

Two new species of *Sphaerodactylus* (Sauria: Gekkonidae) from the southeastern coast of Cuba

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ABSTRACT. Two new species of *Sphaerodactylus* are described from the Southeastern coast of Cuba (Santiago de Cuba province). Both are members of the *S. nigropunctatus* group. The two new species inhabit coastal vegetation and they are distinguished from the other members of that group by lacking a cross banded pattern in females and juveniles, by coloration, and by having a high number of scales in the escutcheon. They are distinguished from each other by male head color and number of dorsal scales.

Key words: Sauria, Gekkonidae, *Sphaerodactylus*, new species, Cuba, West Indies.

INTRODUCTION

Cuba has a distinctive fauna of geckos of the genus *Sphaerodactylus* with 19 species, 15 of which are endemics (Estrada and Ruibal, 1999; Thomas *et al.*, 1998). The *nigropunctatus* group includes the highest number of species and subspecies, the majority of them confined to eastern Cuba. This group is one of the most problematic in terms of taxonomy, due to its high diversity and geographic differentiation, especially in the southern portions of the eastern provinces. Two new species of *Sphaerodactylus* of the *nigropunctatus* group are described in this paper (Figs 1-3), both from coastal localities of Santiago de Cuba province.

MATERIALS AND METHODS

Morphometric and meristic characters classically considered in Cuban *Sphaerodactylus* (see Thomas and Schwartz, 1966; Schwartz and Garrido, 1985; Hedges and Garrido, 1993) were used in this paper. Also the snout scales situated transversally between second supralabial scales were counted. Sex was determined by the presence of an escutcheon in males. Snout-vent length (SVL), snout length (SL) and snout width (SW) were measured with a caliper ruler, with 0.05 mm of precision. Escutcheon counts are reported as the maximum number of scales (anterior to posterior) and the maximum number transversely across the patch (including extensions onto thighs). The total number of scales in the escutcheon was also counted.

The following abbreviations were used: herpetological collection of BIOECO, Santiago de Cuba =BSC.H; Museo Nacional de Historia Natural, Ciudad de La Habana=MNHNCu; Museo de Historia Natural Carlos de la Torre, Holguín=MHNH; Instituto de Ecología y Sistemática, Ciudad de La Habana=CZACC; United States National Museum of Natural History, Washington, DC=USNM; Museum of Comparative Zoology, Cambridge=MCZ.

SISTEMATICS

Family Gekkonidae

Sphaerodactylus siboney sp. nov.

(Fig. 1)

Diagnosis. A moderate-sized *Sphaerodactylus* (SVL to 32.2 mm) belonging to the *nigropunctatus* group (*sensu* Schwartz and Garrido, 1985); with granular and smooth dorsal scales (47-60 axilla to groin, 70-84 around midbody); 15-20 scales situated transversally on the snout; two or three postnasal scales; escutcheon of males large (80-125 scales) with extensions onto thighs; no cross banding in females and juveniles, with yellowish coloration on body and legs, head gray anterior to the ear; males dark yellow on body and legs, a dark yellow nape, head with dark brown small dots, also present in the throat.

Description. SVL 25.5-32.2 mm in females (\bar{x} =28.3, n =30), 28.1-31.3 mm in males (\bar{x} =30.0, n =15). Snout long, narrow and pointed; rostral scales rounded with a small V-shaped central depression, medial cleft extending to the edge of the depression, sometimes extending beyond flat area giving rostral a bilobed appearance; one internasal scale, flanked by pentagonal or hexagonal supranasals; three postnasal (mode) or two, uppermost elongate or subround, larger than the lower most; mental scale subpentagonal, rounded anteriorly; two large and hexagonal postmentals followed by smooth, flattened and subhexagonal gular scales (17-23, \bar{X} =19.3, n =27), changing to imbricate scales on venter. Snout scales large, smooth, broad, subhexagonals to almost rounded (15-20, \bar{X} =17.8, n =20), becoming smaller towards the frontal region, and granular on the dorsum; 47-60 dorsal scales (\bar{X} =54.5, n =30), becoming flattened and imbricate on the venter; 31-40 ventral scales (\bar{X} =36.1, n =23); 70-84 scales around midbody (\bar{X} =76.0, n =27); unregenerated scales of tail smooth, imbricate and swollen, dorsals verticillate, midventral row enlarged; three toe pad bracket scales; escutcheon with extensions onto thighs (8-10 x 14-25 scales); 80-125 total escutcheon scales (\bar{X} =95.7, n =12).

In life, females and juveniles dark yellow on dorsum and legs and yellow on tail. Head (from ear level) gray in color; venter yellow (pale gray in juveniles). Males dark yellow or yellowish-gray (gray in the MCZ specimen) in dorsum and legs. The tail is orange and paler than in males of *S. torrei* Barbour. A yellow band (with irregular edges) on nape extends ventrally on the neck. This band is more notable in specimens with darker dorsum. In individuals with body that is more yellow, this band is joined to the dorsal color and it is seen as a continuation of the dorsal coloration. Head (from ear level) gray brownish with small dark brown dots which can be elongated. In the snout these dots are smaller and diffuse. Between the yellow band in nape and eye level, the dark dots alternate with yellow dots (in MNHN 14.340 the dots reach the snout). Ventral zone of the head gray with a dark brown dotting or stippling. Venter gray with yellowish flanks (only gray in specimen MNHNCu 4527). In alcohol, the entire body is pale brown. The tail, venter and head are cream in coloration, and the dots in male head are dark brown.

Data of holotype. Adult male, 30.5 mm SVL; tail with 22.1 mm (regenerated); 3.65 mm SL; 58 dorsal scales; 38 ventral scales; 70 scales around midbody; one internasal; 3/3 postnasals; two postmental scales; 5/4 supralabials to eye center; 16 snout scales; 18 gular scales; nine lamellae under fourth toe; escutcheon 10x22; 101 total scales in the escutcheon.

Comparisons. *Sphaerodactylus siboney* sp. nov. belongs to the *nigropunctatus* group, (Schwartz and Garrido, 1985). Of the several Cuban taxa of this group, this species can be distinguished from *S. pimentia* Thomas, Hedges and Garrido, by its smaller size, females up to 32.2 mm, males up to 31.2 mm (females up to 36 mm in *S. pimentia*, males up to 35.2 mm); males with yellow nape, head with small dark brown dots alternating with small yellow dots, stippled throat (males of *S. pimentia* without yellow nape, head and throat undotted); females with dark yellow dorsum, gray head and yellow venter (head and body brown grayish, with a peppering of darker scales in dorsum and whitish venter in *S. pimentia*) and males with a higher number of scales transversely across the escutcheon (14-25) (males of *S. pimentia* with 10-12 scales transversely across the patch, Table 1).

Table 1. Comparison of eight species of Cuban *Sphaerodactylus* belonging to *nigropunctatus* group. Means are given between parentheses, modes between brackets.

	<i>dimorphicus</i> sp. nov.	<i>armasi</i>	<i>ruibali</i>	<i>intermedius</i> ¹	<i>docimus</i> ¹	<i>pimentia</i>	<i>torrei</i>	<i>siboney</i> sp. nov.
Males SVL (mm)	26-33	25-28	26-29	28-36	?	34-35	29-36	28-31
Females SVL (mm)	28-33	25-30	28-30	25-35	26-30	25-34	25-37	25-32
Escutcheon	8-12x18-30	3-11x6-23	7-9x16-19	5-8x8-11	?	8-10x10-12	5-11x9-17	8-10x14-25
Total scales	93-170 (113.5)	72-77 (74.5)	98-113 (103.3)	-	?	57-97 (76.7)	47-96 (75.5)	80-125 (95.7)
Extensions onto thighs	yes	no	yes	no	?	yes	no	yes
Postnasal scales	2-3 [3]	2	2-3 [2]	-	-	1-3 [3]	2-3 [3]	1-3 [3]
Gular scales	15-21 (18.3)	20-24 (21.8)	17-21 (19.6)	-	-	16-20 (18.8)	15-20 (18.2)	17-23 (19.3)
Dorsal scales	59-72 (62.5)	49-65 (53.3)	47-60 (55.0)	45-56 (51.7)	53-62 (57.3)	50-65 (56.2)	50-60 (56.1)	47-60 (54.5)
Cross banding pattern	no	females, juv	females, juv	females, juv	females, juv	no	females, juv	no
Spotted/dotted head	males	males	no	males	?	no	no	males
Male head color	gray	yellowish h	grayish- yellowish	yellow	?	gray- brownish	orange	grayish and yellow
Sample size	48	12	10	20	4	11	29	35

¹Data from Schwartz and Garrido (1985) were used.

The total absence of dark cross banding on the body and lineate pattern on the head can distinguish females of *S. siboney* sp. nov. from the other species in the *nigropunctatus* group (*S. torrei*, *S. ruibali* Grant, *S. armasi* Schwartz and Garrido, *S. docimus* Schwartz and Garrido, *S. intermedius* Barbour and Ramsden and *S. nigropunctatus* Gray). Smaller males of these species have the faint dark cross banding of juveniles (similar to the female pattern), but this characteristic is not present in *S. siboney* sp. nov, because juveniles are plain. Males without faint cross banding can be distinguished by the following differences.

Males of *S. ruibali* have brown or gray heads without any pattern and vermiculated bodies, different from *S. siboney* sp. nov which has small dots on the head, a yellow nape, and a body totally unmarked. Also, *S. ruibali* has only two postnasal scales (three as the mode in *S. siboney* sp. nov). Males of *S. torrei* are dark in coloration, with an orange head and plain body, whereas *S. siboney* sp. nov is dark yellow or gray yellow on body and it has a dotted head, with the yellow head coloration reduced to a diffuse nuchal band. *S. torrei* has few scales in the escutcheon (47-96, $X=75.5$ vs 80-125, $X=97.9$ in *S. siboney* sp. nov), and the escutcheon is compact and small, with 9-17 scales transversely (larger, with 14-25 scales in *S. siboney* sp. nov). Three specimens of *S. torrei* (of out 15 examined) had short extensions onto thighs, reaching at most the middle part of the thigh, whereas in *S. siboney* sp. nov all males had extensions reaching the knee.

