

# Rediscovery of the classic locality of Callovian in Babiarzowa Klippe (Pieniny Klippen Belt, Poland)

## Ponowne odkrycie klasycznego stanowiska z fauną keloweju na Babiarzowej Skale w pienińskim pasie skałkowym Polski

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**ABSTRACT:** Red-coloured laminated wackestones to packstones of the filament (*Bositra*-like) microfacies occurring within crinoidal limestones of the Smolegowa Limestone Formation in the Babiarzowa Klippe (Pieniny Klippen Belt, Carpathians) represent infilling of subhorizontal neptunian dyke of Callovian age. The locality is well-known in geological literature as it yielded the rich fossil assemblage of Callovian age (ammonites, gastropods, pelecypods, brachiopods and others) described by Uhlig (1878, 1881).

The Babiarzowa (*vel* Babierzowa, Babierzówka, Babieczówka, Babierszówka) Klippe at the village of Maruszyna near Nowy Targ (fig. 1) constitutes one of the most famous Jurassic localities in the Pieniny Klippen Belt in Poland. It was studied by Zaręczny (1876) who erroneously interpreted fossils occurring in brick-red coloured limestones as Early Tithonian in age. Detailed study of the same macrofauna was undertaken by Uhlig (1878, 1881, 1890) who gave a valuable description of the fossils: ammonites, gastropods, bivalves, brachiopods, solitary corals, echinoids, crinoids and fish teeth. He referred the fossils to the Callovian, but he was not able to indicate either the detailed succession of the deposits, or the geological situation of their occurrence. The fauna was inter-

preted for a long time as the oldest found in the Czo-rsztyń Limestone Formation, and treated as indicative of its lowermost (Callovian) part (Birkenmajer 1963, 1977). Unfortunately, the precise location of the section, and thus its detailed stratigraphy remained unknown.

The value of the fauna from the Babiarzowa Klippe lies in its several features: (a) Callovian faunas are generally poorly known and/or mostly absent in the Pieniny Klippen Belt, (b) the fauna from the Babiarzowa Klippe is dominated by perfectly preserved gastropods, which is a unique feature for the Jurassic in the Pieniny Klippen Belt, (c) the fauna includes new taxa which have their type-locality in the Babiarzowa Klippe, (d) since Uhlig the fauna has been frequently cited in geolo-

