Section 4 – Non-Apis bees

4.1.P Interactive effects of the neonicotinoid Thiacloprid and two common fungicides on foraging performance and reproductive success of the solitary bee *Osmia bicornis* under field conditions

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Abstract

Bee pollinators are often exposed to pesticide mixtures in intensively managed agricultural landscapes. There is increasing evidence for synergistic sub-lethal effects of different agrochemicals on bees, such as insecticides and fungicides, potentially negatively affecting their orientation, foraging performance or reproduction. However, most of this evidence is based on laboratory studies, while much less is known about potential insecticide-fungicide interactive effects under field conditions, and particularly few is known about how they may impact forging performance and reproductive of solitary bees. We used a combined laboratory-field approach treating the solitary bee species *Osmia bicornis* with field-realistic doses of the neonicotinoid insecticide thiacloprid (oral feeding), as well as the two fungicides captan and tebuconazole (contact treatment), individually and in combinations, and assessed impacts on foraging performance, orientation and reproductive success of nesting, *Osmia* under field conditions. We will present the study design and first results.

4.2.P The use of toxic reference chemicals in solitary bee larval bioassays

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Abstract

In Europe, North America and Asia, several species of the genus *Osmia* are successfully reared and managed as pollinators for different crops. Many of these species are active in spring and recognized as important pollinators in orchards. Therefore, it is important to evaluate the exposure and potential risk of plant protection products not only to honey bees but also to other managed bees. New methodologies are under development to assess acute contact and oral toxicity of plant protection products to adult solitary bees (ICPPR non-*Apis* working group). One of the remaining challenges is to set-up a standardized study design to assess solitary bee larval development under laboratory conditions to contribute valuable information for a risk assessment. Such a laboratory test method should allow for a conservative, highly controlled, and standardized evaluation of the relationship between a test item dose and the organism response.

Based on the first results of a previous experiment, assessing the larval development of *Osmia cornuta* feeding on different larval diets, we designed an experiment to test the potential effects of different toxic reference chemicals, used in honey bee and bumble bee laboratory bioassays (*i.e.*, dimethoate, fenoxycarb, diflubenzuron), on the development of solitary bee larvae. Toxic reference items are used to demonstrate that the test system and conditions are responsive and reliable. We compared the larval development and mortality of different treatment groups to untreated control groups and give first recommendations for this test design. Future work should address the robustness of endpoints and acceptable validity criteria.