S. armasi and *S. ruibali* have males with dark spotting on heads and often the bodies are spotted or stippled, in contrast to *S. siboney* sp. nov with smaller dark dots, alternating with yellow dots, a yellow nape, and unspotted body. Some males of *S. armasi* have unspotted heads but spotted or stippled bodies, distinguishing them from males of *S. siboney* sp. nov, which also are larger (31.2 mm versus 28 mm SVL in *S. armasi*).

The taxonomic situation of Cuban *S. nigropunctatus* is very complex (Thomas and Schwartz, 1966; Schwartz and Garrido, 1985), and it is made worse by the limited material or the poor preservation of many specimens in collections. A revision of this group should be carry out in the future, but in the meantime we have decided to make comparisons with the known information for each subspecies, especially for males, because females of all subspecies are easily distinguished by the cross banded pattern. The yellow nuchal band and the small yellow dots of the head in males *S. siboney* sp. nov can distinguish them from males of all other subspecies of *S. nigropunctatus*. An elevate percentage of males of the latter have heads either with large dark spots or totally unspotted; whereas *S. siboney* sp. nov always has smaller alternating dark and yellow dots.

Other differential characteristics include the existence of two internasal scales in the unique known male of *S. nigropunctatus lisodesmus* Thomas and Schwartz (0-1, mode=1 in males of *S. siboney* sp. nov); three supralabial scales in *S. nigropunctatus strategus* Thomas and Schwartz, *S. nigropunctatus alayoi* Grant and *S. nigropunctatus granti* Thomas and Schwartz, (four or five in *S. siboney* sp. nov) and smaller escutcheons, although some overlapping exists (Table 2).

S. nigropunctatus ocujal Thomas and Schwartz is geographically the closest subspecies and the one which could be sympatric with *S. siboney* sp. nov, nevertheless it is the subspecies that is the most different from the new species. Males of *S. nigropunctatus ocujal* have spotted bodies, but the snout and throat are plain. The situation is reversed in *S. siboney* sp. nov, where the nape is yellow. *S. nigropunctatus ocujal* reaches a larger size (up to 35 mm versus 31 mm in *S. siboney* sp. nov), it has a compact escutcheon without extensions onto thighs (with extensions onto thighs in *S. siboney* sp. nov) and with a smaller number of scales (50-73, $X=60.0$ versus 80-125, $X=97.9$ in *S. siboney* sp. Nov).

Types. Holotype. Adult male, BSC.H 2205, CUBA, Siboney, Santiago de Cuba, 40 m elev., 25.i.1999, colls. A. Fong G. and R. Viña. Original number AFG-1331. **Paratopotype** males: CZACC 4.11332, MHNH 14.340-341, same data as holotype; BSC.H 2220, 30.xii.1998, colls. A. Fong and J. L. Reyes; MNHNCu 4528-4529, same collectors as holotype, 4.ii.1999; BSC.H 2222, same collectors as holotype, 21.iv.1999; BSC.H 2248-2249, 25.iii.2000, coll. R. Teruel; BSC.H 2246, 28.ii.2001, colls. R. Teruel and A. González; BSC.H 2250, 19.v.2001, coll. R. Teruel. **Paratype** males:

Table 2. Comparison of *Sphaerodactylus dimorphicus* sp. nov. and *S. siboney* sp. nov with Cuban subspecies of *S. nigropunctatus*. Means are given between parentheses, modes between brackets.

	<i>dimorphicus</i> sp. nov.	<i>ocujal</i>	<i>granti</i> ¹	<i>lissodesmus</i>	<i>alayo</i> ¹	<i>strategus</i> ¹	<i>siboney</i> sp. nov
Adult SVL (mm)							
Males	33	35	32	30	31	35	31
Females	33	35	32	29	33	35	32
Escutcheon	8-12x18-30	5-9x9-16	5-10x8-17	?	5-8x9-12	6-10x8-23	8-10x14-25
Supralabial scales	3-5 [4]	4-5 [5]	3-5 [3]	4	3-5 [3]	3-5 [3]	4-5 [4]
Dorsal scales	59-72 (62.5)	50-70 (60.1)	41-66 (54.3)	49-53	43-61 (56.1)	47-67 (55.7)	47-60 (54.5)
Scales around midbody	75-87 (80.5)	78-87 (81.6)	57-89 (75.5)	79-84	66-83 (75.9)	61-84 (70.0)	70-84 (76.0)
Cross banding pattern	no	females, juv	females, juv	females, juv	females, juv	females, juv	no
Spotted/dotted head	males	no	males	no	no	males	males
Male head color	gray	grayish- yellowish	grayish- yellowish	grayish- yellowish	grayish- yellowish	grayish- yellowish	grayish and yellow