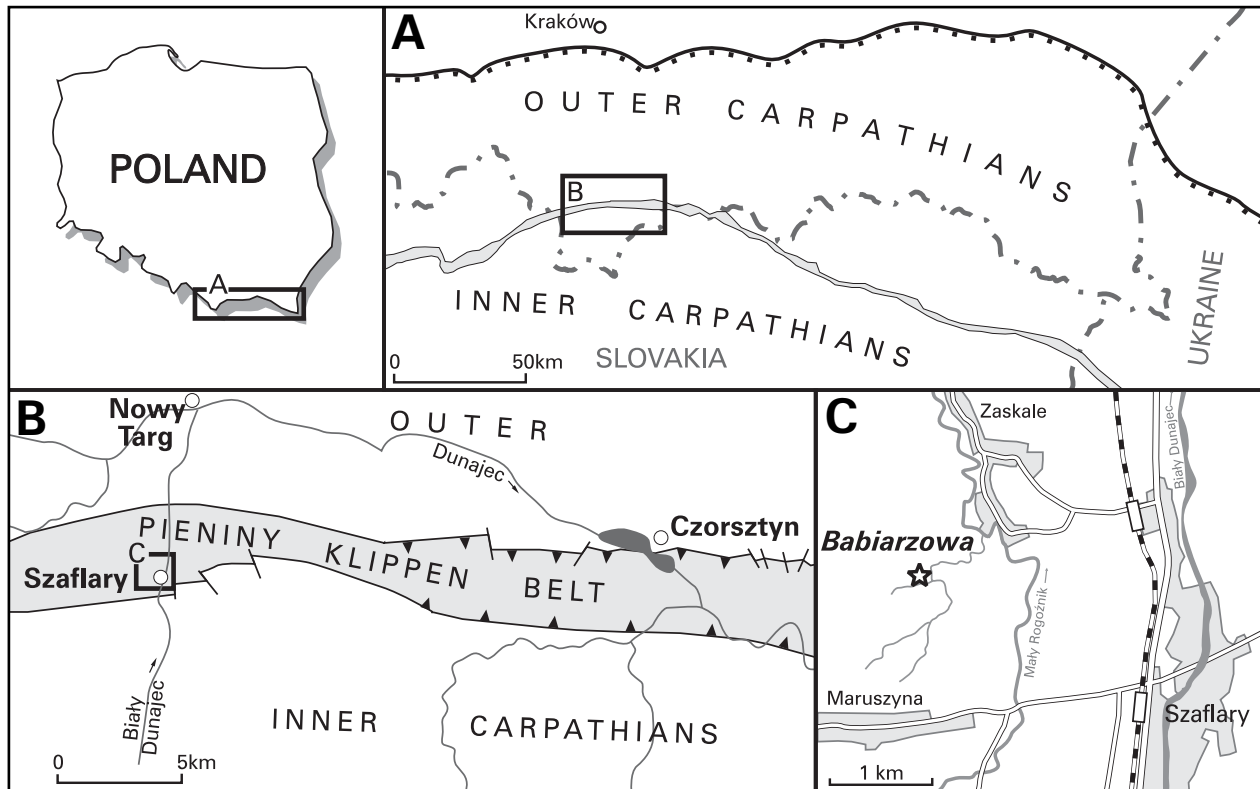


Fig. 1. Location map with position of the Pieniny Klippen Belt (A – grey) and the Babiarczyka section (B, C).

gical literature, but it has never been revised. Thus, the rediscovery of the section with the fauna in question in the Babiarczyka Klippe by our team last year, is of significance for palaeontological and regional palaeogeographical studies in the Pieniny Klippen Belt.

Our field research (in an artificial trench) resulted in the discovery of three thin red limestone beds (in total 0.3 m in thickness) with abundant

invertebrate macrofauna (fig. 2). These beds are underlain and overlain by white crinoidal limestones of the Smolegowa Limestone Formation (Bajocian in age – Birkenmajer 1977; Krobicki & Wierzbowski 2004). The red limestone beds are finely laminated with numerous traces of bioturbation. From the microfacies point of view the limestones are filamentous wackestones to packstones. Apart from thin *Bositra*-like shells, there are numerous crinoid and bivalve fragments, smooth-shell ostracods and benthic foraminifers. Juvenile gastropods and ammonites, aptychi fragments, echinoid spines, bryozoans and silicisponges are less common. Some laminae are graded (fig. 3A) and rich in crinoid ossicles. It is important to note the presence of cavity-dwelling ostracods *Pokornyoopsis* (fig. 3B) which are known to occur in different types of submarine cavity infillings, such as neptunian dykes, but missing, or extremely rare, in normal sea-bottom sediments (see Aubrecht & Kozur 1995). The general character of the macrofauna discovered in the red limestones in Babiarczyka Klippe is also remarkable: it consists of small-sized specimens – mostly ammonites, gastropods, bivalves and brachiopods. The preservation of

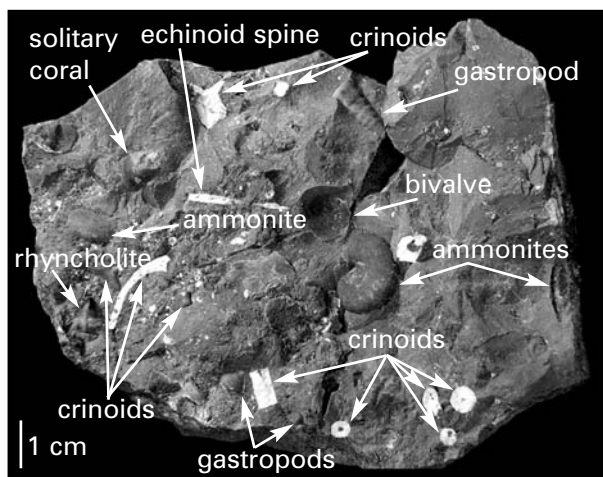


Fig. 2. Fragment of limestone bed with numerous invertebrate fauna.

