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Correspondence

Morphology and colouration of male *Anolis datzorum* (Squamata: Polychrotidae)

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Anolis datzorum was described by Köhler, Ponce, Sunyer & Batista (2007) based on females and a juvenile collected at La Nevera in the Serranía de Tabasará (the eastern section of the Cordillera Central), Comarca Ngöbe-Buglé, western Panama, in January 2006. In the original description, two additional female (SMF 86380, SMF 86642) and one male specimen (MHCH 65, collected by Marcos Ponce in 2002) were assigned to this species, extending its known distribution by about 100 airline km NW into Parque Internacional la Amistad.

Fieldwork conducted around La Nevera in August 2008 produced two specimens (SMF 89460 subadult; SMF 89461 adult, Fig. 1A), which represent the first males available from the type locality of *Anolis datzorum*. In March 2009 we collected a third male (SMF 89704, adult) in the Reserva Forestal La Fortuna (Chiriquí Province), about 50 km west of La Nevera along the Cordillera Central. It is the purpose of the present paper to describe the external and hemipenial morphology as well as the colouration of these specimens.

The format and terminology of the description generally follows Köhler et al. (2007). The comparative specimens examined are MCHC 65, SMF 85067, 85093, 86380, 86642, 89114 (*Anolis datzorum*) and SMF 86930–2 (two males and a juvenile of *Anolis laeviventris* from „Costa Rica, Prov. Alajuela, NNW Zarcero, 1 km east of Zapote, at Río Tapesco, 1680 m a.s.l., 10°13'35"N/84°24'29"W"). Abbreviations for museum collections are MHCH (Museo Herpetológico de Chiriquí, David, Chiriquí, Panama), and SMF (Senckenberg Forschungsinstitut und Naturmuseum Frankfurt). Nomenclature of scale characters follows that of Köhler (2008). Terminology for hemipenial morphology follows that of Myers et al. (1993) and Savage (1997), for dewlap morphology Fitch & Hillis (1984) and Savage (2002). Snout-vent length and tail length were measured with a ruler to the nearest mm. Scale sizes were measured using the ocular micrometer of a stereo microscope (Leica MZ 12) and rounded to the nearest 0.01 mm. All other measurements were made using precision calipers and rounded to the nearest 0.1 mm. Head length was measured from the tip of the snout to the anterior margin of the ear opening. Snout length was measured from the tip of the snout to the anterior border of the orbit. Head width was determined as the distance between the oral ricti. Dorsal and ventral scales were counted at midbody along the midline. Tail height and width were measured at the point reached by the heel of the extended hind leg. Subdigital lamellae were counted on phalanges ii to iv of the 4th toe. Where variation in the bilateral symmetry of scale characters is present, the latter are given right side/left side. The capitalized colours and colour codes (the latter in parentheses) are those of Smithe (1975–1981). Abbreviations used are SVL (snout-vent length), HL (head length), HW (head width), SS (supraorbital semicircles), IP (interparietal plate), SO (subocular scales), SPL (supralabials), and INL (infralabials).

Morphometrics and scalation

The three male specimens agree well with the type and referred specimens in terms of general scale appearance and carination. Thus, the following description focuses on measurements and counts that show variation in SMF 89460, 89461 and 89704. Characteristics of SMF 89460 and 89704 are given in parentheses, separated by a semicolon, only in the case of deviation from SMF 89461. Adult male as indicated by everted hemipenes, well-developed dewlap and habitus (subadult male as indicated by well-developed dewlap and habitus; adult male as indicated by everted hemipenes, well-developed dewlap and habitus); SVL 47.0 (33.0; 44.0) mm; tail complete; tail length 78.0 (56.0; tail incomplete) mm, tail length/SVL ratio 1.83 (1.70; tail incomplete); tail height 2.6 (1.7; 2.2) mm, tail width 2.3 (1.5; 1.7) mm; axilla to groin distance 19.5 (14.3; 19.1) mm; HL 13.0 (9.6; 12.9) mm, HL/SVL ratio 0.28 (0.29; 0.29); snout length 6.5 (5.1; 6.4) mm; HW 8.9 (7.0; 8.2) mm; longest toe of adpressed hind limb reaching to a point between tympanum and eye; shank length 9.1 (7.9; 8.9) mm, shank length/

