



Some Case Studies on Metal-Microbe Interactions to Remediate Heavy Metals- Contaminated Soils in Korea

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Conventional physicochemical technologies to remediate heavy metals-contaminated soil have many problems such as low efficiency, high cost and occurrence of byproducts. Recently bioremediation technology is getting more and more attention. Bioremediation is defined as the use of biological methods to remediate and/or restore the contaminated land. The objectives of bioremediation are to degrade hazardous organic contaminants and to convert hazardous inorganic contaminants to less toxic compounds of safe levels. The use of bioremediation in the treatment of heavy metals in soils is a relatively new concept. Bioremediation using microbes has been developed to remove toxic heavy metals from contaminated soils in laboratory scale to the contaminated field sites. Recently the application of cost-effective and environment-friendly bioremediation technology to the heavy metals-contaminated sites has been gradually realized in Korea. The merits of bioremediation include low cost, natural process, minimal exposure to the contaminants, and minimum amount of equipment. The limitations of bioremediation are length of remediation, long monitoring time, and, sometimes, toxicity of byproducts for especially organic contaminants. From now on, it is necessary to prove applicability of the technologies to contaminated sites and to establish highly effective, low-cost and easy bioremediation technology. Four categories of metal-microbe interactions are generally biosorption, bioreduction, biomineralization and bioleaching. In this paper, some case studies of the above metal-microbe interactions in author's lab which were published recently in domestic and international journals will be introduced and summarized.