

A new tselfatiiform teleost from the Upper Cretaceous (Cenomanian) of the Kem Kem beds, Southern Morocco

Lionel CAVIN & Peter L. FOREY

Abstract

The freshwater detritic Cenomanian units of the Kem Kem beds, southern Morocco, yield a bony fish assemblage with remains of coelacanth, lungfishes, cladistia, gars, semionotids, halecomorphs and teleosts. We describe here new material comprising fragments of braincases and an almost complete skull of a new teleost. *Concavotectum moroccensis* gen. et sp. nov. is characterised by a deep, laterally compressed, head with a skull roof concave in lateral view and strongly arched in cross section. It shows features uncommon in teleosts, such as frontal bones wider anteriorly than posteriorly and no ascending process on the premaxilla. Other characters apomorphic for teleosts are: the antorbital is sutured to the first infraorbital, the upper jaw is edentulous (the lower jaw is incompletely known), minute teeth are found on a dentigerous plate borne by the parasphenoid. This combination of derived characters is shared in part with *Bachea huilensis*, from the Turonian of Colombia, and *Enischnorhynchus dallasensis*, from the Late Santonian-Early Campanian of the Austin Formation in Texas, USA. Both species have been referred recently to derived Tselfatiiformes. They differ from basal tselfatiiforms that have a broad skull roof composed of thick dermal bones, by a laterally compressed head and thin dermal skull roof bones. *Paranogmius doederleini*, from the Cenomanian Bahariya Formation in Egypt, is based on isolated cranial, vertebral and caudal elements originally housed in the Bayerische Staatssammlung für Paläontologie und Geologie, München but now lost. Because *P. doederleini* showed a well-preserved wide snout, it was thought to possess a wide skull roof, which was then distorted and flattened during fossilisation. This morphology would have been very different from *C. moroccensis*. Following the discovery of *C. moroccensis*, we suggest that the material of *P. doederleini* was not so flattened and both fishes had similar gross skull morphology. We suspect that both taxa are related, or possibly conspecific. However, on the basis of the published descriptions and figures, *P. doederleini* shows some differences, and because this material is now lost, the erection of a new taxon here is justified.

Introduction

During the last couple of decades, Cretaceous deposits of southern Morocco have yielded fish assemblages from various palaeoenvironments. The detritic deposits from the Kem Kem Beds, in particular, contain a rich freshwater Cenomanian assemblage of cartilaginous and bony fishes represented by well-preserved specimens. The current collecting methods, i.e. the fossils are discovered by local people and removed without standard palaeontological practices makes it difficult to give accurate geographical and stratigraphic data. Although the origin of the specimens from the Kem Kem Beds can be identified thanks to the mode of preservation and to the attached matrix, we usually have incomplete and isolated material at our disposal. The bony fish assemblage from the continental sandstone units of the Kem Kem beds [excluding the Daoura (CAVIN & DUTHEIL 1999) and the OT1 (DUTHEIL 1999) assemblages, that both yield small articulated fishes in fine laminated clayey sandstone corresponding to slightly different palaeoenvironments], comprise remains of coelacanth, lungfishes, cladistia, *Holostei sensu GRANDE (2005)* (gars, semionotids [unpublished], halecomorphs) and teleosts (ichthyodectiforms, notopterids and gonorynchiformes [unpublished]).

We describe here new remains of tselfatiiforms housed in the Natural History Museum (BMNH) in London and in the Musée des Dinosaures (MDE) in Espéraza. Although the precise locality is unknown,

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.