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Requiem for *Anolis "malkini"*: identity with *A. triumphalis* (Nicholson and Köhler, 2014) and comments on the type locality of *A. pentaprion* Cope, 1863

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A 1000+ page manuscript guide to the lizards of Colombia, titled *Saurios de Colombia*, was developed in the 1970s by Fernando Castro-Herrera, Stephen Ayala, and collaborators, including *Anolis* expert Ernest Williams. This book, never formally published, was a monumental undertaking that contributed greatly to herpetological research on Colombian lizards in the decades following its wide distribution. In their manuscript, the authors included several nomina for species that had not yet been formally described, and most of these were included by Ayala (1986), who listed them in quotation marks. These names were *nomina nuda* and unavailable for the purposes of zoological nomenclature because Ayala (1986) included no descriptions. As a credit to the taxonomic prescience of Ayala and Castro-Herrera, several of the names listed in the *Saurios de Colombia* manuscript and by Ayala (1986) were subsequently made available via correct publication, including *Anolis ruizii* Rueda & Williams, 1986, *A. lamari* Williams, 1992, *A. danieli* Williams, 1988, *A. medemi* Ayala & Williams, 1988, *A. lyra* Poe et al., 2009, *A. anchicayae* Poe et al., 2009, and *A. urraoi* Grisales-Martínez et al., 2017.

One manuscript name in the *Saurios de Colombia* manuscript was not listed by Ayala (1986) and has remained enigmatic: *Anolis* "*malkini*". This purported species was named after the collector Borys Malkin (1917–2009) and has been recognized informally by herpetologists working in Colombia as a form similar to the well-known Central American species *A. pentaprion* but inhabiting lowland sites along Colombia's Pacific coast. In this context, the epithet "*malkini*" has been used to allow identification of a species in need of formal description, but it also has been treated in error as an available name (e.g., Rengifo et al., 2015). A description of *A.* "*malkini*" was never published, and this binomen has no status in zoological nomenclature.

In 2014 Kirsten Nicholson and Gunther Köhler described *A. triumphalis* from the Darién of Panama. This species, with a type locality just west of the one for *A. pentaprion*, is essentially identical to *A. pentaprion* but for the dewlap colour, which is purple-pink in *A. pentaprion* and red and yellow in *A. triumphalis*. Here we present evidence that the lowland northern Pacific-coast South American anole often referred to as *A.* "*malkini*" is properly called *A. triumphalis*, and that the range of *A. triumphalis* extends from the Darién in Panama south to Colombia and Ecuador. In this context we also discuss the geographic status of type material of *A. pentaprion*.

Materials and Methods

All authors have performed fieldwork in Pacific Colombia to collect and photograph anoles that would generally be assigned to *A.* "*malkini*". The first author also examined preserved specimens at the Museum of Comparative Zoology (Cambridge, Massachusetts, USA) from Colombia (MCZ 126233 from "Colombia: Cano Docordo betw. Cucurrupi + Noanama on Rio San Juan, Dept. Choco"; ca. 4.5523°N, 76.9628°W) and Ecuador (MCZ 158388 from Ecuador: Esmeraldas; Estacion forestal 'La Chiquita' 14.4 km SE San Lorenzo; 1.2106°N, 78.7378°W), both accessioned as *A.* "*malkini*", and scored one of these individuals for characters customarily collected for anoles (e.g., Williams et al., 1995; Köhler, 2014). The second author scored a living, subsequently released individual he identified as "*A. malkini*/*triumphalis*" from Arusi, Nuquí, Chocó, Colombia using the same standard. We also compared data from the type specimen of *A. triumphalis*

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(SMF 98033, housed in the Naturmuseum Senckenberg, Frankfurt, Germany) reported by Nicholson and Köhler (2014) with our data for MCZ 126233, a specimen that had been earmarked for paratype status to describe "*malkini*" (Ernest Williams, pers. comm. to SP in 1993), and the live Arusi individual.

