

REEVALUATION OF THE MONITORING DATA OF TRANS-CHLORDANE IN SEDIMENT OF JAPAN TO CONFIRM AND EVALUATE THE EFFECTS OF DIFFERENT KINDS OF DATA CALCULATING METHODS

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Abstract

Ministry of the Environment in Japan has published the monitoring results of chemical substance persistent condition in Japan as “The Chemicals in the Environment” since 1974. And many persistent organic pollutants (POPs) were involved as target chemicals. We reevaluated the data of trans-Chlordane in bottom sediment of Japan which is one of the Persistent Organic Pollutants (POPs) by using not only geometrical mean method but also the 50 percentiles method and 90 percentiles method as the raw data calculating method. At the results, trans-Chlordane should be presented not only using the geometrical mean method but also using the 50 percentiles method.

Introduction

Japanese activities relating to the environmental survey and monitoring of chemicals including the POPs and relative compounds were introduced to the 24th and 25th International Symposiums on Halogenated Persistent Organic Pollutants (Dioxin 2004 and 2005)¹⁻³.

Recently The Central Environment Council of the Ministry of the Environment in Japan recommended that the monitoring results should be considered how to present, for instance it should be presented using not only the geometrical mean method but also the 50 percentiles method as the raw data calculating methods because of avoiding the effect of correction by adding the half of the Quantitation of Limit (QL) in the case of the data is not detectable. But this trial has not yet been done by the Ministry of the Environment in Japan without any reasons.

On the other hand, in 2007 Statistics Law in Japan was amended to promote the usage of the raw data which were provided by the Central Government more and more widely in all fields including the academic field.

Therefore we tried to reevaluate the data of trans-Chlordane in bottom sediments of Japan as the representative of POPs and related compounds using the three different raw data calculating methods and confirm that not only the geometrical mean method but also 50 percentiles method are necessary to present the persistent situation of trans-Chlordane thought Japan.

Materials and Methods

The raw data of trans-Chlordane in bottom sediments of Japan from fiscal year 1988 to fiscal year 2005 were collected by “The Chemicals in the Environment” which was published⁴ and is available on the homepage of the Ministry of the Environment in Japan as well. The reevaluation was conducted by using 50 percentiles methods, 90 percentiles method and geometrical mean method as the raw data calculating method. Sample size was minimum 17 and maximum 22 from 1986 to 2006.

Results and Discussion

We have 3 figures which were drawn by using 50 percentiles method, 90 percentiles method and geometrical mean method. The shapes of figures of annual change of trans-Chlordane in sediment of Japan by both 90 percentiles method and geometrical mean method are similar compared with the shape of 50 percentiles method. This means that the very small group of huge measured raw data critically affected the shapes of graphs of geometrical mean method because of the small sample size.

In addition, the years of peak are the almost same between the figure of 90 percentiles and the figure of geometrical mean methods, which are 1992, 1998 and 2001. But there are big differences between 50 percentiles method and geometrical mean methods. For instance figure of 50 percentiles method has the peaks in 1992, 1995, 1997, 2000 and 2002.

QLs are more than 10 forth differences between till 2002 and after 2002 because of the improvement of analytical method.

In terms of regulation, trans-Chlordane was banned from using as pesticide in 1968 and specified as Class I Specified Chemical Substance in 1986 based on the Law Concerning the Examination and Regulation of Manufacture, etc of Chemical Substances of Japan. These effects were more or less reflected on the 3 figures.

Therefore we consider that not only the geometrical mean method but also 50 percentiles method is necessary to present the persistent situation of trans-Chlordane in bottom sediments of Japan as “The Chemicals in the Environment” in Japan.

References

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Fig. 1 Annual change of trans-Chlordane in sediment of Japan by the 50 percentiles method

