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COMPUTATIONAL MECHANICS SHEDS NEW LIGHT ON THE PALEOBIOLOGY OF EARLY TETRAPODS

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Digital modeling has been largely used to infer the paleobiology of extinct animals. These models imply assumptions and a simplification of the motion or behavior under study to obtain valuable data about functional morphology [1]. The reconstruction of soft tissues in fossil taxa is mainly based on the attachments of the musculature preserved in bones and requires to be inferred using a phylogenetic approach as the extant phylogenetic bracket (EPG). In the case of early tetrapods and early amphibians, some studies attempted to reconstruct the cranial musculature [2]. Herein, we analyze the role of the adductor musculature during feeding in living giant salamanders and in different members of the early tetrapod group of temnospondyls to deep on the feeding mechanics and ecology of extant amphibians and infer the paleobiology of the early tetrapods using Finite Element Analysis (FEA) under different loadings on 3D skull models. Our results suggest that living giant salamanders and some groups of temnospondyls presented different stress patterns, probably representing different ecological niches.

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