

A Late Jurassic carpetshark (*Neoselachii*, *Orectolobiformes*) from southern Germany

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Abstract

A new carpetshark, †*Palaeorectolobus agomphius* gen. et sp. nov., is described from the Upper Jurassic lithographic limestones of southern Germany. The single specimen consists of an incompletely fossilized skeleton including portions of the head, dentition, branchial apparatus, and left pectoral fin. The shoulder girdle is imperfect and only the articular region for the pectoral radials is preserved. All skeletal elements are covered by prismatic calcifications obscuring most of the details. The most conspicuous feature is the presence of short and heavily branched dermal lobes along the lateral margin of the head. This is characteristic for orectolobid sharks. The dental pattern, conversely, is more similar to carcharhiniforms. A hemiaulacorhize root, typical for orectolobiforms, and a low stout, subtriangular crown characterises the teeth. Anterior teeth are devoid of lateral cusplets, and lateral teeth generally display a small and incipient distal cusplet. The crown ornamentation consists of occasional well-developed vertical folds which originate from a transversally oriented labial crest and do not reach the apex. The combination of dermal lobes and the peculiar dental morphology is autapomorphic for this taxon. The dermal lobes identify the specimen unambiguously as a member of the *Orectolobiformes*. A designation to any known orectolobiform family is, however, currently impossible due to the mosaic of anatomical features.

Introduction

The Jurassic was indisputably an important period in the evolution and radiation of modern selachians and rays, and every new taxon contributes to our understanding of modern shark evolution. This is because these early taxa generally exemplify plesiomorphic character sets and help to trace character changes within lineages. Relatively few modern lineages of neoselachians were present in the Early Jurassic, although the fossil record of neoselachians can be traced back into the Triassic with confidence (THIES 1982, CUNY & BENTON 1999). Palaeozoic remains of neoselachians (e.g., DUFFIN & WARD 1983a, TURNER & YOUNG 1987, DUFFIN et al. 1996) are questionable because they lack a triple-layered enameloid ultrastructure, which is one of the best characters for identifying isolated neoselachian teeth (CUNY & BENTON 1999). The absence of modern neoselachian lineages before the Jurassic suggests that there was probably no modern selachian radiation event prior to the Early Jurassic (MAISEY et al. 2004).

The Upper Jurassic lithographic limestones of southern Germany (Nusplingen and Solnhofen area), and their lateral equivalents of lower Kimmeridgian age in France, are amongst the most famous fossil fish localities world-wide, and they produced well-preserved skeletons of vertebrates, especially actinopterygians and selachians (e.g., HEINEKE 1906, SAINT-SEINE 1949, KUHN 1961, SCHWEIZER 1964, LAMBERS 1999, DIETL & SCHWEIGERT 2001, THIES 2005). These specimens have captured the interest of ichthyologists since the 19th century. THIES (1995) and LEIDNER & THIES (1999) examined the placoid scales and teeth of articulated Late Jurassic neoselachians and presented short taxonomic discussions, while KRIWET & KLUG (2004) summarised the current state of knowledge and reviewed all taxa known from the old Solnhofen quarries. Recently, THIES (2005) described a new scyliorhinid from the plattenkalks of the Eichstätt region. According to these works, the following neoselachian taxa occur in the lithographic limestones of the Franconian Alb: †*Eonotidanus*, †*Notidanoides*, †*Protospinax*, †*Sphenodus*, †*Synechodus*,

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