For comparison of these three specimens, we only include those characters clearly comparable between the scoring used in the description of *A. triumphalis* and by the two of us. It should be noted that most characters used in anole taxonomy can be readily interpreted between publications, with only subtle differences or subjective scoring in a few characters (e.g., Williams et al., 1995; Köhler, 2014). Each specimen was scored for snout-to-vent length (SVL); head length; head width; condition of dorsal head scales; number of postrostral scales; condition of circumnasal; condition of supraorbital semicircles; number of superciliaries; length of interparietal scale; number of scales between interparietal and supraorbital semicircles; condition of canthal ridge; number of scales present between second canthals; number of rows of loreal scales; number of supralabials to level below centre of eye; subocular scales relative to supralabial scales; height of ear; condition of mental; number of postmental scales; condition of dorsal, lateral, and ventral body scales; condition of caudal scales; condition of postcloacal scales; condition of axillary region; condition of digital pads; dewlap size; and colour pattern (Table 1). We also compared our photos of live individuals to photos and external description of *A. triumphalis* by Nicholson and Köhler (2014).

Results

Our comparisons of character states between the type specimen of *A. triumphalis* with MCZ 126233 and a live *pentaprion*-like anole from Arusi, Choco, Colombia (Table 1), show no diagnostic differences and only very minor differences attributable to variation. Images of live individuals from populations of anoles from the Pacific coast lowlands of Colombia (Fig. 1), informally assignable to *A.* "*malkini*", depict colour patterns, scalation, and body proportions consistent with those reported for *A. triumphalis*. The dewlap of the adult male Arusi lizard (Fig. 2) clearly has the colour of the dewlap typical of *A. triumphalis*.

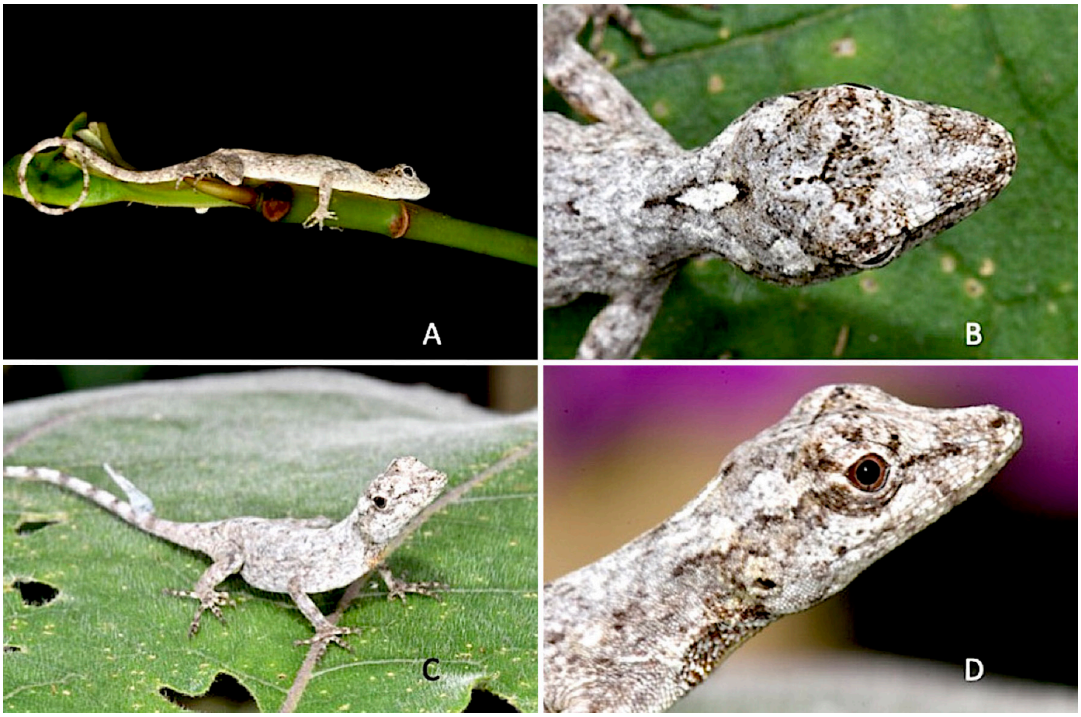

Figure 1. A juvenile *Anolis triumphalis* from San Cipriano, Valle de Cauca, Colombia. (A) In situ position. (B) Head in dorsal view. (C) Whole body view. (D) Head in lateral view. Photos by Tom Kennedy.

Table 1. Comparison of three *Anolis* specimens assignable to *A. triumphalis*. Character states of SMF 98033, the holotype of *A. triumphalis*, are from Nicholson and Köhler (2014). Those of MCZ 126233 and a living lizard from Arusi, Nuqui, Chocó, Colombia, were scored by the authors. Lengths are given to the nearest 0.1 mm.

