**YOUNG RESEARCH TEAMS - PN-II-RU-TE-2012-3-0319**

*“Retrieving new bacterial isolates for potential bioremediation*

*and biotechnological applications”*

**S u m m a r y 2 0 1 5**

In this period, 50 additional new bacterial strains were isolated on phenol and bisphenol-A containing media. Strains were identified based on the comparative sequence analysis of the 16S ribosomal RNA gene and additionally were screened for the presence of the multicomponent-type phenol hydoxylase gene. Selected strains were tested in batch cultures for the ability of phenol degradation, and the results showed that some of them completely degraded this compound even at 1000 mg/L concentration within 24 hours. In the case of some strains, enzyme activity tests have been performed and the activity of the catechol 2,3-dioxygenase enzyme was determined in the function of pH and temperature. After that, laboratory-scale experiments have been conducted in small bioreactors using phenol-containing artificial sewage and phenol-degrading strains individually and as a consortium, which has predicted the potential of these strains in bioaugmentation treatment. Furthermore, the detailed taxonomic characterization of three selected new species candidate strains (including also the type strains of closely related species) continued with chemotaxonomic analyses (determination of fatty acid a polar lipid profiles). Additionally, new species candidate strains have been deposited in public culture collections.