

GSA Connects 2022 meeting in Denver, Colorado

Paper No. 242-4

Presentation Time: 9:00 AM-1:00 PM

MORPHOLOGICAL VARIATIONS OF THE DIMETRODON BRAINCASE FROM THE LOWER PERMIAN OF TEXAS

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Discovered in 1910, The Craddock Ranch bonebed in Seymour, Texas; Baylor County, has been regarded as one of the most extensive and faunally diverse lower Permian vertebrate fossil sites in the world, and is known for an incredibly high abundance of the famous fin-back, *Dimetrodon* (Sphenacodontidae). Multiple species of *Dimetrodon* have been identified within the bonebed including, but not limited to: *Dimetrodon loomisi*, *Dimetrodon giganhomogenus*, and *Dimetrodon grandis*. Occipital complexes displaying morphological variations from the Craddock bonebed offer new functional and developmental implications which will create new methods for determining taxonomy.

The positioning of the paraoccipitals and the corresponding association with the quadrate process have not been explored to date within this context. This study tests the hypothesis that the ventral migration of the paraoccipital is a result of maturity. Initial investigations suggest juveniles possess no ventral orientation in contrast to adults which show the dorsal oriented morphology. The objective of this research will also hope to determine how occipital morphology varies across *Dimetrodon* species.

The majority of juvenile occipitals do not exhibit ventral orientation of the paraoccipitals, which is more consistently observed in the adult specimens. Juvenile specimens that do exhibit this ventral orientation underwent a broader morphological comparison that indicated these variations were hypothetically examples of different *Dimetrodon* species. Specimens exhibiting higher maturity that also exhibited a lack of downward orientation of the paraoccipitals were also broadly compared in morphology across the occipital complex overall. It was determined that downward migration of the paraoccipitals was present in *D. loomisi* and *D. gigashomogenes* but not in *D. grandis*. Even with the size difference between *D. loomisi* and *D. giganhomogenus* species-specific occipital morphological differences could not be, as of yet, fully distinguished. Further implications posed by the varying morphologies of the occipital complex suggest posture and bite force mechanics are greatly affected by the position of the paraoccipital.

Session No. 242--Booth# 106

[T123. Integrative Perspectives on Morphological Change: Shaping Our Understanding of the Fossil Record \(Posters\)](#)

Wednesday, 12 October 2022: 9:00 AM-1:00 PM

Exhibit Hall F (Colorado Convention Center)

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