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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-BIO "Temporal and spatial changes of microfossil 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 (Hohenegger 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, dysaerobic 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.

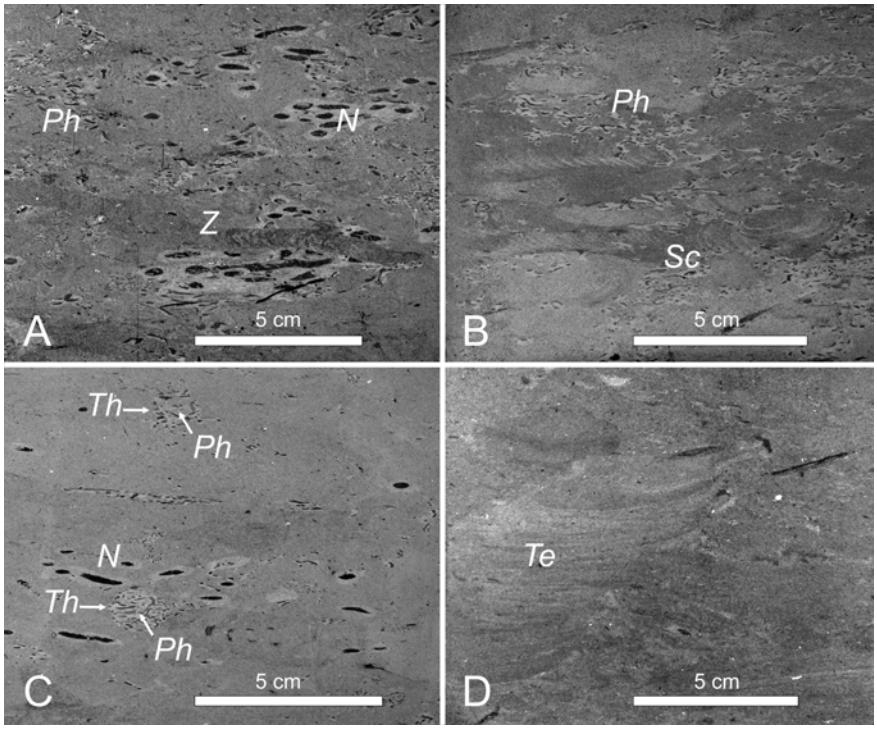

Fig. 1: A) Ichnofabric with *Phycosiphon* (*Ph*), and *Nereites* (*N*) cut by *Zoophycos* (*Z*). Metre 96.04–96.54. B) Ichnofabric with *Phycosiphon* (*Ph*) cutting and being cut by *Scolicia* (*Sc*). Metre 46.56–46.66. C) Ichnofabric with *Nereites* (*N*) and *Thalassinoides* (*Th*) filled with *Phycosiphon* (*Ph*). Metre 46.20–46.30. D) Ichnofabric with Teichichnus cut by *Phycosiphon*. Metre 26.43–26.53.

The distribution of trace fossils in this core shows a shallowing tendency indicated by the transition from the *Zoophycos* ichnofacies to a very distal *Cruziana* ichnofacies. Surprisingly, the distribution of the trace fossils shows a significant correspondence to the insolation and magnetic susceptility cycles.

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