

Ichnology (the study of traces created in the substrate by living organisms) is one of the most important disciplines of paleoenvironmental analysis. Fossilized traces called trace fossils are used by geoscientists to reconstruct water paleodepths, physico-chemical parameters of the environment (e.g., oxygenation, energy, salinity, substrate consistency, or sedimentation rate), and fluctuations of past sea levels. Thereby, they satisfy human curiosity about the geological history of our planet and the origins of mankind.

In the Middle Triassic (247-237 million years ago), much of Europe was covered by a shallow tropical sea thriving in marine life. The organisms (particularly those lacking external shells) produced various traces in the sediment while sheltering from predators or seeking for food within it. The shape, size, and orientation of the traces were controlled by the organism whose behaviours reflected the surrounding environment and its changes. The main goal of this project is to recognize how the Middle Triassic communities of burrowing and boring organisms responded to spatial and temporal changes in sedimentary environment, and which physico-chemical parameters determined particular behaviours of those organisms in a given time interval.

The Middle Triassic rocks containing a record of activity of benthic communities are extracted in a few tens of quarries in the Kraków-Silesia Upland. The project assumes an integration of traditional field and microscopic observations with relatively new techniques such as computer tomography and isotope geochemistry. The results will unequivocally expand the general ichnological knowledge and improve our understanding of environment-organism-substrate interactions in shallow-marine paleoenvironments.