HL ratio 0.70 (0.82; 0.69); 6 postrostrals; 6 (7; 7) scales between nasals; well-developed supraorbital semicircles separated by 2 (1; 0) scale rows; supraorbital disc composed of 10–12 (9–11; 10) distinctly enlarged scales; circumorbital row less rudimentary than in holotype, therefore, only one (most/1; most) supraorbital in contact with SS; 3/2 (3/2; 2/2) elongated superciliaries, anterior one about 1.5/2 (1.5/2; 2) times the size of posterior (second) one; 4–5 (2–5; 2–5) rows of small keeled scales between enlarged supraorbitals and superciliaries; IP 1.15 × 0.80 (1.13 × 0.71; 1.84 × 1.07) mm (length × width), canthal ridge composed of 3 (3; 4) large and 3/4 (4/4; 4/5) small anterior canthal scales; nine (7; 7) scales present between second canthals; eleven (6; 8) scales present between posterior canthals; 45/39 (36/34; 47/41) keeled loreal scales in a maximum of 7 (7/6; 7) horizontal rows; 8 (11/9; 8) subocular scales; 7 (8/7; 7/6) supralabials to level below center of eye; 2/3 (2; 3/3) suboculars broadly in contact with supralabials; ear opening 0.6 × 1.5 (0.5 × 1.1; 0.4 × 1.6) mm (length × height); 6 (6; 5) postmentals; 7/6 (8/7; 7) infralabials to level below centre of eye; dewlap (Fig. 1B, C, D) moderately-sized, extending from about level below anterior border of eye to approximately 4.1 (2.5; 4) mm posterior to axilla; 8 gorgetal-sternal rows, some of which are discontinuous or broken up medially, comprising 8–16 scales each; a weakly developed nuchal crest present (barely discernible); 8–10 (5–7; 5–7) medial rows of dorsal scales slightly enlarged, largest dorsal scales about 0.38 × 0.33 mm (length × width; body scale sizes were not measured on SMF 89460 and 89704); about 54 (44; 52) medial dorsal scales in one HL; about 80 (71; 79) medial dorsal scales between axilla and groin; average diameter of lateral scales 0.23 mm; ventrals at midbody about 0.40 × 0.34 mm (length × width); about 38 (44; 44) medial ventrals in one HL; about 64 (65; 57) medial ventrals between axilla and groin; 138 (130; 128) scales around midbody; largest scales on dorsal surface of forelimb about 0.50 × 0.68 mm (length × width); 26 (26; 24) lamellae under phalanges ii–iv of fourth toe; 11 (11; 9) scales under distal phalanx of fourth toe; six (4; 6) slightly but discernibly enlarged postcloacal scales (Fig. 1E), more or less symmetrically arranged in two groups, wider than long (rounded, about as wide as long; wider than long), the largest one being 0.66 (0.35; 0.60) mm wide, situated 5–6 (4–5; 5–7) scale rows posterior to cloacal opening.

Colouration in life

The subadult male (SMF 89460), closely resembling the adult males (SMF 89461, Fig. 1A, and SMF 89704), was recorded as follows: Dorsal ground colour Sepia (219), grading into Drab-Gray (119D) laterally; dorsal and lateral surfaces mottled with Sepia (119) and Raw Umber (123), showing shadings of Verona Brown (223B) and Bunting Green (150); body with a series of Verona Brown (223B) dorsolateral blotches bordered by Sepia (119) and connected by middorsal chevrons; center of snout Bunting Green (150) with Sepia (119) longitudinal lines; a Verona Brown (223B) interorbital stripe and two postorbital stripes of the same colour bordered by Sepia (119); lateral surface of head dirty white with a suggestion of Yellow-Green (58); ventral ground colour Cream Color (54) with a suggestion of Pistachio (161) at midventer and fine Cinnamon (123A) mottling; iris Cinnamon (123A); dewlap Orange Yellow (18); sternals and posterior marginals dirty white with a suggestion of Pistachio (161), grading into Cream Color (54) towards the gorgetals and anterior marginals; some gorgetals and sternals with Light Neutral Gray (85) centers.

