Testing a Novel Probiotic Formulation for Honey Bees

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PROJECT SUMMARY

Objectives:

- Determine the effects of antibiotics on the newly discovered lactic acid bacteria (LAB) in honey bees.
- Determine whether feeding LAB to honey bees as a probiotic can increase or restore their levels of LAB, given LAB's potential value for improving bee nutrition and health.
- Determine the effects of both antibiotic treatments and probiotic LAB supplements on honey bee nutrition and health.

Background:

The traditional and essential role of honey bees in commercial pollination and honey production is being threatened by various health-related stresses that can result in disease and colony losses. One source of such stress may be the antibiotic treatments commonly used in bee management (e.g., tylosin, fumigillin) and crop protection (streptomyecin).

This new project aims to investigate both the effects of antibiotics on bee nutrition and health, and the use of a novel method of treating any negative effects.

This method derives from recent research studies that have revealed the beneficial presence of lactic acid bacteria (LAB) in the honey stomachs of honey bees.

These naturally occurring gut flora have been found to help protect the bees from *Paenibacillus larvae*, the causative agent of American foulbrood, and possibly from other pathogens as well. They are a key factor in the production of bee bread which nourishes the developing brood and they also appear to protect nectar from spoilage until it becomes honey.

One key issue to be explored by the project researchers is whether LAB has value as a basis for developing probiotic supplements to counter any adverse effects of antibiotics. Consequently, in collaboration with other researchers, they will assess the efficacy of a prototype Probiotic formulation based on a specific LAB patented by the project cooperators.

Having already been tested at the laboratory level, this formulation is to be further tested at the colony level in caged-bee studies and controlled-feeding studies in nucleus colonies.

Also under study is LAB's potential to defend against a range of pathogens and to be a source of key nutrients essential to honey bee health and brood feeding.

The project's findings could lead to changes in both the bee-related use of antibiotics and the use of LAB-based probiotics as a feeding supplement for bees.

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Project Cooperators: Tobias Oloffson and Alejandra Vásquez, Lund University, Sweden

For More Details, Visit

- Poster location 46, Pollination Pavilion, Session 3; or on the web (after January 2011) at AlmondBoard.com/AICposters
- 2009-10 Annual Report CD (09-POLL3-Sammataro); or on the web (after January 2011) at AlmondBoard.com/ResearchReports