Two methods for testing the effects of insecticides on hypopharyngeal glands of honeybees

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Hypopharyngeal gland (HPG) are the mains organs responsible for the royal jelly secretion.

Located in the head of honey bee, the size of HPG is aged and food proteins dependent and correlated to the amount of secretion.

Their development may be also affected by substances known for their insecticide effects

We used two methods to assess the effects of dimethoate on the HPG development

Incubator 34 °C, 50 % RH
30 Newly emerged honey bees per plastic box
10 days chronic exposure to 4 sublethal doses of dimethoate diluted in syrup
1 control
4 treatments (dose range : 53 to 424 ng / ml) Mortality less than 10 % at day 10

syrup +dimethoate
water
pollen

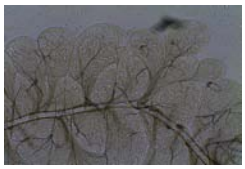
Changed every 2 days

TWO METHODS

MICROSCOPICAL

Dissection of GHP

Measure of acini diameter



control — Dimethoate (212 ng/ml)

BIOCHEMICAL

Bee Head + phosphate buffer

+

Grinding 30 s

Centrifugation 5 min

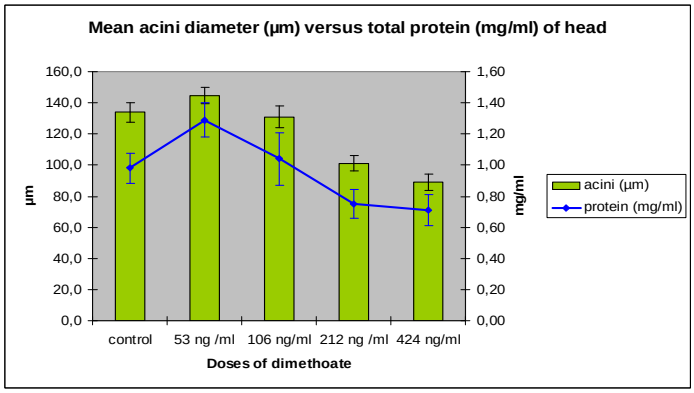
Supernatant + dye reagent (Quick start Bradford,Biorad)

Measure of the absorbance at 595 nm

Standard : Bovine Serum Albumine (BSA)

Results:

- **Dimethoate effects on GHP at 212 ng/ml**
- **Correlation between mean acini diameter and concentration of total protein**
- **Biochemical method is quicker and could be used as a routine test with any other substance**



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APIMONDIA Montpellier, 15-19 sept 2009

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