A REVIEW

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Bioremediation: An ecological solution to textile effluents

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Rapid technological advances, speedy growth in urban sector and unplanned human settlement in the cities have resulted in the pollution problem. Industrial and nuclear energy installation produce large quantities of toxic or hazardous wastes, which have the potential to contaminate the environment. Coloring matter, acidic effluents, suspended solids, waxes, unreacted dyes, starch products, heavy metals etc. which are releasing at different stages of textile processing. Water which emerge out after use from industries is termed as 'industrial effluents' and this waste water have high BOD, pH as well as temperature.

All the conventional remediation methods used for polluted environments have specific benefits and limitations. The use of microorganisms and plant species to control and destroy contamination is of increasing interest to minimize some of these pollution problems called 'Bioremediation'. Bioremediation can serve as a prospective method for decontamination and rehabilitation of contaminated sites. Bacteria, algae, fungi and yeast have all been found to absorb and breakdown metal compounds. Certain lichens were used as bio-accumulator of heavy metals.

As compared to the conventional remediation methods, bioremediation is eco-friendly as well as easy to implement. The future of bioremediation, comprise of ongoing research work and have to go through a developmental phase and many technical barriers. Several hyper-accumulator species still need to be highlighted and implemented for successful future of bioremediation programmes.

Key words : BOD, Conventional remediation, Bioremediation, Hyper-accumulator

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INTRODUCTION

The world's ever increasing population and its progressive adoption of an industrial based lifestyle has inevitably led to an increased anthropogenic impact on the biosphere. In textile production, opportunities exist for the release into the ecosystem of potentially hazardous compounds at various stages of the operation. These pollutants are produced in an effort to improve human standard of living and fashion but ironically, their unplanned intrusion into the environment can reverse the same standard of living by impacting negatively on the environment (Asamudo *et al.,* 2005; El Rahim and Moawad, 2010). Speedy growth in urban sector, rapid technological advances and unplanned human settlement in the cities has resulted in the pollution problem (Fersi *et al*., 2005).

Industries occupy an important place in the economy of India and other developing countries (Textile Ministry, 2005). Textile processing consumes enormous quantity of water and chemical for various operations like washing, dyeing, etc. (Karthikeyan and Venkata Mohan, 1999). The low efficiency of chemical operation and spillage of chemical, cause a significant pollution hazard and a complex problem (Ezeronye and Okerentugba, 1999).

Enormous volumes of effluent are generated at different stages of textile manufacturing, as a result of the use of copious amounts of chemical and dyes. The discharge of these waste residues into the environment eventually poison, damage or affect one or more species in the environment with resultant changes in the ecological balance (Asamudo *et al*., 2005).

The care free use of chemicals in the past has led to the accumulation of a multitude of pollutants in our environment. Frequently, large accumulations of xenobiotics are discovered in former disposal sites or contaminated soils at former locations of chemical enterprises. They represent a threat of human health (Schroeder, 2000).

Several tons of textiles required to meet up with social demands are produced daily in this industry.