



Sedimentology and ichnology of the Lower Badenian (Middle Miocene) Baden-Sooss core at the type locality of the Badenian (Vienna Basin, Lower Austria)

M. Wagreich (1), P. Pervesler (2), A. Uchman (3), M. Khatun (1) and I. Wimmer-Frey (4)

(1) Center for Earth Sciences, University of Vienna, Austria, (2) Department of Palaeontology, University of Vienna, Austria, (3) Institute of Geological Sciences, Jagiellonian University, Kraków, Poland, (4) Geological Survey of Austria, Vienna, Austria

A 102 m long core of nearly completely bioturbated lower to upper offshore fine-grained sediments (Baden Group, “Badener Tegel”) was drilled near the Badenian type locality at Baden-Sooss. An early Badenian age (regional Upper Lagenid Zone; Middle Miocene) is indicated by biostratigraphy.

The core comprises mainly bioturbated, medium to dark grey marls and shales. XRD mineralogy and geochemistry analysis indicates around 30% of quartz, below 10% of albite, 15-20% of muscovite/illite, 10-15% chlorite, 10 to 15% of kaolinite, 15-25% of carbonate including dolomite as constituents. Rare intercalations include sand layers with shell debris and a smectitic tuff bed. Mean grain size ranges from 2 to 4 μm . The positive correlation of carbonate to organic carbon indicates a dilution controlled siliciclastic deposition. HI values from Rock Eval pyrolysis below 90 characterize mainly type III kerogen from terrestrial higher plant material and only minor marine input. The depositional environment can be characterized as offshore, below fair weather wave base and within storm wave base. The sediments are hemipelagites, a mixture from pelagic biogenic carbonate and terrigenous clay and silt.

The trace fossils *Asterosoma*, *Chondrites*, *Nereites*, *Ophiomorpha*, *Palaeophycus*, *Phycosiphon*, *Scolicia*, *Siphonichnus*, *Teichichnus*, *Thalassinoides*, *Trichichnus* and *Zoophycos* are present. Alternating periods of higher and lower accumulation rate

with higher respectively lower input of particulate food and higher respectively lower oxygen content in pore waters led to sequential colonization of the substrate. The trace fossils *Phycosiphon* and *Nereites* represent opportunistic colonization of oxygenated sediments rich in particulate organic matter by deposit-feeding animals, quickly after an increased sediment input. A further step of colonization caused by the decrease of POM induced by consumption and oxidation forced the animals to search for food on sediment surfaces and from the water column. The open burrows *Thalassinoides*, *Chondrites*, *Trichichnus* and *Zoophycos* indicate more stable bottom conditions in periods of low accumulation rates. *Zoophycos*, *Phycosiphon*, *Nereites* and *Teichichnus* suggest the *Zoophycos* ichnofacies for the deeper core, a transition to the distal part of the *Cruziana* ichnofacies is suggested for the upper core with appearance of *Thalassinoides*. Cluster analysis helped to distinguish 7 types of recurrent ichnofabrics. Their changes correspond with periods of orbital cycles.