ACTA PALAEONTOLOGICA POLONICA

Review of the dental pattern in the squalomorph shark *Protospinax annectans*, and a description of two new Jurassic shark genera

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Acta Palaeontologica Polonica 70 (4), 2025: 731-748 doi:10.4202/app.01260.2025

The extinct elasmobranch *Protospinax* is an intriguing shark known mostly from isolated teeth and rare complete skeletons. Most previous studies focused on differences in isolated teeth for taxonomic assignments, with little to no considerations of dental variations. In this study we provide a detailed morphological evaluation of the dentition of the squalomorph shark, *Protospinax* based on three skeletal remains of *Protospinax annectans* from the famous Upper Jurassic lithographic limestone of the Solnhofen area (Bavaria, Germany) with partially preserved dentitions and isolated teeth from the Kimmeridgian of Mahlstetten (Baden-Württemberg, Germany). The aim of this study is to clarify ambiguities in dental morphologies and to establish heterodonty patterns, allowing to taxonomically reassess species previously assigned to *Protospinax*. Accordingly, we consider *Protospinax annectans* (Callovian–Aptian?), *Protospinax carvalhoi* (Bathonian), *Protospinax lochensteinensis* (Oxfordian), and *Protospinax planus* (Kimmeridgian) as valid species. The species of *Protospinax bilobatus* is considered a junior synonym of *Protospinax magnus*. Furthermore, our results show that the dental morphologies of *P. magnus* and *Protospinax? muftius* are very different from those of other *Protospinax* species and rather resemble those of orectolobiforms. Consequently, we introduce two new orectolobiform genera, *Jurascyllium* gen. nov. and *Archaeoscyllium* gen. nov., to accommodate these species. The review of the species confirms a stratigraphic range of *Protospinax* extending from the Toarcian (Lower Jurassic) to the Valanginian (Lower Cretaceous).

Key words: Elasmobranchii, Protospinaciformes, Orectolobiformes, Mesozoic.

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