

A review of the characters of the edentulous pachycormiforms *Leedsichthys*, *Asthenocormus* and *Martillichthys* nov. gen.

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Abstract

With their phyletic trend of non-ossification of their skeleton, the members of the Mesozoic neopterygian family Pachycormidae have long presented problems to systematists. Recent works on this family are revisited with additional data for *Leedsichthys*, *Asthenocormus* and *Martillichthys* (nov. gen.) from the Callovian Oxford Clay around Peterborough (UK). A revised diagnosis of the Family Pachycormidae is presented, along with an updated strict consensus tree for the Pachycormiformes, showing the edentulous pachycormiforms as a discrete clade.

Introduction

The Pachycormidae were an extensive family of Mesozoic neopterygians, ranging in adult size from 300 mm (DELSATE 1999) to 8900 mm (LISTON pers. obs.), and extending from the Toarcian to the Campanian (LAMBERS 1992).

PATTERSON (1982) has noted that WOODWARD (1891) first used the term Actinopterygii to describe the chondrosteans, holosteans and teleosts as a natural group of fishes, based on COPE's 1871 grouping of Actinopteri, and has speculated that this was prompted by his 1889 work on fossil sturgeons. It seems likely that the more specific catalyst for WOODWARD's assessment that this was a natural group of fishes, was alluded to in the reference within his fossil sturgeons survey to there being traces of a new very large fish from the Oxford Clay, with stiff branched rays and irregular dermal bones that made it very 'Acipenseroid'-like (WOODWARD 1889a). This was the first mention of the fish that WOODWARD would later the same year describe as *Leedsichthys problematicus* (1889b), a name that he would soon attempt to change (to the *nomen novum* of *Leedsia problematica* 1890b), despite having already published the original name a further three times beforehand (WOODWARD 1889c, 1890a, WOODWARD & SHERBORN 1890). It is significant that when, in the following year (January 1891), WOODWARD published the section of the British Museum Fossil Fishes Catalogue that dealt with the 'acipenseroid' fishes (volume 2, WOODWARD 1891), that this fish was not mentioned, and when the subsequent volume (3, WOODWARD 1895) emerged in 1895 he classified it as part of the new family Pachycormidae. It appears likely that changing his original assessment of this particular fossil from his suborder Chondrostei to his suborder Protospondyli had focussed WOODWARD's mind on the similarities as well as the differences between these two broad groups. This publication was also the first that referred to a family Pachycormidae. Since then, both Actinopterygii and Pachycormidae have become established terms, although there have been differences of opinion as to where the latter sat within the former (e.g., see PATTERSON 1973 and ARRATIA & LAMBERS 1996, ARRATIA 1999 for Pachycormiformes as either primitive teleosts or non-teleosts).

The aim of this immediate work is to describe the pachycormid specimen BMNH P.61563 in order to assess the identification of *Asthenocormus* sp. given to it by SCHAEFFER & PATTERSON (1984). To aid in the interpretation of aspects of its branchial structure, the gill basket of *Leedsichthys problematicus* (BMNH P.10156) will also be described. The results of these studies will form the basis of a phylogenetic analysis of the Pachycormidae following on from LAMBERS' (1992) work.

The whole contribution can be purchased as PDF file.

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