



UNIWERSYTET OPOLSKI

Instytut Biologii

PRACA DOKTORSKA

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**FAUNA KREDY OPOLSKIEJ: PALEOEKOLOGIA I
PALEOBIOGEOGRAFIA
THE OPOLE CRETACEOUS FAUNA: PALAEOECOLOGY AND
PALAEOBIOGEOGRAPHY**

**STRESZCZENIE W JĘZYKU ANGIELSKIM
ENGLISH SUMMARY**

Praca napisana pod kierunkiem
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Fossil-rich Cretaceous (Cenomanian - Coniacian) marine strata of the Opole area are known since the XIX century. Pioneering studies date to before the World War II, but their scope was limited, and the taxonomy used is now obsolete. In post-war times, only selected groups were subject to detailed treatment (inoceramids, sponges, echinoids). The majority of groups present have been omitted thus far. Numerous disused and working quarries (Fig. 1-3), allowed for an enormous collection of ca. 10 000 specimens of macro- and microfauna, trace fossils and land plants; this allowed an insight into their paleoecology, biostratigraphy and paleobiogeographic potential. Up to now, the Opole Cretaceous was understudied in comparison with Bohemian and Saxonian Basins. Research by the author largely removed this gap and underlined the great similarity between the compared areas.

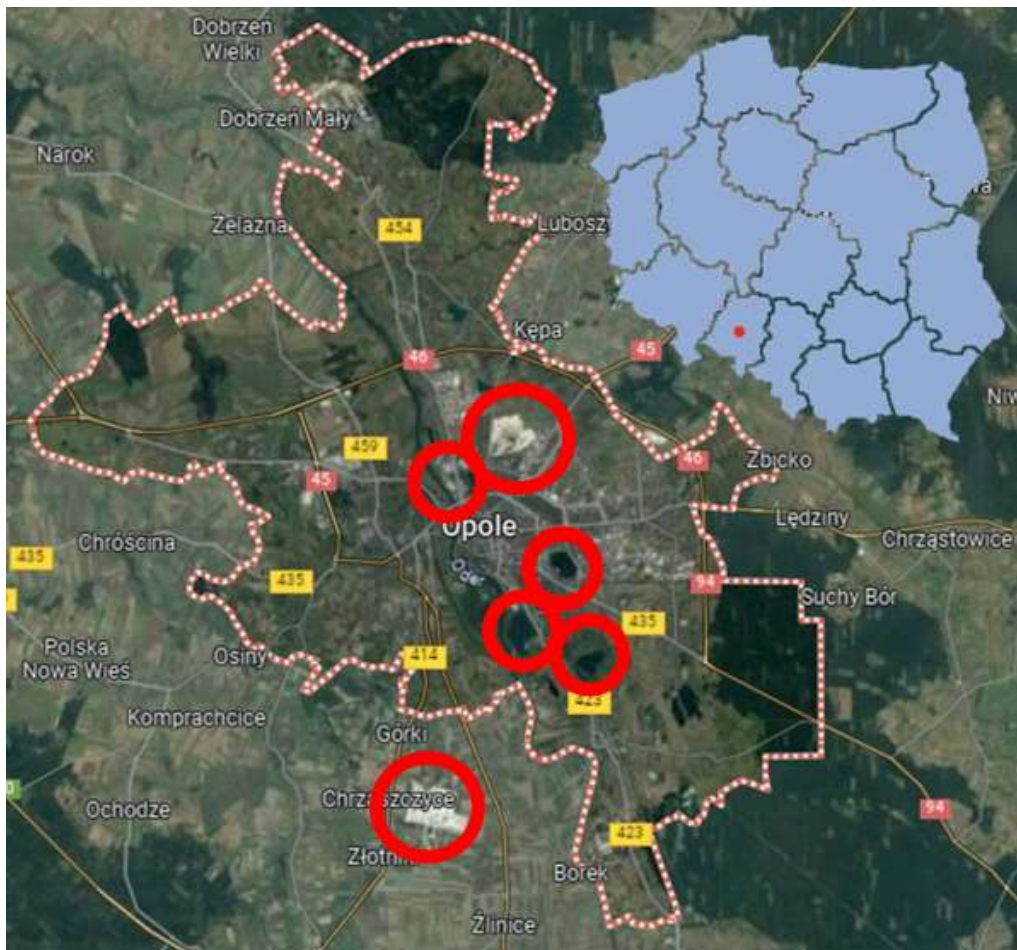


Fig. 1: Location of Opole on a map of Poland. Source: Google Maps. White areas within the city and south to it represent exposures of Cretaceous rocks. Red ellipses mark the biggest of them.



