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DECONTAMINATION AND FUNCTIONAL RECLAMATION OF DREDGED BRACKISH SEDIMENTS

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The continuous stream of sediment dredged from harbors and channels to provide shipping traffic efficiency is a considerable and ongoing problem worldwide recognized. In this study (European Project AGRIPORT) phytoremediation has been considered as a sustainable reclamation technology for bringing slightly polluted brackish sediments into productive use. The experimentation has been carried out in containers of about 1 m3 filled with contaminated (heavy metals and hydrocarbons) brackish sediments. The fine particles granulometric composition made necessary a bio-physical pre-conditioning of sediments by mixing them with an agronomic structured soil (30% v/v). Moreover, a high quality compost was mixed with the sediment-soil matrix at surface level (40t/ha) with the aim of favouring the initial adaptation of the selected vegetal species. Different plant treatments were chosen: i) Paspalum vaginatum, ii) Phragmites australis, iii) Spartium junceum + Paspalum vaginatum, iv) Nerium oleander+ Paspalum vaginatum, v) Tamarix gallica+ Paspalum vaginatum, and vi) No plants used as control. After one year from the beginning of the experimentation all the plant species were still in healthy condition and well developed. During the time, increasing values of nitrate were generally observed in the planted sediments, suggesting an improvement of the chemico-physical conditions for microorganisms and plants. The stimulation of the microbial activity in the planted sediment with respect to control has been confirmed by the increase of the dehydrogenase activity. Concerning the organic and inorganic contaminant concentrations, decreased values were detected, despite the short period passed, indicating the efficiency and success of this technology for brackish sediments reclamation.