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Observations on the Mesozoic Chimaeroid, *Elasmodectes* Newton 1878

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The purpose of this study is to elucidate the morphology and soft tissue anatomy of the Mesozoic chimaeroid, *Elasmodectes*; a genus originally raised for *E. willetti* from the Cenomanian of southern Britain. Since the original description, a total of 7 species have since been identified, ranging in age from the Aalenian (Middle Jurassic) to Maastrichtian (latest Cretaceous). *Elasmodectes* is mostly known from isolated cutting toothplates and incomplete specimens with calcified cartilage and dorsal fin spines. However, complete and fully articulated specimens are recorded from the Late Jurassic of Eichstätt (Germany) and Late Cretaceous of Jebel Tselfat (Morocco).

Around 20 holomorphic specimens of Elasmodectes are known, but two exceptionally well-preserved specimens; E. avitus, LF 2322, housed in the Lauer Foundation Collection (Chicago, USA) and E. willetti, NHMUK PV P73270 (Natural History Museum, London, UK) are the focus of the present study and show soft tissue preservation. The former is of interest since it appears to be a rare male individual. The latter is the only holomorphic chimaeroid so far recorded from Africa.

Elasmodectes avitus



Both species are known from anoxic deposits which have allowed outlines, cartilages and soft tissue preservation. From these two specimens, it is obvious that *Elasmodectes* possessed a fusiform body outline, with a single characteristic fin spine supporting the dorsal fin, and long median fins. The tail is homocercal with expanded dorsal and ventral lobes, in contrast to the long, whip-like condition in Recent genera.

The sensory canal system is represented by articulated lengths of semi-circular calcifications are present in the notochordal sheath. Elements of the musculature are present in both specimens; phosphatised representations of myotomic muscle fibre blocks, arranged in a zig-zag pattern, can be clearly distinguished, as can occasional parts of the dorsolateralis musculature.

The sectorial dentition comprises paired vomerine tooth plates, together with labio-lingually compressed mandibular and palatine plates with beaded tritors along the crest of the occlusal surface.

The frontal tenaculum in E. avitus is relatively long, compared to those in Recent chimaeroids, with a spatulate proximal end and an armature of posteriorly-directed denticles distally opposite a number of frontal denticles on the head forming a "tenacular complex". The scroll-like pelvic clasper is preceded by a triangular pre-pelvic tenaculum.







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