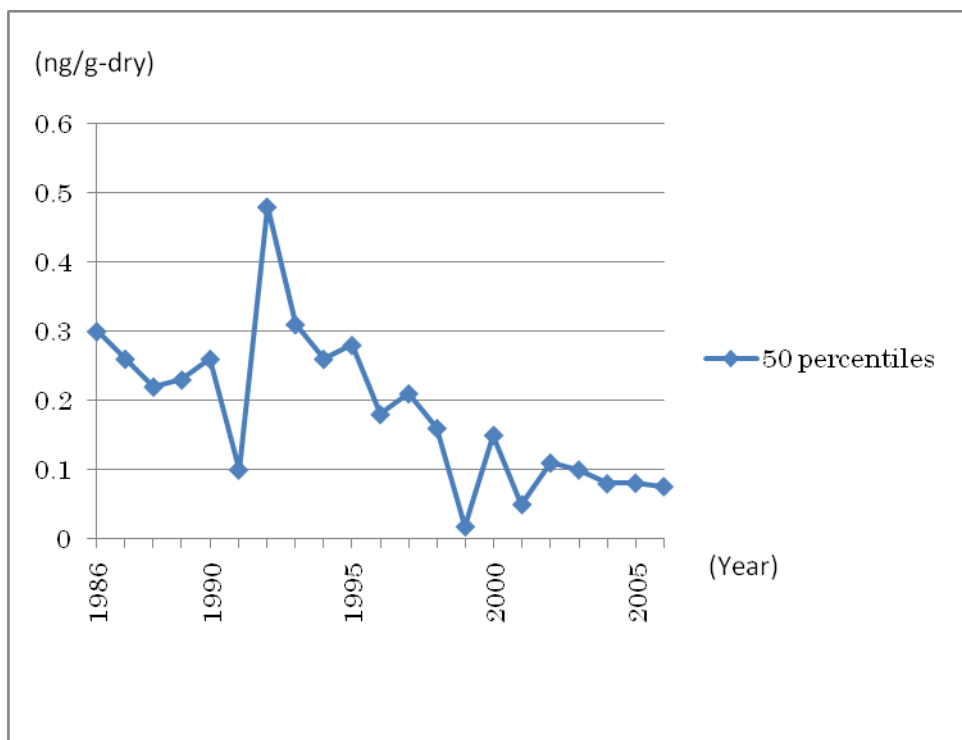


Fig. 2 Annual change of trans-Chlordane in sediment of Japan by the 90 percentiles method

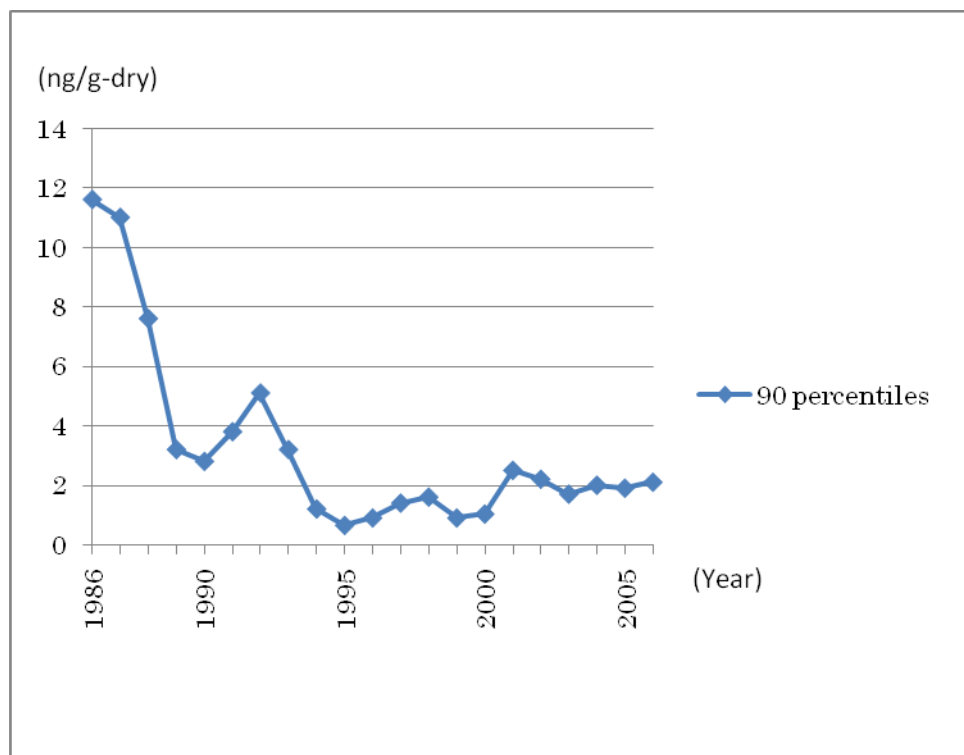


Fig. 3 Annual change of trans-Chlordane in sediment of Japan by geometrical mean method

