

Devonian brachiopod shales of the Grzegorzowice-Skały section (Holy Cross Mountains, Central Poland): the attempt of paleoenvironment reconstruction

Joanna Masorz

Institute of Geological Sciences, Jagiellonian University, Kraków, Poland (j.masorz@o2.pl)

The Holy Cross Mountains (HCM) is one of the most significant geological heritage sites in the European continent. This mountain range located in central Poland and it is a part of a larger structure called 'Mid-Polish Anticlinorium' (Żelaźniewicz *et al.*, 2011). Central part of the HCM called Palaeozoic core is one of the oldest mountain ranges in Europe. Historical geodiversity of the region is evident through the sedimentary rocks which represent every period beginning from the Cambrian. The only exception is the Paleogene period, presumably occurring in karst forms but has not yet been proven (Urban, 2008). Cambrian and Devonian rock occupy most of the Palaeozoic core of the HCM area. Because of the lithological formation, which is the basis of carbonate and quartz materials, the Devonian system of the HCM constantly aroused great interest (Urban, 2008).

The Early to Middle Devonian rock sequence crops out at the slopes of Dobručna creek valley at about 3.5 km distance, in the outcrops. The Lower Devonian shallow marine and the occasional terrestrial deposits of the siliclastic-clayey rocks were replaced by the carbonate succession which encompasses in the beginning of the Middle Devonian. Grzegorzowice-Skały section is located about 8 km NE of Nowa Słupia. The section represents formations from the Upper Emsian to the Lower Givetian stages. Grzegorzowice-Skały profile (stratotype) is represented by marine sandstones, shales, marls, limestone and dolostone with conodonts, corals, crinoids, brachiopods, ostracods, trilobites and acritarchs Pajchłowa (1957).

This geological site is located outside of the western wall of the limestone and dolomite quarry called "Skały". The fossil assemblage of this section was precisely studied by Pajchłowa (1957). She gave detailed description of the entire section and identified a number of fossil species. Some of them were revised and allocated to other genera. So far, the trials of the paleoenvironment reconstructions have not been undertaken.

The outcrop causing the shales and marls is rich in well preserved fossils. Various specimens of brachiopods (*Schizophoria resupinata*, *Schizophoria schnuri*, *Eleutherokomma diluvianoides*,

Xystostrophia umbraculum, *Primpilaria primpilaris*, *Leptaena analogaeformis*, *Poloniproductus varians*, *Atrypa depressa*), individual corals such as *Calceola sandalina* and *Zaphrentis* sp., Crinoids and uncommon trilobites like *Phacops schloteimi* can be found there. In the outcrop these fossils can often be occurred in nests accumulations.

Numerous and diverse brachiopods occurred in so-called "brachiopod shales", which are in fact horizontally laminated siltstones. Their amount and diversity as well as based on the sediment features let us conclude that a lot of organisms adapted to living on the surface of muddy substrate. A non-bioturbated sediment with primary sedimentary structures signify that there was no infaunalization in general. Rugose corals are one of the exceptions to this extent. A significant amount of brachiopods have shell plane with spines that help them to stay on the surface of the soft sediment. Within the common genus of brachiopods we usually observe only single species and from this we can assume that mostly opportunistic species are present. The muddy deposits lie generally within carbonate series and this suggests different sedimentation conditions of "brachiopod shales", which were probably deposited in some isolated lagoon with terrigenous material alimentation.

The preliminary results indicate that the outcrop mentioned and its fossils are well-known but they need a new taxonomical classification and an attempt of paleoenvironment reconstruction for these selected shales. The poster deals with only a necessity of the scrupulous analysis and it notices the initial observations.

Pajchłowa, M. (1957): Biuletyn Instytutu Geologicznego, 122: 145-254.

Urban, J. (2008): Przegląd Geologiczny, 6: 618-628.

Żelaźniewicz A., Aleksandrowski P., Buła Z., Karnkowski P.H., Konon A., Oszczytko N., Ślęczka A., Żaba J., Żytka K. (2011): Regionalizacja tektoniczna Polski. Komitet Nauk Geologicznych PAN. Wrocław. ISBN 978-83-63377-01-4