

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

Arnaud Begat, Eduardo Villalobos-Segura, Patrick L. Jambura, Manuel A. Staggli, Stefanie Klug, and Jürgen Kriwet

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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 Mahlsetten (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.

Arnaud Begat [arnaud.begat@univie.ac.at; ORCID: <https://orcid.org/0000-0003-0017-8346>], Manuel A. Staggli [manuel.andreas.staggli@univie.ac.at; ORCID: <https://orcid.org/0000-0002-3068-3098>], and Jürgen Kriwet [juergen.kriwet@univie.ac.at; ORCID: <https://orcid.org/0000-0002-6439-8455>], University of Vienna, Department of Palaeontology, Josef-Holaubek-Platz 2, 1090 Vienna, Austria; University of Vienna, Vienna Doctoral School of Ecology and Evolution (VDSEE), Djerassiplatz 1, 1030 Vienna, Austria. Eduardo Villalobos-Segura [eduardo.villalobos.segura@univie.ac.at

; ORCID: <https://orcid.org/0000-0001-5475-6143>] and Patrick L. Jambura [patrick.jambura@gmail.com]
; ORCID: <https://orcid.org/0000-0002-4765-5042>], University of
Vienna, Department of Palaeontology, Josef-Holaubek-Platz 2,
1090 Vienna , Austria. Stefanie Klug [stefanie.klug@gauss.uni-goettingen.de]
; ORCID: <https://orcid.org/0000-0001-9437-7236>], Georg-August University School of Science
(GAUSS), Georg-August Universität Göttingen, 37077 Göttingen, Germany.

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