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An early Carboniferous ?Coleoid (Cephalopoda Dibranchiata) fossil from the Kulm of Northern Moravia (Czech Republic)

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Introduction

Since 1996, fossils have been intensively collected in the Lhotka mine near to Vítkov (Fig. 1). During this time, numerous faunal, floristic and trace-fossil remains have been recorded. The locality is among the richest palaeontological locations in the Kulm of Nízké Jeseník and Odra Highland. The coleoid-like fossil was found in 2001 and it is part of the private collection of Mr. M. Pavela.

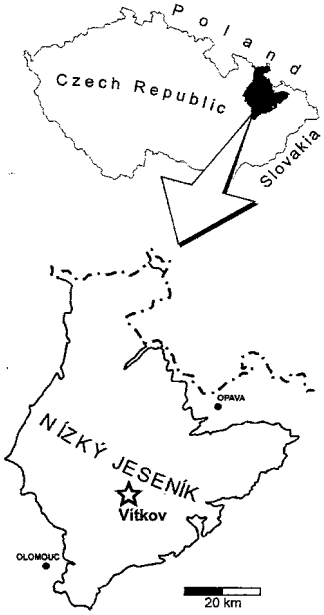


Fig. 1: The geographic position of the locality

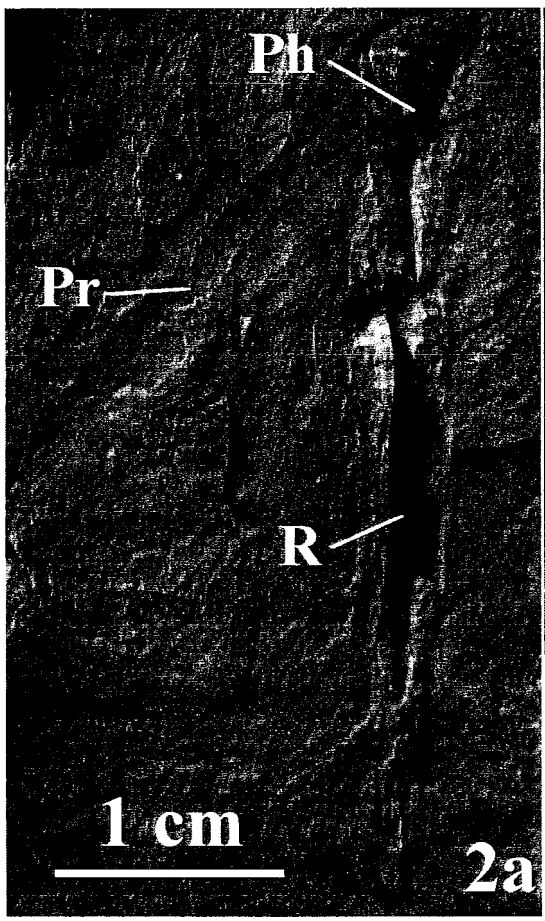
Stratigraphy

Fossils are preserved in dark-grey, silty clayey shales of the Moravica Formation (the East Jeseníky Synclinorium - a part of the Jeseníky sector of the Moravia-Silesian Basin). These sediments are supposed to be distal parts of turbidites. Rich goniatite fauna (currently being worked) enabled the exact stratigraphic determination. The index taxa include: *Paraglyphioceras elegans* (Bisat), *Arnsbergites falcatus* (Roemer), *Paraglyphioceras striatum* (Bisat), *Hibernicoceras ?mucronatus* (Knapp), *Girtyoceras brueningianum* (Schmidt) etc. With the highest probability, the assemblage belongs to the *Gobel* Zone 5. It fully corresponds to the lower part of the Vikstejn Member (see Kumpera, 1983) of the Moravice Fm..

Other common fauna is represented by orthoconic nautiloids, coleolids (both groups are strongly different from the coleoid-like fossil found), bivalves, brachiopods, crinoids, rare trilobites, polyplacophorans, conulariids, ophiurids, serpulids and shark teeth. The manner of preservation seems to be equivalent in all fossil groups – e. g. the fossil remains are partly dissolved and flattened in the most cases.

Description

The ?coleoid fossil consists of the rostrum-like structure (partly dissolved), phragmocone developed, and thin, flat ?pro-ostracum-like structure (Fig. 2a). The rostrum-like structure is 40 mm long, the maximal lateral diameter (6 mm) is situated at the anterior (alveolar) end. The shape of the structure is high conical (angle – 11 degrees). It is strongly compressed and dissolved. No shell-like structures (e. g. calcitic prismatic and/or aragonite layers) are preserved. The longitudinal thin furrows and low ribs are irregularly developed on the compressed surface. The axis line is apparent in the middle part. The depth of the alveolus is 11 mm. The walls of the alveolus are sharply separated from the rostrum-like structure.



