

Holocene landscape changes and human impact in Southern Italy: A case-study from the Mar Piccolo semi-enclosed marine basin (Taranto)

Summary

Coastal environments in the Mediterranean are currently facing significant challenges due to the impact of Global Warming, largely attributed to human activities. The Mar Piccolo stands out as one of the Mediterranean's most polluted semi-enclosed marine basins. To delve into its environmental changes, a sediment core (S05B) and eight surface sediment samples underwent extensive analysis, encompassing sedimentological and palynological organic matter assessments. The main objective was to uncover the principal morpho-sedimentary processes from latest Pleistocene to Holocene, resulting in the identification of five distinct landscape scenarios. Initially, during a period of arid climate, the area transitioned from fluvial incision to the formation of brackish ponds. As the Holocene brought about improved climatic conditions, the Mar Piccolo underwent further transformations, changing into a paralic environment where freshwater and salt marshes coexisted. The saltmarshes were sustained by sporadic marine spillovers, as indicated by foraminiferal organic linings. At 10.3 cal ka BP, a marine ingression took place marked by dinocysts, aligning with the Mediterranean sea level curve. This led to the establishment of a low hydrodynamic semi-enclosed marine basin, although changes in bottom oxygenation occurred over time. Anoxic events were identified during the Sapropel 1 deposition and the 4.2 ka BP megadrought event. After the 4.2 ka BP event, evidence of human impact emerges as indicated by the occurrence of human intestinal parasites resting eggs along with a shift in phytoclasts assemblages towards a dominance of cuticles suggesting intensified agricultural activities around the basin. Furthermore, analyses of palynological organic matter in surface sediments provide evidence of significant impacts from current human activities. Consequently, evaluating both past and ongoing anthropogenic influences through palynological organic matter analysis represents a crucial application in this research area.



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