail had a pale stripe with indistinct, irregular edges; regenerated tail uniform gray below; but one (R-



Fig. 3. Dorsolateral views of a male paratype (above, IRSNB 2631, SVL 44 mm) and a female paratype

151808) had a small subcaudal white spot distally.

Tongue (visible only in AMNH R-151804) fleshy, relatively wide, slightly narrowing anteriorly with a rounded tip having a short median cleft; tongue covered anteriorly with imbricate, scalelike papillae.

**VARIATION IN THE PARATYPES FROM KAIETEUR NATIONAL PARK:** The 10 specimens (3 males, 5 females, 1 subadult, 1 juvenile; IRSNB 2630–2639) collected in Kaieteur National Park are morphologically similar to the specimens of *Gonatodes alexandermendesi* described above (fig. 3). Adult SVL varies from 41 to 49.6 mm, the largest specimen being a male. The subadult is 31.9 mm SVL, and the juvenile is 22.6 mm SVL.

Variation in scalation and coloration showed only negligible differences between the two localities. For instance, 50% of the specimens from the type locality have 3 postrostrals (instead of 4 as in the holotype) versus 70% of the specimens from Kaieteur National Park; IRSNB 2637 has 7 enlarged supralabials on each side (maximum of 6 in the topotypes), and a few specimens from Kaieteur National Park have 15 ventral rows of scales across midbody (instead of 14), but as discussed above, there is some subjectivity in these characters also. Other data fall into the range of variation of the topotypes.

As in the topotypes, the size of the very elongate supraciliary spine is rather constant among the specimens from Kaieteur National Park. This spine was mobile in life and was sometimes observed flexed over the orbit in wet specimens. The spine is clearly visible but very small in juveniles.

Coloration in life was noted for almost all individuals from Kaieteur National Park and reveals sexual dichromatism (fig. 3). Males have dark reddish brown to gray dorsum, with some small irregular black markings; tail has mostly the same coloration as dorsum; yellowish wash on side of face, around neck dorsally, and on anterior surface of arms; yellow beneath arms; ventral part of head,

throat, and chest orangish yellow; chin whitish; venter grayish approximately from arm insertion to vent; under magnification some isolated whitish granules, sometimes in tiny paler patches (up to 4 granules) present on sides of neck and body in IRSNB 2631 and 2636 but absent in IRSNB 2639; ventral surface of tail grayish, large median subcaudals lighter proximally, darker distally; iris gray.

In contrast to the topotypes, males from Kaieteur have a more yellowish throat (bright orange or yellowish orange in the topotypes), but this could be owing to seasonal variation (breeding season) or geographic variation. In contrast to other males, IRSNB 2636 has 3 or 4 small grayish spots on throat, just above arm insertion (throat immaculate in other males), and IRSNB 2631 had a short, thin, light collar on the neck (not visible in preservative).

Females are grayish brown with dark gray or black spots on head and on each side of a reddish brown vertebral area; a crescent-shaped light collar dorsally crosses the neck and connects on each side to the upper postocular edge of the orbit; ventrally, head and throat dirty brown with some darker longitudinal stripes and tiny spots; several larger black spots on throat; under magnification a few tiny patches (generally 1–5 granules) of inconspicuous, pale areas, in which some pale granules are taller than adjacent ones, present on sides of neck and body, but 1 female (IRSNB 2632) has more numerous patches involving up to 12 granules; venter light brown to gray; large median subcaudals pinkish proximally, becoming whitish distally, with several dark spots on side of tail; iris reddish. The subadult (IRSNB 2635) and the juvenile (IRSNB 2638) have coloration and pattern very similar to the females, except that the distal part of the tail of IRSNB 2638 has 14 alternating black and white rings and a black tip.

Coloration in preservative is similar to the topotypes except that IRSNB 2639, a male,

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(below, IRSNB 2630, SVL 47 mm) of *Gonatodes alexandermendesi* from Kaieteur National Park, Guyana. Photographs by P.J.R.K.

has a light pinkish coloration on the ventral part of the head.

**DISTRIBUTION** (fig. 4): Known only from two localities in Guyana: the type locality and Kaieteur National Park. The specimens from the type locality were found in the same span of time with one other species of *Gonatodes* (*G. humeralis*; N = 12) and two other species of geckos, *Pseudogonatodes guianensis* (N = 3) and *Thecadactylus rapicauda* (N = 16). Those at Kaieteur National Park were found with only one other species of gecko, *G. humeralis*, along the Tukeit Trail that runs between the Kaieteur airstrip and Tukeit Landing.

