First results of a method proposal for a solitary bee (*Osmia* spp.) first tier acute contact laboratory test

Ivo Roessink[1], Nicole Hanewald[2], Christof Schneider[2], Piotr Medrzycki[3], Jordi Bosch[4], Silvia Hinarejos[5], David Gladbach[6], Ljubiša Stanisavljević[7], Slobodan Krnjajić[7], Alexander Schnurr[8], Hannah Schmitt[9], Lukas Jeker[10], Emmanuelle Noel[11], Carsten Brühl[12], Fabio Sgolastra[13], Jozef van der Steen[14]

Introduction

The recently updated EFSA draft honeybee guidance document also specifies other hymenopteran pollinators, like solitary bees and bumblebees, as groups to take into consideration when assessing the risk of plant protection products to pollinators. However no validated test protocol and consequently no extensive data set is available to compare sensitivities of other relevant pollinators to those of honeybees. Within the current project of the ICPPR Non-Apis working group a start was made to develop a first-tier acute contact test for *Osmia* spp. bees. Based on the honeybee OECD213 and Ladurner et al. (2005) a test was designed using dimethoate as test substance, *Osmia bicornis* or *Osmia cornuta* as test organisms, housed in groups or individually.

Example of group and individual housing

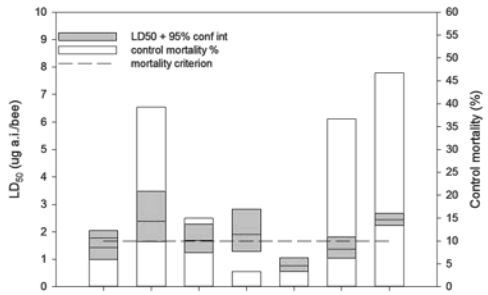
Materials & Methods

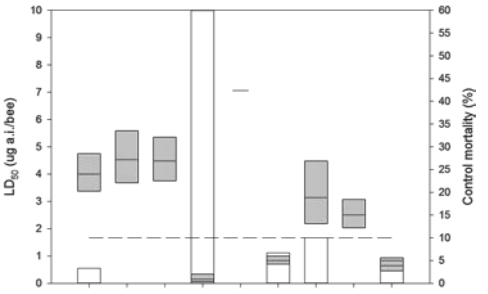
Nine labs participated in the ring test. Bees were acquired by the labs from local breeders. Immediately after hatching, bees were collected and meconium-free non-mated females were used for testing. Bees were tested either in groups, housing 10 individuals, or individually. Dimethoate was applied at dosages of: 0 – 0.625 – 1.25 – 2.5 – 5 – 10 µg a.i./bee using TWEEN80 as a wetting agent. Per treatment level 30 bees were used. At the end of the test control mortality should not exceed 10 per cent. The test followed OECD 214 were possible.

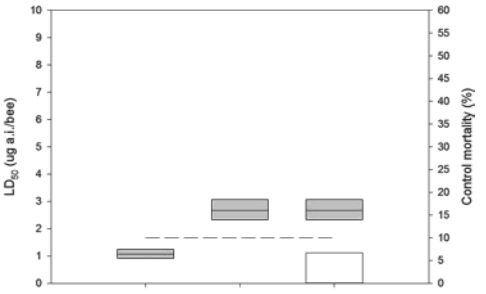
Results

Osmia bicornis - individual | *Osmia bicornis* - group | *Osmia cornuta* - group

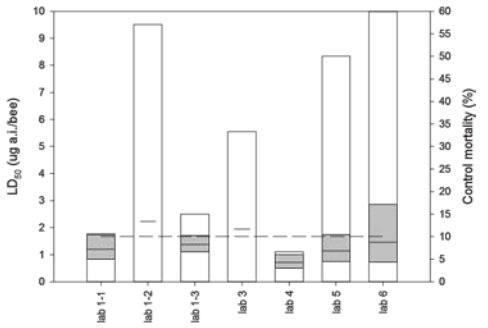
48h

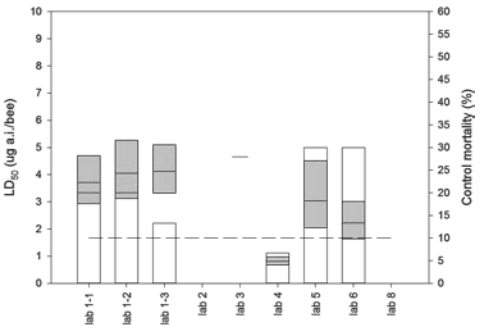


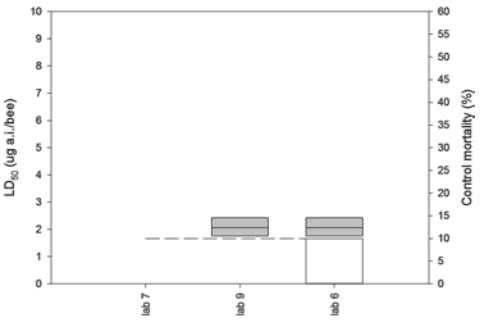




96h







Conclusions

- Control mortality individual housing >> group housing → group housing preferred
- Control mortality in several tests > 10 per cent → likely suboptimal feeding
- Difference between labs due to differences in handling cocoons and anaesthetics
- LD_{50} *O. bicornis* ≈ *O. cornuta*; no difference in sensitivity between species
- TWEEN80 does perform poor as wetting agent

Outlook

Ring test in 2015:

- group housing,
- identical handling of cocoons and method of anaesthetics across labs;
- draft test protocol for acute contact testing of *Osmia* spp. bees;
- proceed with acute oral test trials (adjust feeding method)

[1] Alterra Wageningen UR, [2] BASF SE, [3] CRA-API, [4] CREAF, Autonomous University of Barcelona, [5] Sumitomo, [6] Bayer CropScience, [7] University of Belgrade - Faculty of Biology, [8] BioChemAgar, [9] Eurofins Agroscience Services, [10] Dr. Knoell Consult, [11] SynTech Research, [12] University of Landau, [13] University of Bologna, [14] Plant Research International Wageningen UR