

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

1. Chemical: Lindane
2. Test Material: Technical, 99.5% ai
3. Study/Action Type: Avian Acute Oral Study
Bobwhite Quail (Colinus virginianus)
4. Study Identification: Acute Oral Toxicity Study with Lindane
Technical in Bobwhite Quail. Bio-Life
Associates Ltd. May 6, 1986. Submitted
by Rhone-Poulenc, Inc. for CIEL. EPA
Accession No. 263944.

5. Reviewed by: Ann Stavola
Aquatic Biologist
EEB/HED

Signature: *Ann Stavola*

Date: *9 Dec 86*

6. Approved by: Doug Urban
Supervisory Biologist
EEB/HED

Signature: *Douglas J Urban*

Date: *12/31/86*

7. Conclusions:

The study is scientifically sound and fulfills the EPA Guidelines requirements for an avian acute oral study. With an LC₅₀ value of 122 (90-160) mg/kg, Technical Lindane is moderately toxic to birds.

8. Recommendations: N/A.

9. Background:

Submitted in response to the data requirements of the Lindane Registration Standard.

10. Materials and Methods:

- a. Test Animals: 6-month-old bobwhite quail (Colinus virginianus) from Oak Ridge Game Farm, Gravette, Arkansas.
- b. Dosage: There were five treatment groups: 46.4, 68.1, 100, 147, and 215 mg/kg and a vehicle (corn oil) control group. The doses were administered by gavage.
- c. Study Design: Groups of 10 birds, 5 males and 5 females were housed in steel pens measuring 24" x 21" x 15". Mean relative humidity was 67%, and mean minimum and mean maximum temperatures were 66 °F and 69 °F, respectively. After dosing, there was a 21-day observation period during which the birds were fed standard feed.
- d. Statistic: The LC₅₀ value and 95% C.I. were calculated by the method of Litchfield and Wilcoxon.

11. Report Results:

| Dose mg/kg | Number Dead | | Percent Dead |
|------------|-------------|--------|--------------|
| | Male | Female | |
| Control | 0/5 | 0/5 | 0 |
| 46.4 | 0/5 | 0/5 | 0 |
| 68.1 | 0/5 | 1/5 | 10 |
| 100 | 2/5 | 3/5 | 50 |
| 147 | 4/5 | 3/5 | 70 |
| 215 | 5/5 | 4/5 | 90 |

LD₅₀ and 95% C.I. = 122 (90-160) mg/kg.

All the deaths, but one, occurred within the first 4 days. The remaining death occurred on day 6. Postmortem examinations revealed findings in 20 to 22 dead birds. These findings included hemorrhages of crops and intestines, discoloration of pectoral muscles, and flaccid musculature.

There was a statistically significant decrease in body weight in the groups dosed with 100 and 147 mg/kg on days 4 and 7 and in the group dosed with 215 mg/kg on day 7 only, as compared to the control group.

Food consumption was severely depressed in the first 3 days in all of the test groups as compared to the control group. Food consumption remained low in the 215 mg/kg dosage group throughout day 14.

12. Author's Conclusion/QA Measures

The 21-day LD₅₀ of technical lindane, 99.5% ai, was 122 (90-160) mg/kg of body weight.

QA Statement: "The records will be audited by the Quality Assurance Unit to assure compliance with Good Laboratory Practice regulations and adherence to the protocol and to BLAL Standard Operating Procedures. The final report will be audited by the Quality Assurance Unit prior to submission to the sponsor to assure that the final report accurately describes the conduct and findings of the study."

13. Reviewer's Discussion:

- a. Test Procedures: The study protocol is sound as it follows the protocol recommended by EPA's Pesticide Guidelines of 1982.
- b. Statistics: The LD₅₀ value was calculated by EEB's Toxanal program to be 122 (99.5-152.5) mg/kg by the probit method. The reported LD₅₀ value is acceptable.
- c. Discussion/Results: The results indicate that with an LD₅₀ value of 122 (90-160) mg/kg, technical lindane, 99.5% ai, is moderately toxic to birds on an acute basis.
- d. Adequacy of Study:
 1. Classification: Core.
 2. Rationale: The study is scientifically sound and meets EPA Guidelines requirements for an avian acute oral study.

STAVOLA LINDANE TECHNICAL BOBWHITE QUAIL 11-24-86

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CONC.      NUMBER      NUMBER      PERCENT      BINOMIAL
          EXPOSED      DEAD        DEAD        PROB.(PERCENT)
215       10             9           90          1.074219
147       10             7           70          17.1875
100       10             3           30          17.1875
68.1     10             1           10          1.074219
46.4     10             0           0           9.765625E-02

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THE BINOMIAL TEST SHOWS THAT 68.1 AND 215 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 121.2436

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

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SPAN      G      LC50      95 PERCENT CONFIDENCE LIMITS
4         .167754  121.1227  98.39602  161.076

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RESULTS CALCULATED USING THE PROBIT METHOD

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ITERATIONS  G      H      GOODNESS OF FIT PROBABILITY
3          .2130882  1      .9738241

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SLOPE = 5.548459
95 PERCENT CONFIDENCE LIMITS = 2.987209 AND 8.10971

LC50 = 121.9096
95 PERCENT CONFIDENCE LIMITS = 99.49298 AND 152.5456

LC10 = 71.96903
95 PERCENT CONFIDENCE LIMITS = 44.14035 AND 90.07581
