

A Late Cretaceous thornback ray from southern Italy, with a phylogenetic reappraisal of the Platyrrhinidae (Chondrichthyes: Batoidea)

Marcelo R. de CARVALHO

Abstract

A new genus and species of fossil thornback ray (Platyrrhinidae) is described from the Campanian / Maastrichtian “Calcare di Melissano” Formation of Nardò, in the southern Italian province of Puglia. †*Tethybatis selachoides*, gen. et sp. nov., known from two specimens preserved in part and counter-part, is a large batoid with a relatively complete disc extending anterior to the neurocranium (supported internally by propterygia and radials), a stout shark-like tail with large dorsal and caudal fins, and a dense coating of very small and compacted dermal denticles. The holotype is an adult male exposed in dorso-ventral view, with large regions of the disc, pelvic fins, and part of the tail present; the paratype is laterally exposed and represents only the tail with dorsal and caudal fins. Many anatomical features are preserved, revealing aspects of the braincase, pectoral disc, visceral skeleton, shoulder and pelvic girdles, pelvic fins, clasper, dorsal and caudal fins and dermal skeleton. Soft-tissue (skin patches) is also preserved over much of the disc and fins. Comparisons with other groups of batoids, both fossil and living, reveal that the new form is unique in having a very elongated propterygium, reaching anterior to the braincase, and composed of a single element. The Nardò batoid is further distinguished from living thornbacks by lacking enlarged thorns, and by presenting a prominent space separating the hyomandibulae and lower jaws (indicating, possibly, a larger spiracular opening). The Platyrrhinidae is redefined and its intrarelationships are discussed. †*Tethybatis* is assigned to the family on the basis of presenting its apomorphic rostral morphology, is its most basal member, and is the first Mesozoic record of the family corroborated by shared derived characters. The Nardò deposits are the only fossil beds from the Campanian / Maastrichtian of European Tethys represented by complete fishes, and †*Tethybatis* is the only fossil batoid known from articulated remains from the latest Cretaceous.

Introduction

Fossilized remains of rays (batoids) usually consist of isolated teeth or dermal derivatives. More complete fossils known from skeletal material are relatively rare, but occur with some abundance in the freshwater Eocene deposits of the Green River Formation of Wyoming (western USA) and in the almost contemporaneous marine Monte Bolca beds of northeastern Italy (JAEKEL 1894, GRANDE 1984, CAPPETTA 1987, CARVALHO et al. 2004). From the Mesozoic, fossil batoids known from articulated remains are usually isolated occurrences, with the exception of the Upper Cretaceous Lebanese chalk deposits at Sahel Alma (Santonian) and at Hakel and Hgula (Cenomanian). Some 15 species have been recorded from Lebanon, including sclerorhynchids, guitarfishes, skates, and the enigmatic cyclobatids, many of which are known from multiple specimens (e.g., PICTET & HUMBERT 1866, DAVIS 1877, WOODWARD 1889, CAPPETTA 1980). The oldest fossil batoid skeletons continue to be the Late Jurassic (Kimmeridgian / Tithonian) guitarfishes †*Spathobatis*, †*Belemnobatis* and †*Asterodermus* from the limestones of France and their lateral equivalent in Bavaria (SAINT-SEINE 1949, CAPPETTA 1987, CAVIN et al. 1995). Other Mesozoic batoids known from more complete remains also have a guitarfish Gestalt, and have been found in Brazil (Albian, Santana Formation; MAISEY 1991, BRITO & SÉRET 1996) and more recently in Argentina (Tithonian, Vaca Muerta Formation; CIONE 1999). However, from the latest Cretaceous stages (i.e., younger than the Santonian), no fossil batoid represented by skeletal material has been reported to date – an unfortunate

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 webspace, 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.