

Comparative studies regarding the sensitivity of the honey bee and wild bee species to plant protection products – residue analysis

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From the registration processes of plant protection products (PPPs) and the associated risk assessment for bees arises an increasing need for experimental data on non-*Apis* pollinators, in order to assess potential side effects of PPPs on this largely understudied set of test organisms. At present, the extent of differences in the reaction of honey bees and wild bee species, especially to PPPs and other factors in our agricultural landscape, remains unclear.

So far, toxicity has only been examined for a few species, mainly the red mason bee *Osmia rufa/bicornis* and the bumble bee *Bombus terrestris*. Data on toxicity of active substances to other bee species are limited.

Therefore, we investigated in a series of studies under controlled laboratory conditions the effects on the honey bee (*Apis mellifera* L.) and different wild bee species with various life history characteristics of a pyrethroid insecticide containing lambda-cyhalothrin, classified as harmless to bees, but known for transient effects. To investigate the natural detoxification process of active substances a spray chamber was used to generate a

contact exposure by typical field application rates with standard nozzles types used by farmers. After the application living honey bees and individuals of three different wild bee species (bumble bee *Bombus terrestris*, mason bees *Osmia bicornis* and *Osmia cornuta*) were frozen at -20°C half an hour, three days and ten days after exposition, respectively. Residues were analysed using a multi-residue method. The residue level of lambda-cyhalothrin being quantified by use of gas chromatography/mass spectrometry (GC-MS).

This comparative analysis of the residues of active substances in the honey bee and wild bee species investigates to what extent there are differences regarding effects and the metabolism between the honey bee, as representative organism, and other wild bees and which consequences these have for the risk assessment.

While the analysis has not been finalised yet, preliminary results indicate different reactions of the tested bee species. The final results will be presented during the poster presentation.