

H₂O Photolysis

Shaughnessy No.: 113501

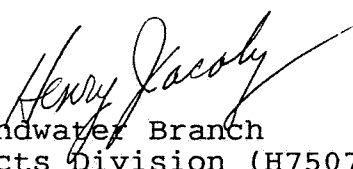
Date Out of EFGWB: SEP - 7 1989

TO: G. LaRocca
Product Manager 15
Registration Division (H7505C)

FROM:

Paul Mastradone, Section Chief 
Environmental Chemistry Review Section #1
Environmental Fate and Groundwater Branch

THRU:

Henry Jacoby, Acting Chief 
Environmental Fate and Groundwater Branch
Environmental Fate and Effects Division (H7507C)

Attached please find the EFGWB review of:

Reg./File # : 100-628

Chemical Name: Metalaxyl 113501

Product Type : Fungicide

Product Name : Ridomil

Company Name : CIBA-Geigy

Purpose : Review data submitted in response to Registration
standard

Date Received: 3 August 1989

Action Code: 660

Date Completed: 24 August 1989

EFGWB No. 90703

Total Reviewing Time (decimal days): 4.0 days

Deferrals to: ☐ Ecological Effects Branch, EFED
☐ Science Integration & Policy Staff, EFED
☐ Non-Dietary Exposure Branch, HED
☐ Dietary Exposure Branch
☐ Toxicology Branch, HED

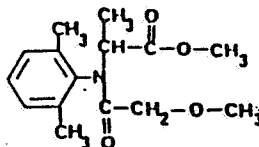
1.0 CHEMICAL:

Chemical name: N-(2,6-Dimethylphenyl)-N-(methoxyacetyl)-alanine methyl ester

Common Name: Metalaxyl

Trade Name: Ridomil, Subdue, Apron, Proturf

Chemical Structure:



2.0 TEST MATERIAL: ¹⁴C-Metalaxyl

3.0 STUDY/ACTION TYPE :

Evaluate the potential for photolytic degradation of aqueous solutions of Metalaxyl exposed to natural sunlight.

4.0 STUDY IDENTIFICATION:

Martinson, J. P. 1988. Photodegradation of Aqueous Solutions of Metalaxyl Exposed to Natural Sunlight. Springborn Life Sciences, Inc. for CIBA- Geigy Corp. MRID No. 411560-01

5.0 REVIEWED BY:

George Tompkins
Entomologist, Review Section 1
EFGWB/EFED

Signature: *George Tompkins*
Date: *5 September 1989*

6.0 APPROVED BY:

Paul Mastradone
Section Chief, Review Section 1
EFGWB/EFED

Signature: *Paul J. Mastradone*
Date: *SEP - 7*

7.0 CONCLUSIONS:

EFGWB concludes that the photodegradation study in water (161-2) for metalaxyl is scientifically valid and satisfies the requirement for which the study was submitted.

Based on the results of the study, EFGWB concludes that metalaxyl is photolytically stable in water when exposed to natural sunlight, with a half life of 400 days.

ENVIRONMENTAL FATE ASSESSMENT

Based on available data, EFGWB concludes that metalaxyl is resistant to photolytic degradation at pH 7.0 when exposed to natural sunlight for periods up to 28 days.

8.0 RECOMMENDATIONS:

The data required for photodegradation(water) study that has been submitted is acceptable and this data requirement is satisfied. Specific deficiencies in methods are listed in the attached individual Data Evaluation Records (DERS).

9.0 BACKGROUND:

Registration Division has requested EFGWB review the photodegradation in water data which CIBA- Geigy has submitted in response to the Registration standard for metalaxyl.

10.0 DISCUSSION OF INDIVIDUAL STUDIES:

See attached DER

11.0 COMPLETION OF ONE-LINER:

One-liner updated

12.0 CBI APPENDIX:

CIBA-Geigy makes no claim of confidentiality for the submitted study.

DATA EVALUATION RECORD

STUDY IDENTIFICATION:

Martinson, J. P. 1988. Photodegradation of Aqueous Solutions of Metalaxyl Exposed to Natural Sunlight. Springborn Life Sciences, Inc. for CIBA- Geigy Corp. MRID No. 411560-01

TYPE OF STUDY: Aqueous Photolysis

REVIEWED BY:

George Tompkins, Entomologist
Review Section 1, EFGWB, EFED

Signature: *George Tompkins*
Date: *5 September 1989*

APPROVED BY:

Paul J. Mastradone, Section Chief
Review Section 1, EFGWB, EFED

Signature: *Paul J. Mastradone*
Date:

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MATERIALS AND METHODS:

A 95.4% pure 40.0 mg sample of ^{14}C -metalaxyl was added to 10.0 ml of reagent grade acetonitrile to make a stock solution containing 3.82 mg A.I./ml. A test solution of metalaxyl was prepared by diluting 0.50 ml of the stock solution to 200.0 ml with aerated pH 7.0 buffer to provide a concentration of 9.6 mg A.I./L. The buffer solution was prepared with deionized water. During aeration a microbial filter was placed in-line to minimize degradation. All glassware and buffer solutions were sterilized prior to study initiation by autoclaving.