¹Data were complemented with that in Schwartz and Garrido (1985)

BSC.H 486, Sardinero, south of Santiago de Cuba, 11.xi.1995, coll. A. Fong; BSC.H 1875-1876, 2571, MCZ w/n [AFG 1784], USNM w/n [AFG 1786], Juticí, south of Santiago de Cuba, 28.ix.2002, colls. A. Fong and R. Teruel. **Paratopotype** females: BSC.H 2224, same data as holotype; BSC.H 2226-2228, MNHN 14.342-14.344, 27. iv.1998, colls. N. Navarro and R. Teruel; BSC.H 2221, CZACC 4.11333-4.11335, 30.xii.1998, colls. A. Fong and J. L. Reyes; USNM w/n [1], MCZ w/n [1], 3.x.2002, coll. R. Viña; MNHNCu 4526, 4.ii.1999, coll. A. Fong; BSC.H 2247, 28.ii.2001, colls. R. Teruel and A. González. **Paratype** female: BSC.H 1471, Sardinero, South of Santiago de Cuba, 24.xii.1997, coll. R. Teruel. **Paratopotype** juveniles: BSC.H 1873-1874, 17.vi.1998, coll. A. Fong; MNHNCu 4527, 4.ii.1999, coll. A. Fong; BSC.H 2223, same collectors as holotype, 21.iv.1999. **Paratype** juvenile: BSC.H 487, Sardinero, south of Santiago de Cuba, 11.xi.1995, coll. A. Fong.

Etymology. The species name alludes to the type locality, Siboney, which is located on the coast of Santiago de Cuba Province, inside an Ecological Reserve.

Distribution. This species is known only from three localities of the south coast of Santiago de Cuba province, both situated east of the bay (Fig. 4).

Natural history. The type locality is situated in a limestone zone characterized by the presence of large steplike terraces with a xerophytic, low shrub and thorny vegetation. Specimens were collected in this type of habitat taking refuge under limestone rocks, leaf-litter and inside dead agaves (*Agave underwoodi*). Two specimens were collected inside a bromeliad (*Tillandsia fasciculata*). Other specimens were found in the same microhabitats, but in sandy coastal vegetation and in sinantropic areas of the Ecological Station. *S. siboney* sp. nov. occurs sympatrically with *S. notatus* and the new species described below.

Sphaerodactylus dimorphicus sp. nov.
(Fig. 2 and 3)

Sphaerodactylus torrei ocujal Thomas and Schwartz (1966: 16): specimens from La Socapa and El Morro in Santiago de Cuba.

Sphaerodactylus nigropunctatus ocujal Schwartz and Garrido (1985: 14): specimens from the bay and around and East of Santiago de Cuba.

Diagnosis. A moderate-sized *Sphaerodactylus* (SVL up to 33.4 mm) of the *nigropunctatus* group (Schwartz and Garrido, 1985); with granular and smooth dorsal scales (59-72 axilla to groin, 75-87 around midbody); three postnasal scales; 16-22 scales situated transversely along the snout; escutcheon of males large (93-170 scales) with extensions onto one or two thighs; females and juveniles without cross banding, body gray with a washing of greenish-yellowish, gray brownish snout; males with yellow body and tail, head gray with dark brown to black spots which can cover all of the body including the throat.

Description. SVL 28.2-33.4 mm in females (X=31.4 mm, n=9), 26.1-32.9 mm in males (X=30.9 mm, n=17). Snout long, something pointed; rostral scales rounded with a central depression not set off by a distinct ridge, medial cleft extending beyond flat area giving rostral a bilobed appearance; one (mode) or two internasal scales, flanked by large and pentagonal supranasals; three postnasal scales (one specimen with two), uppermost elongate and larger than the others and appearing as if split off from the supranasal, second postnasal mid in size between upper and lower postnasals; three to five upper labials to mid eye (mode=4); scales of snout large, broad, subhexagonals (16-22, X=19.4, n=26), becoming smaller on frontal region; pupils rounded to oval; mental subpentagonal (but rounded anteriorly); two large, subpentagonal or subhexagonal postmental scales, followed by large, flat and smooth gular scales (15-21, X=18.3, n=26), becoming imbricate on venter.

Dorsal body scales smooth and granular, 59-72 axilla to groin ($X=62.5$, $n=24$); 34-43 smooth ventral scales ($X=37.2$, $n=25$); scales around midbody 75-87 ($X=80.5$, $n=24$); unregenerated scales of tail smooth, flat and imbricate, dorsal caudals verticillated, midventral caudal row enlarged, although not to the same size; 10-12 subdigital lamellae on fourth digit; three toe pad bracket scales; escutcheon large with extensions onto one or two thighs (8-12 x 18-30 scales); 93-170 total escutcheon scales ($X=113.5$, $n=13$).

