

Cold case: in search of the provenience of an exceptionally preserved Cretaceous shark

Fuchs, Iris (Naturhistorisches Museum Wien, Wien, AUT);

Engelbrecht, Andrea (Universität Wien, Wien, AUT);

Wagreich, Michael (Universität Wien, Wien, AUT)

The preservation potential of shark skeletons is generally poor. Therefore, complete fossils are rather rare. Due to the rarity of articulated specimens, each exceptionally preserved specimen has a fundamental significance for palaeontology in general.

Herein, we present an about 38-cm-long fossil shark preserved as mould on a sandstone slab. The specimen is stored in the collection of the Kammerhof Museum Gmunden, Upper Austria, but lacks any labels. Therefore, the provenience of the fossil is still unknown.

The aim of the study is to identify the taxon on genus level and to speculate about the presumed geological context of the specimen. A nannoplankton sample of the surrounding sediment revealed a Late Cretaceous age. This information was the basis for further taxonomic classification. Despite the rather poor state of preservation of the teeth a distinct affiliation to Lamniformes, the mackerel sharks, can be proven using a cast of the dissolved teeth. After a detailed anatomical description of the complete skeleton, the search for the origin of the fossil had started. First of all, comprehensive literature research had to be conducted, which revealed evidence of other shark bearing horizons of Late Cretaceous age with rather similar sediment characteristics from the Münsterland Basin in Germany. In a next step a heavy mineral analysis and a thin section of the matrix will be analyzed to compare the sandstone of the German location and to determine the provenance of the sediment, aiming at a sedimentological fingerprinting study.

This case study should demonstrate possibilities, which can be used to determine fossils of historical collections with insufficient or lost labeling, which has otherwise limited significance for research.