Character	SMF 98033	MCZ 126233	Arusi Individual
Snout-to-vent length	54.5	44.8	50
Head length	14.3	11.6	12
Head width	8.5	7.9	8.2
Dorsal head scales, condition	smooth to rugose	smooth to rugose	smooth to rugose
Postrostrals, number	6	7	6
Circumnasal, condition	contacts 1st supralabial	separated by one scale from 1st supralabial	separated by one scale form 1st supralabial
Supraorbital semicircles (SOSC), condition	well-developed, broadly in contact	well-developed, broadly in contact	well-developed, broadly in contact
Scales medially bordering SOSC	complete single row	complete single row	complete single row
Superciliaries, number	2	2	2
Superciliaries, condition	elongate, overlapping, anterior > posterior	elongate, overlapping, anterior > posterior	elongate, overlapping, anterior > posterior
Interparietal scale (IP), length	1.8 (3% of SVL)	2.0 (4% SVL)	not recorded
Scales between IP and SOSC, number	2	1	1
Canthal ridge, condition	distinct	distinct	distinct
Scales between second canthals, number	11	8	10
Loreal scale rows, number	6 or 7	6	6
Supralabials, number from rostral to centre of eye	6 or 7	7	7
Subocular-supralabials, contact	broad	broad	broad
Ear height	1.1 (0.02 SVL)	1.1 (0.02 SVL)	not recorded
Mental scale, condition	wider than long, completely divided	wider than long, nearly completely divided	wider than long, nearly completely divided
Postmentals, number	6	6	6
Dorsal body scales, condition	smooth, bulging to conical	smooth, bulging to conical	smooth, bulging to conical
Lateral body scales, condition	smooth, granular	smooth, granular	smooth, granular
Ventral body scales, condition	smooth, granular to subimbricate	smooth, granular to subimbricate	smooth, granular to subimbricate
Caudal scales, condition	keeled, middorsally enlarged, uncrested	keeled, middorsally enlarged, uncrested	keeled, middorsally enlarged, uncrested
Postcloacal scales	absent	absent	absent
Tubelike axillary pocket	absent; shallow axillary depression	absent; shallow axillary depression	absent; shallow axillary depression
Digital pads	dilated, about 3–4 times width of undilated distal phalanx	dilated, about 3–4 times width of unodilated distal phalanx	dilated, about 3–4 times width of undilated distal phalanx
Dewlap size	large, extending from level below anterior margin of eye to level of chest	large, extending from level below anterior margin of eye to level of chest	large, extending from level below anterior margin of eye to level of chest
Dewlap colour	dewlap colour yellow along scale rows and red between scales rows, appearing orange, with yellow distal margin and a mix of dark scales proximally and light scales distally, in rows of single scales	not recorded	dewlap colour yellow along scale rows and red between scales rows, appearing orange, with yellow distal margin and a mix of dark scales proximally and light scales distally, in rows of single scales (with arguably slightly darker red between scale rows

Discussion

Our comparison of morphological traits seen in the type specimen of *A. triumphalis* and the two anoles from the lowland Pacific region of Colombia lead us to the conclusion that lowland Pacific coast *pentaprion*-like *Anolis* populations in Colombia and Ecuador are best recognized as *A. triumphalis*. This conclusion extends the range of *A. triumphalis* from Darién Panama south to Colombia and Ecuador (Fig. 3). The larger range of *A. triumphalis* encompasses the type locality of *A. pentaprion*, which was described from "New Granada, near the river Truando" (ca. 7.4285°N, 77.1105°W). In 1863, the year *A. pentaprion* was described, Colombia had just changed politically from the Granadine Confederation to the United States of Colombia (it was known as the Republic of New Granada from 1830–1856). The territory of both nations comprised Panama, Colombia, parts of northeastern Peru and northwestern Brazil. Of relevance for this discussion is that at the time *A. pentaprion* was described, the Truando River was recognized to flow across northern Colombia near the Colombia-Panama border. Thus, even with a potential uncertainty over the geography due to Cope's reference to New Granada, the Truandó River locality unequivocally places the *A. pentaprion* type locality in northwestern Colombia.

Figure 2. Dewlap of an adult male *Anolis triumphalis* from Arusi, Chocó, Colombia. Photo by Rafael Moreno-Arias.

