

Distribution of trace fossil assemblages in the Grund formation (Lower Badenian)

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Sedimentology, Paleontology and Ichnology of the Grund formation could be studied during a field campaign in August 1998. Five trenches were dug out by an excavator down to a depth of around 5m from the soil surface. The tertiary sediments in these trenches are ranging from 237m to 246.5m above sealevel and are covered by Pleistocene sediments + soil of 100 to 300cm thickness.

The 6 profiles at the type locality Grund contain shallow marine sediments from a channel facies. Several fining upward cycles with shellayers at the base covered by coarse and fine sands with thin pelitic layers on the top indicate periodical high energy events with rapidly decreasing energy level.

The deepest positions of the sequence (Profiles A, B1, B2) with cycles of 60 up to 120cm thickness contain layers of pelitic clasts. These up to 40 cm thick layers contain marine molluscs, terrestrial gastropods, bones of vertebrates (turtles, whales, rhinos, small carnivores and micromammals). The bioturbations in profile B2 are restricted on sparsely developed tubes with a few mm in diameter (*Macaronichnus*, *Skolithos*) penetrating the sandy portions starting from the pelitic layers.

The thickness of the graded beds towards the top of the sequence is decreasing (20 - 45cm in the middlepart - Profiles C, D). Planar laminated layers sometimes can be followed by current ripples showing a reduction of current velocity. The laminated sands are mostly covered by pelitic layers of several cm thickness. Bioturbations starting from these pelitic layers are reaching down 5cm into the sandy layers below. The pearshaped trace fossils (*Asterosoma*) with an diameter of about 1 cm in their thickest portion seem to have similarities to Crustacean dwelling systems with several burrow openings on the muddy seafloor.

The uppermost profile (E) also with graded beds, planar laminated sands with plant debris on the top are covered by pelites of 10 to 20cm thickness. A diverse trace fossil community reaches down into the sandy base developing from the pelitic layers. *Chondrites*, *Thyasiridae*-shells connected with deep shafts, *Ophiomorpha*, *Rhizocorallium*, *Rosselia*, *Teichnus* and *Zoophycos* are well developed. Some *Ophiomorpha* like structures seem to be connected with *Rhizocorallium*, or show transitions to *Teichnus*.

The chemosymbiotic *Thyasiridae* produce root-like branching burrow systems below their dwelling position within the sediment. This well systems are morphologically reminiscent of the trace fossil *Chondrites* in the same horizons of the Grund formation.

The trace fossil assemblage of the deeper profiles can be characterized as a community of oportunistic burrowers being able to settle in short periods of lower hydrodynamic energy. The assemblage of the uppermost profile is characterized by structures typical for deposit feeders (*Rhizocorallium*, *Zoophycus*) below the normal wave base and is corresponding to the *Cruziana* ichnofacies.

The decrease of the hydrodynamic level from the base of the sequence to its top is obvious in the sedimentological record as well as in the development of trace fossil assemblages. The lower Badenian transgression but also changes in the depositional environment could be responsible for this fact.

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