DATA EVALUATION RECORD

TRICHLORFON

METABOLISM

CITATION: Abo-Khatwa N, Hollingworth RM. 1974. Pesticidal chemicals affecting some energy-linked functions of rat liver mitochondria in vitro. Bull. Environ. Contam. Toxicol. 12:446-454.

REVIEWED BY:

Nicolas P. Hajjar, Ph.D.
Senior Scientist
Dynamac Corporation
11140 Rockville Pike
Rockville, MD 20852
301-468-2500

Signature: Nicolas P. Hajjar

Date: July 25, 1983

John R. Strange, Ph.D.
Department Director
Dynamac Corporation
11140 Rockville Pike
Rockville, MD 20852
301-468-2500

Signature: John R. Strange/cc

Date: 25 July, 1983

APPROVED BY:

Irving Mauer, Ph.D.
EPA Scientist

Signature:

Date: 07-25-83

DATA EVALUATION RECORD

STUDY TYPE: Metabolism, in-vitro.

CITATION: Abo-Khatwa N, Hollingworth RM. 1974. Pesticidal chemicals affecting some energy-linked functions of rat liver mitochondria in vitro. Bull. Environ. Contam. Toxicol. 12:446-454.

ACCESSION NUMBER: Not available.

MRID NUMBER: 05004940.

LABORATORY: Department of Entomology, Purdue University, West Lafayette, Indiana.

TEST MATERIAL: Trichlorfon (>95 percent purity).

PROTOCOL:

1. Trichlorfon (>95 percent purity) was used in this assay along with 46 other pesticides.

2. Rat liver mitochondria were isolated according to the method of Katyare et al. (Arch. Biochem. Biophys. 144:209, 1971), and oxygen uptake was measured polarographically at 30°C using an assay previously described by Abo-Khatwa and Hollingworth (Pestic. Biochem. Physiol. ["in press (1973)"]).

3. The incubation mixture consisted of succinate as the substrate (concentration unspecified) and 1.2 mg of mitochondrial protein/ml of reaction mixture at a final volume of 2.5 ml. The test chemical was dissolved in ethanol and 5 µl added to the reaction mixture at a final concentration of 10^{-4} or 10^{-3}M.

4. Four energy-linked functions of the mitochondria were measured:

   (1) ADP/O ratio (efficiency of phosphorylation).

   (2) Rate of O_2 uptake in the absence of a phosphate acceptor.

   (3) Rate of O_2 uptake in the presence of phosphate acceptor.

   (4) Respiratory control index (ratio of O_2 uptake before and after ADP is exhausted as an acceptor).

RESULTS:

Trichlorfon was inactive in all four of the energy-linked functions at concentrations up to 10^{-3}M. The compound was therefore not considered to be an uncoupler of oxidative phosphorylation.

CONCLUSIONS:

Under the experimental conditions used trichlorfon did not uncouple oxidative phosphorylation in rat liver mitochondria. Although, it is not clear if positive controls were used in this study, several compounds (e.g., 2,5 dichloro-4-iodophenol, chlordimeform) were found to be potent uncouplers (10^{-6}M) of oxidative phosphorylation.

CORE CLASSIFICATION: Supplementary data.

The study provides information indicating that the test material is not an uncoupler of oxidative phosphorylation in vitro.