In life, females and juveniles ground color gray with greenish-yellowish washing on body, legs and head. Neck and head with more yellow coloration. From the eyes to the snout tip pale gray-brownish with darker forehead. Supralabial and infralabial scales brown. Yellow tail, becoming paler towards the tip, with some sparse pale yellow scales. Pale gray venter, with dark brown stippling on chin (absent in MHNH 14.336 and BSC.H 2212 specimens). Iris gold-brown. Males yellow on body, tail and legs; head gray with rounded dark brown to black spots, each spot larger than auditory aperture; interocular zone whitish; snout from the interocular region pale brown with darker spots; labial scales pale brown with dark brown spots; venter gray with yellowish flanks; spots in the central zone of throat becoming in a fine stippling; hands and finger gray. Some males with body, tail and legs completely spotted; spots elongated on head, especially on the snout; throat spotted, although the spots smaller than those on dorsum. In alcohol, body with dark brown-grayish coloration, venter and tail tip cream. Males with pale brown head and dark brown spots.

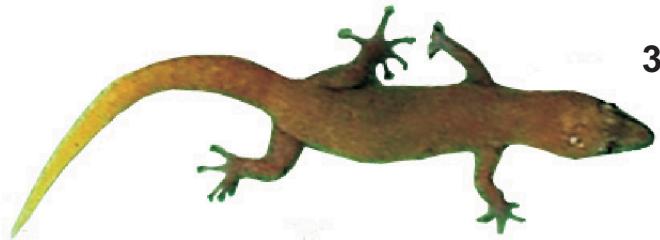
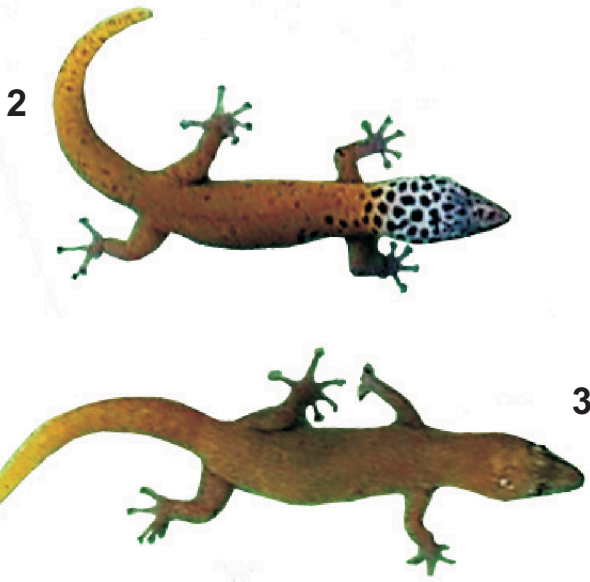
Data of holotype. Adult male, 32.3 mm SVL; tail with 26.1 mm (regenerated); 3.55 mm SL; 62 dorsal scales; 35 ventral scales; 77 scales around midbody; one internasal; 3/3 postnasals; 4/4 supralabials to eye center; 18 snout scales; 20 gular scales; ten lamellae under fourth toe; escutcheon 9x22; 113 total scales in the escutcheon; body yellowish, tail yellow, head gray, dark brown spots on head extending, but sparsely, to the level of the forelimbs.

Comparisons. *S. dimorphicus* sp. nov. belongs to the *nigropunctatus* group (Schwartz and Garrido, 1985) and requires comparison only with the species of this group. Differences with *S. siboney* sp. nov. consist of smaller size (Table 1); females gray with a washing of greenish-yellowish, gray-brownish snout from the eyes level, gray venter (females of *S. siboney* sp. nov. yellow, gray head anterior to ear openings and yellowish venter); males without a yellow nuchal band, gray head with large dark brown to black spots and without yellow dots (males of *S. siboney* sp. nov. with yellow nape, gray-brownish head with small dark brown and yellow dots). Additionally, *S. dimorphicus* sp. nov. has a lower number of gular scales (15-21 versus 17-23 in *S. siboney* sp. nov.), more scales in the escutcheon (93-170, $X=113.5$ versus 80-125, $X=95.1$) and more dorsal scales (59-72, $X=62.5$ versus 47-60, $X=54.7$) than *S. siboney* sp. nov. (Table 1). Only one specimen of *S. dimorphicus* sp. nov. had 59 dorsal scales, the remainder had 60 or more dorsal scales.

From *S. pimentata* it can be distinguished by its smaller size (Table 1), by having females without peppering and males with spotted head and throat (with peppering and without spotting in both sexes of *S. pimentata*) and by having a higher number of scales in escutcheon (97-170 versus 20-97 in *S. pimentata*, Table 1).

