

Some macrofossils, chiefly bivalves, from the Lower Jurassic black shale of the Mecsek Mts (Hungary)

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Abstract

Based on specimens collected *ex situ*, macrofossils including a plant (*Pagiophyllum?* sp.), the bivalve species *Solemya voltzii* (ROEMER, 1839), *Liostrea hisingeri* (NILSSON, 1832), *Parainoceramya? dubia* (J. de C. SOWERBY, 1829) and *Goniomya rhombifera* (GOLDFUSS, 1835), as well as an echinoid (*Diademopsis?* cf. *crinifera* (QUENSTEDT, 1852) are briefly described and figured for the first time from the Lower Toarcian black shale (Rékavölgy Siltstone Formation) of the Mecsek Mts.

Keywords: Jurassic, Toarcian, black shale, plants, bivalves, echinoids, Mecsek Mts, Hungary

Introduction

The Lower Toarcian organic-rich black shale (a. k. a Rékavölgy Siltstone) is a peculiar marine formation cropping out in the eastern Mecsek. It is considered as a marker level in the lithologically monotonous Lower to Middle Jurassic spotted marl (widely referred to as “Fleckenmergel”) succession (RAUCSIK 2012). Its best exposures are situated in left tributaries of the Réka Valley

near the Disznós Spring, to the south of the village Óbánya (Figure 1) (see RAUCSIK & VARGA 2008 as well as VARGA et al. 2007, 2009 for various aspects of the type section). The outcrop was already known to PETERS (1862), who carried out pioneering geological research in the Mecsek Mts and recognized the resemblance of the shale exposed in the “Recca” Valley to the Posidonia Shale of southern Germany. Since that time, macrofossils from the black shale were listed in several publications (e. g. VADÁSZ 1935; FÖLDI et al. 1977; DULAI et al. 1992), but the assemblage has remained largely undocumented except some fine fish remains figured by FÖZY & SZENTE (2014). This paper aims at briefly describing and illustrating some macrofossils — both common and rare ones — collected *ex situ* at the Réka Valley outcrops.

General remarks on the macrofossil assemblage

Fish remains are by far the most common macrofossils in the black shale, followed by ammonites including the subzonal markers *Dactylioceras* (*Orthodactylites*) *semicellatum* (SIMPSON, 1843) and *Harpoceras exaratum* (YOUNG et BIRD, 1828) (VADÁSZ 1935; SZENTE, unpublished), as well as by the bivalve *Parainoceramya? dubia* (J. de C. SOWERBY, 1829). Other bivalves such as *Solemya voltzii* (ROEMER,

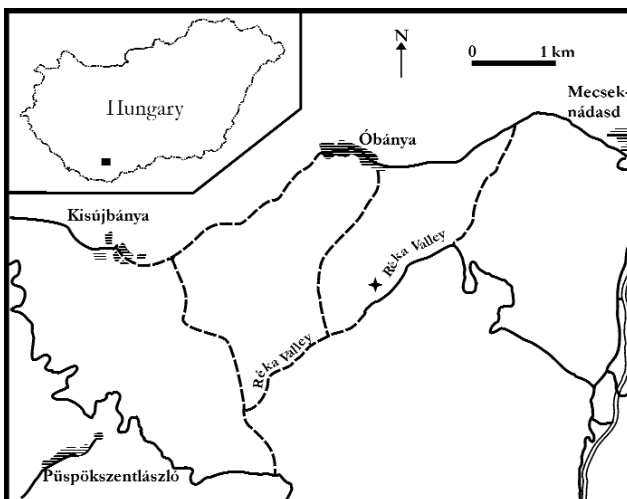


Figure 1. Geographical location of the outcrops of the Lower Toarcian black shale in the Réka Valley

1839) and *Liostrea hisingeri* (NILSSON, 1832) are much less frequent while plants and echinoderms are represented in the material hitherto collected solely by the specimens described here. The apparent lack of *Bositra* (= "*Posidonia*") is a remarkable feature of the fauna.

The only author to report mass occurrence of "*Posidonia*" was NOSZKY Jr. (1961). It proved to be impossible, however, to trace the whereabouts of the material he referred to in his collection now housed at the Hungarian Geological and Geophysical Institute. In addition to the taxa treated below, poorly preserved specimens of *Meleagrinella substriata* (MÜNSTER, 1831), *Pinna* sp. and *Mesomiltha pumilus* (GOLDFUSS, 1841) have also been found.

The fossils figured in this paper are kept in the Palaeontological Collection of the Eötvös Museum of Natural History (prefix EMNH).

