



Ecological responses of benthic foraminifera to hypoxic conditions: results of an experimental study using the CTG method

F. Pucci. (1,2), E. Geslin (1), F.J. Jorissen (1), C. Morigi (2) and A. Negri (2)

(1) Laboratory of Recent and Fossil Bio-Indicators (BIAF), Angers University, France.

(2) Department of Marine Science (DISMAR), Polytechnic University of Marche, Ancona, Italy

In the Adriatic Sea, oxygen-depleted areas have increased in the last century, due to eutrophication. The aim of this work is to determine the response of shallow water benthic foraminifera to oxygen-depleted conditions due to strong anthropogenic impact. We combined an *in situ* study with laboratory experiments under hypoxic/anoxic conditions, in order to obtain databases on the living benthic foraminifera communities useful to evaluate their use as biological indicators of the coastal equilibrium.

Sixteen cores (10 cm long) from the Adriatic Sea, at 35 m water depth were exposed to 1) hypoxic/anoxic conditions (<1 ml O_2 /l); 2) normal condition (>1 ml O_2 /l) for 70 days and were analyzed using a highly accurate method (fluorogenic probe Cell Tracker Green CMFDA) to distinguish the living individuals. The experimental results show that the anoxic conditions do not have a direct lethal effect on the majority of benthic foraminifera species which are able to survive for more than 2 months under hypoxic/anoxic conditions. Some taxa (*Bulimina* spp. and *Eggerella scabra*) seem to have no preference for a specific microhabitat and their presence until the deepest layers of the sediment, denotes their high tolerance with respect to hypoxic/anoxic conditions and the lack of labile organic matter. Some other taxa (*Nouria polymorphinoides* and *Nonionella turgida*), migrate to the surface under hypoxic/anoxic conditions, apparently in response to the strong compression of the succession of redox fronts in the superficial layer. The different responses of the benthic foraminifera species to hypoxic events, may be used as a tool in estimating naturally occurring hypoxia.