

# ***TECO Mobility grant***

**Decontamination of SHOS Raša coal and soil polluted by Raša coal using bacterial biomass: a case study of coal and soil from the Labin city area (North Adriatic, Croatia)**

**Beneficiary of the grant – Prof. dr. sc. Gordana Medunić**

**Home Institution/Company (EU) - University of Zagreb, Faculty of Science,  
Department of Geology**

**Host Institution/Company (INDIA) - Banaras Hindu University**

**Period of the stay in India – 01–31 August 2018**



***TECO Project***

*Technological ECO-innovations for the quality control  
and the decontamination of polluted waters and soils*

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# Objective of the project

- Bioremediation is low-cost, yet highly efficient clean-up technology applied on polluted environments.
- Superhigh-organic-sulfur (SHOS) coal and coal-polluted soil samples were subjected to demineralization and desulfurization using various bacterial strains, and the effect of parameters, such as pH, temperature, incubation time, and pulp density, was observed.
- The relation of mineral matter, major/minor, and trace elements with petrographic components in the SHOS coal was examined in order to formulate the strategy for bioremediation.



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# Activities carried out during the period of the grant

- Bioremediation analysis involved test and trial steps.
- Isolation of bacteria from a selected sample, and culturing 4 different colonies of bacteria, based on speed of their growth.
- Some bacteria colonies were used for identification.
- Bacteria were isolated, then subjected to mass culturing, and beads were prepared. They were used for the bioremediation treatment of coal and soil samples.



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# Main outcomes

- Following the bacterial treatment, a reduction in the content of potentially toxic trace elements and sulfur was observed.
- The toxic trace elements, accumulated in bacterial cells, may be extracted by treating the bacterial biomass at high temperature. Afterwards, the remaining metals can be separated, stored, and suitably used.
- The conducted analysis showed that bioremediation is a successful clean-up technology which can be efficiently utilized in order to solve environmental pollution issues.



**Data Processing**

Calibration Type  
 K-Factor  Linear

Component Table

Element	N	C	H	S	O
Retention time [s]	32	50	132	234	-
Window [±s]	5	10	20	30	-
Interval from [s]	-	-	-	-	-
Integration to [s]	-	-	-	-	-