Ichnology of the Lower Badenian (Middle Miocene) Baden-Sooß core at the type locality of the Badenian (Vienna Basin, Lower Austria)

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Supported by the FWF-project P13743-B10 “Temporal and spatial changes of micro-fossil associations and ichnofacies in the Austrian marine Miocene” a scientific core has been drilled near the western margin of the southern Vienna Basin to a depth of 102 metres. The aim of the study was the answer to problems in biostratigraphy, palaeoecology, palaeoichnology, sedimentology, geochemistry, magnetostratigraphy and magnetic climate proxies such as magnetic susceptibility (Höhenegger et. al., submitted).

After splitting the core vertically and smoothing the cross section scanning and camera did digital documentation. Except several layers with primary laminations the core is completely bioturbated. Seven main ichnofabric types and several subtypes were distinguished (Fig. 1).

Trace fossils from the ichnogenera Asterosoma, Chondrites, Nereites, Ophiomorpha, Phycosiphon, Scolicia, Siphonichnus, Teichichnus, Thalassinoides, Trichichnus and Zoophycos can be distinguished in cross-section. Phycosiphon dominates the core, occurs in nearly all horizons and is accompanied in many layers by Nereites. Other trace fossils such as Scolicia, Trichichnus and Zoophycos are concentrated in the deeper portion of the core. Thalassinoides is completely absent in these deeper horizons, shows a maximum in the middle part and also occurs frequently in the higher portions.

Although Phycosiphon has no connections to the sea floor, it is common in poorly oxygenated sediments (e.g., Ekdale & Mason 1988). This trace fossil is interpreted as a structure originating from deposit feeding and indicates a high portion of particulate organic matter in the sediment. Trichichnus has a typically strong tendency to pyritization. It is a deep-tier trace fossil, produced by opportunistic organisms in poorly oxygenated sediments (McBride & Picard 1991), which maybe belong to chemosymbiotic meio-infauna. Zoophycos and Chondrites are typical members of soft bottom communities settling in muddy, organic rich, dyasaerobic sediments deposited under quiet conditions.

The trace fossil Scolicia, produced by irregular echinoids, indicates full marine conditions (e.g., Bromley & Asgaard 1975; Smith & Crimes 1983). The salinity tolerant crustacean burrow Thalassinoides (Frey et al. 1984) replaces Scolicia in the higher portions of the core.
The distribution of trace fossils in this core shows a shallowing tendency indicated by the transition from the Zoophycos (Z) ichnofacies to a very distal Cruziana ichnofacies. Surprisingly, the distribution of the trace fossils shows a significant correspondence to the insolation and magnetic susceptibility cycles.

References


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