

IDENTIFIKACIJA I PROBIR BAKTERIJA KOJE RAZGRAĐUJU UGLJIKOVODIKE U TLU

IDENTIFICATION AND SCREENING OF HYDROCARBON-DEGRADING BACTERIA IN SOIL

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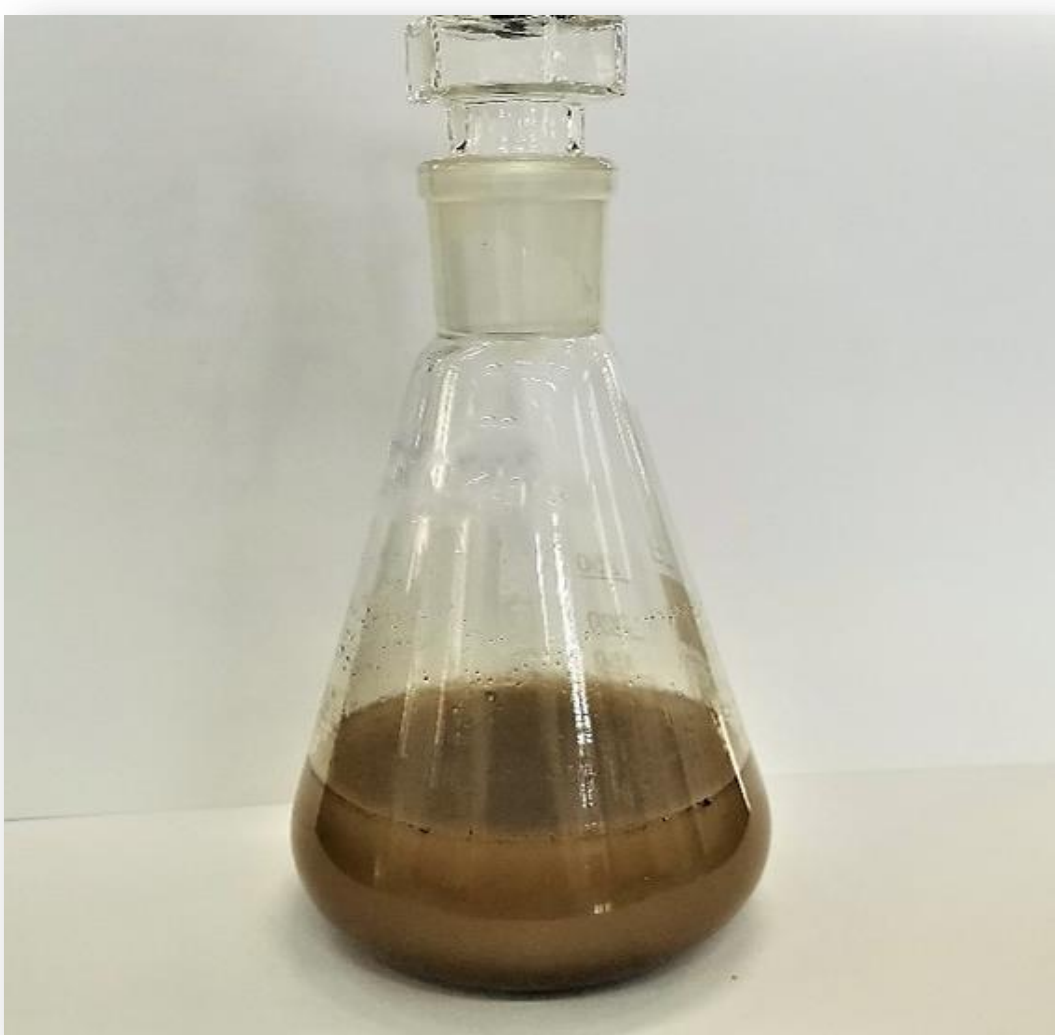


Soil is a non-renewable component of the environment and is essential for all life forms on this planet. Oil is the most important source of energy for various industries and daily life. Soil contamination by oil from various sources disrupts ecosystems, contaminates water, harms human health and reduces agricultural productivity. Bioremediation technology is recognized as an effective, safe and economical soil remediation technique. Microorganisms exposed to oil contamination have developed adaptive mechanisms to survive in a stressful environment and exhibit high biodegradation rates.

