079401
SHAUGHNESSEY NO.

10
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 3-2-84 OUT 4-9-84

FILE OR REG. NO. 11678-5

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 1-12-84

DATE RECIEVED BY HED 2-28-84

RD REQUESTED COMPLETION DATE 4-28-84

EEB ESTIMATED COMPLETION DATE 4-21-84

RD ACTION CODE/TYPE OF REVIEW 655/Reg. Std.

TYPE PRODUCT(S): I, D, H, F, N, R, S Insecticide

DATA ACCESSION NO(S). 252228

PRODUCT MANAGER NO. G. LaRocca (15)

PRODUCT NAME(S) Endosulfan

COMPANY NAME Makhteshim-Agan (America) Inc.

SUBMISSION PURPOSE Submission of mallard duck acute oral LD50 study in support of registration standard

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
079401	Endosulfan - technical	97

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

17 APR 1984

MEMORANDUM

TO: G. LaRocca, PM Team
Registration Division, TS-767c

THRU: Dave Coppage, Head Sec. 3
Ecological Effects Branch
Hazard Evaluation Division, TS-769c

THRU: Clayton Bushong, Chief
Ecological Effects Branch
Hazard Evaluation Division, TS-769c

Subject: Acute Oral LD_{50} Study of Mallard Duck with Endosulfan; Acc. No. 252228.

The following study was reviewed and is acceptable to support registrations under the endosulfan registration standard.

Roberts, N.L. and C.N.K. Phillips. 1983. The acute oral toxicity (LD_{50}) of endosulfan technical to the Mallard duck. Prepared by Huntingdon Research Centre, Cambridgeshire, England; submitted by Makhteshim - Agan (America), Inc., New York, N.Y.; under Acc. No. 252228.

The acute oral LD_{50} of technical endosulfan to Mallards (Anas platyrynchos is 28 mg/kg (22-36 mg/kg).

John J. Bascietto
Wildlife Biologist, Sec. 3
Ecological Effects Branch
Hazard Evaluation Division, TS-769c

DATA EVALUATION RECORD

1. CHEMICAL: Endosulfan

2. FORMULATION: Technical, 97.2%

3. CITATION: Roberts, N.L. and C.N.K. Phillips. 1983. The acute oral toxicity (LD_{50}) of endosulfon - techincal to the mallard duck. Report prepared by Huntingdon Research Centre, Cambridgeshire, England; submitted by Makhteshim-Agan (America) Inc, (New York). Reg. No. 11678-5. Acc. No. 252228.

4. REVIEWED BY: John J. Bascietto
Wildlife Biologist
EEB/HED

5. DATE REVIEWED: 4/12/84

6. TEST TYPE: Avian acute oral LD_{50}

A) Mallard duck (Anas platyrynchos)

7. REPORTED RESULTS:

LD_{50} = 28 mg/kg (22-36 mg/kg)
(95% c.i.)

8. REVIEWER'S CONCLUSIONS: The study is scientifically sound. With an LD_{50} = 28 mg/kg. (22-36 mg/kg), Endosulfan technical is considered "highly toxic" to representative waterfowl tested (mallard duck). The study fulfills the guidelines requirements for an avian acute toxicity study (oral LD_{50}) for wild waterfowl.

9. Materials/Methods

A.) Procedures - the protocol used was that recommended by the current pesticide hazard assessment guidelines (EPA - 540/9-82-024) Subdivision E, Oct., 1982.

B.) Statistical Analysis - the authors calculated the LD_{50} and 95% confidence interval using the dose-mortality data and the Finney probit analysis method (Finney, D.J. 1971. Probit Analysis. 3rd ed., Cambridge University Press).

10. Results

Table 1 gives the dose - response (mortality) data given in the report. Corn oil control birds (0 mg/kg) had no mortality. Most mortality was observed within 2 hours of dose with no deaths occurring more than 4 hours after dose.

(Survivors were observed for 14 days for general health, body weight and food consumption).

TABLE I. Mortality Observed

	Group and Dose		No Dead/10 birds per group (pecent death)	
1.	Corn oil control	0 mg/kg	0	
2.	Endosulfan	5 mg/kg	0	
3	"	10 mg/kg	0	
4.	"	20 mg/kg	1	(10%)
5.	"	40 mg/kg	9	(90%)
6.	"	80 mg/kg	10	(100%)

Soon after dosing (by oral gavage) birds in groups receiving acutely toxic doses (Groups 4-6) showed signs of intoxication, i.e., unsteadiness. Survivors of the 20 and 40 mg/kg treatments continued to exhibit unsteady behavior for several hours. 9 out of 10 birds in Group 6 died within 1 1/2 hours; the last bird in Group 6 died at 4 hours after dose.

Groups 1-3 showed weight gains overall, during 7 days following treatment. Both increases and decreases in weight were seen between Days 7-14 after dose, but were "less marked" with both increases and decreases occurring within treatment groups. Food consumption appeared "normal" although variation was observed.

There were "no abnormalities" observed upon gross necropsy of all birds.

11. Reviewers Evaluation

A. Procedures: acceptable

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B. Statistics: acceptable

C. Results: the results indicate that endosulfan technical is "highly toxic" to mallard ducks. The LD_{50} is 28 (22-36) mg/kg. A review of the raw body weight and food consumption data provided on individuals (body weights) and group means (food consumption) shows that the authors conclusions regarding these parameters are reasonable.

D. Conclusions

1. Category: Core

2. Rationale: Guidelines study.

3. Repair: N/A