12-16-82

CASE GS0097 CHLOROTHALONIL PM 400 ~~08/03/82~~

CHEM 081901 Chlorothalonil (tetrachloroisophthalon

BRANCH ~~EEB~~ EEB DISC ~~10~~ 40 TOPIC ~~05~~ 05103547 Guidelines 40CFR 163.72-6

FORMULATION 00 - ACTIVE INGREDIENT

FICHE/MASTER ID 05001356 CONTENT CAT 01

Armstrong, D.A.; Buchanan, D.V.; Caldwell, R.S. (1976) A mycosis caused by "Lagenidium" sp. in laboratory-reared larvae of the dungeness crab, "Cancer magister", and possible chemical treatments. Journal of Invertebrate Pathology 28(3):329-336.

SUBST. CLASS = S.

OTHER SUBJECT DESCRIPTORS
SEC: EEB -40-05103547

DIRECT RVW TIME = (MH) START-DATE END DATE

REVIEWED BY: Daniel Rieder
TITLE: Wildlife Biologist
ORG: EEB/HED
LOC/TEL: 557-7666

SIGNATURE: Daniel Rieder DATE: 12/16/82

APPROVED BY:
TITLE:
ORG:
LOC/TEL:

SIGNATURE: DATE:

DATA EVALUATION REPORT

1. Chemical: Chlorothalonil

2. Sha. No. 081901

3. Citation: Armstrong, D.A.; Buchanan, D.V.; Caldwell, R.S. (1976) A Mycosis Caused by Lagenidium sp. in Laboratory Reared Larvae of the Dungeness Crab, Cancer magister and Possible Chemical treatments. Journal of Invertebrate Pathology 28(3): 329-336.

4. Reviewed by: Daniel Rieder
Wildlife Biologist

5. Date Reviewed: Nov. 18, 1982

6. Test Type: 96 hour LC50 with dungeness crab larvae (several pesticides tested).

7. Results

Pesticide	% a.i.	Larvae 96-hour LC50* (ppm)
Metiram	100	5.9
Copper Sulfate	54	1.5
Folpet	50	<0.1
Chlorothalonil	75	0.14
Benomyl	50	7.6
Trifluralin	44.5	0.3
Malachite green	100	0.04
Dichlone	50	0.038
Captan	50	8.0

* Concentrations were adjusted so the results are for the equivalent of a 100% a.i. test material.

8. Conclusion

This study is supplemenmtal in that it provides useful information but does not fulfill guideline requirements for a 96-hour acute toxicity test with crabs. The concentration levels were not reported and the test material was a formulated product.

METHODS

"Crab larvae were hatched in the laboratory from ovigerous females collected off Newport, Oregon. During the chronic toxicity tests, larvae were reared in a continuous-flow system of glass aquaria described by Buchanan et al. (1975). All glass in the rearing system was washed twice a week in a chlorine solution, and at this time larvae were fed newly hatched brine shrimp, Artemia salina, at a density of about six shrimp/ml of test solution.

Sea water used in the chronic toxicity tests was pumped from Yaquina Bay, Oregon, passed through a coarse sand filter (to about 100 um) and stored for up to 3 days in a 10,000-gal tank. The water was adjusted to 25 ± 0.5% salinity during the first 15 days of the test and afterwards was 15% or higher. From the storage tank, water was pumped into a constant-temperature laboratory, refiltered through a fine sand filter (to about 20 um), exposed to uv irradiation, and allowed to reach 13° ± 1°C before entering exposure aquaria. The dissolved oxygen concentration of the water always exceeded 90% of saturation and the pH range was 7.6 to 7.9 during the test. The temperature of sea water in Yaquina Bay was less than 13°C when the infection was noted in our laboratory.

The toxicity of eight fungicides and the herbicide trifluralin to crab larvae and to the fungus were tested in separate 96-hour bioassays (Table 1). A logarithmic series of five concentrations of each chemical was tested in duplicate against unfed, first-stage zoeae. In all bioassays, concentrations were adjusted for the percentage of active ingredient in the specific formulation. Tests were performed in 250-ml beakers with 10 larvae per beaker. Solutions were renewed every 24 hours and were kept at 13°C and 25% salinity. The criterion of toxic effect in determining EC_{50} values (the concentration of pesticide producing a sublethal effect in 50% of the test organisms in a specified time period) was cessation of swimming, and for the LC_{50} values (the concentration of pesticide resulting in death of 50% of the test organisms in a specified time period) the criterion was cessation of all movements and development of an opaque appearance. Such values were calculated as described by the American Public Health Association et al. (1971).

The exposure beakers and water conditions were the same for the fungal bioassay. Four concentrations of each chemical were tested in duplicate with 200 ml of solution per beaker."

RESULTS

"Toxicity of Nine Pesticide Chemicals to Cancer magister Larvae and the Fungus Lagenidium sp.

Pesticide	Toxic concentrations (mg/liter)							
	Larvae				Fungus[a]		SR[b]	
	48 hr		96 hr		48 hr.	96 hr	48 hr	96 hr
	EC_{50}	LC_{50}	EC_{50}	LC_{50}				
Metriam	2.4	6.7	0.7	5.9	12.5	12.5	0.19	0.06
Cu^{2-} (Bordeaux mixture)	4.5	>100	<1.0	1.5	1.0	10.0	4.5	<0.10
Folpet	<0.1	0.1	<0.1	<0.1	1.0	1.0	0.1	<0.10
Chlorothalonil	0.17	0.56	<0.1	0.14	1.0	1.0	0.17	<0.10
Benomyl	>100	>100	2.8	7.6	1.0	10.0	>100	0.28
Trifluralin	0.17	0.32	0.15	0.3	0.005	0.1	34.0	1.5
(Chronic test)[c]			0.48	>0.48		0.0041		117.1
Malachite green	0.12	0.16	0.02	0.04	1.0	1.0	0.12	0.02
Dichlone	0.05	0.08	0.038	0.038	0.032	0.1	0.15	0.38
Captan	0.7	>10	0.36	8.0	0.056	0.056	12.0	6.4

[a] Data for inhibition of transfer of fungus to uninfected hemp kernel.
[b] Selectivity ratio[(SR=(EC_{50}larvae)/(concentration toxic to fungus)] for a given time interval.
[c] ~~Data from Caldwell et al. (1976b)."~~

CONCLUSIONS

Category: Supplemental

Rationale: Concentration levels not reported, test material was formulated product. The requirement for a species of crab is no longer in effect.

Repairability: This study could be more useful if the concentration levels and 96-hour mortality was reported, but it could not be core because there is no guideline requirement for a crab study.