UNDATED

DATA EVALUATION RECORD

1. **CHEMICAL:** Molinate
Shaughnessey No. 041402

2. **TEST MATERIAL:** Molinate technical; S-ethyl hexahydro-1H-azepine-1-carbothioate; Test substance No. T256; 99% w ingredient; a straw-colored liquid.

3. **STUDY TYPE:** Growth and Reproduction of Aquatic Plants -- Tier 2 Tested: Lemna gibba G3.

4. **CITATION:** Thompson, R.S., A.J. Winndeatt, J.F. Tapp, and S.A. Sank 1990. Molinate: Determination of Toxicity to the Duckweed L Laboratory Project No. T256/A. Conducted by Imperial Chemical Indu Brixham, Devon, UK. Submitted by ICI Agrochemicals, Fernhurst, S EPA MRID No. 417027-02.

5. **REVIEWED BY:**

Mark A. Mossler, M.S. **Signature:**
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7. **CONCLUSIONS:** This study is scientifically sound and meets the guid requirements for a Tier 2 non-target plant growth and reproducti 14-day EC_{25} and EC_{50} frond number values of molinate for L. gibba w and 3.30 mg ai/l, respectively. The NOEC was determined to be 0.84

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A

11. **MATERIALS AND METHODS:**

A. **Test Species:** The plants used in the test, Lemna gibba G3, ca the University of Waterloo, Canada. Plants were maintained Hoagland's medium (Hillman, 1961) under 5270 lux illuminati temperature of 25 ±1°C. Warm-white fluorescent tubes and a c photoperiod were used. Plants that were growing actively we inoculum for the test.

B. **Test System:** Test vessels used were glass 400 ml cylindrical loose-fitting lids. The test medium was the same as tha culturing, with a pH of 4.8.

The test vessels were kept in an incubator with environmental like those employed in culturing.

C. **Dosage:** Nominal rates of 0.25, 0.5, 1, 2, 4, 8, 16, 32 mg ai/ control and a blank (no algal inoculum) were used for the defi

D. **Test Design:** A 64 mg ai/l stock solution was prepared by dire of the test material to sterile culture medium. Aliquots of added to sterile culture medium to obtain the nominal concent solutions were clear and colorless. One-hundred and sixty mil test solution were placed in each of three replicate 400 ml treatment level). The control dishes were replicated three stock and test solutions were prepared on days 7 and 11 of t the vessels renewed. The dishes were randomized by rows wi incubator and were re-randomized after 7 days.

Five plants with three fronds each were randomly placed in ea dish. Frond counts were performed on test days 3, 5, 7, 10, All fronds which visibly projected beyond the edge of the pare counted. Toxicity symptoms were recorded. At the end of t days), the plants from each dish were rinsed with distilled w to a constant weight.

Samples were taken from the freshly-prepared solutions and t solutions at test initiation (freshly prepared only), each termination (old solutions only). These solutions were anal test material by gas chromatography (GC).

The pH of the freshly-prepared test solutions were measured on and 11. The temperature of the incubator was measured d thermograph and hourly by a datalogger. The light inte

measured once during the study.

E. **Statistics:** For each nominal concentration, the mean of the m concentration was calculated. The mean measured concentratio then used as the basis for the data analysis. Frond number an weight per replicate were examined as a function of time. Mov angle and Dunnett's analysis ($p \leq 0.05$) were conducted on both parameters at day 14.

12. **REPORTED RESULTS:** Plant frond number for the control and the expos concentrations throughout the test are given in Table 2 (attache weights per replicate are given in Table 4 (attached).

Measured concentrations were 80% to 100% of nominal. The means measured concentrations were 0.20, 0.42, 0.84, 1.7, 3.6, 7.5, 15, a

Increasing concentrations of molinate had increasingly inhibitory e growth and reproduction of Lemna gibba.

By day 14, the effect of the test material on the frond number, control, ranged between 11% and 93% inhibition. The EC_{50} was 3.3 m confidence limits of 2.7 and 3.9 mg ai/l.

By day 4, the effect of the test material on dry weight, relativ ranged between 0% and 74% inhibition. The EC_{50} was 7.7 mg ai/l confidence limits of 6.1 and 9.6 mg ai/l.

Results from Dunnett's analysis indicated that the frond numbers on five highest concentrations were significantly less than the contr rate of 0.20 mg ai/l was also significantly different from the con next two highest rates were not significantly different, the NOEC to be 0.84 mg ai/l.

The results from the dry weight data indicate that by day 14, th rates of molinate significantly reduced the growth of Lemna gibba was reported as 1.7 mg ai/l.

From day 10 onwards, at and above a nominal concentration of 4 mg were smaller and had a shrivelled appearance compared to the cont was increasingly apparent with increasing concentration.

The pH in the control and the exposure concentrations ranged from throughout the experiment. The temperature ranged from 24.6 to 25.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:**
No conclusions were made by the authors.

Good laboratory practice and Quality Assurance Unit statements were the report indicating compliance with EPA Good Laboratory Practic under the Federal Insecticide, Fungicide, and Rodenticide Act.

14. **REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:**

A. **Test Procedure:** The test procedure and the report were genera accordance with the SEP and Subdivision J guidelines, excep following deviations:

The conductivity of the test solutions was not measured.

The light intensity was 5.27 klux. The recommended intensity

No subtoxic (EC_{25}) values were reported.

B. **Statistical Analysis:** The reviewer used a computer program to statistical analysis (attached) of the 14 day frond number dat Dunnett's tests were used to determine the EC and NOEC v respectively. The results from Dunnett's analysis were in ag the authors'. The reviewer obtained EC values that were sli than the authors'. Since the authors' EC_{50} value of 3.3 mg conservative, and will better protect non-target plants, it wi the correct EC value.

C. **Discussion/Results:** Although the dosages were not adjusted fo purity of the test material, the

reviewer reported rates in terms of mg ai/l because of the pur material (99%).

This study is scientifically sound and meets the guideline re a Tier 2 non-target aquatic plant study. Growth of Lemna increasingly inhibited by increasing amounts of molinate.

D. **Adequacy of the Study:**

(1) **Classification:** Core.

(2) **Rationale:** N/A

(3) **Repairability:** N/A

15. **COMPLETION OF ONE-LINER:** Yes, 6/5/91.