

Adaptive Response of Plants to Environmental Stress: Natural Oil Seepage; The Living Laboratory in Tramutola, Basilicata Region

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Abstract : One of the major environmental problems today is hydrocarbon contamination. The promising sustainable technologies for the treatment of these contaminated sites involves the use of biological organisms. In Agri Valley (Basilicata Region) there is a living laboratory (natural oil seeps) where the selective pressure has enriched the environmental matrices with microorganisms, fungi and plant species able to use the hydrocarbons as a source of metabolic energy, to degrade or tolerate hydrocarbons. Observers visiting this area are fascinated by its unspoiled nature, and the condition of the ecosystem does not appear to has been damaged. The amazing resiliency observed in Tramutola site is of key importance to try to bring green remediation technologies, but no research has been done to identify high-performing native species. The aim of this research was to study how natural processes affect the fate of released oil or how individual species or communities of plants and animals are capable of dealing with the burden of otherwise toxic chemicals. The survey of vegetation was carried out, more than 60 species have been identified and divided into tree, shrub and herb layer. Plant data sheets have been completed only for the species that showed the most appropriate properties for phytoremediation. In general, members of the Salicales, Cyperales, Poales, Fagales, Cornales, Equisetales orders were the most commonly identified orders. They are pioneer plants with high adaptive capacity and vegetative propagation. The literature review has highlighted the existence of rhizosphere effect and a green liver model on selected plants. The study provides significant information on the environmental stress adaptation processes of many indigenous plants that are living and growing on a natural leak of crude oil and gas that migrates up through subsurface.

Keywords : green liver, hydrocarbon degradation, oil seeps, phytoremediation

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