THE MEDITERRANEAN-BLACK SEA CONNECTIONS

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Abstract
We present the results of phosphorus analyses in sediments from Core SIN97 01-GC retrieved on the Cretan Ridge. Because the only source of this element to the oceans is the runoff from the continents, the relation of this element with climate is straightforward. The sedimentary phosphorus record provides also information about anoxia, circulation, water stratification, and represents a powerful tool to trace paleocirculation changes and possible connections between the Eastern Mediterranean and the Black Sea in the last 30.000 years.
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Sea-level changes are a topic of considerable scientific interest and increasing economic and social importance for their impact on epicontinental seas and semi-enclosed basins. In particular, they have a tremendous impact on coastal areas, the boundary between land and sea, with important consequences for ecosystems and populations living there. Thus, the study of past sea-level changes in these areas is essential to understand how far the environment has changed and how far the response of the environment would go.

The Mediterranean Sea, a complex system subdivided in several basins interconnected by straits and sills, is a natural laboratory for studies on climate and sea-level changes. In the past, many areas of this basin have experienced variations in sea level, which, as a feedback, have influenced its oceanography and geochemistry. Presently connected to the Eastern Mediterranean are the Marmara and Black Seas.

Despite the extraordinary number of researches dealing with the paleoceanographic history of this region [e.g., 1], there are still hotly debated topics concerning the evolution of the area. They deal with:
1 - The nature and mechanisms that controlled the Mediterranean - Black Sea connections.
2 - The exact timing of the connection re-opening.
3 - The environmental interplay between the Black Sea and the Eastern Mediterranean Sea.

Solving these paleoceanographic and paleoenvironmental issues will bring new insights into the evolution of this sensitive region and will provide new information on the behavior of inter-connected and semi-enclosed basins under the impact of sea-level and climate changes.

Using a multi-proxy study of sediment from the Cretan Ridge, we try to reconstruct the history of the opening and closure of the connections between the Eastern Mediterranean and the Black Sea, in relation to sea-level (regional and global) and climate variations. Our research focuses on the last 30.000 years, from the dawn of human civilization to present days. The Cretan Ridge was chosen as it represents the gateway that could intercept the signals of possible in/out-flows between the Black and the Mediterranean Seas.

Our approach will include (1) paleontological studies of benthic and planktonic foraminiferal assemblages, (2) AMS-^{14}C and U/Th dating, and (3) geochemical studies of sediments (oxygen and carbon isotopes of foraminifers shells and serpulids, alkenons, phosphorus and organic matter, XRF).

We present here the preliminary results of the phosphorus content in sediments from Core SIN97 01-GC retrieved on the Cretan Ridge. Because the only source of phosphorus to the oceans is the runoff from the continents, its relation with climate is straightforward. The sedimentary phosphorus record provides also information about anoxia, circulation, water stratification [2], and represents a powerful tool to trace paleocirculation changes and possible connections between the Eastern Mediterranean and the Black Sea.
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References

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