CALCAREUS NANNOPLANKTON CONTRIBUTION TO CARBONATE PRODUCTION AND EXPORT DURING THE LAST 450KY IN THE NW PACIFIC OCEAN (ODP SITE 1209B, SHATSKY RISE)

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Nannofossil assemblages and stable isotopes from the ODP Site 1209B (Shatsky Rise) are analysed in order to evaluate the contribution of the calcareous nannoplankton to carbonate production and export over the last 450 ky in the northwestern Pacific Ocean. Coccolithophorids are the main pelagic carbonate source with a long term and geographically widespread fossil preservation: therefore, the study of their occurrence and distribution and the quantification of their contribution to the carbonate storage in deep-sea sediments is a topic largely discussed. To understand the role of coccolithophorids in the ocean carbon cycle, the evaluation of the contribution of the coccolith-derived $CaCO_3$ must be performed taken into account also the carbonate dissolution and dilution from other sediments that can influence the total $CaCO_3$ content. The chronological framework of the core was set with a combination of isotopic stratigraphy and nannofossil biostratigraphy. The age model is useful to evaluate the sedimentation rate and therefore to calculate the carbonate flux.

The total coccolith carbonate fluxes and the relative contribution of the different coccolith species is carried out to investigate the fluctuations of the carbonate flux into the sediments.

The N index is calculated to reconstruct the variations of both the nutricline/thermocline depth and the paleoproductivity. Moreover, the maxima and minima dissolution events are identified through NDI (Nannofossil Dissolution Index) and FI (Fragmentation Index) indices calculated counting the nannofossil and foraminiferal assemblages respectively: analysis of the marine carbonate preservation are commonly used to infer changes in ocean circulation, dissolution and/or biogenic production. Data about paleoproductivity and dissolution, together with the carbonate fluxes, allow us to understand the glacial-interglacial variations of the carbonate cycles in the studied area and, hence, the contribution of the calcareous nannoplankton to the carbonate content of the bulk.

Our results indicate that productivity is generally higher during glacials than during interglacials, but the long-term N curve shows a negative trend that suggest a general decrease of paleoproductivity from the base to the core top, particularly from the end of the MIS 8. All the preservation indices, based both on planktonic foraminiferal and nannofossil data, suggest better carbonate preservation during glacial intervals; in particular, the highest dissolution events occur at the onset of the glacial phases. The maximum coccolith carbonate flux, instead, is mainly recorded during interglacial phases or during deglaciations. The total carbonate accumulation rate, calculated for the core studied, ranges between a minimum of 6.1×10^{10} (pg cm^{-2} ky^{-1}) and a maximum of 1.2×10^{12} (pg cm^{-2} ky^{-1}); the highest values are recorded during the transitions between MIS8/7, MIS 6/5 and MIS 2/1. Our findings document that there is no a straight correlation between primary productivity and carbonate fluxes: rather, the carbonate supply and dissolution in the northwest Pacific Ocean are mainly modulated by Milankovitch type forcing and mostly influenced by changes in the ocean circulation patterns and therefore in the chemistry of the surface and deep-waters.