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A REVIEW.....

## Bioremediation technologies

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**ABSTRACT.....** Bioremediation is an invaluable tool box for wider application in the realm of environmental protection. Bioremediation technologies have become attractive alternatives to conventional cleanup technologies due to relatively low capital costs and their inherently aesthetic nature. Bioremediation is generally considered to include natural attenuation (little or no human action), bio-stimulation or bio-augmentation, the deliberate addition of natural or engineered micro-organisms to accelerate the desired catalytic capabilities. The scope of environmental bioremediation extends to: Inorganics *viz.*, arsenic, mercury, chromium, fluoride, cyanide, abandoned mines, fly ash disposed sites, engineered phytotreatment technologies, biological permeable barriers and organics *viz.*, petroleum hydrocarbons, pesticides and explosives. A variety of plants, natural, transgenic and/ or associated with rhizosphere micro-organisms are extraordinarily active in these biological interventions and in cleaning up pollutants by removing or immobilizing them. Bioremediation approach is currently applied to contain contaminants in soil, groundwater, surface water and sediments including air. Thus, Bioremediation is emerging as an effective, environment friendly and innovative technology for treatment of a wide variety of contaminants in water and soil.

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