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Organic matter origin and distribution in sediments and suspended particulate matter from a coastal lagoon (pialassa Baiona, nw adriatic)

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Organic matter distribution in temperate coastal lagoons is affected by both terrigenous and marine sources and several inner processes, including sedimentation rate, hydrodynamism, production and mineralization, in turn affected by human disturbance. A deep knowledge of these sources and of the dynamic processes occurring is essential in order to implement the correct policies for management and protection of these habitats.

^{210}Pb-derived sediment accumulation rates, as well as carbon and nitrogen isotopic composition of sediments and particulate organic matter (POM) were used to assess the time-dependent variations of organic matter (OM) sources at impacted and non impacted sites within Pialassa Baiona, a coastal eutrophic lagoon (northern Adriatic Sea, Italy).

Different C isotopic signatures and C/N ratios in POM and sediments were recorded in sites and seasons. Time-series analysis of organic carbon (OC), total nitrogen (TN) and □13C in POM reflected that of chlorophyll a in surface waters, with lower values observed in the winter period, and maximum values corresponding with the phytoplankton bloom occurring in early summer.

The observed δ13C values for sediment from the control area coincide with analyses of marine phytoplankton and zooplankton from a coastal area of the NW Adriatic Sea and suggest a relative contribution of phytoplankton blooms to the sedimentary organic matter pool. Conversely, the depleted δ13C values found in sediment from the impacted area would suggest that the sedimentary organic matter in this area had a clear allochthonous imprint. Unlike the sediments, the average composition of the suspended POC collected in Pialassa Baiona is closer to the marine end-members.

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