GEOCHEMICAL COMPOSITION OF RECENT SEDIMENT FROM THE SW ADRIATIC SEA AND THE GULF OF TARANTO (S. ITALY) COMPARED WITH THAT OF THE LAST 400 YEARS FOR ONE SITE

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Abstract

Previous studies from the Gallipoli shelf area indicate continuous sedimentation and high accumulation rates with low disturbance from bioturbation ([1]) permitting high resolution paleoclimate investigations. In this study major and trace elemental composition bulk organic Carbon and Nitrogen, $\delta^{13}C$ and $\delta^{15}N$ from a multi core (NU04MC) from the Gallipoli shelf is presented. These data is used for a paleoclimate reconstruction using results from 47 surface sediments from the area (Gulf of Taranto and SW Adriatic). Preliminary results indicate a strong anthropogenic influence in the last 100 years.

Keywords: Geochemistry, Eastern Mediterranean, Global Change, Paleoceanography

To improve our understanding of causes and consequence of climate and environmental change on decadal to millennial time scales more comprehension is needed on the underlying processes. The Mediterranean lies between low and mid-latitudes and is influenced by both the monsoonal and NAO climate systems making it a key area for paleoclimatic investigations. Continuous, high resolution sedimentary paleo climatic archives permit us to study in sufficient resolution the required time scale. Previous studies from the Gallipoli shelf area (39N46;17E54) indicate continuous sedimentation and high accumulation rates with low disturbance from bioturbation (e.g[1]) permitting high resolution investigations. Carbonate contents, thermolumuniscense, oxygen and carbonate isotopes ([2]) and sea surface temperatures ([3]) all display compositional cycles at frequencies known from solar cycles. The origin and processes related to these variations, however, remain unclear. Therefore, a study is presented here in which recent surface sediments elemental composition from the area are compared and calibrated with recent environmental factors. These results can then be used for a paleoclimatic reconstruction of the last few hundred years using multicore NU-04-MC . For this study the first centimeter of 47 multicores has been sampled (Fig 1.)The multicores are from the area and recovered during the Cappuccino cruise ([4]). These samples have previously been analysed for their foraminiferal isotope composition and Dinoflagellates ([5]). In addition, these samples were analyzed for their total inorganic geochemistry using total destruction and ICP-OES. These data and Bulk organic carbon have been correlated with local environmental variables such as Primary Productivity, Temperature, Oxygen levels and Salinity. Preliminary results show a decreasing trend along the surface sediment transect (Fig 1.) for some elements (e.g. Ba/Al, Cr/Al) indicating them as an indirect proxy for the amount of Adriatic Surface water. Furthermore correlations were found within a range of cores between oxygen penetration levels and redox elements. Bulk organic Carbon and Nitrogen content showed correlations with satellite-derived chlorophyll-a concentrations in different seasons. Furthermore a multicore was retrieved from the area (NU04-MC) which contains finely laminated sediments. Preliminary dating resulted in an estimated age of 400 years for the 380mm core depth. Every 2.5 mm was sampled and analyzed. Correlations found for the surface sediments are used to explain the variability within the core. First results of the core NU-04-MC show increasing trends of some elements know as anthropogenic indicators together with an increase in Ba/Al ratios (Fig 2.) from a depth of 100 mm towards the recent. Increased Ba/Al ratio's can be indicative for an increase of primary productivity but could also indicate a different source for clay minerals [6]). The timing of the increase in a variety of elements including Ba, however, suggests an anthropogenic origin. This work is supported by the EUROCORES/EUROMARC Program of the European Science Foundation (NWO.817.01.002 MOCCHA project).

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