**NATURAL HISTORY:** All specimens were collected in primary rain forest, those from Kaieteur National Park being from forest on white sand, between 400 and 420 m elevation. Details on habitat at Kaieteur National Park are given in Kok (2005). Most of these specimens were found around boulders, on which they were sometimes active, escaping into cracks and crevices between rocks when disturbed. They were never found associated with bodies of water.

Two specimens were collected on rocks: IRSNB 2630, a male, was collected ca. 150 cm above the ground on a boulder; IRSNB 2633, a female, was collected ca. 100 cm above the ground in a crevice on a boulder. IRSNB 2631 and 2636, both males, were collected in buttress roots, adjacent to boulders. Two females, IRSNB 2632 and 2637, were collected on rotten fallen tree trunks, both of them close to large rocks. IRSNB 2635, a subadult, was collected ca. 80 cm above the ground on a vertical tree trunk; it moved around to the other side of the trunk when disturbed, not trying to escape by running vertically. Only one specimen, IRSNB 2634, a female, was collected on the leaf litter. Two additional specimens, a male (IRSNB 2639) and a juvenile (IRSNB 2638), were collected in pitfall traps installed beneath a plastic drift fence along the trail. A few other specimens were observed in the same microhabitats mentioned above but not collected.

In Kaieteur National Park, *G. alexandermendesi* was observed active only during the day, between 10:00 am and 3:00 pm, in low population density. It is nonheliophilic, avoiding sunny patches, and is found in shady,



Fig. 4. Map of Guyana showing the distribution of *Gonatodes alexandermendesi* (triangle represents the type locality, circle Kaieteur National Park).

moist, cool locations between rocks or on the lower parts of tree trunks. Most specimens were found on objects above ground level but close to it, although an uncollected individual was observed ca. 180 cm above the ground on a boulder. IRSNB 2633, a female collected on 9 November 2004 at 12:25 pm, contained 2 soft, whitish oval eggs measuring  $4.15 \times 3.34$  mm, and  $4.20 \times 3.30$  mm, respectively. Another female, IRSNB 2634, collected on the same day at 12:35 pm, contained a single soft, whitish oval egg measuring  $4.72 \times 3.57$  mm. Juveniles were observed in November and December, which at Kaieteur National Park coincides with the beginning of the short wet season.

As reported for several gekkonid taxa (Bauer et al., 1989; Watkins-Colwell and Bauer, 2004), *G. alexandermendesi* is able to lose part of its skin without significant bleeding or apparent significant injury, which is typical in the antipredator strategy called “regional integumentary loss” (Bauer et al., 1989). The same integumentary fragility was observed by P.J.R.K. in *G. annularis*. To our knowledge, this is the first record of this antipredator defense in the genus.

**COMMENTS:** The type locality of *Gonatodes hasemani* is Villa Bella, Rio Beni, Bolivia, and

its distribution is to the south of the Amazon River and the lower eastern slopes of the Andes to the west, i.e., northern Bolivia, eastern Peru, and southwestern Amazonia, Brazil (Avila-Pires, 1995). It is noteworthy that although they are distinct in some characters (see above), *G. hasemani* and *G. alexandermendesi* share some characters that, within *Gonatodes*, are unique to these two species. Are the very elongate supraciliary spine (present in all *G. alexandermendesi*) and the clusters of enlarged granules in tiny pale spots on the side of the body (polymorphic in *G. alexandermendesi*) shared derived characters or independently derived? The latter character (clusters of enlarged granules on sides) occurs in males of *G. hasemani* (Rivero-Blanco, 1979; Avila-Pires, 1995) and in both sexes of *G. alexandermendesi*, although not in all individuals of the latter. It may be that these two species of low vagility are relatives in a species complex (sharing the very elongate supraciliary spine) of several cryptic taxa yet to be understood in Amazonia and surrounding areas. This will be resolved only after future investigators use modern molecular methods to analyze specimens from diverse localities (as in other tropical lizards, for example, *Cnemidophorus* and *Gymnophthalmus*; Cole et al., 1990, 1993; Cole and Dessauer, 1993).

