SUTURE MORPHOLOGY AND SKULL MECHANICS IN THE PERMIAN 'ANAPSID' *CAPTORHINUS AGUTI* AND THE ORIGIN OF AMNIOTE TEMPORAL FENESTRATION

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Ancestrally, the temporal region in the tetrapod skull was completely covered by dermal bone. This 'anapsid' condition was probably still present in the ancestral amniote; however, temporal openings like fenestrae or emarginations evolved independently at least twice in the subsequent early amniote radiations and have been retained, modified, and sometimes lost multiple times in the branches leading to mammals and reptiles. Yet, the functional backgrounds for the initial evolution of these openings are yet to be understood. They have been hypothesized to be bound to changes in jaw muscle attachment and responses to cranial forces. However, even in extant 'anapsids' such as sea turtles the completely covered temporal region is a result of secondary evolution derived from the ancestors with an emarginated cranium. Hence, they cannot be represented as a suitable analogue for the functional morphology in ancestral amniotes. Here, we use micro-computed tomography of a skull of the early Permian stem-reptile *Captorhinus aguti* as a model for an ancestral 'anapsid'. We describe in detail its skull sutures and discuss the cranial mechanics, as well as the likely arrangement of the jaw adductor musculature and how this would affect cranial force distribution and kinesis. We argue that *Captorhinus* possessed lesser-loaded regions at the jugal-squamosal-postorbital intersection, as well as the parietal-postorbital contact. This corresponds to the loci of temporal openings in other early amniotes, corroborating the hypothesis that temporal openings were evolutionarily formed in response to the reduction of lesser-loaded areas in the skull.