

OR038*Abnormal behavior of honeybee workers due to contamination of Imidacloprid***En-Cheng Yang**, Hui-Chun Chang, Yu-Cheng Chuang

The threat of insecticide is always the major concern to the decline of honeybee population. Mortality rate is normally calculated as the evaluation of harmfulness and lethal dose was used as the indicator of toxicity. However even a small amount of insecticide will affect the behavior of honeybees, and the chronic effects to honeybee colony may be caused by continuous poisoning with tiny dose of insecticide brought from environmental residues by forager's daily activity. In the past decade, an increasing number of studies imply that imidacloprid, a systematic neonicotinoid neurotoxic insecticide, could be associated with colony disorder. Our study shows that the honeybee workers delayed their return visit when they were treated orally with sugar water containing imidacloprid. This time delay in their return visit is concentration-dependent. When treated with higher concentrations, they showed abnormalities in revisiting the feeding site and some of them went missing. Besides, the capped-brood, pupation and eclosion rates of the honeybee larvae were recorded after treating them directly in the hive with different dosages of imidacloprid. The brood-capped rates of the larvae decreased significantly when the dosages increased from 24 to 8000 ng/larva. However, there were no significant effects of DMSO or 0.4 ng of imidacloprid per larva on the brood-capped, pupation and eclosion rates. Although the sublethal dosage of imidacloprid had no effect on the eclosion rate, we found that the olfactory associative behavior of the adult bees was impaired if they had been treated with 0.04 ng/larva imidacloprid in the larval stage. These results demonstrate that a sublethal dosage of imidacloprid given to the larvae affects the subsequent associative ability of the adult honeybee workers. Thus, a low dose of imidacloprid may affect the survival condition of the entire colony, even though the larvae survive to adulthood.