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Prokaryotes: A Promising Agent in Environmental Bioremediation

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Since long been known that microorganisms have different functions and unique detoxification of contaminated soil and, in recent years, this process is called bioremediation or bio reclamation. The role of microorganisms and their limits for bioremediation is to better understand so they can be used more effectively. The application of the principles of microbial ecology to improve the methodology. Improving the microbial degradation to ensure the in-situ cleaning of contaminated soils has stimulated much research. Rhizosphere is an area of more microbial activity can improve the conversion and degradation of contaminants. The most common methods for stimulating the degradation rates include the supply of inorganic nutrients and oxygen, but the addition of inoculation or degrading microbial enzymes and the use of phytoremediation should also be considered. Bioremediation technologies based on the activity of microbial or plant enzymes involved in metabolic transformation and various metabolic co-organic substrates. Many may be degraded xenobiotic compounds intracellular enzymes and thus undergo detoxification. So far, the contaminants are exposed to enzymatic degradation, mainly to stimulate microbial growth in contaminated areas. As is known, enzymes can be active outside microbial cells. The extracellular enzyme activity pursued more in bioremediation technologies here. The enzymes can get large quantities of microbial populations grown under optimal conditions and with no exposure to toxic chemicals. To avoid the loss of enzyme activity in a range of adverse conditions, many studies have focused on the development of methods for the stabilization of enzymes, preferably for immobilization on solid support or gel coating. Also, investigating the use of enzymes stabilized naturally in plant tissues. Enzymatic treatment viability is shown in some studies of laboratory scale. For example, hydrolases, of Pseudomonas spp. And other bacteria shown to hydrolyse and detoxify organophosphate pesticides. Some fungi fenoloxidasas effectively oxidized phenols and anilines intennediates xenobiotics reaction was then detoxified by polymerization or attachment to humus. There needs to be more studies more enzymes may be able to process the increasing number of chemicals that pollute the environment to identify. Today, biotechnology is considered the development of environmental science. Technology involves the use of microorganisms for biological treatment of pollutants from the air, water and soil. Biotechnological treatment is at a lower temperature and pressure, which requires less energy than a traditional physio-chemical treatment technology. Industries producing hazardous waste have benefits Measures new trend biotech treatments. Biotechnology innovation for treatment for hazardous waste under controlled conditions found profitable media reduce the risk of contamination of wastewater, improving public acceptance and respect environmental legislation. Possible contamination of the environment, such as contaminated soil or surface/underground solved biological treatment and / or phytoremediation using living organism's biological and green plants. Biological agents used primarily bioremediation microbes namely yeast, fungi or bacteria for cleaning soil and water. The technology is based on promoting growth micro flora or specific microbial consortia are native to existing sites contaminated desired activity. This microbial consortium can establish a for example, funds to promote growth by adding nutrients from the terminal electron acceptor or control of temperature and humidity. In bioremediation process, the microorganisms used as a pollutant sources of nutrients or energy. The biological treatment is defined as a process wherein micro-organisms are stimulated rapidly disintegrating hazardous organic compounds in an environment of safety level of soil, sediment, substances, materials and groundwater. Recently, biological rehabilitation process and has been developed to effectively precipitate immobilizing pollutants in minerals, such as heavy metals. The stimulation is carried out of the micro-organisms Increasing growth substances, nutrients terminal electron acceptor/donor, or a combination of time which increases the degradation of organic pollutants and biological changes. Energy and carbon are organic compounds derived from the metabolism of the micro-organisms involved in bioremediation process. Bioremediation process which includes biological and biodegradation of pollutants to hazardous chemicals or safer. Often micro-organisms metabolize the production of chemicals carbon dioxide or methane, water and biomass. Biotransformation is a change in the structure of the molecule, or using micro-organisms compounds. Biodegradation is the decomposition of organic materials or bioaccumulation the biotransformation of compounds with inorganic environment. Microorganisms are now known to be the main agents that can clean and modify complex lipophilic organic molecules, once considered recalcitrant, water-soluble products simple. They first attack these organic chemicals by enzymatic apparatus acquired during enrichment when they are exposed to these specific compounds or structurally related. The presence of these contaminants in the environment or induces or depress enzyme function of microorganisms. This ability depends largely on selective microbial community, as well as structural and functional groups of toxic compounds. These intermediates are generally water-soluble primary or secondary attacked by assembly of organisms to form inorganic end products, resulting in complete biodegradation. Bioremediation is the use of living organisms, mainly microorganisms to degrade environmental pollutants into less toxic forms. Used naturally occurring bacteria and fungi or plants to degrade or detoxify hazardous to human health and/or natural environment. Microorganisms may be indigenous to a contaminated area or can be isolated from elsewhere and brought to the contaminated site. Compounds are transferred by contaminated living organisms through reactions that take place as part of their metabolic processes. Microorganisms cannot mineralize individually the most dangerous compounds. Complete mineralization results in sequential degradation by a consortium of microorganisms and includes synergy and co metabolic actions. Natural communities of microorganisms in a variety of habitats to have a large physiological versatility, they can metabolize and mineralize often many biological factors Molecules. Some communities of bacteria and fungi metabolize many molecules that can

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be degraded there are not known, but thousands known to be destroyed due to microbial activity in an environment or another. Most bioremediation systems are performed under aerobic conditions, but an anaerobic system conditions, microorganisms are capable of degrading recalcitrant molecules. Environmental Microbiologist is looking for a genetically modified micro-organisms part of its ability to increase metabolizes hydrocarbons such as chemicals or specific pesticides. The possibilities of genetic engineering to improve the bioremediation process were in the late 1980s, the early recombining arrow techniques have been intensively studied for the decomposition of hazardous wastes as part of the laboratory condition. Increased capacity and consumption of genetically modified organisms has successfully demonstrated for the degradation of various pollutants under certain circumstances. Genetic Technology often modified with many existing and potential applications Process of bioremediation. Bioremediation examines genetic diversity and metabolic flexibility Microorganisms. Due to the genetic architecture of precious organisms Biodegradation, biotransformation, and bioaccumulation. The entire necessary plan coding enzymes present in the biological degradation of chromosomal DNA and of the extra chromosomal order Microbes. Recombinant DNA techniques, facilitates the ability to metabolize organic promotion Foreign body by reducing the detection of these genes and appropriate host becoming through appropriate vector under the control of appropriate tight promoters. It depends on the sensitivity to change and exchange genetic information. Examine the technology of recombinant DNA, PCR, and antisense RNA technique, Site Directed mutagenesis, electroporation and bombardment of particles. Recombinant DNA technology is now refining bioremediation technology by improving by pollutant degrading microbes by improving the pressure and genetic modification specific metabolic law Genes that are essential to effective techniques, to develop safe and effective purification. At present, environmental sustainability is a contemporary issue that receives a lot of attention from researchers. This is the result of the amount of research done to assess the impact that human activity can have on the environment. Although the long-term consequences of this serious issue are not yet fully understood, it is generally accepted that the risk is high enough to merit immediate response. The increase in world population, industrialization and urbanization are the main reasons for contamination the environment. The release of heavy metals in the industries that cause the serious health problem and other animals and pollute environments to their persistence and their bio accumulative nature. In this the bioremediation process provides and Innovative measures for the treatment of Contaminants. Among the various known methods of bioremediation, phytoremediation, rhizoremediation and bioremediation by microbes could be methods to sustain the environment.