



**2000 Student Scholarship and Student Paper Award Winner:
Miguel Arachevaleta-Velasco**

This year both the Student Scholarship and the Student Paper Award were awarded to Miguel Arachevaleta-Velasco of Purdue University. Miguel is currently a PhD student under the guidance of Dr. Greg Hunt.

Miguel was born in Mexico City, Mexico. After graduating from the Autonomous Metropolitan University in Agronomy he operated his own business for queen breeding and honey production. