Chapter 2
Heavy Metal Pollution

ABSTRACT

In this chapter, the authors give information about heavy metal pollution in environmentally caused toxicity for plants and animals. The heavy metal contaminants polluting agricultural land reduce the crop productivity. So, the authors explore the process to work against these problems and reduce the contaminants.

INTRODUCTION

Heavy metals are non-biodegradable elements and progressively more accumulate in the environment and harmful to the human helath and animal also and toxicity cause in plants. Many conventional methods were used to remove contaminants but not successful due to high cost, least effective and remaining some waste after completion of process. Therefore, we focus on phytoremdiation technology in this method use of different kinds of plants for the removal of contaminants from the soil and water, so it provides some ecologically and environmentally sound and safe method for remediation (Chaudhary et al., 2015). However, a number of plant species have ability of hyperaccumulation of heavy metals but this approach is not applicable for all various contaminants to remove. Number of contaminants such as Benzene, toluene, ethylbenzene, xylene, chlorinated solvents (TCE, PCE), chlorinated pesicides, insecticides, petroleum hydrocarbones, oxides of sulfur, nitrogen, radionuclides (cesium, stronium, uranium) pollutants are

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best suited for phytoremdiation. Phytoremdiation technology has been carried out commercially as field scale study in U.S.

The cultivation of plants in agriculture in the form of food, biofuels, fiber, medicinal and other products are used in human life. The study of "agriculture is known as agricultural sciences. The most coming up sectors in the "Indian economy and gross domestic product of the country is the biggest industry in several states can provide job opportunities throughout the nation. Thousands of years ago in agricultural history; there was agricultural development with the help of climates. Heavy metal pollutants are basically derived from industries in the form of waste, chemical reagents and agriculture practices such as pesticides, chemical fertilizers and most important herbicides". Heavy metal pollution also cause from vehicle exhaust; the long durability of sewage sludge; waste water of several sources to soils. These chemical have adverse effects on human helath, plants, soil, microflora, including beneficial microbes to the plants and also producing nitrogen for plant growth. These contaminants has been accumulate in the agricultural soils where they are destroyed crop and reach into the food chain through vegetables, harm to be creating at high risk to the living organisms and finally generous rise to the food scarceness. The contaminants reach plants through the process of absorption by roots from soil and disturb the balance of the food chain in the form contaminants (Tak et al., 2013). The pollutants is any substances in the environment that causes "unlikable effects to the human health, impairing the benefit of the environment to reducing the quality of life, and ultimately causing deaths of plants and animals at their higher concnetration of contaminants present. Heavy metals significantly effect on environmental things and their toxicity is a problem of increasing significance for ecological, evolutionary, and nurtional. The most common heavy metals contaminants are lead (Pb), Magnesium (Mg), copper, (Cu), nickel (Ni) manganese (Mn), selenium (Se), mercury (Hg), chromium (Cr) and cadmium (Cd) (Allen, 2014; Orisakwe, 2012). Some of these metals are micronutrients necessary for plant growth such as cobalt (Co), Ni, Mn, Fe, Zn," whereas other as unknown for biological functions such as As, Hg, Pb, and Cd (Gaur and Adholeya, 2004). They are stable and cannot be degraded; therefore they have a tendency to accumulate in soils and can be harmful to the aquatic life and water contaminated by toxic metals ions leave serious public health problem and destroyed environment where they are present at high amount and cross their limits.