

US EPA ARCHIVE DOCUMENT

7-5-91



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

JUL 5 1991

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: Asana: Honey Bee Data Submitted under 6(a)2

FROM: Douglas J. Urban, Acting Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

TO: George LaRocca, PMT-15
Insecticide/Rodenticide Branch
Registration Division (H7505C)

Douglas J. Urban 7/3/91

EEB has reviewed the honey bee toxicity data (416984-02) for Asana (S-fenvalerate), submitted as adverse data under 6(a)2. These data satisfy the requirement for an acute contact toxicity test on bees, and show that Asana is highly toxic to honey bees.

Any questions or comments on this memo should be referred to Allen Vaughan at 557-0464.

Attachments

DATA EVALUATION RECORD

1. Chemical: S-Fenvalerate; Asana; H-18,151
2. Test Material: Technical, 98.6% ai
3. Study Type: Honey bee acute contact LD50

Species tested: Apis mellifera

4. Study ID: Hoxter, K. A., and G. J. Smith. 1990. H-#18,151 (Technical Asana): An acute contact toxicity study with the honey bee. Wildlife International Ltd. Project No. 112-247. Submitted by E.I. du Pont de Nemours and Company, Newark, DE. EPA Acc. No. 416984-02.

5. Reviewed By:

Allen W. Vaughan
Entomologist
EEB/EFED

Signature: Allen W. Vaughan

Date: 7.1.91

6. Approved By

Norman J. Cook
Supervisory Biologist
EEB/EFED

Signature: Norman J. Cook

Date: 7.1.91

7. Conclusions:

This study is scientifically sound, and shows Asana to be highly toxic to honey bees. In an acute contact test, the LD50 was determined to be approximately 0.017 micrograms per bee. This study fulfills the guideline requirement for an acute contact toxicity test on honey bees.

8. Recommendations: N/A

9. Background: This study was submitted under Section 6(a)2 as adverse data.

10. Discussion of Individual Tests: N/A

11. Materials and Methods:

Six days prior to initiation of the study, one frame containing honey bee pupae was selected from Wildlife International's hives. The frame was placed in an automatic incubator for six days to allow adult emergence. All test bees were 1 to 6 days old at test initiation, and were apparently healthy. On the day of study initiation, all bees that had emerged were immobilized with N₂ and at least 25 bees were placed into each test chamber.

Test chambers were rolled paper containers. Each container was covered with a plastic petri dish through which a glass vial containing 50% sugar water was inserted. This food source was available to the test bees throughout the study.

The photoperiod was eight hours of light per day. Test temperatures ranged from 22 to 24° C.

Six treatment levels, 0.00313, 0.00625, 0.0125, 0.025, 0.05, and 0.1 microgram per bee, were tested along with a solvent control and a negative control. Two replicates were tested at each dosage, with 25 bees per replicate. The solvent control bees received a volume of acetone equal to the largest volume used during the test.

Recently collected bees were immobilized with N₂ to facilitate handling. Each bee was individually dosed with the appropriate test solution. Solvent control bees were dosed with acetone.

Observations on mortality and signs of toxicity were made twice on the day of initiation and once on Day 1 and Day 2 after dosing.

Mortality data were analyzed using the computer program of C.E. Stephan. In this study the binomial probability method was used.

12. Reported Results:

The study authors found that Asana was highly toxic to honey bees, with an LD50 of 0.017 ug per bee.

13. Study Authors' Conclusions/ OA Measures

48-hr. LD50 = 0.017 ug per bee (highly toxic).

14. Reviewer's Discussion and Interpretation of the Study

A. Test Procedures: Procedures were in accordance with protocols recommended in the guidelines. There were no problems in this regard.

B. Statistical Analysis: Independent validation by EEB confirms that the analysis is appropriate and supports the conclusions of the study.

C. Discussion/Results: Asana is highly toxic to honey bees.

D. Adequacy of Study:

1. Classification: Core

2. Rationale: Guidelines protocol

3. Reparability: N/A

15. Completion of One-Liner for Study: N/A

16. CBI Appendix: N/A

NOTE: BECAUSE THERE WAS CONTROL MORTALITY, AND NONE OF THE LOWER CONCENTRATIONS PRODUCED ZERO MORTALITY, THE DATA HAS BEEN SUBJECTED TO ABBOTT'S CORRECTION.

Vaughan Asana Honey Bee Acute

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
.1	48	48	100	0
.05	48	42	87.5	0
.025	48	40	83.3333	0
.0125	48	10	20.8333	0
.00625	48	2	4.1667	0
.00313	48	3	6.25	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.720402E-02

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS
5	2.619529E-02		1.763079E-02
1.486622E-02		2.090646E-02	

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H
4	.3699308	5.175989

0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.003949
 95 PERCENT CONFIDENCE LIMITS = 1.176889 AND 4.83101

LC50 = 1.721889E-02
 95 PERCENT CONFIDENCE LIMITS = 9.203624E-03 AND .0321414

LC10 = 6.504718E-03
 95 PERCENT CONFIDENCE LIMITS = 1.184766E-03 AND 1.136029E-02

5

DP BARCODE: D159075

CASE: 281847
SUBMISSION: S387040

DATA PACKAGE RECORD
BEAN SHEET

DATE: 12/05/90
Page 1 of 1

* * * CASE/SUBMISSION INFORMATION * * *

CASE TYPE: MISCELLANEOUS ACTION: 405 DATA-ADVERSE DATA
CHEMICAL: 109303 S-Fenvalerate
ID#: 281847
COMPANY: E. I. DU PONT DENEMOURS AND COMPANY, INC.
PRODUCT MANAGER: 15 GEORGE LARocca 703-557-2400 ROOM: CM#2 204
PM TEAM REVIEWER: ADAM HEYWARD 703-557-4421 ROOM: CM#2 200
RECEIVED DATE: 11/23/90 DUE OUT DATE: 02/01/91

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 159075 EXPEDITE: N DATE SENT: 12/05/90 DATE RET.: / /
DP TYPE: 001 Submission Related Data Package
ADMIN DUE DATE: 12/30/90 CSF: N LABEL: Y
ASSIGNED TO DATE IN ASSIGNED TO DATE IN
DIV : EFED / / REVR : JAKERMAN / /
BRAN: EEB / / CONTR: / /
SECT: IO / /
EEB out : JUL 5 1991

* * * DATA PACKAGE REVIEW INSTRUCTIONS * * *

Review the attached adverse data.

* * * ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION * * *

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL
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