

# Toxicity of dimethoate to honeybees (*Apis mellifera*) reared in vitro

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## Modes of exposure of larvae

Solutions of dimethoate in water at 5 concentrations added to the larval food

Grafting L1 at D1

Diet	Volume	Day	Diet	Volume
A	20 µl	1	A	20 µl
B	20 µl	3	B	20 µl
C	30 µl	4	C	30 µl
C	40 µl	5	C	40 µl
C	50 µl	6	C	50 µl

**Chronic**

ONE TREATMENT / DAY  
FOR 5 DAYS

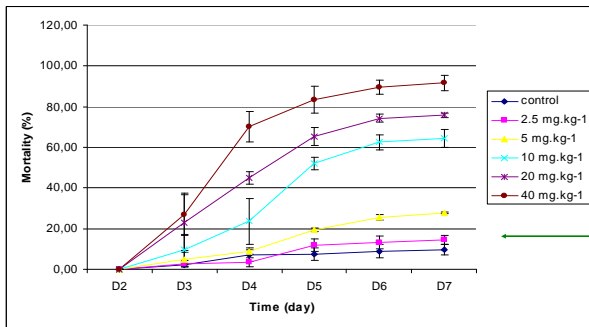
1 control  
5 treatments ( range: 2.5 to 40 mg. kg<sup>-1</sup>diet )

**Acute**

TREATMENT AT D4

1 control  
5 treatments ( range: 0.8 to 12.8 µg. larva<sup>-1</sup> )

### Effect on larval mortality over D2 - D7



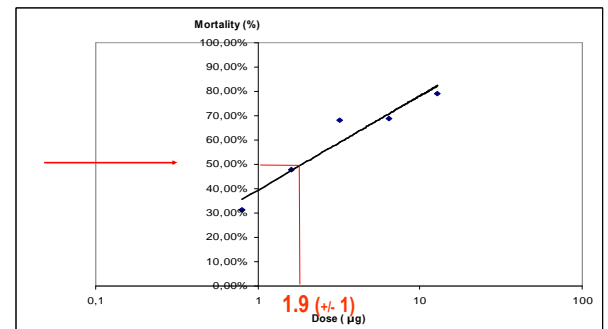
LD 50 48 H  
1.9 µg. larva<sup>-1</sup>

NOEC  
2.5 mg.kg<sup>-1</sup>diet

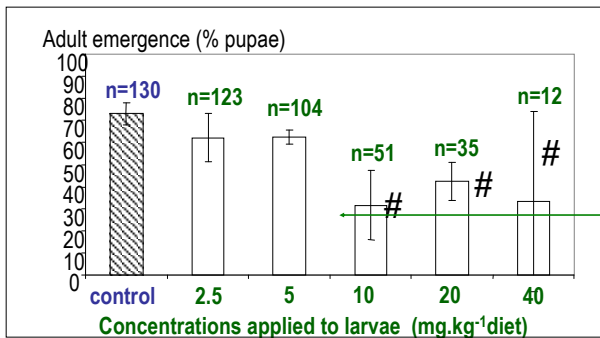
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Emergence of adults

### Effect on larval mortality



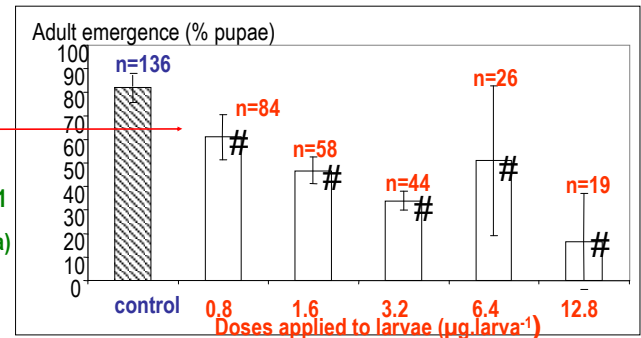
### Delayed effect on adult emergence



LOEL  
0.8 µg.larva<sup>-1</sup>

NOEC 5 mg.kg<sup>-1</sup>  
( = 0.8 µg ingested / larva )

### Delayed effect on adult emergence



Emergence rates compared to control by Chi-Square test ( df = 1 ) (# p<0.05). Errors bars = standard deviations (3 replicates). n = number of pupae

- Larval exposure resulted in delayed effects on adult emergence
- Dose effect relation within the experimental range was evidenced
- Dimethoate suggested as toxic reference
- NOEC suggested as toxicity parameter in the brood risk assessment scheme