Fig. 2: Profile of the Odra Nowa quarry.



Fig. 3: Profile of the Folwark quarry.

The following have been identified:

- diverse land flora (macrofossils of flowering plants are new for the Opole Cretaceous);
- diverse ichnofossils (*Entobia* and *Podichnus* are new for the Opole Cretaceous);
- diverse microfauna (ostracods, encrusting forams, and agglutinated *Coscinophragma* are new for the Opole Cretaceous);
- diverse sponge assemblage (Minchinellidae and *Aulaxinia* are new for the Opole Cretaceous);
- cnidarians (Octocorallia and Hydrozoa are new for the Opole Cretaceous);
- annelid assemblage (*Spiraserpula spiraserpula*, *Neomicrorbis crenatostratus subrugosus*, *Neomicrorbis crenatostratus crenatostratus*, *Dorsoserpula* cf. *wegneri*, *Neovermilia ampullacea*, *Propomatoceros* sp. and *Vermiliopsis fluctuata* are new for the Opole Cretaceous) (Fig. 4);
- bryozoan assemblage („*Stomatopora*”, „*Berenicea*”, „*Proboscinopora*”, *Herpetopora anglica*, *Biaviculigera strehlensis* and „*Cribrilinidae*” are new for the Opole Cretaceous) (Fig. 5);
- diverse brachiopods;
- nautilids, ammonites and gastropods;
- diverse bivalve assemblage (*Brachidontes*, *Pseudoptera* and *Durania* are new for the Opole Cretaceous);
- decapods;
- cirriped assemblage (*Stramentum* is new for the Opole Cretaceous);
- diverse echinoderm assemblage – crinoids, echinoids, asteroids, ophiuroids (*Crateraster quinqueloba*, *Pycinaster* and *Ophiotitanos serrata* are new for the Opole Cretaceous; Zeugopleuridae is new for Poland);
- diverse ichthyofauna (Hexanchidae, Pachyrhizodontidae, *Cimolichthys* and *Rhynchodecertis* are first confirmed with certainty for the Opole Cretaceous);
- reptiles.

