# Ecological response of Tethyan benthic foraminifera to the Middle Eocene Climatic Optimum (MECO) from the Alano section (NE Italy)

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The Middle Eocene Climatic Optimum (MECO) is a prominent and transient (~500 Kyr) warming episode that, at 40 Ma, interrupted the overall cooling trend of the middle Eocene (Bohaty & Zachos, 2003; Tripati et al., 2005; Sexton et al., 2006; Edgar et al., 2007a). MECO is recorded worldwide by pronounced changes of the $\delta^{13}C$ and $\delta^{18}O$ values and coeval oscillations in global CCD (Bohaty et al., 2009).

The expanded and continuous Alano di Piave section (northeastern Italy), located in a marginal basin of the central-western Tethys, provides an excellent record of the MECO, offering the opportunity to investigate this event in detail with multi-proxy, high-resolution approaches (Spofforth et al., 2010). At Alano a peculiar sapropelic interval, characterized by excursions in both the carbon and oxygen bulk-carbonate isotope records, represents the lithological expression of the post-MECO event. Such organic-enriched interval follows the $\delta^{18}O$ negative shift, interpreted as the peak of MECO warming (Spofforth et al., 2010). Previous studies on the Alano section, indicate profound changes in calcareous nannofossil and planktonic foraminiferal assemblages during the MECO and post-MECO intervals and highlight a marked increase in eutrophic, opportunist, low-oxygen tolerant taxa and a decrease in oligotrophic and specialized ones (Luciani et al., 2010; Toffanin et al., 2010). These biotic modifications suggest increased nutrient input and surface ocean water productivity in response to the environmental perturbation associated with the MECO.

In order to improve our knowledge about the marine ecosystem response to the MECO, we investigated benthic foraminiferal fauna of the middle bathyal Alano di Piave section through the analysis of the ≥ 63 µm fraction. Here we present a detailed, high-resolution, quantitative analysis of benthic foraminiferal assemblage with the aim to reconstruct the modifications of the sea-floor conditions during the environmental perturbations of the MECO and post MECO intervals. Our preliminary results show, in the sapropelic intervals, increased abundance of *Uvigerina*, a taxon common in oxygen-depleted, organically enriched settings, together with other bi-triserial taxa (bolivinids and buliminids) and *Hanzawaia ammophila* (another indicator of dysoxic conditions). These faunal modifications are interpreted as a result of deeply perturbed/stressed environmental conditions and in particular: a) a remarkable food transfer to the sea-bottom and b) development of dysoxic waters at the sea-floor, but no total anoxia as also indicated by geochemical proxies (Spofforth et al., 2010). Such conditions were an effect of eutrophication of surface waters, because of the modified, enhanced hydrological cycle in response to the MECO warming.