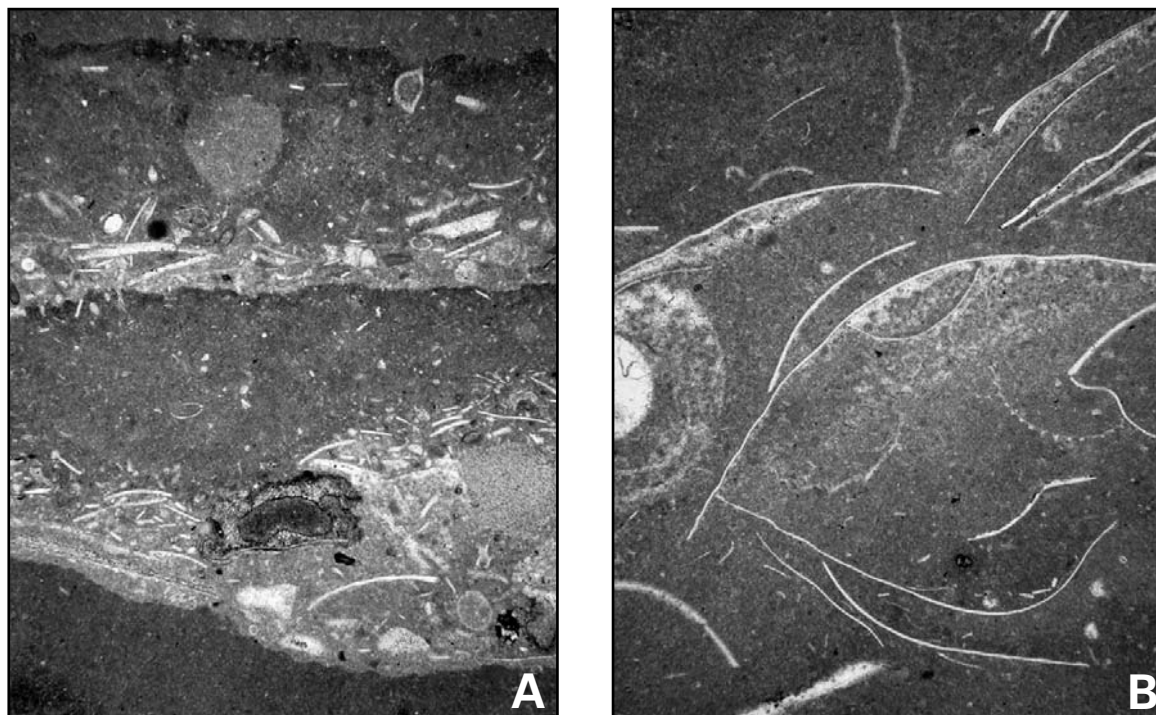


Fig. 3. A – two graded laminae full of crinoid ossicles and thin-shelled bivalves; B – thin-shelled *Bositra*-like bivalves and *Pokornyopsis* ostracod shell (ornamented).

the fauna is generally excellent, the shells are partly filled with sediment, partly empty, or infilled by drusy calcite. This type of fauna is often reported from neptunian dykes, such as the Jurassic neptunian dykes at Vršatec in western Slovakia, and the well-known neptunian dykes in NW Sicily. The latter show similar macrofaunal content, with ammonites, gastropods and bivalves prevailing markedly over other groups of fossils (e.g. Martire *et al.* 2002). Moreover, the Sicilian fissure-fillings and the red coloured laminated limestones from the Babiarzowa Klippe share the same type of extensive bioturbation (Wendt 1971, pl. 18, fig. 7, 8). Thus, it seems that the laminated red coloured limestones from the Babiarzowa Klippe represent in fact infillings of fissures which penetrate the massive crinoidal limestones of the Smolegowa Limestone Formation of Early Bajocian age. The fissure was opened during late Middle Jurassic (Callovian) and played the role of natural sedimentary trap for the fauna acting as a sieve. Some parts of the fissure could also have been colonised by specific small-sized faunal groups.

Detailed studies of all fossils mentioned are in progress.

#### Acknowledgements

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## STRESZCZENIE

Skałka Babiarszowa koło Nowego Targu w zachodniej części pienińskiego pasa skałkowego Polski jest stanowiskiem szeroko znanym w literaturze geologicznej (fig. 1), które dostarczyło bogatego zespołu skamieniałości, w tym zwłaszcza amonitów, ślimaków, małży i ramienionogów wieku kelowejskiego (Uhlig 1878, 1881, 1890). Znaczenie tego stanowiska wiąże się przede wszystkim z faktem, że skamieniałości wieku kelowejskiego są w pienińskim pasie skałkowym słabo poznane, i tym samym, że stanowiło ono główny punkt odniesienia dla znajomości fauny tego wieku w omawianym rejonie (Birkenmajer 1963). Niestety zarówno dokładna lokalizacja wspomnianego stanowiska, jak i sytuacja geologiczna występujących tu utworów pozostawały nieznane.

Dlatego też obecne odkrycie wspomnianego stanowiska na Babiarszowej Skałce posiada doniosłe znaczenie zarówno dla poznania zespołów faunistycznych jak i zawierających je utworów. Utwory kelowejskie są tu wykształcone jako drobno-laminowane czerwone wapienie typu wackestone i packstone o mikrofacji filamentowej, lecz wzbogacone w warstewki materiału krynoidowego (fig. 2, 3). Utwory te stanowią wypełnienie poziomej żyły neptunicznej rozwiniętej w obrębie wapieni krynoidowych bajosu należących do formacji wapienia ze Smolegowej. Szczegółowe studia paleontologiczne zebranych skamieniałości są w toku.