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Osteological intraspecific variation in Taxonomy: a look into the green iguana

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INTRODUCTION & AIM

Taxonomy studies of extant taxa generally focus on external morphology, often ignoring all intraspecific variation, thus possibly creating morphospecies that do not correspond to valid taxonomic units (Krell, 2004). Additionally, osteological studies are often neglected, which could provide a lot of new information regarding morphological traits. Hence, studying not only osteology but also intraspecific variation in skeletal structures could be of great value for species description and separation. To better assess the relevance of intraspecific osteological variation for taxonomy, here, we study this variation in the skeleton of the species *Iguana iguana*.

METHOD

- We analyzed the axial and appendicular skeleton of nine specimens of *Iguana iguana;*
- We use X-ray computed tomography, 3D segmentation and osteological analyses.

RESULTS & DISCUSSION

- We observed considerable individual variability in skull bones, including differences in shape and proportions; variability in the atlas vertebra (Fig. 1); and variation in the number of ribs; and, most notably, in caudal vertebrae morphotypes (Fig. 2).
- The caudal vertebrae displayed significant variation among individuals, comprising seven distinct morphotypes that exhibited a consistent sequential pattern while also differing in count and presence. No specimen shared the same caudal vertebral pattern as another.

CONCLUSION

Evaluating intraspecific variation may help prevent the overestimation of the number of existing species. Moreover, understanding the estimated degree of variation in a determined extant taxon could be extrapolated to its fossil representatives. The present study highlights the importance of incorporating osteological individual variation into taxonomic analyses.

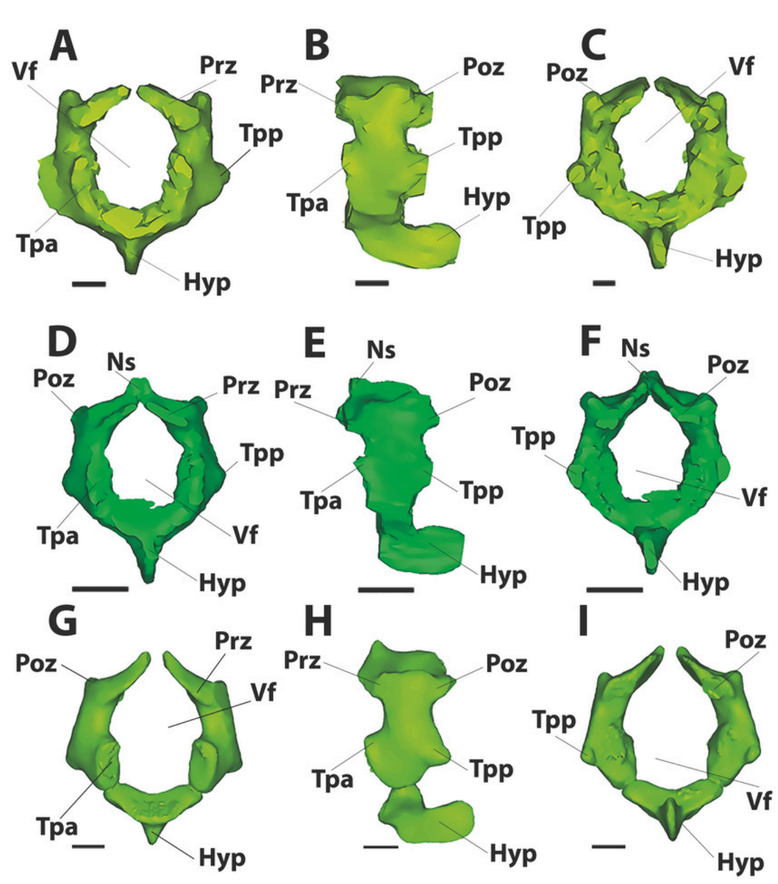

Figure 1. Atlas vertebra: (A-C) Ig04 specimen, (D-F) Ig01 specimen, and (G-I) UF:Herp:181922 specimen in anterior, lateral, and dorsal view. Abbreviations: Hyp, Hypapophysis; Ns, Neural spine; Poz, Postzygapophysis; Prz, Prezygapophysis; Tpa, Anterior transverse process; Tpp, Posterior transverse process; Vf, Vertebral Foramen. Scale bars 0.3 cm in (A; B), 0.2 cm in (C; G-I), 0.5 cm in (D-F).

