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CALCAREOUS NANNOFOSSIL ASSEMBLAGES AT CORE KC01B (IONIAN SEA) THROUGH OXYGEN MARINE ISOTOPE STAGES 9-13

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ABSTRACT: Tarantino F. *et al.*, *Calcareous nannofossil assemblages at core KC01B (Ionian Sea) through oxygen Marine Isotope Stages 9-13* (IT ISSN 0394-3356, 2011).
Calcareous nannofossil assemblages from deep sea core KC01B in Ionian Sea have been analysed in high sample resolution (0.6-0.8 kyr) through the Pleistocene Marine Isotope Stages (MIS) 9-13 interval, which includes significant climate changes during the known Mid-Brunhes Event. Collected data show complex relationships between coccolithophores modification and environmental parameters.

RIASSUNTO: Tarantino F. *et al.*, Associazioni a nannofossili calcarei durante gli stadi isotopici 9-13 nella carota KC01B (Mar Ionio) (IT ISSN 0394-3356, 2011)
Sono state studiate le associazioni a nannofossili calcarei nella carota di mare profondo KC01B recuperata nel Mar Ionio. Le analisi, condotte in alta risoluzione temporale (0,6-0,8 kyr) indicano complesse relazioni the le modificazioni delle associazioni e i cambiamenti dei parametri ambientali durante un intervallo di importanti variazioni climatiche conosciuto come Mid-Brunhes Event.

Key words: calcareous nannofossils, Ionian Sea, core KC01B, MIS 9-13.

Parole chiave: nannofossili calcarei, Mar Ionio, carota KC01B, MIS 9-13

Quantitative analyses have been performed in high temporal resolution (one sample per 0.6-0.8 kyr) on calcareous nannofossil assemblages from core KC01B throughout the Pleistocene interval spanning Marine Isotope Stages (MIS) 9-13. This interval includes the Mid-Brunhes Event (MBE, JANSEN *et al*., 1986), a time of significant climate modification that experienced a warm and prolonged interglacial, MIS 11, considered the modern analogous of the Holocene. The MBE is also characterized by an increase of atmospheric CO_2 and a global increased $CaCO_3$ accumulation mainly linked to enhanced coccolithophores production associated with a high proliferation of *Gephyrocapsa* Genus in many oceanic settings (BARKER *et al.*, 2006, *cum biblio*). The core KC01B, recovered by R/V Marion Dufresne at the water depth of 3643 meter in the Ionian Sea, represents a reference section for Pleistocene chronostratigraphy due to its continuous sedimentary record and richness in sapropel and tephra layers which contributed to establish the Astronomical Tuned Neogene Time Scale (LOURENS *et al.*, 2004). The analyses revealed that the nannofossil assemblages mainly consist of *Gephyrocapsa caribbeanica* and *G. muellerae*, differently from the living and surface sediment associations recorded in Mediterranean Sea (KNAPPERTSBUSCH, 1993). *Gephyrocapsa* may reach up to 90% in the total assemblages. Other abundant taxa are "small placoliths", and *Florisphaera profunda*, a deep dweller photic zone taxon indicative of deep nutricline (MOLFINO & MCINTYRE, 1990). These taxa have been used to obtain a paleoproductivity proxy (N index) according to FLORES *et al*. (2000). Comparison of abundance patterns of all taxa and N index with the planktonic oxygen isotope curve (ROSSIGNOL-STICK *et al*., 1998; LOURENS, 2004) provides details on the meaning of species fluctuations through the glacial/interglacial cycles. The pattern of classical "warm and oligotrophic" taxa does not have a clear positive relation with interglacials as it occurs in the oceans, suggesting a primary response to oligotrophic conditions rather than to temperature changes. In addition it shows opposite trends with respect to N index that has high values mainly during interglacials and glacial/interglacial transitions, especially from MIS 12 to MIS 11. *G. muellerae* mainly increases during glacial periods, in agreement with its known ecological preference for cold surface waters (BOLLMANN, 1997), whereas *G. caribbeanica* has higher abundance during interglacials and at the transition MIS 12/11, thus implying ecological preference for eutrophic and nutrient-rich surface waters during the investigated interval, according to LOPEZ-OTALVARO *et al*. (2008). A distinct interval of absence or extreme rarity of taxa indicative of warm and stratified surface waters (i.e. *Umbilicosphaera sibogae*) has been recorded through late MIS 12 and lower MIS 11 when also *F. profunda* decreases, suggesting persistent cold/cool conditions up to about 410 kyr in the early interglacial MIS 11, before the lowest values of d18O (at about 405 kyr); also unstable and more productive conditions may have occurred at MIS 12/11 transition. Distinct peaks of *Helicosphaera carteri* mark the MIS 12/11 transition which seem in agreement with its ecological preferences for decreased salinity and high turbidity level (COLMENERO-HIDALGO *et al*. 2004) and possible r-selected life strategy. These results agree with the higher primary productivity during glacial-interglacial transitions documented in oceanic setting by LIU *et al.* (2003) who also retain that higher biogenic calcification (planktonic foraminifers and coccoliths) may lead the lightest δ^{18}O. The preliminary data of the present study indicate that the modifications of nannofossil assemblages have relation with the global climate changes known in oceans during the investigated interval; however additional environmental factors different from the temperature alone (the complex local Ionian hydrography, the variability of surface Atlantic water influence at the core location, the nutrient availability in the photic zone) have to be considered to fully explain the poorly known paleoecology of selected taxa in Mediterranean Sea.

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