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A New Species of *Anolis* (Sauria: Iguanidae) from the Sierra de Trinidad, Sancti Spiritus, Cuba

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ABSTRACT. – A new species of *Anolis* is described from the Sierra de Trinidad, in central Cuba. It is a member of the twig ecomorph and is most similar to *A. guazuma* from the Sierra Maestra of eastern Cuba, but is smaller, has a shorter snout and differs in several scale characters.

INTRODUCTION

The West Indies is a major center of species diversity for lizards of the genus *Anolis*, which number more than 300 described species (of which 128 occur in West Indies; Schwartz and Henderson, 1991). Adaptive convergence in ecology and morphology is an important aspect of the West Indian radiations of anoles (Williams, 1969, 1983). Of the different convergent types, termed ecomorphs, the twig ecomorph is characterized by species with short limbs, a long snout usually covered with enlarged scales, a relatively short prehensile tail, and cryptic coloration. To escape predation, twig species often rely on crypsis rather that rapid movement.

The fifteen described species of twig anoles are found on Jamaica *(A. valencienni)*, Hispaniola *(A. darlingtoni, A. fowleri, A. insolitus, A. sheplani* and *A. placidus)*, Puerto Rico *(A. occultus)* and Cuba (eight species). The Cuban twig anoles are placed in two groups: the chamaeleonides group *(barbatus, chamaeleonides, guamuhaya,* and *porcus)* and the *angusticeps* group *(alayoni, angusticeps, guazuma,* and *paternus).* Species in the former group, previously placed in the genus *Chamaeleolis,* are twig giants (Hass et al., 1993) due to their very large size (as well as other morphological similarities), whereas those in the latter group are twig dwarf anoles (Estrada and Hedges, 1995). In general, the relationships of West Indian anoles are not yet clearly established, but the present molecular evidence suggests that the twig anoles on each of the four Greater Antilles are not closely related, and that convergence exists even among species within Cuba and Hispaniola (Burnell and Hedges, 1990; Hass et al., 1993; Hedges and Thomas, 1988). In this paper we describe a new species of West Indian twig anole from the Sierra de Trinidad in the southern portion of central Cuba. It shows affinities with *A. guazuma* from the Sierra Maestra of eastern Cuba (Garrido, 1983).

In the account below, the following abbreviations are used: AMNH (American Museum of Natural History, New York), CZACC (Colección Zoológica del Instituto de Ecología y Sistemática, La Habana Cuba), MNHNCU (Museo Nacional de Historia Natural de La Habana, Cuba), CARE (Colección Alberto R. Estrada), SVL (snout-vent length), HL (head length), HW (head width), FL (femoral length), TL (tibial length), BL (brachial length), OSD (orbit-snout distance), RW (rostral width).

Anolis garridoi sp. nov.
(Fig. 1)

Holotype. — MNHNCU 4285, an adult male from Topes de Collantes, Sierra de Trinidad, Sancti Spíritus province, Cuba, approximately 700 m elevation, collected by Luís M. Díaz and Luís V. Moreno in January 1991.

Paratypes(7). — MNHNCU 4286-90; CARE 60900-01; paratopotype AMNH 96499, 1.8 mi (3 km) S Topes de Collantes; CZACC

7281 from Sierra de Trinidad, without date, collected by Lorenzo Zayas.