Systematic palaeontology

Kingdom Plantae
Order Pinales GOROZHANKIN, 1904
Family ? Cheirolepidiaceae TAKHTAJAN, 1963
Genus ? *Pagiophyllum* HEER, 1881

Pagiophyllum? sp. Plate 1, A, B

Material. A shale slab with coalified and compressed fragments of a branching leafy shoot (EMNH 2011.50.1)

Description. The leaves are persistent, rhomboidal in face view, moderately adpressed and spirally arranged. Their free portion is relatively short. The abaxial side of the leaves bear rows of stomata arranged in longitudinal rows, situated in sunken bands. Adaxial side of the leaves could not be studied.

Remarks. The general appearance of the specimen is also reminiscent of *Brachyphyllum* BRONGNIART, 1828, another genus attributed to the araucarian family Cheirolepidiaceae. The ratio length of the free portion of the leaves to width of the leaf cushions serve as the base of the distinction of the fore-mentioned genera (e. g. McLOUGHLIN & POTT 2009). THÉVENARD et al. (2003), however, observed polymorphism in the foliage, i. e. co-occurrence of characters of both genera in the same plant. The existence of transitional forms appears to indicate that taxa assigned either to *Pagiophyllum* or to *Brachyphyllum* are congeneric. If it is the case, the latter name should be used for them.

Kingdom Animalia
Phylum Mollusca LINNÉ, 1758
Class Bivalvia LINNÉ, 1758
Order Solemyoidea DALL, 1889
Family Solemyidae H. ADAMS et A. ADAMS, 1857
Genus *Solemya* LAMARCK, 1818

Solemya voltzii (ROEMER, 1839) Plate 1, C–F

Material. 6 specimens, most of them open double-valved ones, including EMNH 2011.51.1– 2011.51.4.

Remarks. This relatively frequent species has already been recorded, as "*Solemya bollensis* QUENSTEDT", from the Mecsek black shale by VADÁSZ (1935), FÖLDI et al. (1977) and DULAI et al. (1992).

Order Ostreida FÉRUSAC, 1822
Family Flemingostreidae STENZEL, 1971
Genus *Liostrea* DOUVILLÉ, 1904

Liostrea hisingeri (NILSSON, 1832) Plate 1, G, H

Material. 7 specimens including EMNH 2011.52.1, EMNH 2011.52.2.

Remarks. This long-ranging and variable species is represented in the assemblage of the black shale by relatively small-sized specimens of more or less circular outline.

Order Myalinida PAUL, 1939
Family ? Inoceramidae GIEBEL, 1852
Genus ? *Parainoceramya* ROS-FRANCH, DAMBORENEA, MÁRQUEZ-ALIAGA et MANCENÍDO, 2015

Parainoceramya? *dubia* (J. de C. SOWERBY, 1829) Plate 1, I, J

Material. About two dozen specimens including EMNH 2011.53.1 and EMNH 2011.53.2.

Remarks. This widespread although poorly known species, assigned to *Parainoceramya* with doubt by ROS-FRANCH et al. (2015), is represented in the Mecsek fauna almost exclusively by compressed specimens, often associated with ammonites.

Order Pholadomyoidea NEWELL, 1965
Family Pholadomyidae GRAY, 1847
Genus *Goniomya* AGASSIZ, 1841

Goniomya rhombifera (GOLDFUSS, 1835) Plate 1, K

Material. A single specimen (EMNH 2011.54.1).

Remarks. *G. rhombifera* is a relatively rare, although characteristic element of the fossil assemblage of the Lower Toarcian black shale in Europe (e. g. RIEGRAF 1977; CASWELL et al. 2012).

Phylum Echinodermata KLEIN, 1734
 Class Echinoidea BRONN, 1860
 Order Pedinoidea MORTENSEN, 1939
 Family Pedinidae POMEL, 1883
 Genus ?*Diademopsis* DESOR, 1855

Diademopsis? cf. *crinifera* (QUENSTEDT, 1852)
 Plate 1. L, M

Material. An incomplete external mould (EMNH 2011.55.1).

Remarks. The specimen, although poorly preserved, can be identified with some certainty with “*Cidarites*” *crinifera*, doubtfully assigned to *Diademopsis*, on the basis of its characteristically small size. Fragments of thin echinoid spines, supposedly of *D.*? cf. *crinifera*, are not uncommon in washing residue of the Réka Valley black shale.