In this study, bacterial screening of two different soil samples contaminated with oil was performed. Microbiological and MALDI-TOF analyses were performed to characterize the bacterial isolates. The results show that a microbial community from the genera *Lysobacter*, *Bacillus*, *Cupriavidus*, *Pseudomonas* and *Novosphingobium* is present in oil-contaminated soils. The identification and screening of hydrocarbon-degrading bacteria is a promising solution to improve the effectiveness and sustainability of bioremediation.



CONTAMINATED SOIL



SOIL SUSPENSION

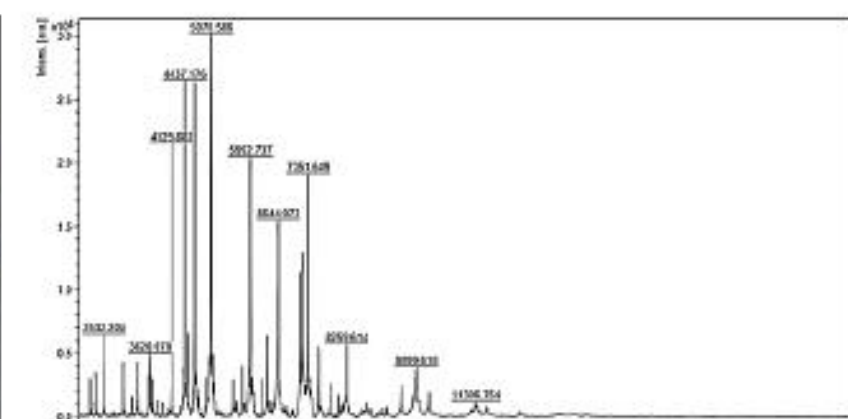
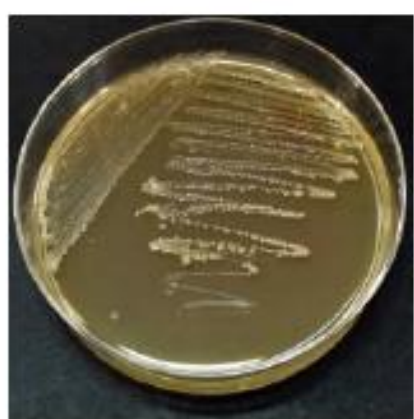
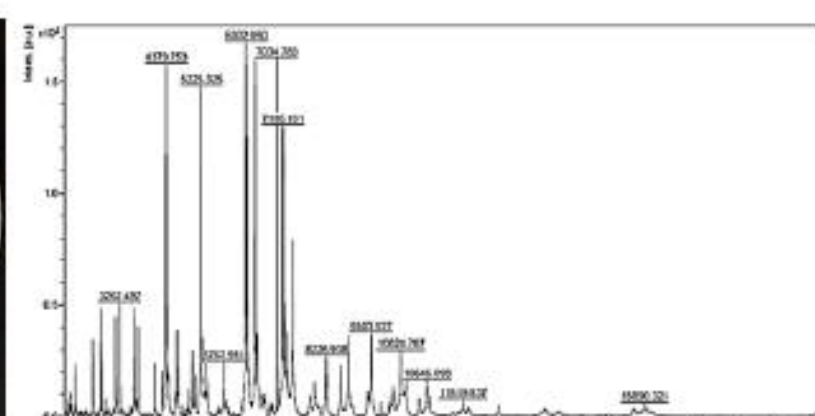
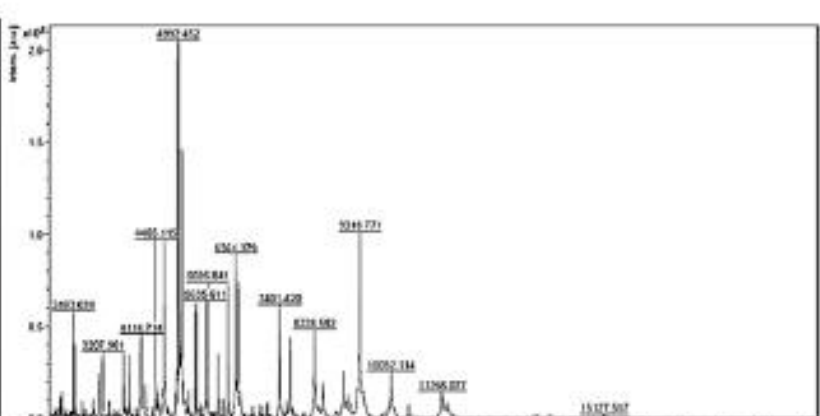
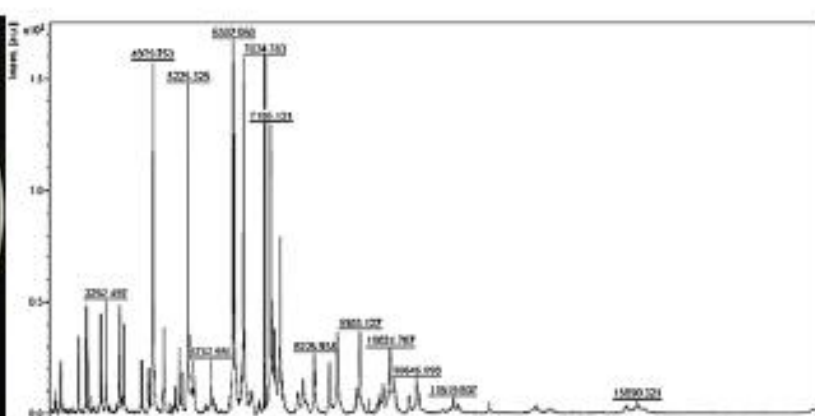
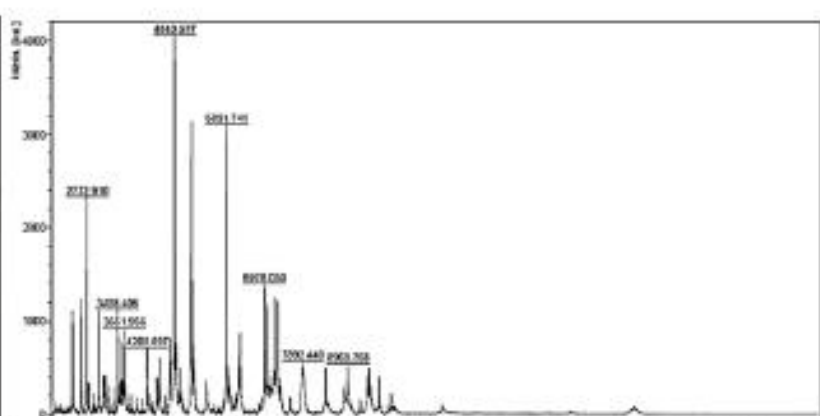