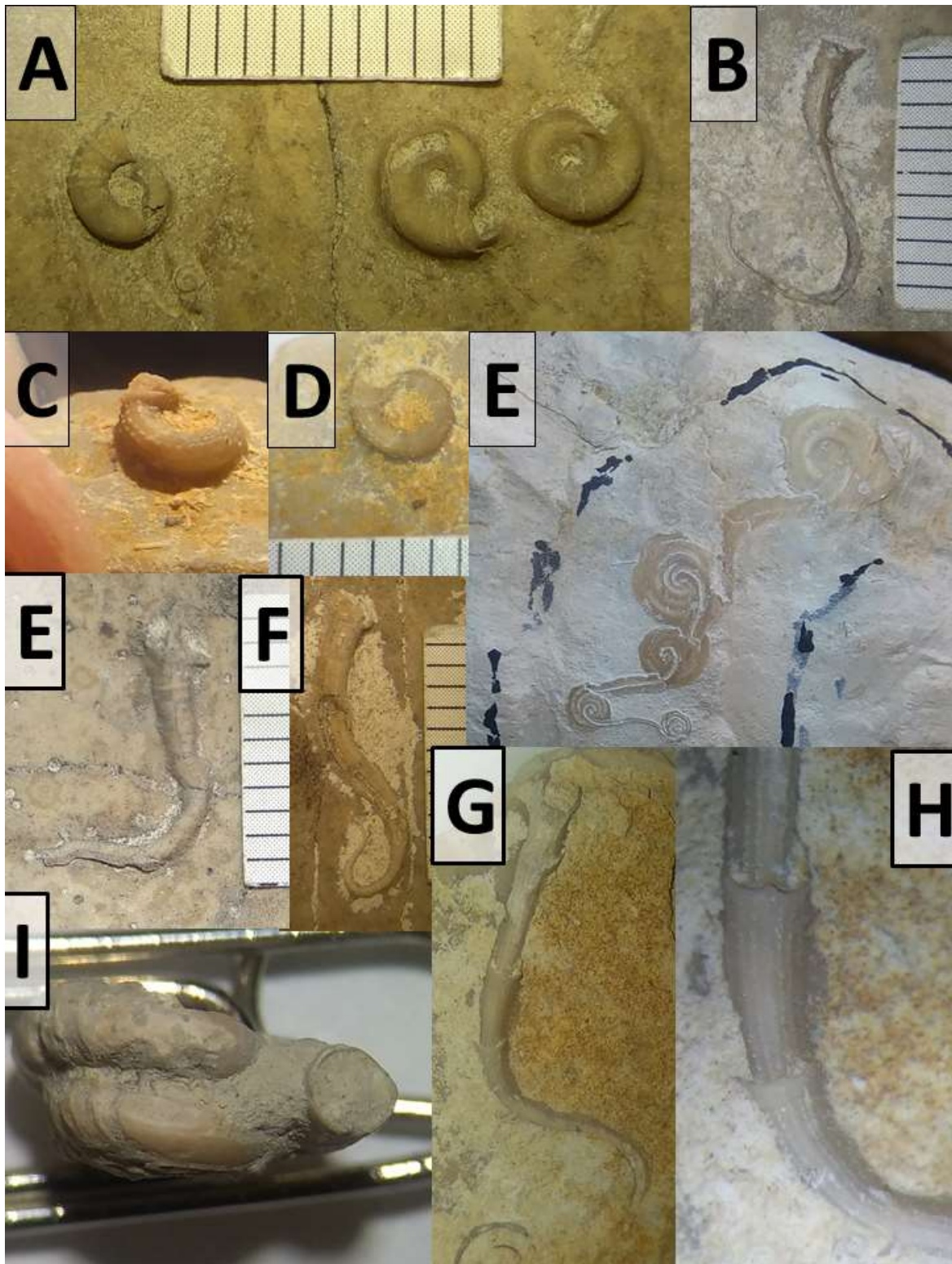


Fig. 4: Sabellida – taxonomic diversity: A) *Neomicrobis crenatostratus subrugosus*; B) *Propomatoceros* sp.; C-D) *Neomicrobis crenatostratus crenatostratus*; E) *Spiraserpula spiraserpula*; F-G) *Neovermilia ampullacea*; H) *Dorsoserpula* cf. *wegneri*; I-J) *Vermiliopsis fluctuata*.

