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A NEW CUBAN SPECIES OF *SPHAERODACTYLUS*
(GEKKONIDAE) OF THE *NIGROPUNCTATUS*
COMPLEX

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The *nigropunctatus* complex of the gekkonid genus *Sphaerodactylus* occurs in the Bahama Islands (*S. nigropunctatus* Gray), Hispaniola (*S. stejnegeri* Cochran), and Cuba (*S. nigropunctatus*, *S. torrei* Barbour, *S. alayoi* Grant, *S. intermedius* Barbour and Ramsden, and *S. ruibali* Grant). The last revision of the group is that of Thomas and Schwartz (1966); they, however, used the name "*decoratus* complex" for this group of species. Later Thomas and Schwartz (in press), after examination of the long-neglected holotype of *S. nigropunctatus*, showed that this name, which has priority over *S. decoratus* Garman, should be applied to the species which formerly was called *S. decoratus* and which occurs in both the Bahamas and Cuba. Thomas and Schwartz (1966:25) also suggested that perhaps *S. cinereus* Wagler should be included within this complex, but neither they nor others have studied that species in detail.

In Cuba, the center of *Sphaerodactylus* diversity is in the eastern portion of the island, in Camagüey and Oriente Provinces. This is true not only for the genus but also for the *nigropunctatus* complex. Of the five Cuban species of this complex, all occur in Oriente, and *ruibali*, *torrei*, and *alayoi* are restricted to that province. *S. intermedius* has a peculiarly disjunct distribution, occurring in extreme southwestern Oriente Province (vicinity of Cabo Cruz) and in northern Habana

and Matanzas Provinces far to the northwest. The systematic status of *S. alayoi* remains in doubt; no further specimens of this taxon have been collected since the Thomas and Schwartz review. Those authors commented that *S. alayoi* was a distinct form, but whether it should be regarded as a separate species or as a subspecies of *S. nigropunctatus* would depend in part upon learning details of distribution of both forms in Oriente.

Gradually, additional material from the southern Oriente coast has reached collections in the Instituto de Zoología, Academia de Ciencias de Cuba. Previously, *S. ruibali* has been known only from the United States Naval Base, both east and west of Bahía de Guantánamo. More recent specimens taken by the junior author and Jorge de la Cruz have extended the range of this species to the east as far as Baitiquirí (two specimens) and Loma de Macambo between Imías and San Antonio del Sur (one specimen). These newly collected specimens agree in most details with long series of topotypes from the east side of Bahía de Guantánamo on the United States Naval Base; but specimens, taken primarily by Peter J. Tolson, from the west side of Bahía de Guantánamo differ in several respects from topotypical material and likely represent a new subspecies of *S. ruibali*.

A series of six specimens of *Sphaerodactylus* was taken by Luis de Armas in 1973 at Cabo Maisí, Cuba's extreme eastern point. This locality is about 60 kilometers northeast of the nearest locality for any other member of the *nigropunctatus* complex (*ruibali*, at Loma de Macambo). At first, we considered that this series of geckos was a well marked subspecies of *S. ruibali*. Further comparisons, however, suggest that they are more closely related to *S. intermedius* but are separated from the nearest locality for that species (Río Puerco) not only by about 330 kilometers but also by the intervening distributions of *S. torrei*, *S. alayoi*, *S. nigropunctatus*, and *S. ruibali*. Although we are reluctant to add still another named population to this complex of geckos on the southern Oriente coast, the Cabo Maisí specimens are so distinctive that we cannot associate them nomenclaturally with any other named species. To complicate matters even further, the Oriente specimens of *S. intermedius* number only two and are old and faded;

additionally, they may not be identical with the Habana-Matanzas segment of the species (the type-locality of *S. intermedius*). Since much of this xeric coastal area of Oriente is still difficult of access, remote from most populous areas, and collecting there is difficult, we feel justified in naming the Cabo Maisí series as a distinct species, despite the presently insoluble uncertainties involved with *Sphaerodactylus* from this entire area. Accordingly, we name the Cabo Maisí lizards in honor of Sr. de Armas who collected the type-series.

***Sphaerodactylus armasi*, new species**

Holotype: Instituto de Zoología (IZ), Academia de Ciencias de Cuba, 4089, an adult female, from Cabo Maisí, Baracoa, Oriente Province, Cuba, taken 6 October 1973 by Luis de Armas.

Paratypes: IZ 4093-94, ASFS (Albert Schwartz Field Series) V28442-43, and NMC (National Museum of Canada) 15849, same data as holotype.