MIXED BACTERIAL CULTURES FROM CONTAMINATED SOIL

Soil is of fundamental importance for life on earth. It plays a key role in food production, nutrient cycling, climate regulation and carbon sequestration, and forms the basis for industrial activities and infrastructure. It is a vital ecosystem that provides a habitat for plants, animals and humans. However, soil degradation, a major global problem exacerbated by industrial pollution, poses a serious threat to living organisms. Autochthonous microbial cultures isolated from contaminated soils are central to achieving a level of bioremediation efficiency that enables the rational reuse of remediated soils without introducing new chemicals into the environment, building specialized facilities or negatively impacting other environmental components. This is in line with the principles of the United Nations Sustainable Development Goals and contributes to the realization of a green economy and sustainable development. This study represents a remarkable contribution to sustainable land use and management practices.

MORPHOLOGICAL CHARACTERISTICS OF ISOLATED BACTERIAL STRAINS

Isolate #	Colony characteristics			Cell characteristics			
	Growth on nutrient medium	Morphology	Colour	Microscopic view, M = 1000×	Gram's reaction	Schaeffer-Fulton's reaction	Shape
A		Convex, round, shiny, entire edge, medium-sized	Cream, smooth, opaque		Gram positive	Endospores	Large bacilli
B		Large, Irregular, rough texture	White, creamy		Gram positive	Endospores	Bacilli
C		Large, wavy edge	White, opaque		Gram positive	Endospores	Large rods
D		Small, round, raised	Transparent, creamy		Gram negative	Not forming endospores	Small rods



MALDI-TOF MASS SPECTRA OF THE BACTERIAL ISOLATES