Each test system consisted of a 4.0 ml borosilicate, screw capped (teflon lined) vial, which was filled completely with the radioactive metalaxyl buffer solution. Triplicate test systems (consisting of 2 exposure and 1 control) were established for seven sampling intervals yielding a total 21 vials. Control vials were wrapped in aluminum foil to exclude light. The test systems were placed on a black, nonreflective background, inclined at 30° from the vertical, with the upper end of the vial pointing due north, in an area free of shade and sunlight reflections. The test systems remained outdoors for the appropriate period until sampled. Sampling of the aqueous solutions was performed at test

initiation (0 hour) and after 1, 3, 5, 7, 14, 21, and 28 days of natural sunlight exposure. The testing was conducted at 41° 46" N latitude and 70° 45" W longitude. Daily measurements were made of the solution temperature and the light intensity. Weather conditions were recorded daily.

At each sampling interval the samples were analyzed for material balance by liquid scintillation counting (LSC) and for photochemical degradation by thin layer chromatography (TLC). Analytical grade metalaxyl and CGA-62826 were dissolved in methanol and spotted on the origin of each plate to assist in the characterization of the ¹⁴C-material present in each sample.

REPORTED RESULTS:

The author reported the recovery of radiocarbon for all exposed samples to range from 93 to 100% with a mean material balance of 97.1% (Table 2). The dark control samples showed a similar mean material balance of 97.1%.

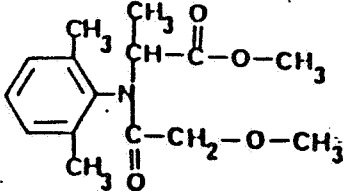
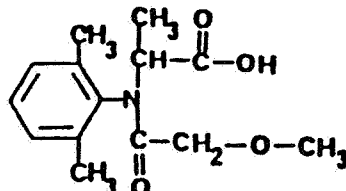
The total radiocarbon remaining as metalaxyl was 88.5% for the irradiated samples and 89.9% for the dark controls (Table 2), after 28 days exposure. The major degradation product identified was CGA-62826 which was 5.7% in day 14 irradiated sample and 6.1% in day 28 dark control samples. No unknown products were detected greater than 5%.

The calculated half-life values were 400 days for irradiated samples and 660 days for dark control samples (Table 3).

DISCUSSION:

1. No mention was made of whether a separate blank containing buffer solution was used to record the temperatures or how these recordings were taken.
2. Guidelines for this study indicate that the temperature should be held at $25 \pm 1^\circ \text{C}$. This study deviated from the guidelines in that the temperatures ranged from 14-45° C (mean of $31 \pm 7.9^\circ \text{C}$). This is believed to have only a minimal effect on the results or conclusions drawn from this study.
3. Based on the results of the study, EFGWB concludes that metalaxyl is photolytically stable in water when exposed to natural sunlight, with a half life of 400 days, and that less than 10% of the material photolyzed during the test period of 28 days.
4. The report did not list the chemical name or structure of CGA-62826, the major degradation product of metalaxyl in this study. The chemical name of CGA-62826 is N-(2,6-dimethyl-phenyl)-N-(methoxyacetyl)-alanine. The chemical structure of metalaxyl and CGA-62826 can be found in Figure 1.

FIGURE 1. Metalaxyl and its metabolite CGA-62826.

Structure	Chemical Name	Common Name/ Abbreviation
	N-(2,6-dimethylphenyl)- L-(methoxycarbonyl)-alanine methyl ester	Metalaxyl, CGA-48988
	N-(2,6-dimethylphenyl)-N- (methoxycarbonyl)-alanine	CGA-62826

Metaxy/

Sha # 113501

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Pages 7 through 9 are not included.

The material not included contains the following type of information:

- ☐ Identity of product inert ingredients.
- ☐ Identity of product impurities.
- ☐ Description of the product manufacturing process.
- ☐ Description of quality control procedures.
- ☐ Identity of the source of product ingredients.
- ☐ Sales or other commercial/financial information.
- ☐ A draft product label.
- ☐ The product confidential statement of formula.
- ☐ Information about a pending registration action.
- ☒ FIFRA registration data.
- ☐ The document is a duplicate of page(s) _____.
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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.
