

RESEARCH PAPER:

Heavy metal content in Gomti river water, sediment and hydrobiota in Jaunpur

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SUMMARY

Heavy metal concentrations viz., Zn, Cu, Fe, Cd and Ni in the river Gomti, flowing along the city Jaunpur, have been reported selecting four stations. Analysis of water, algal populations and sediments samples from Gomti river was carried out for a period of 12 months, for quantitative estimation of metals. The values were found to be maximum at mixing zone (S3) followed by S2, S4 and S1. All metal values were higher in algal cells and sediments than water concentration. The sediment samples were also analysed for particle size, distribution of organic carbon, nitrogen and extractable metals. There has been more clay and organic matter in sediment of S3 along with higher concentration of each metal in sediment and water.

In natural water bodies, there are several sources of input of heavy metals and non-heavy metals and other chemicals which are required in very small quantities for good growth of plant and animals but when they reach in higher concentrations cause pollution in aquatic life and through food chain can cause serious health problem in terrestrial animal and man (Bowen, 1966).

Metals are an unique class of toxicants since they can not be broken to non-toxic forms. Environmental contamination by toxic heavy metals due to many human activities is a serious problem due to their biomagnification and accumulation in food chain and continued persistence in terrestrial and aquatic ecosystem (Abhik and Susmita, 1990). There are few reports available on studies of heavy metals in water, plankton, sediment and in animal tissues (Kureishy *et al.*, 1979; Ayyadurai *et al.*, 1994; Madhystha *et al.*, 1996; Biswal *et al.*, 1998; Rao and Rao, 2001; Fotedar and Raina, 2009; Ali *et al.*, 2009). Several heavy metals present in wastewaters of the industries and municipal sewage find their way into the river but their toxic concentration can cause serious health problem.

Bioavailability of metals in sediments and planktons is governed by various factors including precipitation, adsorption on to the organic and inorganic sediments fractions. Several reports are available on the distribution and accumulation of heavy metals in sediments and planktons of river, lakes and other water bodies (Rao and Rao, 2001; Roy and David,

2002; Biswal *et al.*, 1998; Abidin *et al.*, 2009; Ali *et al.*, 2009). Measurement of the total metal concentration in soil, sediment or in cells are, therefore, unlikely to reflect the amount of metal actually available to the biota. The present study was, therefore, undertaken with a view to determine the concentration of heavy metals at various stations all along the route of the river Gomti in Jaunpur (U.P.).

MATERIALS AND METHODS

Gomti river:

The river Gomti, ranks third Position in eastern W.P. of India among the hobiest river Ganga near kaithi of district variance. over 940 km. journey with water restoring area of nearly 30,437 km², on its way it is joined by many small seasonal and perennial rivers River in polluted at several stretch by different industries.

Site selection :

Four sampling sites were selected all along the 4 km route of the river in Jaunpur city from Kalichabad to Ramghat. Five major drainage channels and several open drains are adding effluents and domestic wastes into the river which enhance the pollution load in river water and aquatic flora and fauna. Selected sampling sites were : Baradavi ghat (S1); Bajarang ghat (S2); Achala Devi ghat (S3) and Ram ghat (S4).

Water sampling and heavy metal analysis:

For heavy metal analysis in water,

Key words :

Heavy metals,
Algal cells,
sediments, River
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