

The Mesozoic record of osteichthyan fishes from Spain

Francisco José POYATO-ARIZA, Ángela D. BUSCALIONI & Joan CARTANYÀ

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;

The whole contribution can be purchased as PDF file.

Availability

Generally all our publications are available as PDF files; full publications as a general rule after the printed version is out of print. If you have questions concerning particular contributions please contact us by e-mail:

pdf@pfeil-verlag.de.

The PDF files are protected by copyright.

The PDF file may be printed for personal use.

The reproduction and dissemination of the content or part of it is permitted.

It is not allowed to transfer the digital personal certificate or the password to other persons.

Prices

Books: Prices are to be found in the catalog.

Articles in journals and single contributions or chapters in books:

10 EURO basic price per order (including the first 10 pages),
and

0.50 EURO per page, beginning with the 11th page.

Page numbers are found in the contents of the publications.

Orders

Use our order form for PDF files or send your order informal per e-mail (pdf@pfeil-verlag.de). The only accepted payment is by credit card. While using the order form for PDF files, your data will be transmitted by secure link (ssl). You also may send the informations informally by e-mail, fax, phone or mail.

Handling

As soon as possible, depending on our business hours and your order, you will receive your PDF file together with the certificate and password by e-mail.

Larger PDF files can be downloaded from our webpage, if necessary.

Your invoice will be sent out by e-mail after we charged your credit card.

To open the encrypted PDF files you have to install your personal certificate after your first order. All PDF files with the same certificate can be opened from that time on.

Dieser Beitrag kann als PDF-Datei erworben werden.

Verfügbarkeit von PDF-Dateien

Prinzipiell sind von allen unseren Publikationen PDF-Dateien erhältlich. Komplette Publikationen in der Regel erst nachdem die gedruckte Version vergriffen ist. Anfragen bezüglich bestimmter Beiträge richten Sie bitte per E-Mail an pdf@pfeil-verlag.de.

Die PDF-Dateien sind urheberrechtlich geschützt.

Ein Ausdruck der PDF-Dateien ist nur für den persönlichen Gebrauch erlaubt.

Die Vervielfältigung von Ausdrucken, erneutes Digitalisieren sowie die Weitergabe von Texten und Abbildungen sind nicht gestattet.

Das persönliche Zertifikat und das Passwort dürfen nicht an Dritte weitergegeben werden.

Preise

Bücher: Die Preise sind dem Katalog zu entnehmen. Zeitschriftenbeiträge und einzelne Kapitel aus Sammelbänden bzw. Büchern:

10 EURO Grundbetrag pro Bestellung (einschließlich der ersten 10 Seiten),
und

0,50 EURO pro Seite ab der 11. Seite.

Den Umfang der Beiträge entnehmen Sie bitte den Inhaltsverzeichnissen.

Bestellungen

Bestellungen sind mit dem PDF-Bestellformular oder formlos per E-Mail (pdf@pfeil-verlag.de) an uns zu richten. Die Bezahlung ist ausschließlich per Kreditkarte möglich. Bei Verwendung unseres Bestellformulars werden die Kreditkartendaten über eine gesicherte Verbindung (ssl) übermittelt. Sie können die Daten aber auch formlos per E-Mail, Fax, Post oder telefonisch übermitteln.

Abwicklung

So bald wie möglich, aber abhängig von unseren Bürozeiten und der gewünschten Bestellung, schicken wir Ihnen die PDF-Datei(en) zusammen mit Ihrem persönlichen Zertifikat und dem zugehörigem Passwort per E-Mail. Größere Dateien bieten wir Ihnen gegebenenfalls zum Herunterladen an.

Der fällige Betrag wird von Ihrer Kreditkarte abgebucht und Sie erhalten die Rechnung ebenfalls per E-Mail.

Um die verschlüsselten PDF-Dateien öffnen zu können, muss bei der ersten Bestellung das passwortgeschützte persönliches Zertifikat installiert werden, welches anschließend auf dem Rechner verbleibt. Alle mit diesem Zertifikat verschlüsselten Dateien können anschließend auf diesem Rechner geöffnet werden.