Disturbances of the ocean ecosystem during the Mesozoic: nanno-stories of resilience, opportunism, fragility

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Understanding the Earth's long-term processes is essential because anthropogenic activities have the potential to accelerate rates of environmental changes that typically result from natural processes. The ocean, as the oldest and largest ecosystem on Earth, serves as a valuable record of global changes in climate and atmospheric composition. Although there is no exact geological equivalent to the current global changes, past climatic states that experienced various temperature ranges can provide insights into our future world. Paleoclimate episodes preserved in the geological record are valuable sources of information about how the marine biosphere functioned in much warmer conditions than today. The Mesozoic evolution of calcareous nannoplankton is characterized by a general increase in diversity, punctuated by speciations, extinctions, and turnovers. Times of accelerated rates or a decrease in nannofloral diversification and abundance correlate with global changes, suggesting that their evolutionary patterns are intimately linked to environmental modifications. Calcareous nannofossils provide us with many stories of adaptation, resilience, and failure that enable us to better understand the current and future ocean.

Brief Curriculum Vitae of Elisabetta Erba

Position: 2005- present: Full Professor -Dept. of Earth Sciences, Univ. of Milan, Milan (Italy)

Research interests: Mesozoic calcareous nannofossils. Biostratigraphy and Timescales. Paleoecology and Paleoceanography. Past Greenhouse worlds. Evolutionary history and dynamics of calcareous nannoplankton. Calcareous nannoplankton biomineralization. Oceanic Anoxic Events and organic C-rich black shales. Cyclostratigraphy. Biogenic nannofossil carbonate fluxes and paleo-pCO_2 reconstructions. Biosphere-geosphere interactions.

Publications: (co)Author of ~190 papers on stratigraphy and paleoceanography. The ground-breaking nature of the track record is demonstrated by publications in top peer-reviewed journals such as Science, Nature, and Nature Geoscience; the five most-cited paper (ca. 2000 citations) unravel the interplay between global change, oceanic ecosystem dynamics (calcareous nannoplankton), volcanism, CO_2 and palaeoclimate