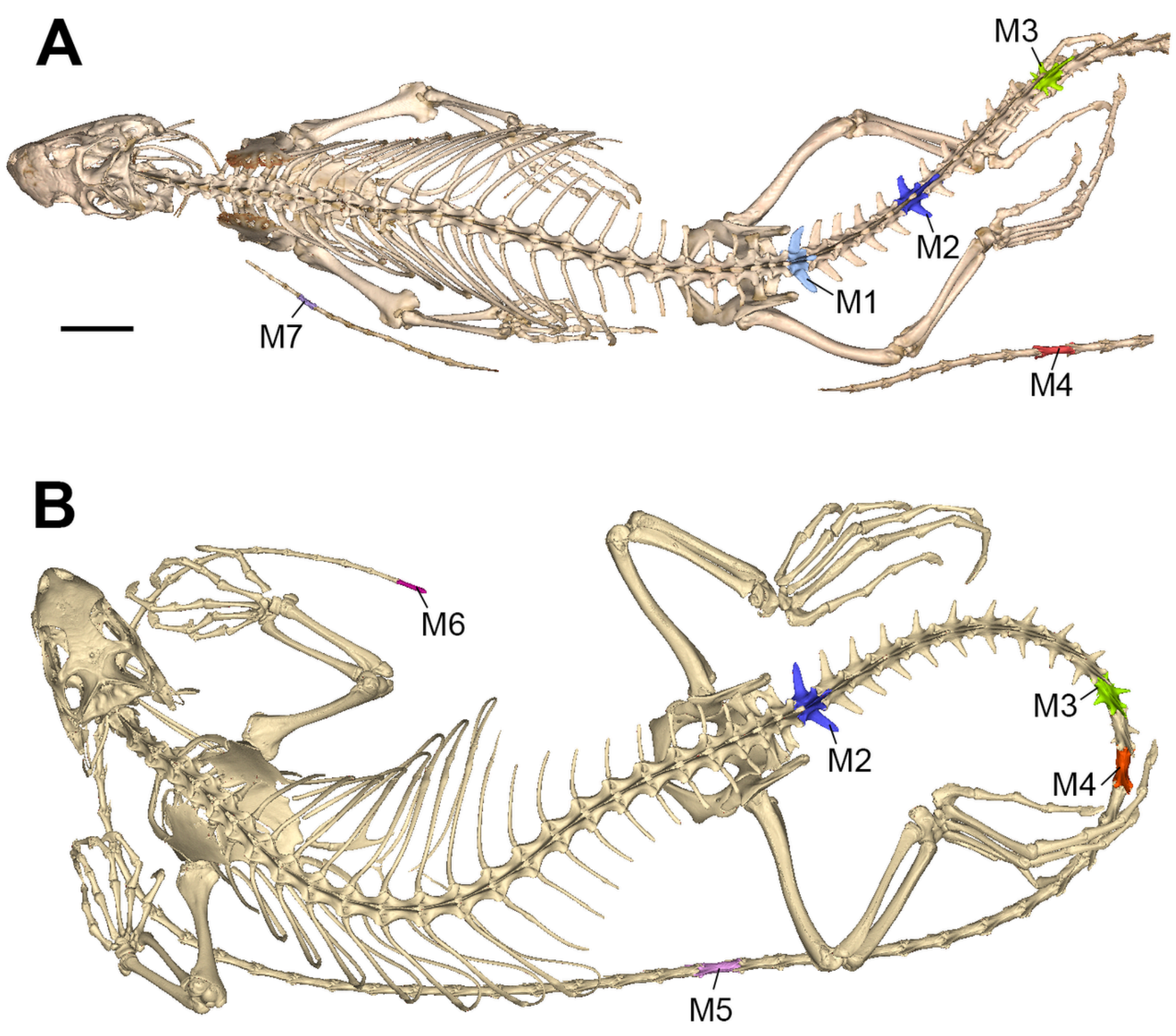

Figure 2. Skeleton of (A) Ig04 and (B) UF:Herp:181922 specimens with coloured caudal morphotypes. Abbreviations: M1-M6, morphotype one to six. Scale bars 5 cm.

REFERENCES

Krell, Frank-Throsten. (2004). Parataxonomy vs taxonomy in biodiversity studies - pitfalls and applicability of 'morphospecies' sorting. *Biodiversity and Conservation*, 13, 795-812.