From the other species of this group (*S. torrei*, *S. ruibali*, *S. armasi*, *S. docimus*, *S. intermedius* and *S. nigropunctatus*), females of *S. dimorphicus* sp. nov. can be distinguished by the absence of dark cross banding on body and head, which is very prominent in those species. Many males of the *nigropunctatus* group have crossbanding reminiscent of the juvenile pattern (especially in smaller males), which is not present in *S. dimorphicus* sp. nov. Those males with faint crossbands can be distinguished as follows: Males of *S. ruibali* and *S. torrei* have unspotted heads, but spots are present and prominent in *S. dimorphicus* sp. nov. Also, *S. ruibali* has a vermiculated dorsum and a pair of white sacral ocelli is frequently present, whereas *S. torrei* have an orange head and a dark gray body, characteristics not present in *S. dimorphicus* sp. nov. (Table 1). *S. torrei*, which could be sympatric with the new species, has a smaller escutcheon (5-11x11-13 versus 8-12x18-30 escutcheon scales, Table 1).

Males of *S. armasi* can have a spotted head similar to *S. dimorphicus* sp. nov., but the body is



Figs. 1-3. New species of *Sphaerodactylus*. 1. *S. siboney* (BSC.H 2204), adult male from La Socapa, Santiago de Cuba. 2. *S. dimorphicus*, male (BSC.H 2205). 3. *S. dimorphicus* female (BSC.H 2224).

stippled or weakly spotted in a different manner from that on the head, whereas *S. dimorphicus* sp. nov has the body either totally unspotted or with large prominent spots similar to that on the head. In addition, *S. armasi* is a smaller species (Table 1), it has few gular scales (21-24, $X = 24.2$ versus 15-21, $X = 17.8$), fewer escutcheon scales (3-11x6-21 versus 8-12x21-30) and only two postnasal scales (Table 1).

In *S. intermedius*, a species separated by more than 500 km from *S. dimorphicus* sp. nov, males have spotted heads, but there is a yellowish ground color (grayish in *S. dimorphicus* sp. nov) and they have a dark median triangular snout (absent in *S. dimorphicus* sp. nov). Also, *S. intermedius* have few dorsal scales (45-56, $X = 51.7$ vs 59-72, $X = 62.5$), fewer scales around midbody (60-77, $X = 69.6$ versus 76-87, $X = 81.6$) and a smaller escutcheon (5-8x 8-11 versus 8-12x18-30 escutcheon scales, Table 1).

Herein we review the taxonomic situation of *S. nigropunctatus* in Cuba, relevant to this discussion. The spotted head of *S. dimorphicus* sp. nov. males can distinguish them from *S. nigropunctatus lissodesmus*, *S. nigropunctatus strategus*, *S. nigropunctatus alayoi* and some specimens of *S. nigropunctatus granti*, which can have spotted or unspotted bodies, but they always have unpatterned heads. *S. dimorphicus* sp. nov. has a higher number of dorsal and midbody scales than any of these subspecies, although some overlapping exists (Table 2). These subspecies have a mode of three supralabials to mid-eye (four in *S. dimorphicus* sp. nov.) and smaller escutcheons in *S. nigropunctatus granti* and *S. nigropunctatus alayoi* (Table 2).

S. nigropunctatus ocujal could be sympatric with *S. dimorphicus* sp. nov. and it was initially confused with *S. nigropunctatus ocujal* (Schwartz and Garrido, 1985), nevertheless there are large differences between the females of these species. Males can be distinguished by a completely spotted body in *S. nigropunctatus ocujal* (only spotted head in *S. dimorphicus* sp. nov.), a higher number of snout scales (20-28, X= 23.3 versus 16-22, X= 19.4 in *S. dimorphicus* sp. nov.), a smaller number of escutcheon scales (50-73, X= 60.0 versus 93-170, X= 113.5 in *S. dimorphicus* sp. nov.) and escutcheon small and without extensions onto thighs (with extensions onto one or two thighs in *S. dimorphicus* sp. nov.).

