



How dinoflagellate cysts from the Po-river discharge plume can provide information about past variations in temperature and precipitation in the Italian region (MOCCHA Project)

K. Zonneveld (1), L. Chen (1), J. Möbius (2), and M. Mahmoud (3)

(1) Fachbereich 5-Geowissenschaften, Postfach 330440, D-28334 Bremen, Germany (zonnev@uni-bremen.de), (2) Institut für Biogeochemie und Meereschemie, Bundesstraße 55, 20146 Hamburg, Germany, (3) Geology Department, Faculty of Science, Assiut University, Assiut 71516, Egypt.

Continuous marine high-resolution climate records with sufficient time resolution are needed to detect high-frequency variations in paleo-climate. Such records are rare but vital for our understanding of causes and consequences of climate and environmental change at decadal to millennial time scales. The eastern Mediterranean Sea is particularly sensitive to climate change and within the EuroMark fundet project MOCCHA (Multidisciplinary study Of Continental/ocean Climate dynamics using High-resolution records from the eastern mediterraneAn) we intent to obtain detailed information about short term climate perturbations in climate at annual to decadal time resolution.

Recently unique sediment cores have been recovered from the Southern Italian Region that allow the reconstruction of climate in the region at this resolution. Pilot studies at these sites have revealed that these short term perturbations in climate involve either temperature or precipitation changes or a combination of both (Versteegh et al., 2007).

A way to determine the precipitation and temperature history of the Italian climate is to establish reconstructions of past variations in Po-river discharge and sea surface temperatures in the region. Fossil dinoflagellate cyst associations are very suitable tools to achieve this information as they reflect in detail changes in surface water salinity concentrations and upper water productivity as well as temperature. However, to do this precise information about the relationship between present day upper ocean environmental conditions and cyst association in modern surface sediment samples has to be established. To obtain this information we have studied the association of 48 sites in the middle and distal part of the discharge plume. The dinoflagellate cyst association reflects both upper and bottom water circulation. Four associations can be distinguished that are characteristic for the major oceanographic settings in the region. (1) River discharge association, (2) Warm water association (3) Oxygenated bottom water group (4) Golfo di Taranto group. The results from this study allow the reconstructions of past variations in Po-river discharge, Sea surface temperatures and bottom water circulation. As such they form the basis for future studies within the MOCCHA projects that are presented in this session as well as in session CL15.

Versteegh, G. J. M., de Leeuw, J. W., Taricco, C., and Romero, A. Temperature and productivity influences on UK'37 and their possible relation to solar forcing of the Mediterranean winter. *Geochemistry Geophysics Geosystems* 8, Q09005. 18-9-2007.