



Sedimentological, geochemical and biogeochemical facies, and sediment provenance in Central and Southern Adriatic Sea

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This work discusses the sedimentological and geochemical features of surface sediment of the Central and Southern Adriatic Sea. A total of 107 samples from the cruise PERTRE2016 project were analysed for grain-size, major and trace elements and organic matter content. The aim of this work was to identify sedimentary facies based on geochemical and biogeochemical features and to describe their spatial distribution to recognize regional patterns of sediment dispersal, geochemical signals for provenance and eventually local features.

In this work a Q-mode factor analysis of grain-size, geochemical (major and trace elements) and biochemical (organic carbon) properties of surface and sub-surface sediments has been used to identify the sedimentary facies. The statistical processing of the sediment properties made it possible to identify five factors that can be interpreted as different sedimentological, geochemical and biogeochemical facies and to evaluate their surface distribution: 1) Clayey component, made up of clayey and clayey-silty sediments, originated from the contribution of the Po River and the Apennine rivers and that are redistributed by the Adriatic circulation in a SE direction; 2) sandy component, made up of sandy-silty sediments with silicate minerals and enriched in Magnesium; this facies is more abundant along the Italian coastline; 3) coarse carbonatic component, made up of sandy-gravel sediments; this facies is more abundant in the outer areas of the Adriatic Basin, coinciding with the depositional areas of the relict sands; 4) silty component with heavy minerals, characterized by silty sediments enriched in heavy minerals resulting from the action of waves and coastal currents; 5) component of sediment provenance, useful to identify the origin of sediments. This component shows high values in different areas mainly located offshore of northern Gargano Promontory and is due to sediment features mainly controlled by geochemistry rather than grain-size. The characterization and distribution of the above describe facies allowed understanding in more detail the present hydrodynamic, sedimentological, geochemical and biogeochemical processes occurring in the Central and Southern Adriatic Sea and to identify the main sediment source areas.