Effect of Aroclor 1254 on Ring Doves and Kestrels.

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The breeding success of Ring Doves(Streptopelia risoria) fed Aroclor 1254 at 10ppm was determined over two generations. Six pairs of birds were fed PCB's for three months, then allowed to incubate their clutch of two eggs. Then eggs were collected again until six months when they were allowed to incubate another clutch. Results are given in table 1. The low hatching success of the 2nd generation was due to heavy embryonic mortality. The age of embryonic death varied considerably, mainly in the range of 3-8 days. This finding is at variance with that of Scott et. al.(1971) who found significant decrease in hatchability of chicken eggs in the first generation with 10ppm Aroclor 1248 for eight weeks and almost complete failure at both four and eight weeks at 20ppm Aroclor 1248. In this case mortality occurred immediately before hatching.

Eggshell thinning was not observed in either the first or second generation(Peakall, 1971; and unpublished data). This is in agreement with the findings of Dahlgren and Linder(1971) for the pheasant(Phasianus colchicus)and Heath et. al. (in press) for the Mallard(Anas platrhynchos) and Lincer (unpublished)for the American Kestrel(Falco sparvarius). Some studies were made on the levels of carbonic anhydrase in the oviduct of Kestrels treated with Aroclor 1254(10ppm in diet), DDE(5ppm) or DDE + Aroclor 1254(5ppm and 10ppm respectively). Sample size was small, but values indicate no decrease with Aroclor 1254 and decreases with Aroclor 1254 + DDE were equivalent to DDE alone. This finding agrees lack if eggshell thinning caused by PCB's.

Chromosomal studies, using three day embryoes, have been started.

Bloom will do

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Residue analysis on eggs laid at various times from the start of the experiment showed that the levels increased for three months when an approximately steady xxxxx level of 50 ppm(dry weight) was reached. The second generation eggs had similar levels; thus increased embryonic mortality was not caused by increased levels of PCB's.

The most striking finding of the seabird "wreck" in the Irish Sea in 1969 was the elevated concentration of PCB's in the liver(Holdgate,1971). In birds shot as controls the concentration was only 0.4ppm(wet weight) whereas birds found dead had 40ppm in the liver. In an attempt to evaluate these findings we stressed five first generation birds after they had been exposed to Aroclor 1254 in their diet for six months. The stress was applied by reducing the food intake severely so that the birds lost approximately 10 percent body weight per week. Control,birds were also stressed in a similar mannar. No signficant difference was found in either the time to death nor in the weight loss to death between controls and experimental groups. The organ levels of the first generation birds sacrified at the end of the breeding experiment can be compared to organ levels after stravation(table2). A massive increase in all tissues studied as a result of mobilization of fat is clearly shown. The fact that liver levels ranged from 937 - 1688 ppm at the time of death strongly suggests that the 40ppm recorded in the seabirds in the Irish Sea was not responsible for the death of these birds.

Table 1.

	No. of pairs	Eggs laid	Hatched	Fledged
Pre-experiment	6	24	22	22
1st generation	6*	24	24	24**
2nd generation	6	20	4	2
Control, 2nd gen.	6	24	22	22

* One pair failed to produce any eggs during the period of the experiment.

** Fledging losses consisted of one young found outside the nest at one day of age and one deformed bird killed at the age of three weeks.

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Table 2.

	Muscle	Brain	Liver	Fat
Pre-stress	8.1 ± 2.3(4) (4.1 - 9.9)	5.5 ± 1.6(4) (4.8-8.0)	15.3 ± 12.6(4) (3.6-27.5)	736.1 ± 211.6 (481.2-1069.4)
Post-stress	172.9 ± 38.3(5) (120.0-227.0)	293.0 ± 27.6(5) (254.0-340.2)	1118 ± 267(5) (937.3-1688.0)	*

Figures are means, standard deviations, sample size and range.

* No fat present.

Regret that typing is sub-standard.
I had to do it myself

DSW 028148