

REVIEW ON SOURCES AND EFFECT OF HEAVY METAL IN SOIL: ITS BIOREMEDIATION

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ABSTRACT

Heavy Metal (HM) contamination issues are becoming increasingly common in India and elsewhere, Heavy metals are natural constituents of the environment, but indiscriminate use for human purposes like agriculture, industrial, foundries, mining, smelters, coal-burning power plants and metallurgical has changed their atmospheric geochemical cycles and biochemical balance. This results in excess release of heavy metals such as chromium, mercury, lead, cadmium, copper, iron, zinc, nickel, etc. are major environmental pollutants, particularly in areas with higher anthropogenic activity. The exposure of humans to heavy metals can occur through a variety of routes, which include inhalation as dust or fume, vapourization, and ingestion through food and drink. Prolonged exposure and higher accumulation of such heavy metals can have deleterious health effects on human life, soil, air and aquatic biota. The role of plants and microorganisms in the biotransformation of heavy metals into nontoxic forms is well-documented, and understanding the molecular mechanism of metal accumulation has numerous biotechnological implications for bioremediation of metal-contaminated sites. The process of bioremediation uses various agents such as bacteria, yeast, fungi, algae and higher plants as major tools in treating oil spills and heavy metals present in the environment. In view of this, the present review article details the range of heavy metals, their occurrences and toxicity, investigates the abilities of microorganisms and plants in terms of tolerance and degradation of heavy metals. An assessment of the current status of technology deployment and suggestions for future bioremediation techniques and research has also been included. Finally, there is a discussion of the molecular basis of metal tolerance in plants and microbes, with special reference to the genomics of heavy metal accumulator plants and the identification of functional genes involved in tolerance and detoxification.

KEYWORDS: *Bioremediation, Biodegradation, Phytoremediation, Heavy metals, Toxicity*