How the Mar Piccolo (Taranto, southern Italy) has changed from the Late Pleistocene to today: the evidence from organic matter and pollen analyses

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Abstract

Palaeoenvironmental changes have been traced by palynological (pollen and organic matter) and sedimentological analyses of the S05B core (ca. 40 m; late Pleistocene to Holocene) retrieved from the Mar Piccolo (MP) basin (southern Italy). The palaeoenvironmental history of MP starts from MIS 2 with a fluvial incision and deposition of high-energy sediments. The successive instauration of a hypersaline anoxic saltmarsh has been inferred by the very high abundance of halophytes taxa (salty soils) and Dark Amorphous Organic Matter (DAOM, anoxic bottom). Steppe taxa are also abundant and possibly attest the Younger Dryas event. At the beginning of the Holocene, freshwater inputs support the establishment of a brackish lagoon with anoxic/disoxic bottom (high DAOM); in the area both freshwater and saltwater marshes are present. Solely from 23.91m, the evidence of an inner marine environment with oxygenated bottom is attested by the appearance, in the palynological record, of Clear Amorphous Organic Matter and dinocysts. Anoxic events are in coincidence with the increase of non-arboreal plant during rapid Holocene climatic changes (e.g., 4.2 ka BP event). In the upper portion of the sedimentary core, a marine environment with low hydrodynamics and a high burial rate of plant material is attested by the significant increase in cuticles and resins. The parallel study of the organic matter and pollen analyses from MP surface sediments provided an image of the present-day freshwater and saltwater marshes, around the basin. The comparison among fossil and sub-actual data is useful for a more comprehensive interpretation of the environmental and morpho-sedimentary changes in the past.

Keywords: palynofacies, structured organic matter, amorphous organic matter

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