Types. **Holotype** adult male, BSC.H 2204, CUBA, La Socapa, East side of Santiago de Cuba bay, 20 m elev., 19.i.1999, colls. A. Fong G. and Rolando Viña. Original Number AFG-1321. **Paratopotype males:** BSC.H 2211, 2213, 2215, MNHN 14.347, MNHNCu 4531, same data of holotype; BSC.H 1869, CZACC 4.11331, colls. A. Fong and R. Teruel, 19.vi.1998; BSC.H 1871-1872, MNHN 14.338, colls. A. Fong and D. Maceira, 26.vi.1998. **Paratype males:** BSC.H 1865-1867, Cayo Damas, S of Chivirico, Guamá, Santiago de Cuba, colls. R. Teruel and E. B. Castillo, 1.x.1994; BSC.H 2218-2219, Ciudadamar, East side of Santiago de Cuba bay, coll. R. Teruel, 29.i.1999; BSC.H 2225, Siboney, Santiago de Cuba, colls. A. Fong and R. Viña, 25.i.1999; BSC.H 2234, Boca de Dos Ríos, Guamá, Santiago de Cuba, colls. A. Fong and D. Maceira, 26.viii.1999; BSC.H 2241-2245, Boca de Cabañas, West of Santiago de Cuba bay, coll. A. Fong, 24.xi.1999. **Paratopotype females:** BSC.H 2210, 2214, 2216, MNHNCu 4530, same data as holotype; BSC.H 1870, CZACC 4.11330, MNHN 14.336-337, colls. A. Fong and R. Teruel, 19.vi.1998; BSC.H 2217, colls. R. Teruel and J. L. Reyes, 1.iv.1999; **Paratype females:** BSC.H 1867, Cayo Damas, S de Chivirico, Guamá, Santiago de Cuba, colls. R. Teruel and E. B. Castillo, 1.x.1994; BSC.H 2230-2231, Boca de Dos Ríos, Guamá, Santiago de Cuba, coll. A. Fong, 24.vii.1999; BSC.H 2235-2236, Boca de Dos Ríos, Guamá, Santiago de Cuba, colls. A. Fong and D. Maceira, 26.viii.1999; MNHNCu 4532, Boca de Cabañas, West of Santiago de Cuba bay, coll. A. Fong, 21.xi.1999; MNHN 14.345, Boca de Cabañas, West of Santiago de Cuba bay, coll. A. Fong, 24.xi.1999. **Paratopotype juvenile:** BSC.H 2212, same data as holotype. **Paratype juveniles:** BSC.H 2232-2233, Boca de Dos Ríos, Guamá, Santiago de Cuba, coll. A. Fong 25.viii.1999; MNHN 14.349, Boca de Cabañas West of Santiago de Cuba bay, coll. A. Fong, 24.xi.1999.

Associated specimens. BSC.H 223-224 (female and male, respectively), CUBA, La Cuquita, 0 m a.s.l., Guamá, Santiago de Cuba province, colls. N. Viña Dávila, N. Viña Bayés and L. O. Melián, 9.x.1990; BSC.H 2566-2567 (females), La Cuquita, 0 m a.s.l., Guamá, Santiago de Cuba province, colls. L. Viña Dávila, A. Fong and D. Maceira, 21.xi.2001. BSC.H 2568-2569 (juveniles), 2570 (female), 2 km East of Chivirico, Guamá, Santiago de Cuba province, 21.xi.2001, colls. A. Fong, L. Viña Dávila and J. Tamayo.

Distribution. Known from some coastal localities in the Santiago de Cuba province, all of them situated between La Cuquita and Siboney, in a line occupying about 80 km in east-west direction (Fig. 4).

Natural history. Specimens from localities in Santiago de Cuba bay were collected inside dead plants of the genus *Agave*, and some of them were seen taking refuge in live plants of this genus. These localities are on a limestone with xerophytic vegetation. Cayo Damas is a small island of about 2 ha separated about 150 m from the mainland. According to the collectors, these geckos

were found under stones, on the seashore and around an abandoned structure. The specimens from La Cuquita and Chivirico were collected under round stones on the seashore in a zone completely cleared of vegetation. The specimen of *S. siboney* sp. nov. was inside a dead plant, *Agave underwoodi*. Sympatric with *S. dimorphicus* sp. nov. live *Hemidactylus baitianus* Meerwarth and *Tarentola americana* Gray in La Socapa, and *S. notatus* and *S. siboney* sp. nov. in Siboney.

Etymology. From the Latin *di* (two), and *morpho* (form).

DISCUSSION

The *S. nigropunctatus* group (*sensu* Schwartz and Garrido, 1985) now includes nine species from Cuba, inhabiting principally central and eastern regions of the island. The center of diversity for this group is primarily the south coast of the easternmost provinces, with six species restricted to this region. Previous phylogenetic studies (Hass, 1991; 1996) have not included all the species comprising the *nigropunctatus* group, so the phylogenetic relationships of the species are unclear. Nevertheless, three species seem to be more closely related (*S. dimorphicus* sp. nov., *S. siboney* sp. nov. and *S. pimienta*) because they share several features: lack of crossbanding at any stage of life, slender and acute snouts, large escutcheons, and greater elaboration of color pattern in males than in females.

Females and juveniles of *Sphaerodactylus* typically have a “basic color pattern” that is more elaborated than in males. The latter often have a simplified version of this pattern, or are unpatterned (Thomas and Hedges, 1998). A remarkable characteristic of the two new species is the condition we call “basic pattern inversion”, where males have a more elaborate pattern than females. This feature is absent in the other species of the *nigropunctatus* group, except in *S. pimienta* in which both sexes have the same pattern.

In the paper describing *S. nigropunctatus ocujal* (as *S. torrei ocujal*), Thomas and Schwartz (1966) included two associated specimens from La Socapa and El Morro in Santiago de Cuba bay and they called attention to their coloration. One of us (AFG) analyzed photographs of these specimens (taken by G. Schneider in the Museum of Zoology, University of Michigan) and both of them can be associated with *S. dimorphicus* sp. nov.