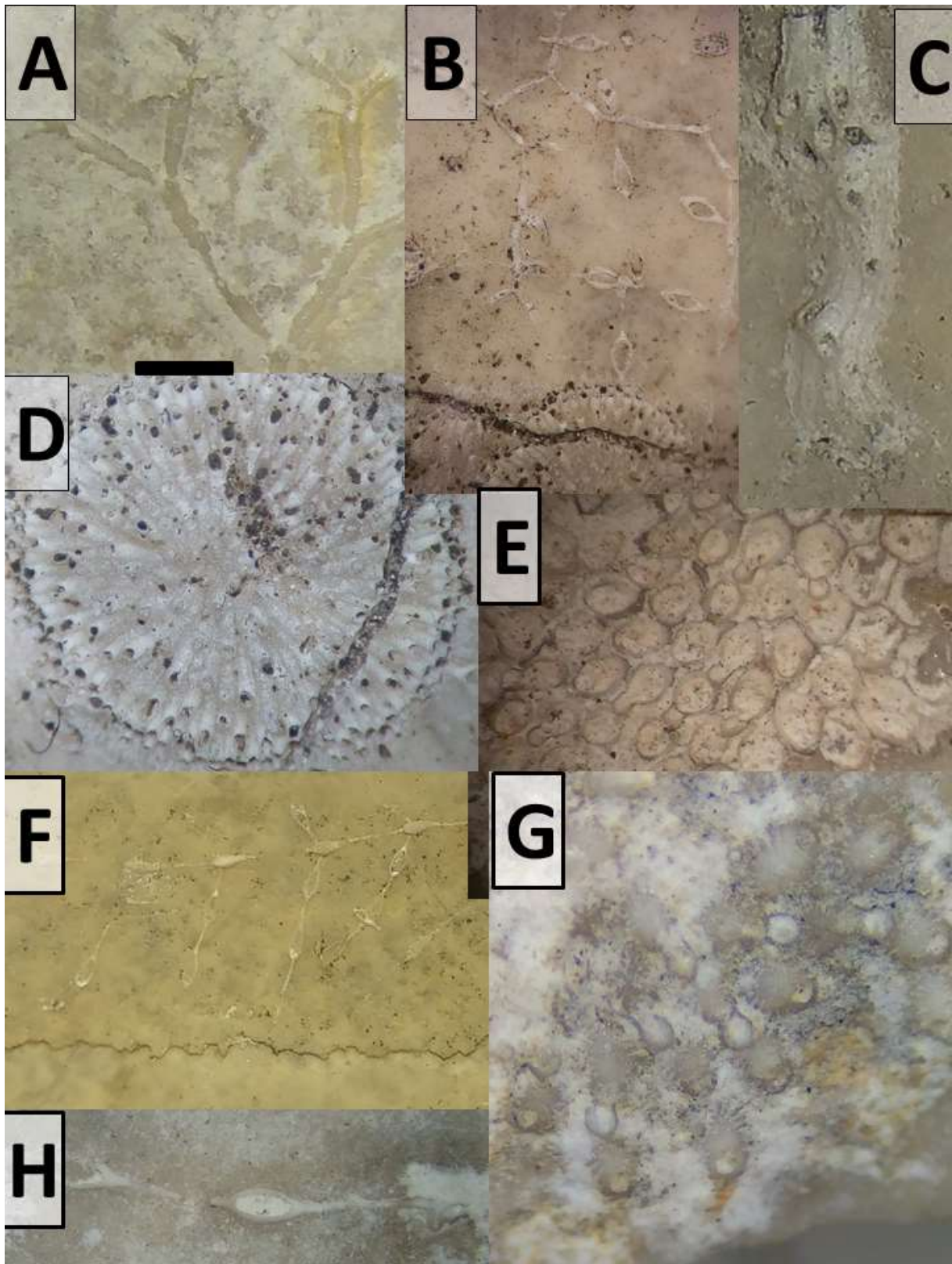


Fig. 3: Bryozoa – taxonomic diversity: A) „Stomatopora”; B) „Stomatopora”, *Herpetopora anglica*, „Berenicea”; C) „Proboscipora”; D) „Berenicea”; E) *Biaviculigera strehlensis*; F) *Herpetopora anglica*; G) *Herpetopora anglica*; H) „Cribriliniidae”.

Identified groups show a striking taxonomical similarity to faunas of adjacent basins, especially the Bohemian Cretaceous Basin. Many taxa at the genus, or even species, level are shared. Apparent paucity of the Opole Cretaceous biota is shown to be an artifact. Remaining differences are not essential and point to a good interconnection between the areas. The Opole Cretaceous succession shows a change from transgressive sands and sandstones to clayey marls rich in land plants and fish remains. With deepening of the basin, the content of calcium carbonate rose, and sponges and inoceramids, often of large size, become a dominant element. After the maximum of transgression, more clayey marls were again deposited, followed by siliceous marls. The final stage of transgression is not preserved.

Index fossils and bioevents allowed for a direct inter-basinal correlation. Differences in lithology result from a certain level of individuality of the basins. The most important is the *Hyphantoceras* event, defined by the appearance of the ammonite genus *Hyphantoceras*; this was linked to global changes of unknown nature. *Hyphantoceras* dispersion was possible thanks to the presence of planktotrophic larval stage in this taxon.

Preserved traces of ethology, the morphology of the fossils, and comparisons with the biology of Recent organisms, allowed insight into the paleoecology of Opole Cretaceous taxa.

The collection as established is unique in sole number of specimens and taxonomic breadth, itself forming a base for future studies.

Zebrana kolekcja jest unikatowa pod względem liczby okazów i ich zróżnicowania taksonomicznego. Tym samym stanowi punkt wyjścia do kolejnych badań w przyszłości.