

Utilization of the seagrass *Posidonia oceanica* (L.) Delile to evaluate the spatial and temporal dispersion of metal contamination in the marine protected area of Cape Carbonara, Villasimius, Sardinia (Italy)

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Metal concentrations (Ag, Al, As, Cd, Cr, Ni, Pb, Zn) were measured in leaves, roots and rhizomes of the endemic Mediterranean seagrass *Posidonia Oceanica* (L.) Delile in the protected area of Cape Carbonara, Villasimius, Sardinia (Italy). Seven sites were sampled to study the influence of different potential contaminant sources. The aim of this work is to provide a method and reference data to monitor metal concentrations of this protected area in the future, to correlate the metal concentrations to the contaminant sources, to identify the plant part-metal selectivity for each metal, and to evaluate the evolution of metal concentration over years via lepidochronological analysis of the rhizomes.

The results showed that metal concentrations in this area are rather similar to the ones observed in other sound Mediterranean sites, confirming the low local pollution. Amongst the sampled sites, Fortezza Vecchia appeared logically as the most contaminated and Cape Boi as the most pristine. The leaves of *Posidonia Oceanica* are significantly selective for Cd, Ni, Pb and Zn while the roots are more selective for Ag and Cr. As for the rhizomes, they tend to be rather selective for Ag. Interestingly, Al, a metal scarcely studied in the literature, displayed no concrete selectivity for any plant part studied.

Over the years, metals concentrations remained rather limited in the different sites studied. Arsenic values showed a decrease along the years and Nickel values increased. The results presented in this study demonstrated the usefulness of the *Posidonia Oceanica*.

Keywords: ecotoxicology; *Posidonia Oceanica*; Mediterranean sea; trace metals; lepidochronological analysis