P2.5 Manual application of insecticidal dust in semi-field trials – effects on honeybees (*Apis mellifera* L.)

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In order to assess the risk of insecticidal dusts for honeybees, next to several field trials with sowing of maize and winter oilseed rape and drift of dusts on neighbouring flowering crops, semi-field trials with manual application of fractionated maize dust on flowering *Phacelia* and winter oilseed rape were conducted in order to assess the effects on bees after manual application of different rates of active substance (0.1, 0.25, 0.5, 1.0 and 2.0g a.i. / ha Clothianidin) or different particle sizes of dust ($x \leq 160\mu m$, $250 < x > 450\mu m$, $x > 500\mu m$; application rate: 2.0g a.i. / ha).
In the experiments, twelve gauze-covered tents (10x4 m) with bee colonies were set up on the flowering crop. During full bee flight activity a mixture of dusts and soil (seed treatment dusts and standard soil LUFA 2.2) was manually applied on the flowering crop inside the tents. Foraging intensity and mortality of the colonies were assessed for at least 7 days after application and samples of dead bees taken for residue analysis. In contrast to other dust fractions applied at the same rate of a.i. per ha significantly increased mortality was detected for fine dust particles "$x \leq 160\mu m$", which is the particle size range of pollen (2 – 250µm). The comparison of application rates showed that the "no observed effect rate" application is below 1.0g a.i. / ha. Further trials in 2012 are expected to allow a further specification of the NOER.

P2.6 Propolis chemistry and resin provisioning in Australian stingless bees (*Tetragonula carbonaria*).

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Propolis is a mixture of beewax, salivary secretions and plant resins. Bees use propolis to build their nests, for chemical defence and social immunity. The chemical variability of propolis depends on the botanical resins foraged by bees. Differently than honeybees, stingless bees store deposits of plant resins inside their nests, likely for incorporation into propolis (bee cerumen). This study investigated the chemistries of propolis and hive-resins in Australian stingless bees (*Tetragonula carbonaria*). Beehives were located in surveyed botanical sites in 2011. Four different resin deposits were observed, and labelled as ‚creamy', ‚white', ‚orange' and ‚red' hive-resins. Ethanolic extracts of propolis and hive-resins were subjected to gas and liquid chromatography mass spectrometry (GC-MS, LC-UV-MS) for the identification of individual Natural Products. Methylated flavonoids, isoprenoids and polar unknowns were found across samples. Comparative profiling of hive-resins indicated a diversity of chemical composition with some compounds found in common across deposits. Chemotaxonomy of the 'creamy' hive-resin confirmed that *Corymbia torelliana* was the botanical source for fruit resins. Molecular fingerprinting of the hive-resins indicated characteristic compounds as the chemical markers of the different propolis types. As propolis is valuable for medicinal preparations, these findings will enable next dereplication work on these chemotypes of Australian stingless bee propolis.

[2] Chem Ecol POSTER

P2.7 Cuticular profiles of the robber stingless bee *Lestrimelitta* and its potential hosts (Hymenoptera: Meliponini).

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The Neotropical stingless bee *Lestrimelitta* is an obligate cleptobiont that obtains food and nest resources by raiding other stingless bee colonies. Cleptobionts may enter a target host colony by deception, force or possibly a combination of both. In various taxa of social insects, the blend of surface cuticular compounds is responsible for nest mate recognition. We compared the cuticular profiles of *L. niitkib* from the Yucatan Peninsula in Mexico and its potential hosts to determine if chemical mimicry may be used by this cleptobiont. The results showed that adult *L. niitkib* had few compounds (n=6) that represented more than 1% of the total peak area of analyses, and that it shared four out of those six with worker foragers of its preferred hosts *Nannotrigona perilampoides* and three out of six with *Plebeia* sp.. However, *L. niitkib* shared only two and three compounds of the 14 and 15 most abundant in the seldom raided species *M. beecheii* and *S. pectoralis*, respectively. Our results suggest that chemical deception may be a first step to enter some host species, leading to eventual mass raids by *L. niitkib.*

P2.8 The fate of *Bombus cullumanus*: regression and species status.

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B. cullumanus is known as a strongly regressing species in West-Europe. While the species once had a large distribution from S-Sweden to N-Spain, it now seems to be extinct. The last specimen was collected in 2004 in the Massif Central (France). There are two other taxa from disjunct areas that are very close relatives: *B. serrisquama*, from Spanish, Central- and East-European steppes, and *B. apollineus*, from the Caucasian mountain steppes. Despite their conspicuously different colour patterns and differences in ecology, these three taxa share a very similar morphology. Based on a study of CO1 barcodes, Williams et al. (in press) showed that these taxa appear conspecific. Most bumblebee species can also be accurately identified from the secretions of the male labial glands, which they use as species-specific recognition cues. We sampled and analysed these secretions. For *B. cullumanus*, *B. apollineus*, and *B. serris quama*, we found that the male cephalic labial secretion are almost identical, sharing all of their components with similar relative abundances. As they do not show any difference in their species-specific recognition blend, we confirm that *B. cullumanus*, *B. apollineus* and *B. serrisquama* are best seen as conspecific. While the ssp. *cullumanus* is extinct, the sspp. *apollineus* and *serrisquama* remain more or less abundant in some parts of the original distribution area. However, the general regression of the whole species is so drastic that its long-term survival could be questioned.