Definition: A moderate size species of *Sphaerodactylus* (males to 26 mm, females to 30 mm snout-vent length), characterized by the combination of: a short blunt snout; dorsal scales small and granular, 45 to 60 between axilla and groin; ventral scales smooth and imbricate, 31 to 41 between axilla and groin; 74 to 89 scales around body at midbody; usually 4 enlarged supralabials to eye center; 1 internasal scale. Head pattern in females diffuse grays and white without a distinct pattern (even in female-patterned juveniles) except for a dark gray to black postocular line and a dark loreal line which in fully adult females may expand to give a solid dark loreal region; dorsum strongly cross-banded pale and dark, with five pale (whitish in preserved specimens) crossbands, at times composed of transverse series of isolated pale elongate dots, bordered by black bands on either side, the most anterior black bands and their included pale band forming a collar immediately posterior to the ear opening; a pair of large pale ocelli on the base of the tail, followed by two additional tail bands of two fused ocelli (no tail is complete). Males dull grayish brown dorsally, more or less vaguely spotted with dark gray, the upper surface of the head at times with scattered black irregular spots, extending onto the lores and snout, and onto the sides of the throat.

Variation: The series of *S. armasi* consists of three adult females, two adult males, and one juvenile. The largest male (ASFS V28443) has a snout-vent length of 26 mm, the largest female (ASFS V28442) 30 mm, and the juvenile 20 mm. Dorsals between axilla and groin are 45 to 60, ventrals between axilla and groin 31 to 41, scales around body at midbody 74 to 89, fourth toe lamellae 7 to 11, almost always 4 enlarged supralabials to eye center (one specimen with 3 enlarged supra-

labials bilaterally), internasal scale usually 1 (one specimen with 2), escutcheon in two males 3 to 10 \times 6 to 15. All ventral scales smooth, including gular and pectoral scales; dorsal scales small and granular, showing very slight keeling dorsolaterally.

The two males are generally undistinguished. The dorsal color (as preserved) is dark tan to grayish, with vague to moderately prominent dark blotches densely appressed and almost leopard-like. One male (IZ 4093) has the upper surface of the head heavily marked with black spots, these extending laterally and ventrally onto the sides of the throat, whereas the other male has the head and throat unmarked. The heavily spotted male also has a tiny pair of pale ocelli, outlined with dark gray, on the neck, and both males have a pair of almost-fused postsacral ocelli, the tails showing vague further indications of more distal transverse bands.

The three females and the female-patterned juvenile are very distinctive. Basically, the pattern consists of a series of five pale transverse bands, at times showing their origin from a series of elongate (anterior to posterior) pale spots which fuse with each other laterally to give a continuous pale band. Each pale band is bordered both anteriorly and posteriorly by dark gray to black edging, which may be irregular or scalloped due to the nature of the pale crossbands (*i.e.*, that they represent fused rows of pale spots). Of the five pale bands, one is nuchal, one is more or less scapular, and three are on the body. The anterior dark border of the first pale band lies just behind the auricular opening. There is a prominent pair of large pale, but dark-bordered, ocelli postsacrally, and the unregenerated portions of the tails likewise have at least two prominent irregular pale crossbands which represent pairs of fused ocelli. The juvenile is like the females in dorsal pattern, but the pale transverse body bands are less prominent than in adults. The head in females is mottled with shades of gray and white dorsally and has no clear-cut pattern except for the presence of a dark postocular line, and in the juvenile a dark loreal line. The latter line, in adult females, is so expanded that the entire loreal region is black. The holotype has some large pale areas on the temporal region, and the dark postocular line is much obscured. The venter (including the chin and throat) are immaculate, but there may be some uniform dark stippling (ASFS V28442) on the throat.

Comparison: *S. armasi* requires comparison primarily with *S. ruibali*, that species of the complex which is closest geographically. In *S. ruibali*, dorsals between axilla and groin are 42 to 60, ventrals between axilla and groin 30 to 43, scales around midbody 69 to 80, fourth toe lamellae 6 to 12, supralabials to eye center usually 4 (occasionally 3 or 5), 1 internasal, and escutcheon 5 to 10 \times 19 to 28. None of these counts is strikingly different between the two species; however, *S. armasi* has a higher number of scales around the body at midbody (74 to 89) than does *S. ruibali* (69 to 80); there is, however, considerable overlap.

It is in pattern that *S. armasi* differs most strongly from toptotypical and eastern *S. ruibali*. In the *S. ruibali* populations east of Bahía de Guantánamo, males are finely stippled dorsally and lack any sort of head pattern; there is no tendency for these males to have spotting on the body. In females from the same region, there is a nuchal pattern of three fine dark transverse bands not including a pale ocellar band, and occasionally there is a fourth dark band across the back at the axilla. The female head pattern in *S. ruibali* consists of a clearly delineated dark canthal line which continues as a distinct postocular line; the loreal region is never generally black. The top of the head is vaguely patterned with pale dots or merely variegated smudges of grays. Both sexes of *S. ruibali* are shown in Thomas and Schwartz, 1966, fig. 19. In addition, *S. ruibali* lack ocellate tails, although there may be (rarely) a pair of faint ocelli in the sacral region in males.