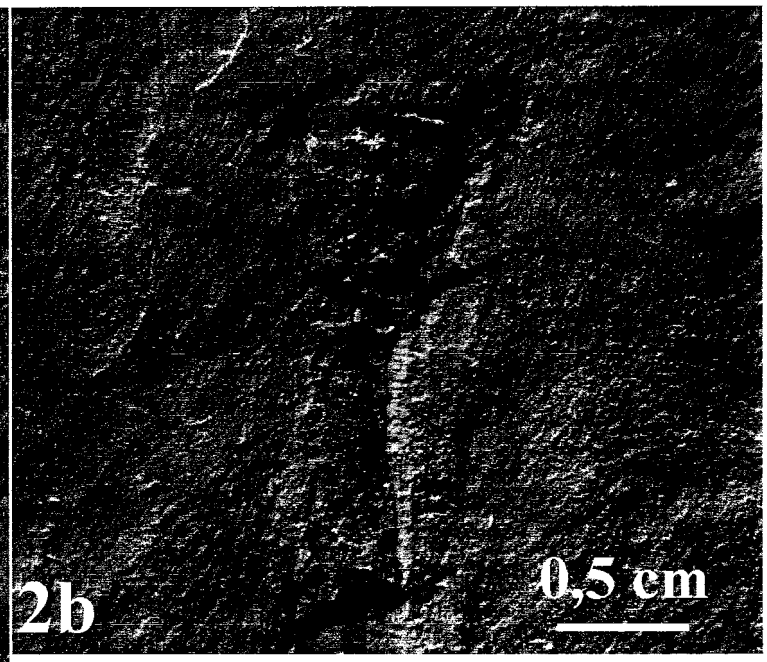


Fig. 2a: The Coleoid-like remain, Early Carboniferous, Northern Moravia (Czech Republic). R – rostrum-like structure. Pr – pro-ostracum-like structure. Ph – phragmoconus.
Fig. 2b: Detail of the alveolar part with the phragmoconus partly preserved. (Specimen figured in Figs. 2a-b is coated with ammonium chloride).

The phragmocone is preserved inside the alveolus only. It is strongly compressed. The angle of the phragmoconus is 43 degrees. Septa are apparent only near the place of the unpreserved protoconch. They are very dense (the distance = not more than 0.3 mm apart) and poorly visible (Fig. 2b).

The ?pro-ostracum-like structure is partly preserved as a long (26 mm) and smooth structure. The width is 3.7 mm. It is longitudinally divided into two parts by the very thin and low rib. No hyperbolar lines are present. It is connected with the anterior part of the rostrum-like structure and phragmoconus respectively. In addition, the way of connection is unclear because of the absence of the phragmoconus anterior part.

Discussion

The Coleoidea stock seems to be derived from the Bactritida during the Devonian (Young, Vecchione, Donovan; 1998). In addition, Bandel et al. (1983) described little diversified coleoid fauna from the Lower Devonian Hunsrück black shale. The first representatives of belemnoid cephalopods - Aulacocerida (genera *Hematites*, *Bactrimimus* and *Paleoconus*) were described by Flower and Gordon (1959) from the Lower Carboniferous of North America. In the Permian, the aulacocerids became more diversified and they were quite common in the Triassic and Jurassic. Belemnites s. s. occurred in the Triassic for the first time. Both groups, i. e. aulacocerids and belemnites are characterized by a well-developed rostrum (telum) structure. Aulacocerids lack a pro-ostracum structure, which is fully developed in belemnites. The rostrum surface is mostly ribbed in Aulacocerida, in belemnites it is usually smooth. Phragmoconus camerae are long and the alveolar angle is generally more acute in aulacocerids (Doyle, 1990).

The find of ?coleoid-like fossil from the Kulm of Nízké Jeseník highland demonstrates typical signs for aulacocerids and belemnites equally. The rostrum-like structure is strongly ribbed, but the alveolar angle is quite large, the alveolus is relatively shallow and the ?pro-ostracum-like structure seems to be present. The pro-ostracum is divided into two parts, in addition, this division is unknown in the belemnoid cephalopods. With the highest probability, this division was not original. However, the poorly preserved ?pro-ostracum-like thin and flat structure could represent other fossil remain too.

We do not attach larger importance to the find because of its very poor preservation.

Acknowledgements

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