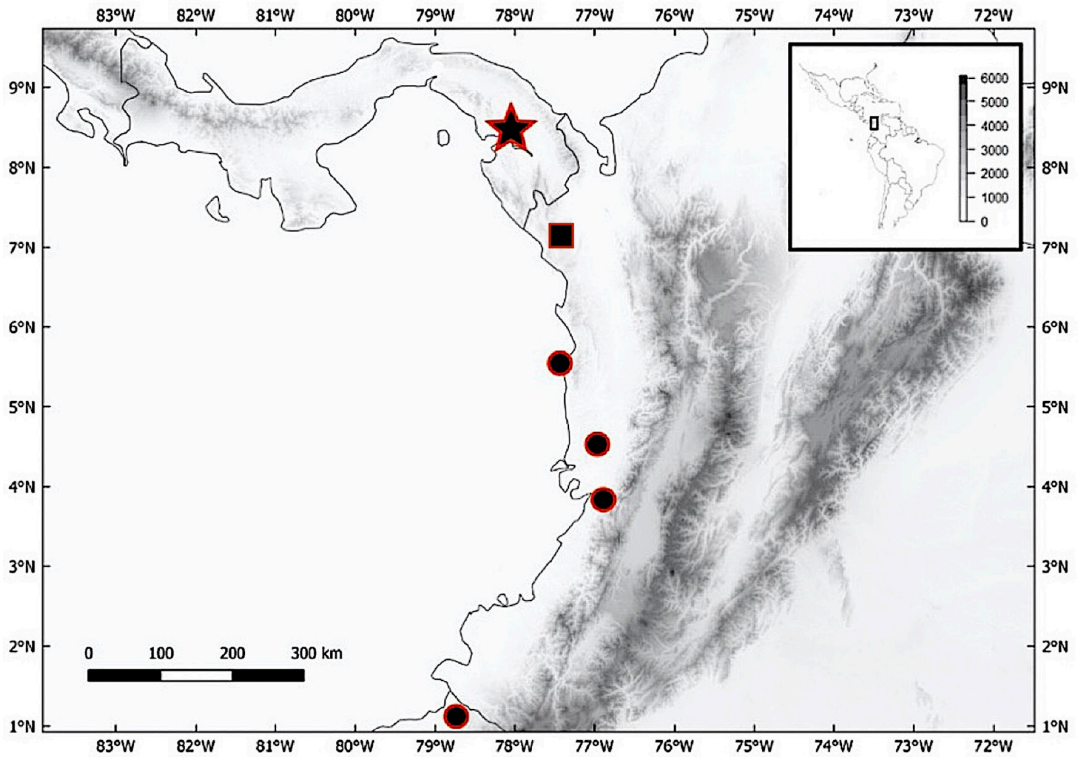

Figure 3. Localities for *Anolis triumphalis* in Colombia, Ecuador, and Panama. The type locality is marked with a star. Circles correspond to (from top to bottom) the Arusi specimen, MCZ 126233, the San Cipriano specimen, and MCZ 158388. The square corresponds to the original type locality of *A. pentaprion*. Map created by Joseph Barnett.

Köhler (2012: 12) reported that the holotype of *A. pentaprion* was lost and designated SMF 83608 from "San Rafael, ca. 15 km S Los Chiles, 10.73719°N, 84.49378°W, 60 m elevation, Alajuela Province, Costa Rica" as the neotype of the species. This designation, so distant geographically from the actual type locality in Colombia, is potentially problematic taxonomically. If accepted, this neotype designation fundamentally changes the concept of *A. pentaprion* as originally described. It is unlikely that a *pentaprion*-like species found in Costa Rica (i.e., the neotype region) is the same species as a trans-Darién *pentaprion*-like form found in the former Truandó River region (i.e., the original type locality). The *triumphalis* population of *pentaprion*-like anoles seems more likely to represent the Truandó River population (i.e., the population of the *A. pentaprion* type specimen) than does the Costa Rican neotype population of *pentaprion*-like anoles.

Designation of a neotype in this case appears to violate Article 75 of the *International Code of Zoological Nomenclature*. The reason is that a neotype was not needed in order "... to define the nominal taxon objectively" but rather was designated as a "... matter of curatorial routine" (Article 75.1). Clearly, the qualifying condition of Article 75.3.6, that "... the neotype came as nearly as practicable from the original type locality", was not met. We flag this issue but advocate no nomenclatural action at this time.

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