

UNITED STATES DEPARTMENT OF THE INTERIOR  
Fish and Wildlife Service

**METABOLISM OF PESTICIDES  
AN UPDATE**

By

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Trichlorphon (Dipterex, Trichlorfon, Chlorofos, Neguvon, Tugon, Dylox) [O,O-Dimethyl 2,2,2-trichloro-1-hydroxyethylphosphonate]

Releasable

(See also DDVP)

$^{14}\text{C}$ -Methoxy-labeled trichlorphon was incubated with human serum for 3 hours at  $37.5^{\circ}\text{C}$ . After separation of the metabolites,  $^{14}\text{C}$ -activity appeared in three amino acid fractions when the serum protein was hydrolyzed and analyzed (Dedek and Lohs, 1970a).

$^{14}\text{C}$ - $\text{CH}_3\text{O}$ -trichlorphon was administered i.v. or i.p. to rats. Most of the label found in the liver was not extractable. The specific activity of  $^{14}\text{C}$  remained constant in the globulin and albumin fractions after several ammonium sulfate precipitations, indicating methylation of the protein (Dedek and Lohs, 1970b).

After intraperitoneal injections of  $^{32}\text{P}$ -labeled trichlorfon into rats, urine was collected and analyzed. The major detoxification product was dimethyl phosphate. Some monomethyl phosphate, orthophosphate, O-demethyl dichlorvos, O-demethyl trichlorfon, and two unknowns were also observed. One of these was characterized as a glucuronide containing trichlorfon but not further identified (Bull and Ridgway, 1969).

In cotton leaves treated with trichlorfon, the major metabolites were demethyl phosphate and an unknown. In addition to these compounds, orthophosphate, monomethyl phosphate, dichlorvos, O-demethyl trichlorfon and O-demethyl dichlorvos were also observed (Bull and Ridgway, 1969).

Studies with insects revealed substantial differences between species in the rate of diminution of external radioactivity and the accumulation of internal radioactivity. After 4 hours, unabsorbed radioactivity on green lacewing larvae was 72.5% of the dose, that on tobacco budworms was 41% and 7% on lygus bugs. After 1 hour lygus bugs accumulated 57.3% of the dose internally but the other two species never exceed 8% (Bull and Ridgway, 1969).

In the digestive fluids of the silkworm Bombyx mori, DDVP formed from trichlorphon under a wide range of pH (Sugiyama and Shigematsu, 1969).

Compounds Observed

	Lygus Bug		Tobacco budworm		Green Lacewing	
	External	Internal	External	Internal	External	Internal
$H_3PO_4 + CH_3OPO_3H_2$	+	+	+	+	+	-
$(CH_3O)_2PO_2H$	+	+	+	+	+	+
Trichlorfon	+	+	+	+	+	+
Dichlorvos	+	+	-	+	-	+
O-demethyl trichlorfon	+	+	-	-	-	-
Unknown A	+	+	+	+	+	+
Unknown C	+	+	-	-	-	-

Half-life at 37.5 degrees C

System	Trichlorphon
Buffer, pH 7.0	7.3 hr
Buffer, pH 8.0	1.4
Cow blood, pH 7.7 (in vitro)	0.8

(Kuhnert et al., 1963).