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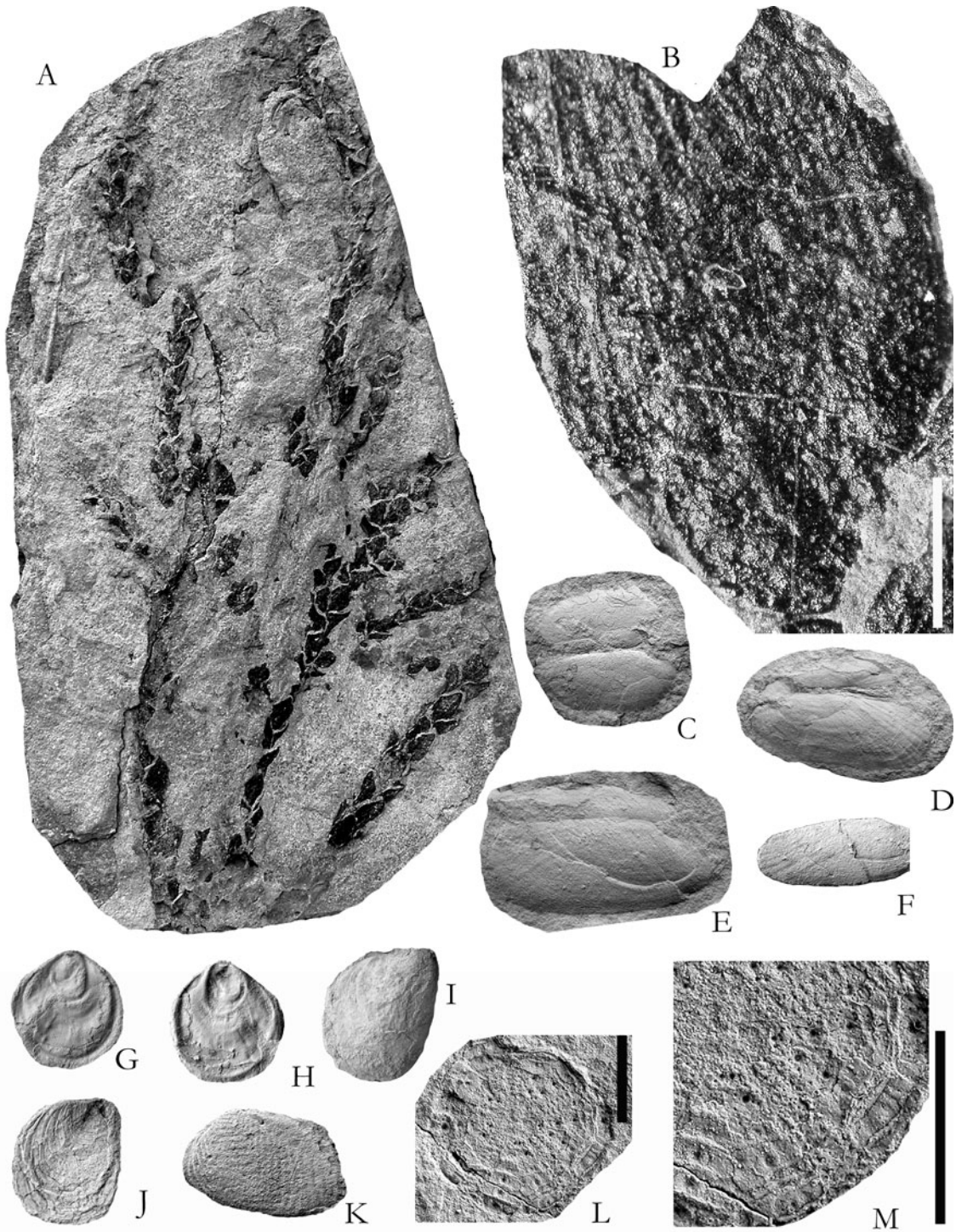


Plate 1.

Macrofossils from the Lower Toarcian black shale of the Mecsek Mts

A) *Pagiophyllum?* sp., EMNH 2011.50.1; B) detail of the same specimen, abaxial side of a leaf displaying light-colored spots interpreted as stomatal rows, scale bar = 1 mm; C-F) *Solemya voltzii* (ROEMER, 1839), EMNH 2011.51.1 - 2011.51.4; G, H) *Liostrrea hisingeri* (NILSSON, 1832), EMNH 2011.52.1, EMNH 2011.52.2; I, J) *Parainoceromya? dubia* (J. de C. SOWERBY, 1829) EMNH 2011.53.1, EMNH 2011.53.2; K) *Goniomya rhombifera* (GOLDFUSS, 1835) EMNH 2011.54.1; L) *Diademopsis? cf. crinifera* (QUENSTEDT, 1852) EMNH 2011.55.1; M) detail of the same specimen, scale bar = 0.5 mm.

The specimens are figured in natural size unless otherwise indicated. Specimens are coated with ammonium chloride except A and B.