ACTA PALAEONTOLOGICA POLONICA

First occurrences of neural canal ridges in Crocodylia

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Acta Palaeontologica Polonica 70 (4), 2025: 749-753 doi:10.4202/app.01269.2025

Crocodylia is a crown group inclusive of the last common ancestor of extant crocodylians, followed by successive extinct and extant taxa forming Alligatoroidea, Crocodyloidea, and Gavialoidea. Rigorous work on fossil and extant crocodylian postcrania is vital for understanding the evolution of their functional morphology. Here, we document neural canal ridges (NCRs) in the genera *Thecachampsa* and *Deinosuchus*. The morphology of the NCRs in these taxa is consistent with bony spinal cord supports that anchor the denticulate ligaments in extant taxa. To date, we have only found NCRs in the caudal vertebrae of *Thecachampsa* and *Deinosuchus*, consistent with the serial distribution of NCRs in non-avian dinosaurs. However, NCRs are present in more regions of the vertebral column in non-amniotes, and absent in Anura, Aves, and Mammalia. Many vertebrate clades await systematic surveys for NCRs, in both fossil and extant representatives. Additional methods, such as osteohistology and embryology, may shed further light on the functional morphology and biomechanical underpinnings of neural canal ridge development and evolution. Our findings expand known axial postcranial morphology in Crocodylia and broaden the known distribution of NCRs in vertebrates.

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