Hemipenis

The hemipenes (Fig. 2) are about 5 mm long and relatively stout. The lobes are short and hemispherical. The sulcus spermaticus emerges from the cloaca caudally between the two organs and is circular around the base of the truncus to the sulcal side, where it changes direction and runs towards the apex. It is bordered by well-developed fleshy lips. On the base of the apical region the sulcus spermaticus opens into an unornamented sulcal field that stretches over the sulcal sides of both lobes. The asulcal surface of the lobes is covered with fine calyces that become coarser towards the center and the base of the lobes and gradually turn into folds. At the base of the apical region on the asulcal side between the lobes, a prominent asulcal processus is developed. The asulcal side of the truncus is covered with an ornamentation of transversal folds.

Natural history

Both individuals from La Nevera were encountered at night, sleeping on vegetation. The young male was found on a fern leaf 1 m above a small creek at about 1600 m a.s.l., the adult male on a thin branch covered with foliose liverworts, 3 m above the ground at 1800 m a.s.l. The surroundings can be characterized as premontane rainforest which seems little disturbed, except for some trails and minor wood extraction by locals. Between 1500 and 1600 m a.s.l., close to the creek where we found the subadult specimen, the forest is broken up by a clearing intended for cattle, while around the 1800 m-contour minor clearings created by wind breakage and landslides are scattered on the steep slopes of the Caribbean versant just below the continental divide. Reptile species that we recorded at La Nevera include *Anolis microtus* Cope, 1871; *A. pseudopachypus* Köhler, Ponce, Sunyer & Batista, 2007; *A. pseudokemptoni* Köhler, Ponce, Sunyer & Batista, 2007; *Dendrophidion paucicarinatum* Cope, 1894; and *Bothriechis lateralis* Peters, 1863. While we could not detect any ectoparasites on the adult male, the subadult individual carried 16 acarians on the dewlap (six of which are visible in Fig. 1C), another five in the axillae and one just left of the cloaca.

The specimen from La Fortuna (SMF 89704) was found at night, sleeping on epiphytes covering a tree trunk about 2 m above the ground, in a pristine ridgetop cloud forest at 1750 m a.s.l. Reptile species that we collected in the vicinity include *Anolis fortunensis* Arosemena & Ibañez, 1993 and *Anolis microtus* Cope, 1871. This male carried 17 acarians on the dewlap (9 of which are visible in Fig. 1D), and seven in the axillae.

