UNDATED

DATA EVALUATION RECORD

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

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

3. **STUDY TYPE:** Growth and Reproduction of Aquatic Plants -- Tier 2. Species T Selenastrum capricornutum.

4. **CITATION:** Smyth, D.V., J.F. Tapp, S.A. Sankey and P.A. Johnson. 1990. Molin Determination of Toxicity to the Green Alga Selenastrum capricornutum. Labo T256/F. Conducted by Imperial Chemical Industries PLC, Brixham, Devon, UK. Sub Agrochemicals, Fernhurst, Surrey, UK. EPA MRID No. 416136-12.

5. **REVIEWED BY:**

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7. **CONCLUSIONS:** This study is scientifically sound but does not meet the guideline for a Tier 2 non-target plant growth and reproduction test. The study was cond rather than the recommended 5 days. The 4-day EC_{25} and EC_{50} values of molinate f capricornutum were 0.15 and 0.22 mg ai/l, respectively. The NOEC was determine mg ai/l.

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:**

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

11. **MATERIALS AND METHODS:**

A. **Test Species:** The alga used in the test, Selenastrum capricornutum Printz, laboratory stock cultures kept under axenic conditions. Stock cultures we synthetic nutrient medium (Miller et al., 1978) at a temperature of 24 ± shaking at 100 rpm. Cool white tubes provided a light intensity of 3570 l Cultures that were growing logarithmically were used as inoculum for the te

B. **Test System:** Test vessels used were glass 250 ml conical flasks fitted wit stoppers. The test medium was the same as that used for culturing, with a

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

C. **Dosage:** Nominal rates of 0.056, 0.10, 0.18, 0.32, 0.56, 1.0, 1.8 mg ai/l, control and a blank (no algal inoculum) were used for the definitive test.

D. **Test Design:** A stock solution of 72 mg ai/l was prepared by direct additio material to sterile water. Aliquots of the stock were added to sterile obtain the nominal concentrations. All solutions were clear and colorless milliliters of the test solution were placed in each of three replicate 2 treatment level). The control flasks were replicated six times.

An inoculum volume of 0.125 ml was used to provide 0.3×10^4 cells/ml per flask. Cell counts were performed every 24 hours fo an electronic particle counter. The flasks were randomized by rows within

At the start of the test, samples were taken of each test solution, us remaining after filling the test vessels, and were analyzed for the concen substance by gas chromatography (GC). At the end of the test each blank sampled and analyzed in the same manner.

The pH of the test solutions were measured at test initiation and term intensity was measured once during the experiment and temperature was m continuously.

E. **Statistics:** For each nominal concentration, the mean of the measured conce from the blanks on day 0 and day 4 was calculated. The mean measured conc were then used as the basis for the data analysis. The area under the gro growth rate were examined as a function of time. Probit and Dunnett's ana were conducted on both of these parameters at day 4.

12. **REPORTED RESULTS:** Algal cell densities for the control and the exposure concentr throughout the test are given in Table 2 (attached).

Measured concentrations on day 0 were 94% to 102% of nominal while day 4 concentrations were between 94% and 105%. The means of the measured concentrati 0.055, 0.10, 0.17, 0.32, 0.58, 1.0, and 1.7 mg ai/l.

Increasing concentrations of molinate had increasingly inhibitory effects upon reproduction of Selenastrum capricornutum.

By day 4, the effect of the test material on the area under the growth curve, re ranged between
7% and 100% inhibition (Table 3, attached). The EC_{50} was 0.22 mg ai/l with confi 0.15 and 0.32 mg ai/l.

By day 4, the effect of the test material on the growth rate, relative to the co 1% and 95% inhibition (Table 4, attached). The EC_{50} was 0.50 mg ai/l with confid 0.36 and 0.69 mg ai/l.

Results from Dunnett's analysis indicated that the areas under the growth curve four highest concentrations were significantly less than the control. The NOEC to be 0.17 mg ai/l. The results from the growth rate data were similar to are curve results. The NOEC was again reported as 0.17 mg ai/l.

The pH in the control and the exposure concentrations were 8.0 to 8.1 and respectively, by test termination. The hourly temperatures ranged from 24.4 to 2

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

Good laboratory practice and Quality Assurance Unit statements were included indicating compliance with EPA Good Laboratory Practice Standards under th Insecticide, Fungicide, and Rodenticide Act.

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

A. **Test Procedure:** The test procedure and the report were generally in accord the SEP and Subdivision J guidelines, except for the following deviations:

The dissolved oxygen and conductivity of the test solutions were not measur

The study was conducted for 4 days. All algal studies should be conducted

The age of the organisms used for inoculum was not stated.

The light intensity was 3570 lux. The recommended intensity is 4000 lux.

Although the raw data were submitted for cell densities, the converted ra under the growth curve and growth rate were not.

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

B. **Statistical Analysis:** The reviewer used a computer program to perform stat analysis (attached) of the 4 day cell density data to determine the NOEC. growth curve data were used for the determination of EC values. This par data better than growth rate. Probit and Dunnett's tests were used to de and NOEC values, respectively. The results from Dunnett's analysis were with the authors'. The reviewer obtained EC values that were slightly h authors'. Since the authors' EC_{50} value of 0.22 mg ai/l is more conservative, and will better protect non-target plants, it will be taken value.

C. **Discussion/Results:** Although the dosages were not adjusted for percent pur test material, the reviewer reported rates in terms of mg ai/l because of test material (99%).

This study is scientifically sound but does not meet the guideline requir 2 non-target aquatic plant study. The study was not conducted for the amount of time (i.e., 5 days). The NOEC and EC_{50} of molinate for S capricornutum were 0.17 and 0.22 mg ai/l. Growth of Selenastrum caprico increasingly inhibited by increasing amounts of molinate.

D. **Adequacy of the Study:**

(1) **Classification:** Supplemental.

(2) **Rationale:** The study was not conducted for the correct length of tim days).

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(3) **Repairability:** No.

15. **COMPLETION OF ONE-LINER:** Yes, 6/4/91.