Schwartz and Garrido (1985) described (although not unequivocally) some specimens from the bay, surroundings, and East of Santiago de Cuba as *S. nigropunctatus ocujal*. In this series, they mentioned seven specimens completely unspotted and without an escutcheon, which they considered males. These specimens probably are females of *S. dimorphicus* sp. nov., which were confused due to the absence of the crossbanded pattern always present in known species of the *nigropunctatus* group. The SVL of these specimens (23-32 mm, following Schwartz and Garrido, 1985) fall within the SVL range of the females of *S. dimorphicus* sp. nov.

The other specimens of this series also seem to be associated with *S. dimorphicus* sp. nov., if we take into consideration the characteristics mentioned by Schwartz and Garrido (1985), including males possessing only a spotted head. This material was deposited at CZACC, although presently it cannot be located (Luis V. Moreno, pers. comm.).

With these taxonomic changes, the known distribution of *S. nigropunctatus ocujal* is confined to areas West of the bay of Santiago de Cuba, with Guamá (Guamá river) as its easternmost locality. Due to the distribution of *S. dimorphicus* sp. nov. extends to La Cuquita in the West, these two species appear to have a small zone of sympatry.

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Specimens examined. *Sphaerodactylus nigropunctatus ocujal*- Santiago de Cuba Province: La Mula, Guamá (BSC.H 222, 456-459, 530, 705, 711, 2189-2193, 2237, 2238-2240, 2251, 2519-2524); Los Morones, La Mula, Guamá (BSC.H 531); Las Cuevas, Guamá (BSC.H 2287); Granma Province: Los Muertos, Alegría de Pío (BSC.H 842, 843).

Sphaerodactylus nigropunctatus granti- Villa Clara Province: Cayo Las Brujas, N de Villa Clara (BSC.H 2550); Cayo Santa María, N de Villa Clara (BSC.H 727 y 829). Holguín Province: Cerro Galano, Rafael Freyre (BSC.H 2551-2553); Cayo Bariay, Rafael Freyre (BSC.H 2554).

Sphaerodactylus nigropunctatus strategus- Guantánamo Province: Finca El Cuero, SW of Guantánamo (Charles T. Ramsden Museum, Universidad de Oriente)

Sphaerodactylus torrei- Santiago de Cuba Province: Santiago de Cuba (BSC.H 479, 480, 496, 1155, 1159, 1468-1470, 1847, 1848, 1862, 1863, 1868, 1880, 1881, 2160, 2206); Quintero, Santiago de Cuba (BSC.H 2053, 2054); Siboney, Santiago de Cuba (BSC.H 1877-1879); Cuabitas, Santiago de Cuba (six specimens collected by P. Alayo in 1950 and deposited in the Charles T. Ramsden Museum of the Universidad de Oriente, although not in the Ramsden Collection). Guantánamo Province: Los Monitongos, Hatibonico (BSC.H 1932).

Sphaerodactylus ruibali- Guantánamo Province: 12 km N, 2 km E of Baitiquirí (BSC.H 1921); Los Monitongos, Hatibonico (MNHNcu w/n [10]).

Sphaerodactylus armasi- Guantánamo Province: Punta de Maisí (BSC.H 1894); Punta Negra, 22 km E of Jauco (BSC.H 1912-1915); 12 km N, 2 km E of Baitiquirí (BSC.H 1919-1920); Tortuguilla (BSC.H 2540-2544).

Sphaerodactylus pimienta- Santiago de Cuba Province: La Tabla (BSC.H 2493); near La Pimienta (BSC.H 2494-2503).

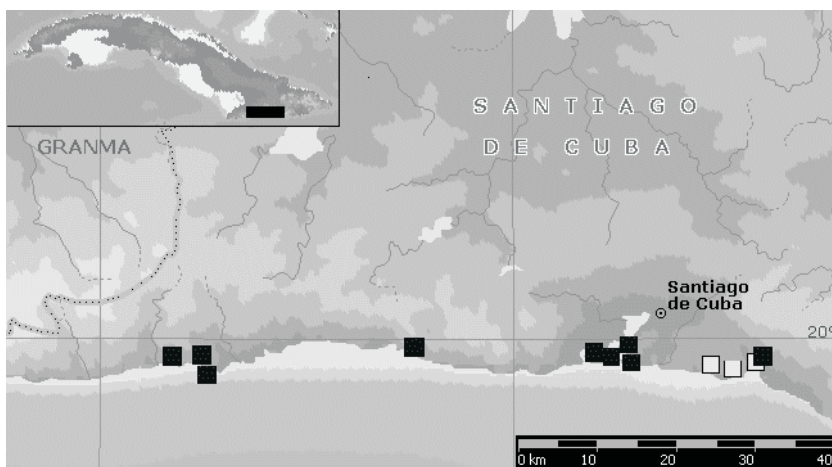


Fig. 4. Distributions of two species of *Sphaerodactylus* of the *nigropunctatus* group: *S. dimorphicus* sp. nov. (dark square) and *S. siboney* sp. nov. (light square).

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