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Ecomorphology and bone microstructure of Proterochampsia from the Chañares Formation

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Proterochampsians are a South American endemic group of non-archosaurian archosauriforms with morphological characteristics recollecting Recent crocodilians, and therefore have been proposed as aquatic species. However, this has not been based on careful examination of anatomical and histological features. We provide a review of the morphological and histological evidence present in the skeleton of proterochampsids and discuss its implications for inferring the lifestyles of these organisms. Anatomical features such as a secondary palate, marginal dentition, palatine teeth, morphology of the tail, limb modification, and dermal armor are reviewed, and details of histological structures are described based on bone thin sections. Histological examination reveals a predominance of fibrolamellar bone tissue, suggesting rapid periosteal osteogenesis and therefore overall fast bone growth. The existence of discontinuities (LAGs) demonstrates that these animals responded to changes in their environment. Ecomorphological features do not provide definitive evidence for the lifestyles of proterochampsids, but allow us to propose a terrestrial/amphibious condition. The same is true of the histological features, particularly compactness of the bone.

Key words: Archosauriformes, Proterochampsia, paleobiology, ecomorphology, bone microstructure, Carnian, Argentina.

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