

*A Case Study:*

## ENVIRONMENTAL DETORINATION THROUGH ORGANOCHLORINE PESTICIDE RESIDUES IN AQUATIC BIODIVERSITY OF GOMATI RIVER IN DISTRICT JAUNPUR (INDIA)

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### SUMMARY

Gomati is located in Jaunpur district, which is very famous for aquatic biodiversity in U.P. Aquatic biodiversity in this river is depleting rapidly due to human development, anthropogenic stress, pollutants, and habitat degradation affecting the water quality. The accumulation of organochlorine pesticides like DDT, BHC in Fresh water aquatic ecosystem is well documented. Several pesticides are being used in India both in agriculture and public health sectors. Although the use of pesticides have resulted increased food production and other benefits, it has raised concerns potential adverse effects on the environment and human health. The greatest potential for unintended adverse effect of pesticides is through contamination of the hydrologic systems, which supports aquatic life and related food chains and is used for drinking water, irrigation, recreation and many more purposes. The persistence of the organochlorines in aquatic ecosystem has special significance as they are picked up by aquatic organisms like plankton and in the process pesticide residues enter in the food chain. In view to conserve the Aquatic biodiversity of Uttar Pradesh, it is necessary to determine the level of contamination in stream and aquatic biota, since these are important in the food web of terrestrial organisms, with some aquatic biota, such as fish, being consumed by people and wildlife. In the present communication a systematic survey was carried out in Gomati at Jaunpur.

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and rivers of Uttar Pradesh.

### MATERIALS AND METHODS

The water samples were collected from different sampling sites of river Gomati at Jaunpur during November, December, 2006. Samples were collected from different segments of river Gomati. Water samples ( $n = 6$ ) were collected from the sides and midstream. The details of the sampling locations and the details of the water quality parameters of the river stream given in Fig. 1 and Table 1, respectively. Fishes ( $n = 12$ ) were collected using cast net and gill net and preserved in crushed ice till analysis. The sample processing, extraction, cleanup and gas chromatography was done by the pesticide laboratory of Industrial Toxicology Research Center (ITRC) Lucknow, Uttar Pradesh, India as per standard methods (Singh *et al.* 1987). Physico-chemical parameters of the water were analysed as per standard methods (APHA, 2000).

### RESULTS AND DISCUSSION

The result of the physicochemical parameters of Gomti indicates that the mean value of all the parameters were on the higher side except chloride, COD and BOD in Gomati. Highly significant differences ( $p < 0.001$ ) were recorded for conductivity and hardness. The other

The organochlorine pesticides are lipophilic, extremely toxic and non biodegradable. It is reported that DDT and Endosulfan at concentration of 16 ppb and 1ppb respectively, are toxic to fresh water fish (Brown, 1979). In river streams there is also possibility of pesticide contamination through non-point source pollution and agricultural runoff during wet season the other possibility is deposition of pesticides originating from plains during snow melting and interference of various physicochemical processes. The recent reports indicate contamination of United States river streams from atmospheric deposition and erosion of soil contaminated from past use. The pathways by which the pesticides are transported from the application areas to other parts of the environment with reference to stream are given in Fig. 1. Incidence of fish kill due to insecticides had occurred in different streams (Young and Nicholson, 1951). However, in India report on occurrence and distribution of organochlorine pesticide in aquatic environment is very rare and no systematic investigation was done on the pesticide in stream environment is very rare and no systematic investigation was done on pesticide residues in the streams