



Trace metals in coastal sediments and in soft tissues of *Paracentrotus lividus* in the northern Tyrrhenian sea, Italy

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The understanding of sediment dynamic is of fundamental help in defining the potential susceptibility to the accumulation of potentially harmful elements in coastal environment.

The present work shows the spatial and temporal assessment of pollution degree and potential toxicity of some trace metals in marine sediments and the spatial assessment of bioaccumulation levels in soft tissues of *Paracentrotus lividus* in the coastal area of northern Tyrrhenian sea, Italy.

Spatial distribution of trace metal concentrations highlights a notable enrichment degree of As and Mn located in two hotspots. These hotspots are profoundly influenced by the coastal dynamic of the area and by the sedimentary productivity of the Mignone and Marangone river basins.

Moreover, the results of the trace metals spatial distribution are in agreement with the levels of trace metals measured in soft tissues of specimens of *Paracentrotus lividus*.

Temporal assessment of trace metal concentrations in coastal sediments was carried out by sampling sediment cores at a depth of -50m. The chronology of sediment cores covers 40 - 60 years and trace metal values measured in the sections of the cores result to be below the Sediment Quality Guidelines (SQGs) numerical indices.

Temporal distribution of trace metals in sediment cores does not show notable increases in the last 60 years as would be expected in the study area. This temporal trend can be attributable to the presence of geochemical anomalies and to the past mining activities occurred in the study area which could have masked any further enrichment of trace metals derived from fossil fuels combustion and maritime traffic. However, further geochemical and mineralogical studies are needed to better discriminate between the anthropogenic contributions and natural sources.