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## The bizarre false-chameleons (clade *Chamaeleolis*, *Anolis*) from Cuba

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Cuba and Hispaniola are characterized by the presence of “unique anoles” not found on any of the other Antillean islands (Losos 2009, Mahler et. al. 2016). Cuban twig–giant anoles from the “*Chamaeleolis*” clade (Poe et al. 2017) have been of interest to anole biologists due their highly derived morphology, aberrant way of life, and extreme camouflage (Fig. 1). Moreover, these species are poorly understood; very few papers regarding their taxonomy, evolution, and ecology have been published (Rodríguez-Schettino 1999 and literature therein; Losos 2009; Mahler et. al. 2016; Cádiz et. al. 2018).

However, over the past three decades, multiple researchers have gathered enough specimens and tissue samples to investigate the species delimitation, biogeography, and evolution within this understudied group of anoles. Anoles of the *Chamaeleolis* clade have been historically diagnosed based on few morphological characters and the most recent description (*A. sierramaestrae*) lacks proper diagnosis.

We are recognizing species based on the evolutionary species concept, utilizing quantitative analyses on large morphological datasets in combination with molecular phylogenetic analysis (mtDNA, nDNA) of several populations for each described taxon along the Cuban archipelago. We are currently testing several hypotheses involving potential adaptive radiation scenarios in the Cuban archipelago by considering the Cuban paleo–island and current terrain accidents. We are also analyzing the dentition morphology between species and clades using high-resolution X-ray micro-computed tomography (Fig. 2) to better understand the evolution of heterodonty within the group.

Recently, Prötzel et al. (2017) reported that true chameleon species (*Calumma* spp.) have bony tubercles on the skull that are visible through their scales and fluoresce under UV light. After examining Cuban false-chameleons under UV light, we have identified similar fluorescent tubercles associated with hyperossified regions of the skull (Fig. 3). We will need to review this finding more thoroughly to determine if there is any correlation between the fluorescent

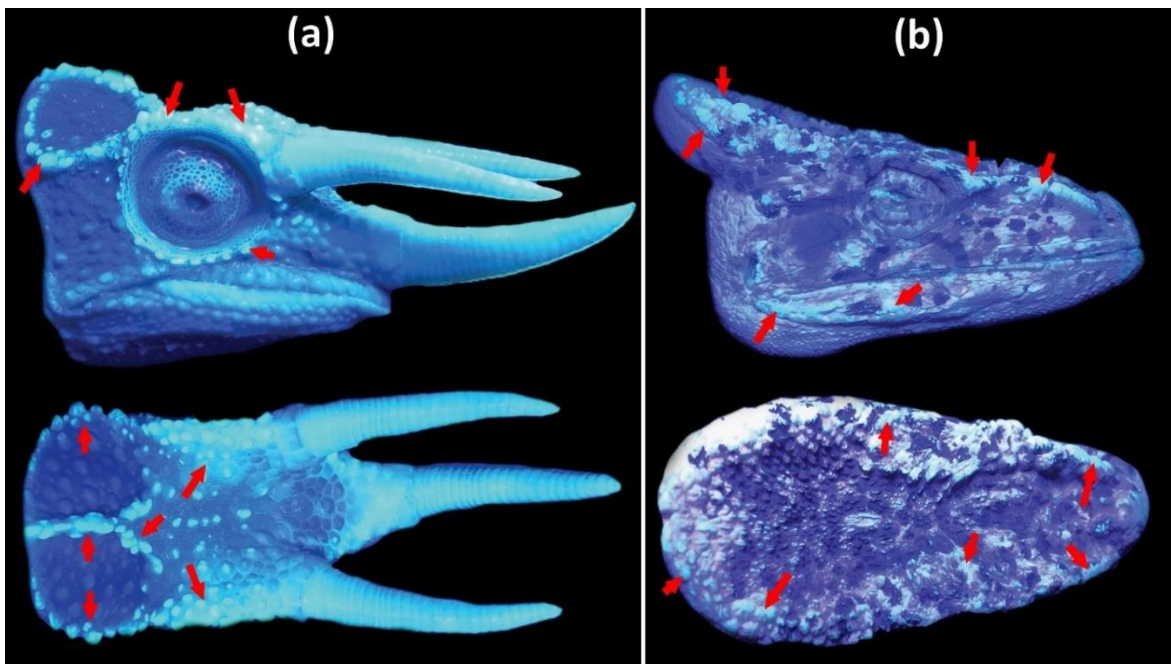
tubercles, aberrant lifestyle, and extreme camouflage present in these two highly divergent lineages of lizards.



**Fig. 1** – (a) *Anolis chamaeleonides* (perching on a branch, note the similar coloration between the anole and bark), (b) *Anolis barbatus*, (c) *Anolis porcus* and (d) Osvaldo López (biologist) holding a female of *Anolis porcus* in eastern Cuba. Photographs by Nils Navarro (a, c), Raimundo López-Silvero (b) and Yasel U. Alfonso (d).



**Fig. 2** – Micro-computed tomography scan of *Anolis chamaeleonides* USNM 51891 collected on 1914 from La Mulata, Pinar del Rio, Cuba.



**Fig. 3** – Vouchers museum specimens examined under UV light. (a) *Trioceros jacksonii* UF 174349 and (b) *Anolis chamaeleonides* USNM 51891. Fluorescent tubercles are indicated with a red arrow. Photographs by Yasel U. Alfonso.

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