Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06260, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06260
EGU General Assembly 2008

Late Neogene Ba/Ca evolution in water masses of the Mediterranean basin

M. Sprovieri (1) and M. Ribera d'Alcalà (2)

(1)Istituto per l'Ambiente Marino Costiero (IAMC)- CNR, Naples, Italy, (2)Stazione Zoologica 'A. Dohrn', Naples, Italy

A Mediterranean composite sedimentary record was analysed for Ba/Ca ratios on carbonate shells of *Orbulina universa* planktonic foraminifer (Ba/Ca_{carb}) providing the opportunity to study and assess the extent of the freshwater inputs on the basin and its possible impact on its dynamics during the Serravallian to Recent period.

A number of electron scanning microscope analyses and auxiliary trace element measurements (Mn, Sr and Mg), obtained from the same samples, seem to exclude important diagenetic effects on the studied biogenic carbonates and corroborate the reliability of Ba/Ca ratios in the foraminifera calcite as indicators of seawater source components during the studied interval.

A long-term trend with Ba/Ca_{carb} values shifting from 9 to 3 μmol/mol from the base of the Serravallian to the top of the Messinian is observed. The interval of the Late Messinian salinity crisis, where biogenic carbonates are missing or strongly diagenised, represents a crucial passage not monitored in our record.

At the base of the Pliocene, up to about 4.7 Ma, the Ba/Ca_{carb} record shows a decreasing trend from $\sim$4 μmol/mol stabilizing itself to an about constant value of 0.9$\pm$0.3 μmol/mol value for the whole Plio-Pleistocene interval.

These results suggest a dramatic change in the continental runoff values, up to $\sim$15-3 times higher during part of the late Neogene (Serravallian-Early Pliocene), with a possible profound modification in the physical dynamics of the Mediterranean basin. First-order mass-balance equations used to estimate barium and salinity budgets in

the Mediterranean Sea during the Late Miocene-Early Pliocene interval support the hypothesis of an active connection of the basin with the Paratethys region and of a definitive restriction at the base of the Pliocene, after about 0.7 My from the well-known Messinian *Lago-Mare* phase. They also open intriguing scenarios on possible circulation shifts during Neogene.