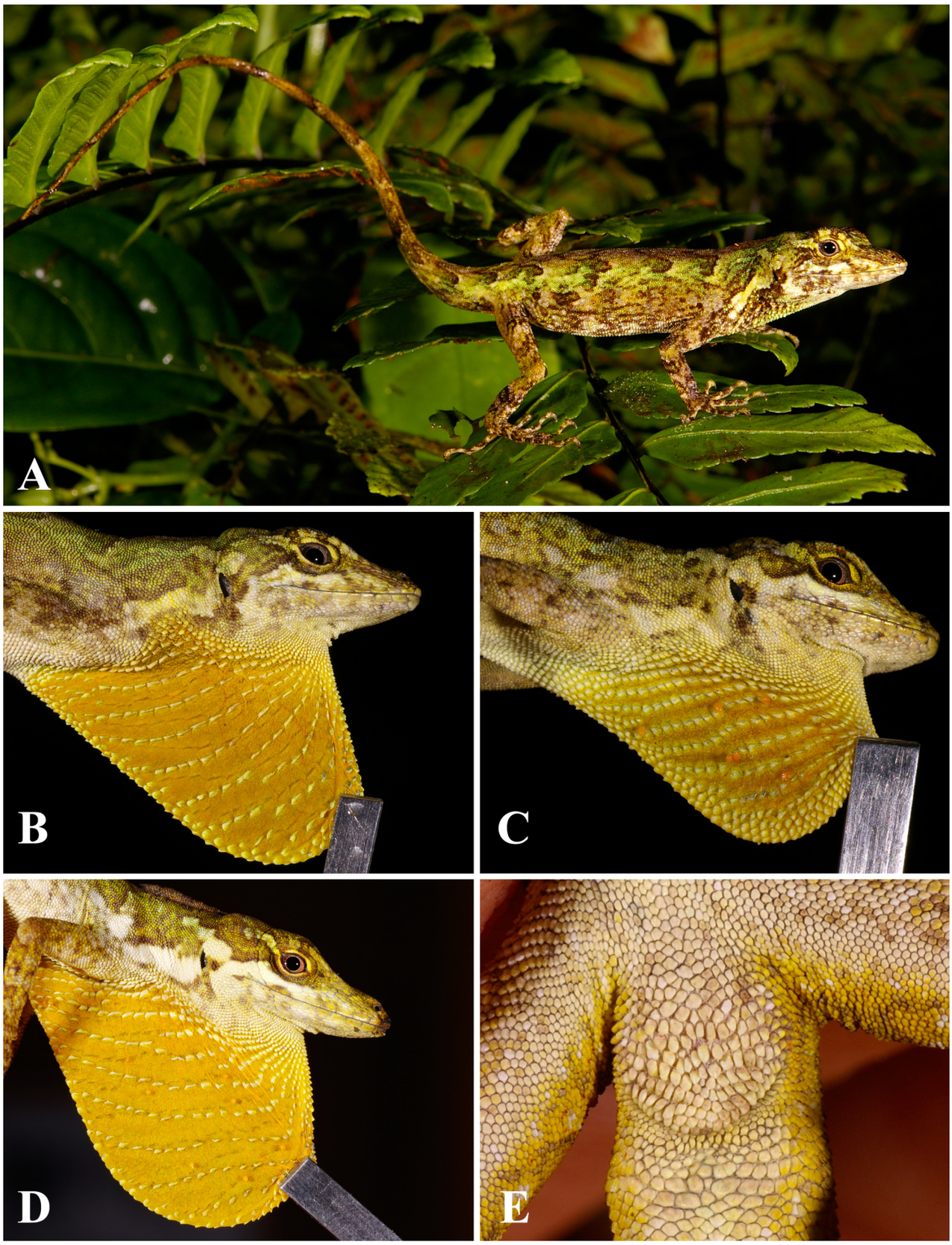

Figure 1. Adult male of *Anolis datzorum* (SMF 89461) in life (A); extended dewlaps of the adult male SMF 89461 (B), the subadult male SMF 89460 (C), and the adult male SMF 89704 (D), width of tweezers = 3 mm; cloacal region of the adult male SMF 89461 in life (E; photo was taken before the evertion of hemipenes).

