
Ontogenetic variability of the intertympanic sinus distinguishes lineages within Crocodylia

Gwendal Perrichon*¹

¹Laboratoire de Géologie de Lyon - Terre, Planètes, Environnement [Lyon] – École Normale Supérieure - Lyon, Université Claude Bernard Lyon 1, Institut national des sciences de l'Université, Centre National de la Recherche Scientifique : UMR5276, Institut National des Sciences de l'Université, Institut national des sciences de l'Université – France

Résumé

The phylogenetic relationships within crown Crocodylia remain contentious due to conflicts between molecular and morphological hypotheses. However, morphology-based datasets are mostly constructed on external characters, overlooking internal structures. Here, we use 3D geometric morphometrics to study the shape of the intertympanic sinus system in crown crocodylian during ontogeny, in order to assess its significance in a taxonomic context. Intertympanic sinus shape was found to be highly correlated with size and modulated by cranial shape during development. Still, adult sinus morphology distinguishes specimens at the family, genus and species level. We observe a clear distinction between Alligatoridae and Longirostres, a separation of different *Crocodylus* species and the subfossil Malagasy genus *Voay*, and a distinction between the *Tomistoma* and *Gavialis* lineages. Our approach is independent of molecular methods but concurs with the molecular topologies. Therefore, sinus characters could add significantly to morphological datasets, offering an alternative viewpoint to resolve problems in crocodylian relationships.

*Intervenant