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PCB Suspected Responsible for Environmental Pollution

Ehime University Reports PCB Accumulation in Birds and Fish.

As a result of analytical studies conducted recently by the analytical laboratory of the Agricultural Chemistry School of Ehime University, it has been reported that PCB (polychlorinated biphenyl) known as the main cause of the Kanemi rice-bran oil case* is found accumulated in the bodies of birds and fish, allegedly polluting environments on an extensive scale as in the case of environmental pollution caused by use of agricultural chemicals such as DDT and BHC.

Although PCB pollution has been discussed in Europe and the United States as an environmental problem since several years ago, it is the first time in Japan that PCB has loomed large as a pollutant in general terms, excepting for the Kanemi rice-bran oil case.

Ehime University studies were started last fall under the guidance of Assistant Professor R. Tachikawa (40) with Mr. T. Wakimoto (30), his assistant as a nucleus. Measurement of test materials, all obtained in Ehime Prefecture, was made by gas-chromatography and mass spectrometer.

The following are part of their findings:

PCB was detected,

1.0 - 2.1 ppm in great omentums of crows,

0.19 - 0.40 ppm in shark livers,

0.15 - 0.20 ppm in flesh of sea-eel,

0.19 - 0.29 ppm in viscera of "mebaru",

0.20 - 0.31 ppm in flesh of yellow-tails,

0.46 - 0.86 ppm in great omentums of yellow-tails,

0.04 - 0.07 ppm in cow fat

It was also reported that 0.05 - 0.19 ppm of PCB was detected in the mud dredged up from Tokyo Bay.

According to Assistant Professor Tachikawa, such small PCB concentrations as listed above will do no immediate harm to human beings, but some restrictive measures will be necessary in view of its cumulative characteristics and residual effect stronger than those of DDT.

PCB is one of the chlorinated organic compounds having a simple chemical structure. PCB is used in various industrial fields, for example, as insulation oil for transformers and capacitors, as heat-transfer medium(as in the case of Kanemi rice-bran oil manufacture) because of its excellent heat stability and as plasticizer for plastics. It is also added to agricultural chemicals to maintain their effectiveness for a long period of time.

In Japan manufacture of PCB was initiated by Kanegafuchi Chemical after the end of the war. Then, Mitsubishi Monsanto commenced PCB production at Yokkaichi in 1968 and has been continuing operations with an annual production capacity of 4,500 metric tons.

Since it is only recently that PCB has been taken up as a pollutant, there is no definite criteria for PCB concentration except the one laid down in the United States as the Labor Sanitary Standards setting the maximum safe concentration of PCB in the air at 0.5 - 1.0 mg./m^3.

Note*: Kanemi rice-bran oil case

Kanemi Rice-Bran Oil Company was reported to be responsible for a number of skin eruption cases reported in Kyushu in 1968. Results of investigations indicated that sufferers were found to have use rice-bran oil containing PCB and that rice-bran oil was the product of Kanemi Rice-Bran Oil Company. Later on, it was found out that PCB used as heat transfer medium in their manufacturing process had leaked out from pipe cracks and got mixed with rice-bran oil.