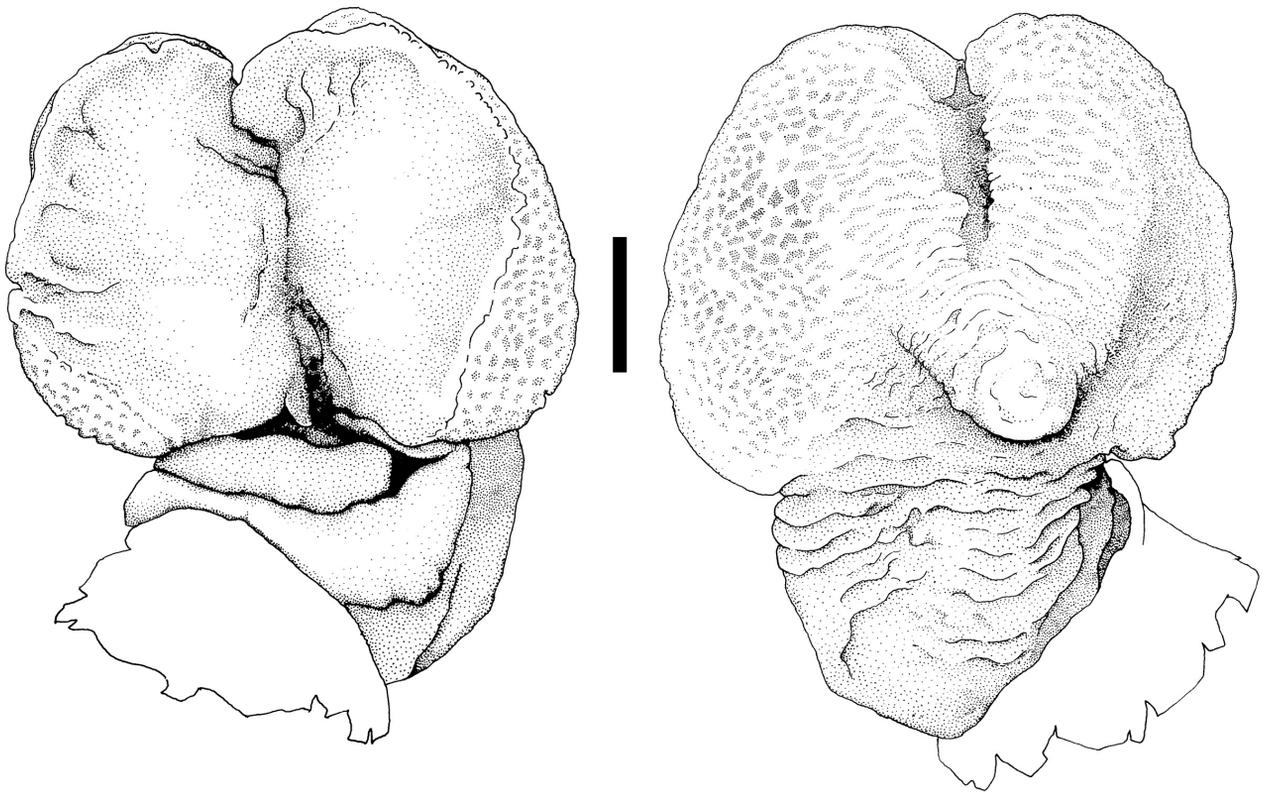

Figure 2. Hemipenis of *Anolis datzorum* (SMF 89461): left sulcate view; right asulcate view. Scale bar = 1 mm.

Relationships

The three specimens are clearly assignable to the species *Anolis datzorum,* agreeing well with the diagnostic characters given by Köhler et al. (2007) for the type and referred specimens as well as in terms of general appearance, morphometric and pholidotic characters. Morphologically, our specimens show a strong concordance with male specimen MHCH 65, which was assigned to this species in the original description, suggesting that the minor differences observed in certain measurements and scale counts (e.g., lateral compression of tail, number of loreals and canthals) are the result of individual variation. However, for a comprehensive assessment of the intraspecific variability among the known populations of *A. datzorum,* additional material is required.

Our specimens' light-coloured dewlaps, slightly enlarged postanal scales and middorsal scale rows, keeled ventrals, and relatively short legs confirm the affinities of *A. datzorum* to *A. laeviventris* Wiegmann, 1834, *A. kreutzi* McCranie, Köhler & Wilson, 2000, and *A. cusuco* McCranie, Köhler & Wilson, 2000 as originally proposed by Köhler et al. (2007).

However, *Anolis datzorum* is readily distinguished from *A. laeviventris*, which occurs close to the known distributional range of *A. datzorum*, by the lack of the single elevated, enlarged, "wartlike" white scales scattered between the laterals, by more easily discernible enlarged postcloacal scales in males, and by the multicarinate surfaces of most dorsal head scales. The hemipenial morphology of *A. datzorum* is somewhat similar to that of a specimen of *A. laeviventris* from Costa Rica (SMF 86930), concerning the form of the lobes, the ornamentation, and the presence of a well-developed asulcal processus. However in *A. laeviventris*, the sulcus spermaticus opens into two separate sulcal fields at the apical region instead of the single undivided sulcal field found in *A. datzorum*. No well-everted hemipenes of *A. kreutzi* and *A. cusuco* were available for comparison.

Type locality

Finally, we feel the need to comment on the type locality of *Anolis datzorum* (which is also the type locality of *A. pseudokemptoni* and *A. pseudopachypus*). During our visits to La Nevera in 2008, different GPS receivers unanimously indicated that the coordinates given by Köhler et al. (2007) are somewhat incorrect. In fact they correspond to a point in secondary shrub vegetation on the Pacific (southern) slope of the Cordillera Central about 600 m southwest of the actual collection area (approximately 8°30'N, 81°46'20"W), which is situated on the Caribbean slope just north of the continental divide and exhibits a less secondary vegetation than characterized above.

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