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S12. A NOVEL APPROACH FOR ENVIRONMENTAL BIOREMEDIATION

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Organic and heavy metal contamination are major environmental problem, whichleads to serious degradation in ecosystem. Traditional remediation techniques are based on physical, chemical and thermal methods. However, these techniques are very expensive, non-effective and labour intensive. Microbe-oriented methods generally known as bioremediationare proposed to be effective solution in remediation of soil, water and air. In these methods, microorganisms like bacteria, fungi and plants are commonly used. This is considerably new technology at development stage, which has several advantages as compared to the conventional ones like being economic and environmental friendly. However, the long-term decontamination period and lack of sustainability are the disadvantagesof bioremediation. Environmental factors such as pH, salinity, temperature etc. may negatively affect biosorption capacity of these microorganisms. There is a need for an accurate method for the discrimination of metal resistant microorganisms in order develop effective and sustainablebiosorption strategy. In the bioremediation literature, there is no rapid, accurate, reproducible and cost effective technique to screen and discriminate the heavy metal resistant bacterial strains from other strains. At this study, we aimed to develop a reliable method to identify and differentiate heavy metal resistant bacteria using ATR-FTIR spectroscopy together with multivariate analysis techniques such as HCA and PCA. Results of the study revealed that both control and metal exposed bacterial strains could be successfully discriminated from each other. This study shows that ATR-FTIR spectroscopy with chemometric analysis can be usedas a rapid and accurate method for the screening and diagnosis of microorganisms.