

Early Cenomanian acanthomorph teleost in the Cretaceous Fish Scale Zone, Albian/Cenomanian boundary, Alberta, Canada

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Abstract

The Fish Scale Zone marks the Albian/Cenomanian boundary in the Western Interior of Canada. Exposed in northwestern Alberta within the Shaftesbury Formation, it contains scales as well as abundant disarticulated bones of teleostean fishes. The fish remains occur immediately above the presumed boundary and include †Ichthyodectidae, †*Osmeroides*, †Enchodontiformes, and Acanthomorpha. The acanthomorph bones are the oldest described North American acanthomorph fossils and among the oldest anywhere of that group. Numerous bones of the skull and pectoral girdle appear to belong to a single species; this is confirmed by a single associated but mostly disarticulated skull combining many of the distinctive elements. Some bones have a striking similarity to those of the paracanthopterygian genus †*Sphenocephalus* found previously in the Campanian of Germany. The fossils are described as †*Xenyllion zonensis* gen. et sp.nov. in Family †Sphenocephalidae. They extend the range of the Paracanthopterygii by about 20 My, eliminating their previously anomalous late appearance in the fossil record as compared with other acanthomorph higher taxa, but further emphasizing the late appearance of what are currently thought to be cladistically more primitive freshwater percopsiforms that do not appear in the record until the Paleocene.

Introduction

The Fish Scale Zone is a regional stratigraphic marker bed containing abundant bones and scales of teleostean fishes (LECKIE et al. 1992). Usually seen only in drill core but identifiable also by wireline logs and known to be widespread in the subsurface of western Canada (JACKSON et al. 1975, LANG & MCGUGAN 1988), it is exposed in outcrops of the Shaftesbury Formation along the lower Smoky River, Alberta. Fish taxa identified from the Fish Scale Zone (LECKIE et al. 1992) include †Ichthyodectidae, †*Osmeroides*, †Enchodontiformes, and Acanthomorpha.

The acanthomorph bones, though mostly disarticulated, are the oldest North American examples and among the oldest anywhere of that group, which has not been seen in rocks older than Cenomanian. Elements available include dentaries, angulo-articulars, premaxillae, maxillae, preopercles, opercles, quadrates, anterior ceratohyals, posterior ceratohyals (epihyals), branchiostegals, and cleithra. One specimen represents the disarticulated skull of a single fish, demonstrating that most of the more distinctive acanthomorph bones came from a single species. Characteristic features of the jaws and opercular series point to membership in Paracanthopterygii (ROSEN & PATTERSON 1969, PATTERSON & ROSEN 1989), with closest similarity to †*Sphenocephalus*, which is represented only by two species from the Campanian of Germany (PATTERSON 1993).

The superorder Paracanthopterygii contains several basal lineages and more derived groups including †*Sphenocephalus* and the Anacanthini, which includes the Gadiformes. Referred to collectively as “percopsiforms” in the present work, the basal lineages are currently considered to be potentially paraphyletic (PATTERSON & ROSEN 1989). The fossil record of Paracanthopterygii dates back to the Late Cretaceous,

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