

## ***Interactive comment on “Status of organochlorine pesticides in Ganga river basin: anthropogenic or glacial?” by P. K. Mutiyar and A. K. Mittal***

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We thank Dr Hardeep Rai Sharma for the comments.

Comment 1. At page 3 lines 14-17 author mentioned that OCP are banned recently? It would be better if they clear on which context they are reporting on Global or country scale. Also DDT is banned for agriculture from 1989? It's better to modify this statement. Reply: The statement was in context of country scale. All the 16 targeted pesticides are not used for agricultural application, as the agricultural practices account major share of pesticides. The year in which the pesticides were banned for agricultural use could be different for different pesticides, like DDT was banned in 1989 for agricultural practises, but Endosulfan was banned in 2011.

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Comment 2. On the same page lines 18-19 author write that there is so single study on Ganga basin however river Yamuna is also a part of Ganga basin and there are published research on Ganga basin like of : A. Agnihotri, N. P., Gajbhiye, V. T., Kumar, M., & Mohapatra, S. P. (1994). Organochlorine insecticide residues in Ganga river water near Farrukhabad, India. *Environmental Monitoring and Assessment*, 30, 105–112. B. Mohapatra, S. P., Kumar, M., Gajbhiye, V. T., & Agnihotri, N. P. (1995). Ground water contamination by organochlorine insecticide residues in a rural area in the Indo-gangetic plain. *Environmental Monitoring and Assessment*, 35, 155–164. C. Singh, K. P., Malik, A., Mohan, D., & Sinha, S. (2005). Persistent organochlorine pesticide residues in alluvial groundwater aquifers of Gangetic plains, India. *Bulletin of Environmental Contamination and Toxicology*, 74, 162–169. D. Micropollutants levels in macroinvertebrates collected from drinking water sources of Delhi, India. H. R. Sharma, R. C. Trivedi, P. Akolkar and A. Gupta. *International Journal Environmental Studies / (A Taylor & Francis Group, U.K)* 60(2): 99–110 (2003). E. Kaushik, C. P., Sharma, H. R., Jain, S., Dawra, J., Kaushik, A. (2008). Levels of pesticide residues in river Yamuna and its canals in Haryana and Delhi, India. *Environmental Monitoring and Assessment*, 144, 329–340. F. Kaushik, A., Jain, S., Dawra, J., Sahu, R., & Kaushik, C. P. (2001). Heavy metal pollution of river Yamuna in the industrially developing state of Haryana. *Indian Journal of Environmental Health*, 43(4), 64–168. In this case I advised the authors to rewrite their statement. Reply: It's true that all these published research reports are from Ganga basin area, but most of the reports represent a particular area viz., city, district or a small stretch of the river. None of the study has covered the significant portion of Ganga river and its tributaries in a single study. On page 3, line 17-19, it is stated that, “The reported OCP levels in river Ganga are either for specific tributaries or for a stretch of the river. There is no single study available which reports the levels of these contaminants across the Ganga basin.” What we meant here is that no single report on OCP contamination in rivers of Ganga basin is available. .

Comment 3. . As beta-HCH was found in most of the samples of UK stretch, author

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can highlight and elaborate this finding. Among HCH isomers beta-HCH is most persistent and least reactive and even resistance to microbial degradation can be one of the explanation of more beta-HCH residues in water. Reply: Yes,  $\beta$ -HCH was most frequently detected compound in UK stretch because it is most persistent HCH. There could be various reason for the higher existence of this HCH isomers as it is resistance to microbial degradation, and very less reactive.

Comments 4. Author can compare his findings to see the trend in OCP residues in river water. Reply: We have compared the trends of OCP occurrences in river and categorised the trends as per their possible origin source. We have also compared the OCP residues trends in Ganga river water by comparing the present levels to the previously reported levels (Table 5).

Comment 5. It would be better if authors can continue their research on OCP residues in soils and agricultural runoff during rainy seasons in Ganga basin to have more interesting and fact based findings. Reply: Thanks for appreciation. We also wish to extend the OCP residues research from water matrices to soil and agricultural run off.

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