Geophysical Research Abstracts, Vol. 9, 11030, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-11030

High-resolution pollen analysis of Late Miocene brown coal in the Staniantsi Basin (W Bulgaria)

D. Ivanov (1), T. Utescher (2), A.R. Ashraf (3), V. Mosbrugger (4), E. Slavomirova (1), N. Djorgova (1)

(1) Bulgarian Academy of Sciences, Institute of Botany, Sofia, Bulgaria, (2) Geological Institute, Bonn, Germany, (3) Institute of Geosciences, Tübingen, Geermany, (4) Senckenberg Research Institute and Natural History Museum, Frankfurt/M, Germany

The Staniantsi Basin is situated in West Bulgaria, within a NW-SE trending intramountain depression. The Neogene sedimentary succession in the open cast mine starts with approximately 30 m of brown coal. The brown coal seam displays small-scale cycles characterized by changes in clay and carbonate contents representing cyclic changes of lacustrine und palustrine facies conditions. Above the brown-coal, there follows a horizon with alternating finer-grained layers rich in organic carbon and coarser-grained clastic sediments, up to 50 m in total thickness.

The terrestrial vegetation is reconstructed by means of palaeoecological analysis. Detailed, quantitative climatic records for various temperature and precipitation parameters are reconstructed using the Coexistence Approach. The vegetation changes observed in the profile reveal larger scale evolutionary trends as well as short-term cyclicity. We apply high-resolution (HR) pollen analysis to document the short-term vegetation and climate dynamics in order to understand the response of vegetation to climate oscillations. Three HR cycles are analysed. The HR cycles 1 and 2 from the brown coal horizon show almost symmetrical changes with respect to their palynomorph spectra. These spectra clearly express the affinity of an Osmunda – Cedar association to clastic sedimentation and to higher carbonate contents while the brown coal facies is characterized by a peat bog community comprising Polypodiaceae, angiosperm herbs and Taxodiaceae. HR cycle 3 from the clastic part of the profile displays unidirectional change in the palynomorph spectra with percentages of the peat bog community increasing at the top of the cycle terminated by a thin layer rich in organic carbon. The records for mean precipitation of the warmest month (MPwarm)

reconstructed for the HR cycles show cyclic changes in intervals of 20 to 50 cm. Marl layers and horizons containing freshwater molluscs tend to be correlated with a higher MPwarm (HR cycles 1 and 2). The reconstructed temperature records resolve no clear cyclicity, nor correlation with change of sedimentary facies. Thus, the palynological data indicate that the sedimentary cycles displayed in the Staniantsi section are likely to reflect changes in the moisture gradient caused by variation of the rainfall in the warm season.