During the 1990s C.J.C. and Carol R. Townsend visited two localities in Guyana that had primarily rain forest habitats (the type locality of *G. alexandermendesi* and the upper Berbice River), one locality with riverine gallery forest and small patches of forest mixed with patches of savanna (Dubulay Ranch), and two localities with riverine gallery forests within savanna (Karanambo and Aishalton). We found a total of three species of *Gonatodes*, and *Gonatodes humeralis* was the most widespread. At one rain forest site we collected 3 *G. annularis* along with 19 *G. humeralis*. *Gonatodes alexandermendesi* was found only at the Konawaruk locality, along with 12 *G. humeralis*. This is consistent with our other observations indicating that the combination of species in the herpetofauna at many localities in Guyana is unique, and there is much to be learned in studying its natural history. Future progress in developing this knowledge will be efficient if scholars, scien-

tists, and students are not impeded by rumor-mongering, petty obstructionism, and corrupt practices of some of the people in control.

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## APPENDIX

### SPECIMENS EXAMINED ADDITIONAL TO THE TYPE SERIES

*Gonatodes annularis*: BRAZIL: Amapa; Serra do Navio (RMNH 26391, 26392). Para; Cruz Alta, 6 km S Rio Trombetas, Municipio de Oriximina (RMNH 26393). FRENCH GUIANA: Matoury; Lac des Americains, Mont Grand Matoury, 30 m elevation (RMNH 26397). Remire-Montjoly; Montagne du Mahury, 120 m elevation (RMNH 26394). Roura; Montagne Gabrielle, 50 m elevation (RMNH 26395, 26396). Saul; Montagne Belvedere, ca. 250 m elevation, 3°37'N, 53°10'W, in WGS 84 (IRSNB 14575). GUYANA: Berbice River Camp at ca. 29 km (linear) SW Kwakwani (ca. 3 km downriver from Kurudini River confluence), 60 m elevation, 5°5'6"N, 58°14'14"W, in WGS 84 (AMNH R-151801–R-151803). Kartabo (AMNH R-21251, holotype of the synonym, *Gonatodes beebei* Noble, 1923). SURINAME: Saramacca; Coppename River Basin (RMNH 4462, holotype of the synonym, *Gonatodes boonii* Lidith de Jeude, 1904).

*Gonatodes ceciliae*: VENEZUELA: Sucre; 4 km S San Juan de Las Galdonas (RMNH 40093).

*Gonatodes hasemani*: BOLIVIA: Ivon (AMNH R-22539, R-22542). BRAZIL: Amazonas; Maues (AMNH R-91636). PERU: Rio Utoquinia region, Peru–Brazil frontier, 305 m elevation (AMNH R-

56378). Rio Tapiche, Bombo, 245 m elevation (AMNH R-56379). Upper Ucayali River (AMNH R-71094).

*Gonatodes humeralis*: GUYANA: Potaro-Siparuni District; Kaieteur National Park, Kaieteur Plateau (IRSNB 17243, 17244). Region 9; South Rupununi Savanna, Dadanawa Ranch, 2°49'30"N, 59°31'34"W, in WGS 84 (IRSNB 16567–16569). Southern Rupununi Savanna; Aishalton (on Kubanawau Creek), 150 m elevation, 2°28'31"N, 59°19'16"W, in WGS 84 (AMNH R-139740). Dubulay Ranch on the Berbice River, 60 m elevation, 5°40'55"N, 57°51'32"W, in WGS 84 (AMNH R-140952, R-140953, R-140955). Warniabo Creek, 6.4 km (by rd.) SW Dubulay Ranch house, 60 m elevation, 5°39'46"N, 57°53'24"W, in WGS 84 (AMNH R-140954). Berbice River Camp at ca. 29 km (linear) SW Kwakwani (ca. 3 km downriver from Kurudini River confluence), 60 m elevation, 5°5'6"N, 58°14'14"W, in WGS 84 (AMNH R-151772–R-151790). Magdalen's Creek Camp, near (ca. 275 m north) NW bank of the Konawaruk River (ca. 40 km [linear] WSW Mabura Hill), 120 m elevation, 5°13'07"N, 59°02'43"W, in WGS 84 (AMNH R-151791–R-151800).

*Gonatodes taniae*: VENEZUELA: Aragua; Rancho Grande (RMNH 40094).

*Gonatodes vittatus*: VENEZUELA: Nueva Esparta, "at 3 miles of west coast of Isla Margarita" as translated from French writing on the field tag (IRSNB 2531 [4 specimens]).





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