THE PRESENCE OF FLUORAPATITE IN PRISMATIC CARTILAGE FROM THE PERMIAN OF TEXAS

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ABSTRACT

Prismatic cartilage in the Craddock bone bed from the lower Clear Fork Group (Early Permian) in Baylor County, Texas, belongs to a xenacanth shark (*Orthacanthus platypternus*), the only shark present in this fauna. The composition of this fossilized cartilage is fluorapatite and quartz, based on X-ray diffraction (XRD) and thin-section analyses. Under a polarized-light microscope, individual prisms can be seen. Each prism consists of concentric layers dominated by quartz and fluorapatite. The prisms are surrounded by a matrix composed of calcite and dolomite. Prismatic cartilage from an earlier xenacanth shark from the Lower Permian Archer City bone bed has a similar chemical composition based on XRD. A third sample of prismatic cartilage from a ctenacanth shark (*Ctenacanthus amblyxiphias*) from the Winfield Limestone in Morris County, Kansas, which is about the same age as the Archer City specimen, yielded a similar XRD result. This ctenacanth cartilage also has concentric layers of fluorapatite and quartz, based on thin-section analysis. The fluorapatite may have been partially replaced by silica (quartz) during the fossilization process. This suggests that the composition of prismatic cartilage in the Craddock bone bed is not unique because of age or taxonomic affinity.