Referring to Thomas and Schwartz, 1966, fig. 18, which shows two female *S. intermedius* from northern Habana and Matanzas Provinces, one can see the similarities between that species and *S. armasi*. The dorsal pattern in the Habana specimen shows a diagrammatically transversely banded lizard, with five pale crossbands (which do not show indications of a fused ocellar origin) and with distinct and sharp-edged black borders; there is a postsacral pair of ocelli. The Matanzas specimen illustrated shows the same sort of pattern but only the axillary pale band is clearly shown. However, the head pattern of *S. intermedius* is sharply delineated, and consists mainly of a complete or incomplete black U-shaped figure, along with additional dark cephalic lines including a loreal and a postocular line. As far as scale counts are concerned, *S. intermedius* has 49 to 62 dorsals between axilla and groin, 31 to 44 ventrals between axilla and groin, 65 to 77 scales around midbody, internasals usually 1 (0 to 2), and enlarged supralabials 4 (mode) or 5. *S. armasi* is comparable in scale counts to *S. intermedius*, but the midbody counts are higher in *S. armasi* (74 to 89) than in *S. intermedius* (65 to 77) with less overlap than between *S. armasi* and *S. ruibali*. In addition, *S. intermedius* reaches a greater snout-vent length (35 mm) than does *S. armasi*. It should be recalled that the major portion of the known distribution of *S. intermedius* lies far to the northwest along the northern coast of Habana and Matanzas Provinces, but that there are two old and faded specimens from the Cabo Cruz region which Thomas and Schwartz assigned to *S. intermedius*.

The three other species of the *nigropunctatus* complex which occur in southern Oriente Province are *S. nigropunctatus*, *S. alayoi*, and *S. torrei*. Females of all these species are vividly crossbanded and also have distinct dark head patterns, a feature which is absent in *S. armasi*. All species are quite comparable in scale counts; for instance, all (including *S. armasi*) regularly have 1 internasal scale and 4 enlarged supralabials to eye center as the modal conditions. Dorsal scales are less in *S. t. torrei* (45 to 49), the subspecies closest geographically to

S. armasi, and these two species are distinguishable by this feature as well as in details of pattern. *S. alayoi* (whose status as a distinct species remains questionable) differs from *S. armasi* in its vividly marked cross-banded dorsum (three dark but uniformly hollowed crossbands), head pattern, and slightly larger size (32 mm in *S. alayoi*). From *S. n. strategus* (the subspecies of *S. nigropunctatus* closest geographically to *S. armasi*), *S. armasi* differs in smaller size (*S. n. strategus* to 40 mm snout-vent length), quite different dorsal and head patterns in females, and lesser number of dorsal scales between axilla and groin (45 to 60 versus 50 to 67). In addition, none of the species with which *S. armasi* might be confused locally is distinctly short-snouted; this is especially true of *S. ruibali*, which is a long-headed and attenuate-snouted species.

Remarks: Very much yet remains to be learned concerning the distributions and variation of the southern Oriente *Sphaerodactylus*. In those species about which we have some ecological information, *S. torrei* and *S. nigropunctatus* are mesophilic or at least inhabitants of shaded situations. *S. ruibali* on the other hand inhabits open and more xeric areas. *S. intermedius* (along its northern Habana-Matanzas distribution) likewise is mesophilic and most closely associated with rock rubble; it appears to some extent to be saxicolous. The series of *S. armasi* was secured in xeric situations associated with a species of *Agave*. Also secured syntopically with *S. armasi* was *S. notatus atactus* Schwartz; this species is tolerant of a wide variety of ecological situations, from semi-mesic coastal woods to open and exposed beaches. *S. notatus* is widespread in Cuba (where it is less common in the western and central portions of the island), Isla de Pinos, throughout many of the Bahama Islands, and the Swan Islands; it also occurs on the continental mainland in extreme southeastern Florida and the Florida Keys. Its broad geographical distribution is due at least in part to its ecological tolerances in contrast to other species of *Sphaerodactylus* which are often more rigidly restricted ecologically.

One further comment is pertinent. Specimens of *S. ruibali* from west of Bahía de Guantánamo (an area where the species has not previously been recorded) show strong differences in dorsal and cephalic pattern from specimens taken east of the bay. It is likely that these *S. ruibali* are subspecifically different from their eastern relatives. However, they do not approach *S. armasi* in complexity of dorsal pattern and are typically long-snouted *S. ruibali*. They show no trends toward the very few Cabo Cruz *S. intermedius*, and indeed the hiatus between the two species in this area is about 220 kilometers. Thomas and Schwartz (1966:24) suggested that *S. ruibali* and *S. intermedius* are related (*S. armasi* seems to be close to this species-pair), but there is as yet no unequivocal evidence that *S. ruibali* should be regarded as a subspecies of *S. intermedius*. Certainly, the southern Oriente coast of Cuba and its adjacent lower montane slopes well merit intensive collecting for the *nigropunctatus* complex of *Sphaerodactylus*.

LITERATURE CITED

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