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DISSERTATION ABSTRACT

The research presented in this dissertation fits the subject of searching for micropalaeontological tools for dating carbonate rocks of the Late Palaeozoic and for the analysis of environmental changes that took place on carbonate platforms from that period of time, which were related to the eustatic sea level fluctuations. This research tool in this work were benthic foraminifers, some of which evolved rapidly in the Late Devonian and Early Carboniferous. The presented research was based on the Upper Devonian–Lower Carboniferous succession of the carbonate platform, which was formed in the former Silesian-Moravian basin, being a part of Rheno-Hercynian back arc basin situated along the SE margin of the Laurentia. This succession is part of the folded rocks of the so-called Upper Silesian Block.

The author's research was based on the analysis of 177 thin section of rocks taken from the surface outcrops in the southern part of the Ojców Plateau in the Kraków Upland, at the site of erosive cuts in the valleys of the Szklarka, Racławka and Czernka creeks. Taxonomic analyzes allowed to identify 102 taxa of Foraminifera. They belong to two suborders, *i.e.* Fusulinina (calcareous foraminifers) and Textularina (agglutinated foraminifers). Forty seven genera have been identified within the suborder Fusulinina, which belong to 15 families. On the other hand, the Textularina suborder is represented by forms of three genera belonging to one family (Ammodiscidae). This part of the dissertation is its most extensive section and was the basis for biostratigraphic analyses.

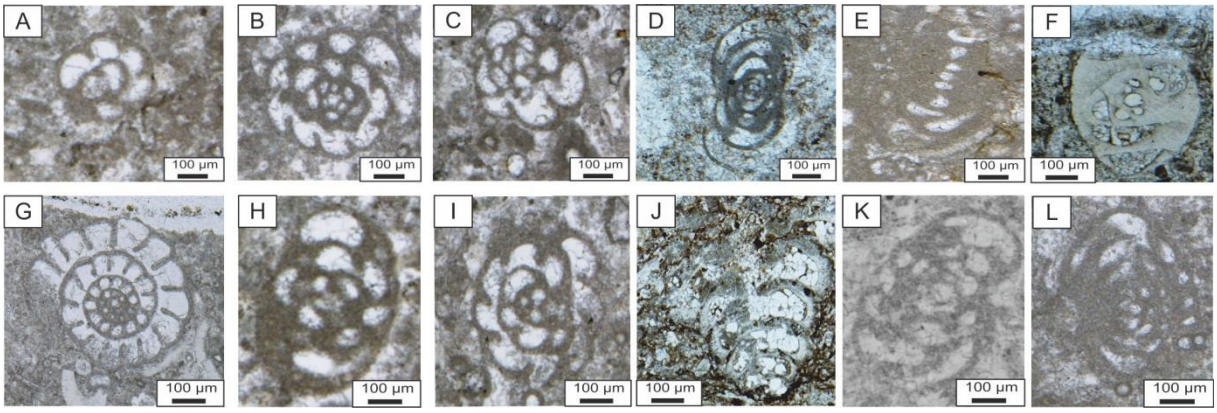

Fig. 1. Examples of the Late Devonian and Early Carboniferous benthic foraminifers occurring in limestones of the Silesian-Moravian Basin: A. *Chernyshinella tumulosa* Lipina; B. *Globoendothyra ordinata*; C. *Spinochernella brencklei* Conil et Lys; D. *Eostafella mosquensis* (Vissarionova); E. *Uralodiscus rotundus* (Chernysheva); F. *Archaeodiscus inflatus* Schlykova; G. *Endothyranopsis compressa* (Rauzer-Chemousova et Reitlinger); H. *Dainella chomatica* (Dain); I. *Uviella aborigena* Ganelina; J. *Palaeotextularia longiseptata* Lipina; K. *Quasiendothyra communaeformis* Grozdilova; L. *Eostafella parastruvei* (Rauzer-Chernousova).

Some of the identified species are stratigraphic markers for the Upper Devonian and Lower Carboniferous. On this basis, the studied sediments have been included to nine biostratigraphic zones; eight of which were defined as new. Based on the taxonomic similarity of the described foraminiferal assemblages with the assemblages occurring in other rock sections of the same microfaunal province, and on their correlation with the conodont zones, it can be concluded that the studied sediments correspond to the

highest part of the Famennian and parts of the Tournaisian and the Visean.

A detailed microfacial analysis of thin sections of the rocks revealed that they are composed of numerous biogenic components, dominated by fragments of crinoids, algae and foraminifers, as well as lithogenic components, with various types of cement. The quantitative proportions of biogenic components as grains and different type of cements have been the basis for define ten various microfacies. The microfacies analysis was the base for the interpretation of the development stages of the studied carbonate platform. This interpretation that its development was continuous through the Famennian, the entire Tournaisian and Visean. Throughout this period of time, *i.e.* for approx. 30 Ma, it was a shallow water carbonate platform with a bottom located near the mean wave base, the depth of which fluctuated in relation to: (i) eustatic sea level changes and (ii) the rate of accumulation at the bottom in the so-called platform carbonate cycles. The highest rates of carbonate accumulation occurred in the middle and late Tournaisian, and was much slower than the rate in the modern (Holocene) platforms (e.g. Bahama platform).

Detailed analysis of the middle Tournaisian foraminiferal assemblages allowed for recognition of special episode in the evolution of fusulinids, *i.e.* the bloom of forms from genus *Chernyshinella*. It was associated with high sea level and dysoxic conditions at the bottom, but also with the low temperature of surface waters in the equatorial zone, associated with global climatic cooling. The second such period of the evolutionary boom in the fusulinid group took place in the middle and late Visean, when the amount of taxa in the investigated sediments doubled. These evolutionary changes have been favored by an increase of surface water temperature and long termed periods of sea level rise. In the middle Visean, massive pseudo-reef structures returned to the carbonate platform. The record of these events, confirmed by the microfacial analysis, proves the normal salinity of the bottom waters, with the sea floor located near the mean wave base. Carbonate sedimentation on the studied platform was finished by facies typical for low-energy environments with dysoxic conditions at the bottom. According to the author, this stage of sedimentation could be associated with the regressive phase of the fourth cycle in the Visean, during which the sea level was one of the lowest during the entire Early Carboniferous, and after which the siliciclastic sedimentation began in this area.