

From the above comprehensive discussion of bioremediation, one can easily understand that ex situ and in situ bioremediation techniques are widely using for waste minimization and the cleanup of contaminated soil and water. Also the application of genetically engineered microbes in bioremediation is a promising and advanced technique which facilitates the effective degradation of a recalcitrant pollutant by utilizing the novel and efficient catabolic pathways, increasing the substrate domain for degradation process, and increasing the stability of the degradation activity of microbes (Paul et al., 2005). On the other side, the emerging advanced molecular techniques (metagenomics, genomics, metabolomics, transcriptomics, and proteomics) have resolved the problems associated with microbial culturing and provide better knowledge of microbial diversity and their functions, and the metabolic and catabolic pathways present at a given polluted environmental site, which contribute to enhancing the mitigation of emerging pollutants and related problems.