

MEDICAL AND VETERINARY ENTOMOLOGY

Sublethal Effects of Neurotoxic Insecticides on Insect Behavior



DESCRIPTION

As insecticide resistance and the dwindling availability of insecticides continue to be a major concern in pest management, uncovering sublethal effects of insecticides could allow for new directions of insecticide discovery. The aim of this project is to determine the impact of sublethal exposure to insecticides within four commonly used classes of insecticides on bed bug behavior. Bed bugs from three lab colonies with differing levels of insecticide resistance were exposed to insecticides for a time that resulted in only 10% mortality. Bugs were given 24 hours to recover from this exposure and then the healthy bugs were tested for their ability to locate an artificial host and successfully take a blood meal, respond to aggregation pheromone, successfully mate, oviposit and maintain proper circadian rhythm. Overall, bugs that had been exposed to insecticides were less likely to feed. So far we have shown no effect of insecticide exposure on aggregation, locomotion or oviposition. There was some effect of insecticide exposure on mating success.

HOW THIS IS DIFFERENT THAN RELATED RESEARCH

Studies of sublethal effects of insecticides on behavior have focused on a single insecticide, a single strain of an insect species, and a single behavior. Here we expand on this more traditional approach in each of these dimensions (insecticides, strains, and behaviors). This project will determine behavioral syndromes associated with classes of insecticides, and the relationship between insecticides resistance and behavioral responses .

MEMBER BENEFITS

- Behavioral protocols developed for bed bugs will serve as models for other species.
- Improved understanding of sublethal effects will help fill the gap between laboratory results and field efficacy.
- The definition of behavioral syndromes should help guide future insecticide discovery and development.