Diagnosis. — A small species (maximum SVL 41.8 mm males; 36.8 mm female) of twig *Anolis* with short limbs, long snout, short prehensile tail, and enlarged scales on dorsal surface of head. It is a member of the Cuban *angusticeps* group of dwarf twig anoles and most closely resembles *A. guazuma* in having the tail shorter than SVL. It can be distinguished from *A. guazuma* by a smaller body size (37.5-41.8, $\bar{x}$ = 39.5 mm SVL males, 36.2-36.8, $\bar{x}$ = 36.5 mm SVL females in *A. garridoi;* 40.6-48.0, $\bar{x}$ = 44.1 mm SVL males, 36.4–42.8 $\bar{x}$ = 39.7 mm SVL females in A. guazuma), a relatively wider head (0.43-0.45, $\bar{x}$ = 0.45 HW/HL males, 0.46-0.47, $\bar{x}$ = 0.46 HW/HL females in *A. garridoi;* 0.39 = 0.41 HW/HL males, 0.40-0.45, $\bar{x}$ = 0.43 HW/HL females in *A. guazuma),* a shorter snout (0.43-0.50, $\bar{x}$ = 0.47 OSD/HL males, 0.45-0.51, $\bar{x}$ = 0.47 OSD/HL females in *A. garridoi,* $\bar{x}$ = 0.52 OSD/HL males, $\bar{x}$ = 0.50 OSD/HL females in *A. guazuma),* and a wider rostral (0.40-0.48, $\bar{x}$ = 0.43 in *A. garridoi,* 0.28-0.37, $\bar{x}$ = 0.34 in *A. guazuma).* Scale characters that distinguish most *A. garridoi* from most *A. guazuma* are: modally 3 (3-4) loreal scale rows [modally 5 (4-5) in *A. guazuma],* modally 5 (5-7) scales between first canthals [modally 7 (4-8) in *A. guazuma],* and modally 1 (1-2) scale rows between supraorbital disc and supraorbital semicircles [modally 2 (1-2) in *A. guazuma].* The rostral is straight and does not overhang the mental in *A. garridoi,* whereas it is bevelled and overhangs the mental in (in lateral view) *A. guazuma.*

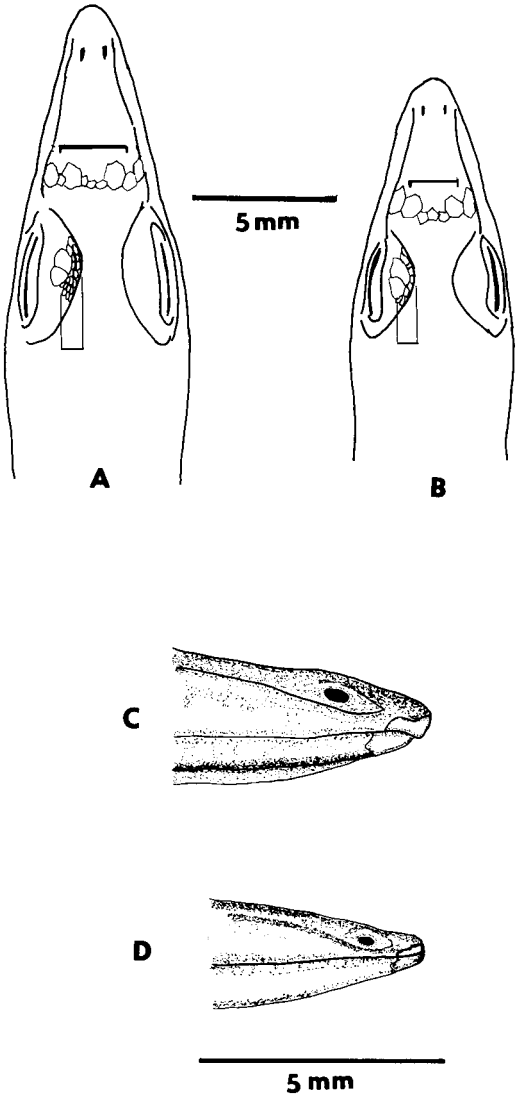

FIG. 1. Head profiles and scalation in *Anolis guazuma* (CZACC 6129) and *A. garridoi* (MNHNCU 4288, holtype): A-B Dorsal view showing scales between canthals and between supraorbital disc and supraorbital semicircle; C-D Lateral view of snouts, illustrating differences in rostral shape.

