



## Bioaccumulation of Heavy Metal in *Brassica oleracea* Effects on Human Health

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**ABSTRACT :** Industrial waste waters containing a number of heavy metals find their way into the effluents. The use of sewage sludge and waste water for irrigation further increase the concentration of heavy metals in agriculture crops. Agricultural runoff together with soil erosion is the potential source of heavy metals in vegetable bodies. Disposal of industrial as well as domestic sewage sludges and domestic waste on land is a common practice. One of the major problems with land disposal of sludge is the likely introduction of heavy metals into the soil. Vegetable growers in East Kolkata predominantly use water from jheels and fishponds to meet their irrigation requirements. Generally, sludge solutions appear to increase the mobility of elements in soil. Vegetable farming in the EKW is centred on Dhapa with estimates suggesting 320 ha of land under cultivation producing as much as 370 t ha<sup>-1</sup> y<sup>-1</sup>. Several crops are cultivated in a year and inter-cropping of several varieties is common practice. Intensive cropping is possible due to widespread irrigation, much of which involves wastewater use. Accumulation of heavy metal (Pb, Cd, Cr, Hg, Ni) in cauliflower which are cultivated by using sewage sludge.

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Crops, *Brassica oleracea*, Heavy metals, Wastewater, East Calcutta Wetlands, Ramsar site

Increasing of human population has increased the need for food supply. This with the need for quality vegetable production has increased the demand for production of cauliflower whole round the year. The global consumption different type of vegetables and derived products has generally increased during recent decades. The East Kolkata Wetlands (EKW), located on the eastern fringes of Kolkata city is one of the largest resource recovery sector spread over an area of 12,500 ha. The global importance of the wetlands was confirmed, following the designation of the East Kolkata wetland as a Ramsar site (Wetland of International importance). The wetland plays a crucial role and man usage this wetland various ways from gathering food to disposal of wastes. The utilization of raw sewage by multiple use resource recovery system has sustained by the farmers very rapidly during the past 20 years and is presently undergoing rapid changes in response to pressures from globalization and

growing demand for foods in both developing and developed countries.

Distribution of heavy metals in plant body depends upon availability and concentration of heavy metals as well as particular plant species and its population (Olaniya *et al.*, 1998). Many researchers have shown that some common vegetables are capable of accumulating high levels of metals from the soil (Garcia *et al.*, 1981). Certain species of *Brassica oleracea* (Cauliflower) are hyper accumulators of heavy metals into the edible tissues of plant. Many people could be at risk of adverse health effects from consuming common market vegetables cultivated in contaminated soil. Often the condition of the soil is unknown or undocumented; therefore, exposure to toxic levels can occur. Neurological disorders, CNS destruction, and cancers of various body organs are some of the reported effects of heavy metal. Low birth weight and severe mental retardation of newborn children have been reported in some

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