

US EPA ARCHIVE DOCUMENT

Methoxychlor

# 1

UNDATED

2. Weanling rats fed at 200 ppm in one laboratory at at 1600 ppm in another laboratory did not show liver alterations usually seen with other chlorinated hydrocarbon insecticides when fed at much lower dosages.
3. In the dog experiments reported from the two laboratories, methoxychlor also had a lower order of chronic toxicity. The very high dose of 300 mg/kg/day allowed the survival of both of one laboratory's dogs for the experimental period of 1 year, and the survival of 2 of the 4 dogs in the other laboratory for the experimental period of 3-1/2 years. There was little cumulative morphological effect.
4. Methoxychlor has a low order of accumulation in the tissues. At a dietary level of 500 ppm the storage in rat fat amounted at not more than 30 ppm. Essentially no storage occurred at dietary levels below 100 ppm.
5. Stored methoxychlor disappears from fatty tissue within 4 weeks after cessation of exposure.
6. The only noticeable effect of low dosages of methoxychlor is a retardation of growth of weanling rats at dosage levels of 200 ppm or more. This was greater in females than in males.
7. In the chronic rat experiment conducted in the FDA laboratories liver tumor production occurred at 2000 ppm methoxychlor, with no liver tumors occurring at either the next lower level (500 ppm) or below. In the group of rats fed for 18 months at a level of 2000 ppm of methoxychlor, there were 20 survivors out of an original group of 24 animals. Among these, three were found to have benign liver tumors ranging in size from 1.7 x 1.3 x 0.9 cm. to 3.2 x 2.6 x 1.4 cm. A fourth animal, living 97 weeks, had a malignant tumor. There were tumors other than those in the livers but not significantly greater than in the controls. In contrast to the liver tumors which appeared only in the animals receiving the highest dose of methoxychlor, other types of tumors such as lymphosarcomas and breast tumors were randomly distributed throughout the control and lower dosage groups. The FDA representatives advised the Committee that, in the case of the liver tumors,

F. D. A. laboratory tests - regarding  
Methoxychlor's chronic toxicity  
1957

such as alcohol, and in petroleum solvents,  
Readily soluble in aromatic and chlorinate solvents  
Readily dehydrochlorinated when insoluble

1. Methoxychlor has a relatively low order of chronic toxicity. There was no effect on mortality even at 200 ppm of the diet in a 2 year rat experiment

WATER QUALITY Criteria Data Book vol. 1 - organic Chemical Pollution of Freshwater

Methoxychlor - rat - positive carcinogenic result  
2000 ppm. for 18 mos.  
Quail - 1000 ug/kg 40% reduction in reproduction

PLANTS

The exposure of phytoplankton communities for 4 hours to 1 ppm of methoxychlor reduced their productivity 80.6%

10.11.14 - Ecological Effects of Pesticides to  
 Man - Toxicity of Pesticides.

15%

<u>PERSISTENCE</u> - $V_2$ LIFE	<u>DDT</u>	<u>METHOXYCHLOR</u>
	3-10 years	

<u>Toxicity</u> -	LD <sub>50</sub> RAT <sup>MG/KG</sup>	LD <sub>50</sub> B.W. QUAIL	LD <sub>50</sub> PHEASANTS	LD <sub>50</sub> PHEASANTS	LD <sub>50</sub> QUAIL
	113	200-800	600-1,000 ppm	1,200-1,500 ppm	1,000 <sup>MG/KG</sup>
			600-1,000 ppm	850-1,200 ppm	1,000 <sup>MG/KG</sup>
			.007 ppm		
			.008 ppm		
			.012 ppm		
			850-1,200 ppm		
			300-700 ppm		
			1,200 <sup>MG/KG</sup>		
			1,000 <sup>MG/KG</sup>		

BIOACCUMULATIVE POTENTIALS:

- 1) METHOXYCHLOR - Practically insoluble in water; moderately soluble in alcohol and petrol oils; readily soluble in most aromatic solvents.
  - Resistant to oxidation. More stable than DDT toward dehydrochlorination in alcoholic alkali. Susceptible to catalytic dehydrochlorination of  $\beta$ -rays and heat catalysts. little or no tendency to be stored in fat.
- 2) DDT - Practically insoluble in water (hydrophobic), moderately soluble in hydroxylic and polar liquids such as alcohol, and in petroleum solvents; readily soluble in aromatic and chlorinated solvents. Readily dehydrochlorinated when dissolved.

DDT CONT.

with organic solvent by alkali or organic bases.  
Otherwise stable and inert.

Biological Concentration

- Methoxychlor
- Oysters exposed to 0.05 ppm in flowing seawater for 10 days concentrated 289 ppm (5,780 times)
  - Brook trout exposed to 0.005 ppm in water for 7 days accumulated 1.759 ppm.
  - \* Note - this is less than DDT at the same rate and for the same time (DDT in fish - averaged 2.948 ppm).  
When placed in fresh water the fish lost 41.3% of the accumulated methoxychlor within one week.

- DDT
- oysters placed in flowing seawater containing 0.1 ppb of DDT for 40 days concentrated some 70,000 times the level in the water.
  - Saltwater croakers concentrated DDT 20,000 times the level in water (0.001 ppm)
  - Earthworms in a cotton field concentrated DDT 11 times the level in the soil (32 ppm)
  - The chemical attributes of DDT make it susceptible to biological concentrations in algal living systems. 4 species of algae concentrated DDT 220-fold when exposed to a concentration of 1 ppm for 7 days. A zooplankton organism concentrated DDT 100,000 fold during 2 weeks.

Mobility

DDT - The % of DDT applied at a rate of 100 ppm to sandy loam remaining after 17 years was 39%. (1967)

Soil residues in a Maine forest treated with DDT at 114A showed little decrease during the 9 years studied after application. (1970)

Methoxychlor - Not Available

Reproduction

There is much well documented literature regarding Egg-shell thinning, cracking and embryo mortality in several avian species (Mallards, Black ducks, pelicans, Alaska-falcons and Hawks) due to DDT concentrating in these species and interfering with the calcium metabolism during the reproductive stages.

While there is a noticeable lack of literature for Methoxychlor in comparison, it is believed to have a relatively insignificant effect upon avian reproduction at present.

- Lillie, RG + others - Methoxychlor in Chick and Breeder Diets

Poultry Science Vol. 42 NO. 3 Pp. 1134-1138

Fed - 5000 ppm. 16 weeks

NO effect on consumption of food by chicken

NO egg shell thinning - no weight loss

NO noticeable effects - in general.