Description. — Head: narrow and elongate; head scales large, smooth, smallest anteriorly; nostril circular; nasal scale separated from rostral by 2 (two in holotype) irregularly shaped scales. Supraorbital semicircles large, in contact; 1-2 (modally 1; 1 in holotype) scale rows between supraorbital disc and supraorbital semicircles, 13-24 (bimodally 18 and 22; 18 in holotype) loreal scales with 3-4 (modally 3; 3 in holotype) loreal rows; 9-13 (11 in holotype) scales around interparietal; interparietal ovoid in contact with supraorbital semicircles; ear opening small, rounded, placed behind and dorsal to the commisure of mouth. Subocular directly in contact with supralabials, anteriorly grading into loreals; 8-9 (modally 8; 8 in holotype) supralabials to center of the eye; 7-9 (modally 7; 9 in holotype) infralabials; mental large, divided, in contact with 5-8 (modally 7; 5 in holotype) small granular postmarital

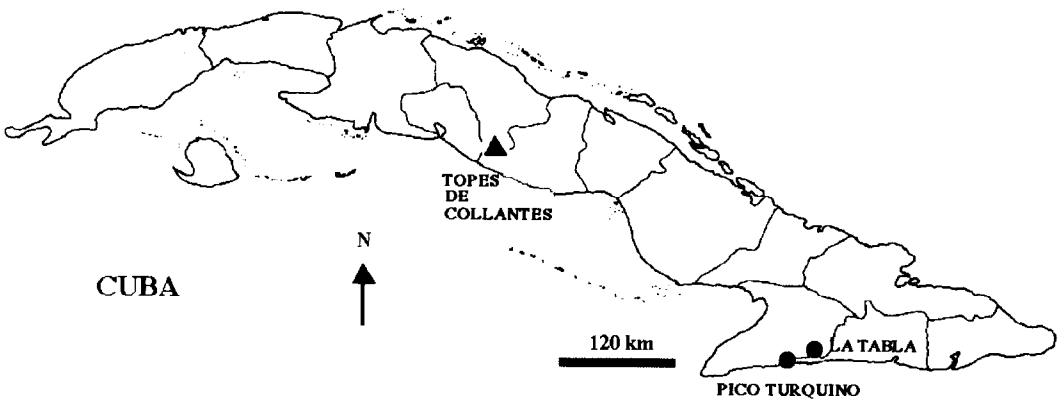

FIG. 2. Distribution of *Anolis garridoi* (triangle) and *A. guazuma* (circles).

scales. The rostral is straight and does not overhang the mental in lateral view.

Trunk: dorsal scales small, granular, 28-42 (modally 30; 39 in holotype) scales counted in 5 mm; ventrals larger than dorsals, 22-32 (modally 28; 28 in holotype) scales counted in 5 mm.

Dewlap: large, present in males; scales large and arranged in rows, larger than throat scales, and about the same size as ventrals; marginal dewlap scales intermediate in size between throat and ventral scales.

Limbs, digits, and tail: limbs short, 12-15 (modally 13; 13 in holotype) lamellae under phalanges II and III of fourth toe; scales of limbs smooth dorsally; supradigital scales smooth; tail shorter than SVL and broad at the base.

Coloration (in life): pale gray to reddish-brown (dark phase) with black and brown lichenate markings; 3 faint triangular spots on body flanks, more evident during dark phase; some narrow dark-brown lines radiating from eye; temporal blotch dark-brown or black, more evident during light phase; a dark-brown interocular bar; black or dark-brown butterfly-like spot over sacral region; anterior side of thigh and proximal portion of tail reddish brown; 3–4 yellow dots over anterior side of thigh; dewlap dark reddish-orange, white anteriorly and centrally grading to light yellow, with yellow internal scales; belly yellowish-white; throat sometime with dark markings; throat (internal) black.

Coloration (in alcohol): Basically homogeneous grayish to beige or with dots and black markings, the temporal dark blotch evident in all males and one female does not reach ear opening, some narrow dark-brown lines radiating from eye, posterior part of the head dark brown delimited by one V shaped mark in 60%, absent in 40%, supra orbital bar present in 83%; 3 faint triangular spots on body flanks (60%); butterfly-like spot over sacral region; belly white or only lightly flecked with gray.

