

# The Mesozoic record of osteichthyan fishes from Spain

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## Abstract

The record of Mesozoic osteichthyan fishes from Spain is evaluated: the faunas of 51 localities are revised and catalogued, updating their age. This record is analysed from an integrative multidisciplinary perspective.

The Mesozoic localities of Spain are mostly restricted to the north and central eastern half of the Iberian Peninsula, being most of them Cretaceous in age. The osteichthyan record, as retrieved from literature, comprises 50 genera grouped into 29 families, together with 25 incertae sedis or undetermined taxa. The record is patchy; 53 % of the entire generic diversity is provided by three fossil-Lagerstätten only (Mont-ral, Middle Triassic; Las Hoyas and El Montsec, both Early Cretaceous), which have yielded abundant complete and articulated remains. The other 48 localities have yielded only relatively diverse isolated remains. The most extensively cited actinopterygian genus is *Lepidotes*, followed by *Coelodus* and other pycnodonts, most of them being unreliably identified on the basis of isolate remains. The Sarcopterygii are represented by a scarce record of the family Coelacanthidae only.

The metric completeness analysis at family level and series-stages reveals that the Mesozoic fossil record of osteichthyans from Spain presents a 54 % of completeness. Three major groups of Actinopterygii have been analysed to approach their completeness: 1) the non-halecostome Actinopterygii are restricted to the Triassic, associated to the Mont-ral fauna; 2) the record of non-teleostean Halecostomi is affected by the poorly informative beds from the Jurassic, thus showing the lowest values of completeness: 48 %; against 100 % of non-halecostome Actinopterygii and 70 % of Teleostei. The non-teleostean Halecostomi include the most extended Lazarus taxa; 3) finally, the Teleostei families are distributed throughout the Early Cretaceous and Late Cretaceous, with an unexpected lack of record in the Aptian-Albian.

The worst documented records correspond to the Jurassic stages, in which the number of localities, the diversity, and the completeness of the stratigraphic record are quite poor.

## Introduction

The most recent synopses of the Mesozoic fish fauna from Spain are those of BATALLER (1960), POYATO-ARIZA & WENZ (1990), and QUESADA et al. (1998). The first one lists the complete Cretaceous vertebrate fauna from Spain as known at the time. The second one offers a commented list of the Early Cretaceous fauna, mainly focused on El Montsec and Las Hoyas localities. The third one is a commented bibliographic list of publications dealing with Mesozoic vertebrates of Spain. The present paper is the first one in English, and represents the first comprehensive compilation of the whole Mesozoic Spanish osteichthyan fauna. It is also the first one that provides an evaluation of the metric completeness and analyses the fossil record from a multidisciplinary perspective.

Mesozoic beds in Spain outcrop mostly in the eastern part of the country (Figs. 1-4). There are fewer areas in the south, and none at all in the west. Concerning the islands, there is no Mesozoic in the Canarias, which are volcanic in origin, and only a few Jurassic and Triassic outcrops (without fish remains) in the Balears. The paper will, then, focus on the Iberian peninsular territory. Most Mesozoic localities of Spain are Cretaceous in age (Figs. 3-4).

We will deal with osteichthyan fishes only for reasons of limited time and space. This overview of the Mesozoic osteichthyan record of Spain provides a comprehensive list of: 1) localities, updating their age;

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