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ORGANOCHLORINE CONTAMINANTS IN SPRAINTS FROM CAPTIVE OTTERS

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Abstract: Assays for DDE, Dieldrin and PCBs were carried out on captive otters to provide a baseline of presumed uncontaminated animals for comparison with results from surveys in the wild. Results for captive animals were much lower than those from upland Wales, which has a thriving population of wild otters.

Over the past three years we have undertaken detailed regional surveys of the levels of organochlorine contaminants in spraints of otters *Lutra lutra*. .All natural habitats may have been subject to historical contamination of these persistent chemicals and contamination is likely to be continuing in many wetlands. It seemed therefore of value to analyse a sample of spraints from captive otters, fed a zoo diet, to provide a reference against which to compare samples from wild otters. We were fortunate in being able to collaborate with the Alpenzoo, Innsbruck, Austria, on this project.

METHODS

Spraints wore collected during July and August 1990 from:-

1. a female, born in the wild in eastern Germany (former GDR) and about 4 years old. This animal had not yet bred.
2. a female, born in 1979 in the Alpenzoo, together with her cub, born in January 1990 (spraints from the cub could not be separated). The female had produced 8 litters since 1982, totalling 16 cubs, 14 of which survived.

Otters in the Alpenzoo are fed carrots in the morning. In the afternoon they receive food, *ad libidum*. consisting of either guinea pigs, veal, chicken; rats, hens, salmonids or cow heart. They have a weekly supplement of vitamins, this diet is thus likely to be low in contaminants.

Spraints were kept deep-frozen prior to analysis. Organochlorine concentrations were determined on a Varian 3300 gas chromatograph, with a tritium electron capture detector, using a 25m capillary column. PCB concentrations were determined against an Aroclor 1260 standard. The detection level was 0,01 mg kg^{-1} lipid. Details of extraction and analytical methods are given in Mason el al. (1992).

RESULTS

Results are given below in mg kg^{-1} lipid (nd = below limit of detection).

Table 1: Results

	n	DDE	DIELDRIN	PCBs
Female 1 % detected	24	 96	 66	 100
mean		0.07	0.04	0.99
range		nd - 0.38	nd - 0.49	0.10 - 5.59
Mother and Cub % detected	21	 48	 29	 95
mean		0.04	0.01	0.39
range		nd - 0.83	nd - 0.05	nd - 1.64

Contaminants were detected in a greater percentage of samples from Female 1 than from the Mother and Cub. Mean concentrations were also higher in spraints from Female 1 than from the Mother and Cub. However means (of samples above the limit of detection) were not significantly different for DDE or Dieldrin, though they were for PCBs ($t = 2.06$; $P < 0.05$).

DISCUSSION

The Mother and Cub had a lower proportion of contaminated spraints, compared with Female 1, and a lower mean level of contamination, significantly so in the case of PCBs. The sample may have had a higher proportion of cub spraints (which were not distinguished from the mother) and a growing cub may assimilate contaminants across the gut wall more efficiently than does an adult (this is certainly true, for example, with metals such as lead), leading to less contaminant being rejected in the spraints. Alternatively Female 1 may have been releasing contaminants in secretions via her anal gland at a greater rate than did Mother and Cub.

Nevertheless the concentration of contaminants in spraints from these captive otters is low. Mason & Macdonald (in press) calculated environmental background levels of contaminants in spraints from a large sample (n = 288) from rivers in upland Wales, U.K., where otter populations are thriving. These background levels (mg kg^{-1} lipid) were:-

DDE 1.61 Dieldrin 1.07 PCBs 2.22

Clearly spraints from the captive otters fed a zoo diet were 2-6 times lower in PCBs than these background levels, and an order of magnitude lower still for organochlorine pesticide residues.

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