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

*“Retrieving new bacterial isolates for potential bioremediation*

*and biotechnological applications”*

**S u m m a r y 2 0 1 3**

In this period, we tested a combined method for bacterial strain isolation from three different environments: a polluted salt lake, an acidic peat bog lake and a bioreactor treating landfill leachate. The general physicochemical characters of these sampling sites were determined. The unconventional cultivation methods included media design, application of *in situ* bacterial traps and spreading from dilution series. The following considerations were taken in account during solid media design: adjusting pH, organic carbon, salt, nitrogen and phosphorous content to the conditions presented in the sampling sites to mimic natural environment, and testing other solidifying agent than agar (gellan gum). Incubation time was also increased up to several weeks to enhance the retrieval of slow-growing bacteria. Polyurethane foam blocks were used as *in situ* traps, which were impregnated with the proper cultivation medium. Adjustment of medium organic carbon content to environmental conditions meant that even in the case of the wastewater treating reactor, threefold dilution of minimal R2 medium was applied, which indicated that conventional laboratory media contain extremely high amounts of nutrients compared the conditions present in nature, and this could be a key determining feature of selection during cultivation. Gellan gum proved to be a superior solidifying agent compared to agar, since higher plate counts were recorded comparing media having the same composition but containing different gelling agent. Analyzing the bacterial communities of water samples and those grown in the polyurethane foam blocks using terminal restriction fragment length polymorphism confirmed that even cultivation conditions supposed to be close to the natural milieu have strong selective pressure on bacterial cultivations attempts. The taxonomic identification of the isolated bacterial strains based on the 16S ribosomal RNA gene has been initiated.