

Distribution of heavy metals in edible aquatic plant: water chestnut (*Trapa natans* var. *bispinosa* Roxb.)

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Received : March, 2011; Accepted : May, 2011

SUMMARY

Lakes, ponds and streams are the sources of surface water, which anchorage the survival of aquatic life flora and fauna and maintain ecological balance. Due to urbanization, population explosion, and industrialization, these natural sources are getting polluted. Present paper is an attempt to evaluate the accumulation of heavy metals namely, lead (Pb), copper (Cu), and iron (Fe) by the macrophytes. The one macrophyte taken for the study was *Trapa natans* var. *bispinosa* (Roxb.). The macrophyte has the capacity to absorb heavy metals from contaminated water. The present experimental study was conducted to identify their potential to improve the water quality by removing the heavy metals. The paper critically evaluates the water-purifying capacity of macrophyte *Trapa natans* var. *bispinosa* Roxb.

Babu, Mukesh, Dwivedi, Deepa H. and Lata, Rubee (2011). Distribution of heavy metals in edible aquatic plant: water chestnut (*Trapa natans* var. *bispinosa* Roxb.). *Internat. J. Plant Sci.*, 6 (2): 270-273.

Key words : Heavy metal accumulation, Phytoremediation, Polluted water, *Trapa natans* var. *bispinosa*

The principle sources of water for human use are lakes, ponds, and streams are the sources of surface water. Water quality in lakes and reservoirs is subjected to the natural degradation, the process of eutrophication, and the impact of human activities, Shrivastava (2008). Natural sources of water are fast depleting and are polluted due to industrialization and urbanization in haphazard manner. Pollution of the aquatic bodies by (synthetics and organic) pollutants like pesticides, polyaromatic hydrocarbons, heavy metals, etc., have caused imbalance in the natural functioning of the ecosystem. Among these pollutants, heavy metals cause severe damage to the living system at various levels. Heavy metals also enter the water bodies from industrial and consumer waste from acid rain breaking down soils, rocks, and releasing heavy metals. The potential toxic metal elements such as chromium, lead, copper, zinc, etc. are identified to cause health hazards in animals (Bryan 1976). These heavy metals are reported to be toxic and found associated with the occurrence of

several health effects. Considering its effect on human being and aquatic life, appropriate treatment of heavy metals from wastewater is of utmost importance. Increasing awareness of ecological hazard of toxic metals from urban and industrial sources have involved considerable interest in the study of levels and fate of heavy metals in the aquatic environment. Water chestnut growing in ponds under different agro climatic regions accumulated many toxic metals in its edible parts. Besides, habitats of water chestnut are threatened recently due to increasing load of metal pollution from municipal, agricultural and domestic wastes. However, no studies have been undertaken on water chestnut laden with toxic metals which may cause numerous health problems through food chain biomagnifications. Hence, the present detailed investigation to quantify toxic metal accumulation in different parts of *Trapa* growing in contaminated water bodies was undertaken to determine quantities of Pb, Cu and Fe in vegetative and reproductive organs of water chestnut.

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MATERIALS AND METHODS

The site (SI - SIV) selected for present study were situated in Lucknow, U.P. which varied with respect to the level of metal contamination. Lucknow lies between the parallels of 20°30' and 27° 10' north latitude and 80°34' and 81°13' east longitude. The four sites in the present study have been represented by SI - Mohanlalganj,