Distribution of persistent organochlorine pesticides in samples from the Canadian Arctic

SOME soil, moss, kelp and reindeer liver were collected at 5 sites in a wide range of the Canadian Arctic from 58°N to 81°31'N by the First Scientific Expedition of China to Canadian Arctic during April through May, 1995. The concentrations of persistent organochlorine HCH and DDT of these samples were determined. After sampling, the samples were extracted with appropriate solvents, analyzed by packed column gas chromatography with electron capture detector^[1]. The result of the soil sample collected from the area of Great Wall Station of China at King George Island, Antarctic in Januray 1991 was also reported.

Three isomers of HCH (α -, γ - and δ -HCH) were detected for all the samples. 7.7 $\mu\text{g/kg}$ β -HCH was detected only in kelp sample. HCH contents in the samples were 3.3—28.0 $\mu\text{g/kg}$ except reindeer liver. The isomer γ -HCH was majority in HCH. In early years α -HCH highly predominated in HCHs insecticides, and in later years products of Lindan (γ -HCH) have been introduced. Therefore, the predominance of γ -HCH in our findings could indicated a recent arrival to the Canadian Arctic. In 2 soil profiles of Eureka (80°N) and Resolute (74°43'N), the vertical profiles of HCHs residues in soil showed a decrease with depth of the soil, concentration of HCHs decreased from 12.3 to 7.9 $\mu\text{g/kg}$ from 0 to 35 cm deep (Eureka) and from 9.1 to 5.7 $\mu\text{g/kg}$ from 0 to 25 cm deep (Resolute), respectively. It was shown that concentration of HCH decreased with increase of latitude. The concentration of HCHs in reindeer liver was 205 $\mu\text{g/kg}$, much higher than that in soil. This is obviously related to the fact that HCHs was easily accumulated in biotics and easily bioconcentrated through food chain. By analysing soil sample from Great Wall Station of China at Antarctic, 8.5 $\mu\text{g/kg}$ of HCH was found, the same residue content as that from Canadian Arctic. Gregor (1989) reported that content of HCH in snow at Canadian Arctic was 1 ng/kg, near the detecting limit of DDT.

Many studies have confirmed that the pollution of remote areas which had been little influenced by human activities may be caused by snow, drain and long-range atmospheric transportation. In spite of regulation and prohibition of organochlorine pesticides in the most countries or areas since the 1970s, it has not decreased in environment. Therefore, effects of organochlorines on environment and biotics will last for a long time.

Reference

- 1 Compiler Group of Analytical Method of Environment Pollutants, *The Method for Environmental Pollutant Analysis* (in Chinese), Beijing: Science Press, 1980, 313—327.

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