



Evidence for tidal currents and benthic mass-mortality events in the Sarmatian Paratethys Sea (middle Miocene; North Alpine Foredeep Basin)

O. Mandic (1), M. Harzhauser (1), R. Roetzel (2)

(1) Natural History Museum Vienna, Austria, (2) Geological Survey of Austria, Neulinggasse 38, A-1030 Vienna, Austria (oleg.mandic@nhm-wien.ac.at)

Lower Sarmatian tidal flat deposits are documented from the Hollabrunn/Aspersdorf section in Lower Austria. The paleogeographic position of the investigated section was at the western margin of the Central Paratethys Sea which reached here about 50 km from the Vienna Basin to the west into the otherwise already dry North Alpine Foreland Basin. It represents one of the north-western most Sarmatian sections of the Central Paratethys and was part of an ancient incised valley. This unusually long and narrow embayment was prone to rapid environmental changes due to shifts in water circulation and regional sea-level fluctuations. Detailed sedimentological and paleontological analyses point to tidal influence in this part of the Central Paratethys Sea. The type of grain size distribution is similar to those described from channel sands from estuaries and tidal areas (e.g.: tidal sands of the East Frisian coast).

Aside from characteristic tidal-flat sediments, the section yields an outstanding fossil Lagerstätte with census assemblages of solenid bivalves and potentially pagurized batillariid gastropods in death position. In-situ occurrences with traces of former iron-sulfide concretions strongly suggest hypoxic events as cause for the mass-mortalities on the tidal-flats. In modern estuaries and intertidal zones, such tidal-flat hypoxia are typically occurring during green tides. Such algal blooms are responses to eutrophication due to elevated loads of nutrients and organic carbon. Subsequently, the macroalgae are washed up on the shoreface where their decay causes hypoxia in the intertidal zone. The geomorphology of the incised valley, producing a very narrow but elongated

marine inlet, suggests that the water body was influenced easily by shifts in freshwater discharge being responsible for that loading. Similarly, the current system of such a shallow inlet was fragile and strongly depending on the relative sea-level, inducing periodical isolation events supporting eutrophication. The in-situ occurrence of obliquely buried batillariid gastropod shells with limonitic concretions at the apertures hints at the occurrence of otherwise completely unrecorded hermit crabs in the highly endemic fauna of the Paratethys Sea during the Sarmatian.

The paper is a contribution to the FWF project P19013 and to the NECLIME project.