

PS27.5 - BIOREMEDIATION OF CHRONICALLY OIL-POLLUTED MARINE SEDIMENT USING BEATS OF HYDROCARBONS-DEGRADING BACTERIA

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Bioremediation is a good kind of "green biotechnology" based on the microorganisms ability to degrade hydrocarbons fractions.

In this work sediment samples were collected from the industrial harbor of Priolo Gargallo (Augusta, Syracuse, Sicily - Italy), a chronically polluted area.

Enrichment cultures and microbial isolation were performed. Among 258 bacteria and 5 consortia isolated, strain S1 (*Alcanivorax borkumensis*, 98%) and two consortia (PSO and PSM) showed degradation rates of ~98% for linear and polycyclic aromatic hydrocarbons (PHAs) after 10 days of incubation (25±1°C, shaking 100 g). Taxonomic analysis (16S clone libraries) of consortia showed as dominant genera hydrocarbonoclastic bacteria (HCB): *Cycloclasticus* sp. (~ 80%) in PSM and *Alcanivorax* sp. (~70%) in PSO.

Bacteria and Consortia selected were tested to develop a bioremediation strategy using chitosan/ agar beats for polluted marine sediments recovery.

9 different bioremediation treatment were performed: Control (C), Immobilized Hydrocarbonoclastic bacteria(HCB) (IH), Immobilized (HCB) + Air Insufflation (HIA), Air Insufflation (A), Oxygen (O), Oxygen + Immobilized HCB (OHI), Immobilized HCB + Oxygen₂₀ (IHO₂₀), Bioturbing (B), Bioturbing + Immobilized HCB (HIB).

Analysis of hydrocarbons (GC-FID), TOC, structure of bacteria population (16S clone libraries) and enumeration of total bacteria (DAPI count) were performed at the end of experimentation.