

"Heliolitids" are a group of colonial corals which died out at the end of Middle Devonian, c.a. 380 million years ago. They belong to tabulates (superorder Tabulata), a group which went extinct by the end of Paleozoic, and its evolutionary legacy most likely disappeared. "Heliolitids" are unique among them, because their skeletons share many similarities with some modern corals, especially the so-called "blue coral", the species *Heliopora coerulea*, an octocoral (order Coenothecalia) commonly occurring on the Pacific reefs. Even though the affinity between them is very remote, their skeletons have a very similar, seemingly identical architecture. It is probably an effect of convergence - developing similar structures by different organisms as a result of adaptation to similar environments.

The aim of the proposed research is to determine the environmental constraints on life and development of "heliolitids", as well as to find out how far does the convergence between them and their analogues among the Coenothecalia (such as the blue coral) reach. An additional objective of the project will be the analysis of the distribution of "heliolitids" in the Middle Devonian Rheic ocean. It will help reconstruct the configuration of this ocean, whose paleogeography remains a matter of discussion.

In order to achieve that, field works will be undertaken in the Silurian and Givetian outcrops in Poland, Czech Republic and Gotland. The gathered coral fossils will be assigned to the lowest possible taxonomic unit (e.g. species). Then their growth forms and the history of colony development will be analysed. Additionally, a microscopic analysis will be performed, of the rocks from which the fossils came. It will allow the determination of such parameters of the environment, in which the corals lived, as water dynamics, depth and the inventory of associated organisms. The results of the abovementioned studies will be compared with the data on modern corals belonging to Coenothecalia, which live on the reefs of Ryukyu Islands in the northern Pacific.

Determining the environments of life and adaptations of the "heliolitids" will allow for a comparison of these long extinct organisms to modern, endangered species of corals. Thanks to that, it will be possible to determine, how far does the convergence between them reach, which in turn will shed a new light on the adaptation processes of corals from very remotely related groups, living in analogous environments of life.