

## The end of the mammal-like reptile era in Europe

Dicynodonts were a diversified group of herbivorous synapsids (“mammal-like reptiles”). Very early (approx. 270 million years ago) they diverged from the lineage leading to mammals and the last certain representatives of these animals are known from Lisowice near Lubliniec (Poland). Until lately they were not known from Poland, but in recent years their bones were discovered in three places: Woźniki, Lisowice, and Marciszów, and this year we found them in a new locality in Myszków. All of these localities are dated to varied stages of the Late Triassic. In Europe, Early and Middle Triassic dicynodonts are known from rare finds near the boundary with Asia.

For three years, excavation works have also been performed in the Middle Triassic sediments in Miedary, in which numerous vertebrate remains are present. This newly discovered locality has, therefore, the potential to reveal the secret of very important period in dicynodont evolution. One-month-long excavation camps thus far provided a lot of fish, amphibian, and reptile fossils of marine, freshwater, and terrestrial species. The latter two categories are represented by carnivorous rauisuchians reptiles, semiaquatic mastodontosaurid and plagiosaurid amphibians, and freshwater dipnoan fish. The presence of the terrestrial dicynodonts in temporally and geographically close Woźniki as well as in younger, but still adjacent Lisowice and Marciszów suggests that their eventual finding in Miedary is highly probable.

Biostratigraphic studies of Krasiejów and Woźniki sediments indicate that these localities are of similar geological age of approx. 230 million years. Dicynodont remains from this time period in Europe (excluding a single bone from Germany) were only found thus far in Woźniki and Myszków. The latter is a new locality discovered in September 2017, and it seems to be rich in fossils, not only belonging to dicynodonts. The Institute of Paleobiology, Polish Academy of Sciences, for many years has organized fieldworks in Krasiejów. The studies performed in a new region of that locality revealed there new, previously not encountered fossils. This gives hope that dicynodont remains may be present in this locality as well. The exceptionally good state of preservation of Krasiejów specimens may potentially bring answers to many questions concerning this group.

During the Middle Triassic, most of Poland’s territory was flooded by the great Muschelkalk Sea, including in its extent the whole Germanic Basin. This is one of the reasons why fossils of terrestrial animals are so rare in the European Middle Triassic. Because of that, the new locality in Miedary, where both marine and terrestrial animal remains are found, is so important for understanding the evolutionary changes of tetrapods. Its impact is global as well, because the comparatively old, Ladinian dicynodonts are known from Brazil (*Stahleckeria potens*) and Argentina (*Dinodontosaurus turpior*). The dicynodonts geographically closest to Poland are known from Russia (Orenburg region) from the Anisian (e.g., *Rabidosaurus cristatus*), they are therefore older than the Miedary and South America species. Unpublished studies of the Principal Investigator suggest that the Russian *Rabidosaurus* is ancestral to the forms known from Poland. We believe that new dicynodont fossils from Miedary and Krasiejów will solve this enigma.