Mean measurements. — The mean (±1 SE) of 5 adult males and 3 adults females (the male holotype in parentheses) are (in mm): SVL 39.5 ± 1.07 males; (39.4), 36.5 ± 0.03 females; HL 12.2 ± 0.28 males; (12.3), 10.8 ± 0.007 females; HW 5.5 ± 0.06 males; (5.5), 5.1 ± 0.007 females; FL 7.1 ± 0.026 males; (7), 6.7 ± 0.05 females; TL 5.7 ± 0.06 mm males; (5.6), 5.3 ± 0.05 females; BL 5.5 ± 0.02 males; (5.7), 5.3 ± 0.03 females.

Distribution. — *Anolis garridoi* is known only from the proximity of the type locality, Topes de Collantes, Sierra de Trinidad, in south-central Cuba. This locality is separated by more than 400 km from the Sierra Maestra, in eastern Cuba where *A. guazuma* lives (Fig. 2). These are two highest mountain ranges in Cuba and between them there are no other heights above 350 m.

Etymology. — This new species is named in honor of the eminent Cuban herpetologist, Orlando H. Garrido.

Natural History. — *Anolis garridoi* occurs in hardwoods and is sympatric with another

twig anole, *A. angusticeps* in Topes de Collantes. Likewise *A. guazuma* is also sympatric with *A. angusticeps* in the Sierra Maestra, but *A. angusticeps* is an islandwide species distributed from sea level to mountain areas. From 10 animals observed in the anole. From 10 animals observed in the field, four were on twigs, two on branches, two on leafs, one on leaf litter and one on a shrub trunk (L. M. Diaz, unpublished data; J. Lossos, pers. comm.). When the observer located one animal, it moved slowly, orienting its body on the opposite side of the twig from the disturbance. Two females were observed in the field. The first was watched for 42.5 minutes from a distance of five meters. It walked 19 times, most just a step or two, and jumped three times. It also caught an insect. The second female was watched for 23.5 minutes from a distance of 2.3 m. It is possible that this animal was disturbed by the proximity of the observer. It walked or crept 10 times, ran four times and jumped one. It also bobbed at least five times (J. Lossos, personal communication). All the animals were found between 30 cm and 3 m above ground level ($\bar{x}$ ± SE; 1.78 ± 0.42 m, males; 1.50 ± 0.16 m, females). Perch diameter was 0.7 to 4 cm (2.56 ± 0.61 cm, males; 2.0 ± 1.59 cm, females). Captive males chose shaded areas and avoided the direct sunlight during the morning and midday. The same situation was observed for three males and three females in the field. The lizards remain motionless most of the time, moving head and eyes independently of each other, catching prey with a very fast motion like a "sit-and-wait" predator. Movement along the twigs is very slow and occasionally the lizards touch the surface of the twig with the tongue. They also were observed to hold the twig with their semiprehensile tail when catching prey or moving to another twig. One male made an agressive display by raising the nuchal and dorsal crest toward an intruding male. During the display, the temporal blotch turned darker and extended to the posterior edge of the orbit. The lizard then oriented his body perpendicular to the twig, the body became compressed laterally, and head bobbing commenced. The lizard increased the amplitude of the head bobs and pushups, and during the last head bob it extended its dewlap. Occasionally, the encounter finished with movement of the resident towards the intruder, sometimes biting, with the intruder finally escaping and trembling his tail tip.

Remarks. — We found the paratypes CZACC 7281 in the old Academy of Science collections and AMNH 96499 illustrated in Schwartz and Henderson (1985: 52, Plate II-3); both were refered to as *A. angusticeps*. The illustration of AMNH 96499 shows the body color pattern and the right dewlap coloration in correspondence with our description.

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APPENDIX I

Specimens Examined

Anolis guazuma (12). — MNHNCU 2044 1.5 km al S de La Tabla north foot hills of Sierra Maestra, 547 m a.s.l. August 1989, collected by Richard Thomas and S. Blair Hedges.; CZACC 6121-30 (including holotype) La Emajagua, Pico Turquino, 600 m a.s.l., collected by Raúl Cabrera and Orlando H. Garrido.