

Carpathian Flysch from Wadowice – history and perspectives of research

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Wadowice is a town located in the southern part of Poland, approximately 50 km from Cracow. Over one hundred years ago –in 1894– the famous Polish micropaleontologist Józef Grzybowski carried out microfaunistic research on some deposits from this area. Also the earliest practical applications of Micropaleontology in the field of Petroleum Geology were carried out by Józef Grzybowski. He is considered, by many scientists, as “the father of applied micropaleontology”. Grzybowski also described a lot of new species of foraminifera. Due to his initiative, the micropaleontological laboratory was founded at the Jagiellonian University in 1912 (Kaminski *et al.*, 1993).

Geologically, the Wadowice area belongs to the Outer Carpathians, and are built mainly by deposits of the Subsilesian Nappe. The Oligocene menilite shales and sandstones with cherts dominate in this area. Recently, during road works some of these deposits have been exposed in the vicinity of “Czumówka” estate in Wadowice. This new outcrop is located about few dozen meters from the place which was the subject of Grzybowski’s research.

In 1893, thanks to the initiative of dr J. Daniel –a wealthy lawyer, citizen of Wadowice– digging began on an exploration shaft in search for coal. In the following year, after reaching the depth of 84 metres, the further work was abandoned as the coal was not found. Samples of the recovered material during the digging work, collected by Henryk Walter, were sent to the geological cabinet in Cracow to Józef Grzybowski for micropaleontological analysis. The profile compiled by Grzybowski consisted of the following strata (from bottom to top): menilite shales, black bituminous shales, red clays with white sandstones, gray claystone with white marl and green clays, and thin layers of sandstones and sandy shales. This exploratory coal shaft was located near the place known as “Daniel’s Garden”. Unfortunately, its site is difficult to be precisely point out nowadays.

The results of Grzybowski’s studies were published in 1896 in one of his well known scientific papers “Foraminifera of the red clays from Wadowice”. In the examined samples both, the agglutinated and calcareous foraminifera were present. According to Grzybowski most of the agglutinated forms represented deep-sea species, thus the analysed deposits were considered to be of deep-water origin. In his opinion taxonomic composition pointed to Oligocene age of the studied microfauna. Of the 112 taxa of foraminifera, illustrated by him, 55 were described as the new

species (Grzybowski, 1896). It was the great achievement, not only for Polish, but also for the world micropaleontology.

A few decades later, the Wadowice area was the subject of research by Professor Marian Książkiewicz. Based on the study of H. Hiltermann (vide Książkiewicz, 1951) he suggested that the microfauna, described by Grzybowski, indicated rather Late Cretaceous or Paleocene than Oligocene. In 1981, the revision of Grzybowski’s collection from Wadowice was published by Mr. and Mrs. Liszka. These authors concluded that red clays were Campanian in age, whereas green shales and marls Paleocene (Liszka & Liszkowa, 1981).

After over one hundred years since Grzybowski’s research it is possible to examine deposits, presently exposed in the outcrop described, that seem to be similar to those recovered from the 19th century exploratory shaft. The main purpose of my research is to compare the foraminiferal assemblages with those described by Józef Grzybowski and also to determine stratigraphic affinities of the exposed strata on base of their lithology and character of foraminiferal assemblages.

Study of a new outcrop in Wadowice is a chance for more precise recognition of the local geological structure, in the nearby future. Then aim of research is a comparison between teams of microfauna from new outcrop and foraminifera described by Józef Grzybowski. Moreover, the aim is also to determine stratigraphic affiliation of rock layers. Based on the preliminary examination of profile in Wadowice can be concluded that the layers lays different to these from 19th century exploratory shaft (from bottom to top of profile lays: black shales, sandstones and menilite shales; without red clays). The recent outcrop have approximately 5,5 m high and contains generally of black shales, sandstones, grey marls and menilite shales. Collected 20 samples, in most from layers of shales, marls and menilite shales. To extract the foraminifera from samples were used method based on heating and freezing rocks.

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