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Sommario/riassunto

Healthy environment is important for any kind of biota on earth. It provides the basic elements of life such as clean water, fresh air, fertile soil and supports ecosystem of the food chain. Pollution drastically alters quality of the environment by changing the physico-chemical and biological aspects of these components. Accordingly, toxic metals, combustible and putrescible substances, hazardous wastes, explosives and petroleum products are all examples of inorganic and organic compounds that cause contaminations. Specifically, pollution of toxic and heavy metal in the environment is a growing problem worldwide, currently at an alarming rate. Toxic metals threaten the aquatic ecosystems, agriculture and ultimately human health. Traditional treatment techniques offer certain advantages such as rapid processing, ease of operation and control and flexibility. But, they could not maintain the quality of the environment due to the high operational costs of chemicals used, high energy consumption and handling costs for sludge disposal and overburden of chemical substances which irreversibly affect and destroy biodiversity, which ultimately render the soil useless as a medium for plant growth. Therefore, bioremediation and biotechnology, carried out by living assets to clean up, stabilize and restore contaminated ecosystems, have emerged as promising, environmental friendly and affordable approaches. Furthermore, the use of microbes, algae, transgenic plants and weeds adapted to stressful environments could be employed to enhance accumulation efficiency. Hence, sustainable and inexpensive processes are fast emerging as a viable alternative to conventional remediation methods, and will be most suitable for developing countries. In the current volume, we discuss pollution remediation challenges and how living organisms and the latest biotechnological techniques could be helpful in remediating the pollution in ecofriendly and sustainable ways.