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Brief Communication

RESIDUES OF POLYCHLORINATED BIPHENYLS (PCB) AND ORGANOCHLORINE INSECTICIDES IN LIVER TISSUE FROM TERRESTRIAL DANISH PREDATORY BIRDS

Several observations of the occurrence of PCB in marine organisms have been published since *Jensen* (1966) proved the presence of these compounds as pollutants in the environment. In the last years the occurrence in terrestrial animals, especially birds have been reported a.o. by *Prestt & Moore* (1970).

The present communication deals with the analytical results from screening livers for organochlorine insecticides and PCB from 52 terrestrial birds of prey collected in Denmark and three from Greenland and obtained from a taxidermist. Unfortunately there were no records of cause of deaths.

Purification and isolation of the organochlorines were done in accordance with *Faubert Maunder et al.* (1964). Gaschromatography was performed on a Varian Aerograph 204 (ec) using two different columns: QF = 1 (5 %) and a mixed column containing QF = 1 (6 %) and SF = 96 (3 %) in the ratio 65:35. As PCB standard was used Clophen A 50® and Clophen A 60® (Bayer) diluted in hexan. As proofs of the presence of PCB were taken retention times on the two columns and resistance to treatment with concentrated sulphuric acid or alcoholic potassiumhydroxide.

In all results there was a distinct similarity to Clophen A 60®. The determination of the concentration of PCB was carried out by comparison with the chromatogram for this compound in the following way: only chromatograms in which four PCB peaks were clearly without interference from organochlorine insecticides were used. Of these the heights of the two largest peaks were measured. These measurements were compared to the corresponding peaks obtained by the Clophen A-60 standard. The result of the measurement was then multiplied by a factor, which is the reciprocal of the fraction, which the two measured peaks made out of the 14 peaks in the complete PCB-chromatogram.

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Table 1.

Species	p.p.m. liver (wet weight)			
	DDE	DDD	Dieldrin	PCB
Buzzard (Buteo buteo)	0.03	0.03	0.01	1.3
Kestrel (Falco tinnunculus)	0.09	0.06	0.07	1.9
Long-eared Owl (Asio otus)	0.08	0.04	0.05	2.2
Owl	0.32	0.11	0.07	2.4
Hen Harrier (Circus cyaneus)	0.18	0.10	0.07	5.1
Owl	1.02	0.13	0.09	5.5
Gyr Falcon (Falco rusticolus candicans)	0.30	0.21	0.19	10.7
Long-eared Owl (Asio otus)	1.8	0.35	0.15	11.6
Kestrel (Falco tinnunculus)	0.46	0.30	0.33	12.0
Buzzard (Buteo buteo)	1.36	0.86	0.74	26.9
Owl	20.0	1.08	0.98	45.5
Long-eared Owl (Asio otus)	7.2	1.3	0.71	45.6
Long-eared Owl (Asio otus)	18.1	3.2	1.56	92.0
Tawny Owl (Strix aluco)	17.7	6.35	4.1	272

In Table 1 the results obtained on 14 livers containing more than 1 p.p.m. PCB (wet weight) are shown. DDT was never detected in this material, which had been stored deep-frozen for months. It is seen that there is a certain correlation between the concentration of organochlorine insecticides and PCB with a much higher load of the latter.

Table 2 contains the findings of DDT metabolites and dieldrin in 41 birds in which the concentration of PCB was found not to exceed 1 p.p.m. in the liver. Among the species investigated only owls and sparrow hawks contain amounts worth mentioning.

After this preliminary investigation owls seem to present a group of immense interest under Danish conditions. The result

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Table 2.

Species	No. of specimens analysed		No. of specimens positive	Content in liver tissue p.p.m. (wet weight)	Mean (p.p.m.)
Owls	7	DDE	7	0.48 —16.1	3.2'
(Strigidae)		DDD	1	0.87	
		Dieldrin	2	0.02 — 2.1	
Kestrel	7	DDE	7	0.01 — 0.32	0.1
(Falco tinnunculus)		DDD	1	0.01	
		Dieldrin	7	0.01 — 0.11	
Sparrow Hawk	14	DDE	14	0.19 — 8.6	2.3
(Accipiter nisus)		DDD	4	0.12 — 0.32	
		Dieldrin	6	0.08 — 0.30	
Buzzard	11	DDE	11	0.02 — 0.55	0.19
(Buteo buteo)		DDD	10	0.01 — 0.38	0.12
		Dieldrin	8	0.01 — 0.29	
Gyr Falcon	2	DDE	2	0.03	0.03
(Falco rusticolus		DDD	1	0.02	
candicans)		Dieldrin	2	0.02 — 0.04	

from one of the gyr falcons from Greenland also sharpen the interest to elucidate more systematically the conditions in this area.

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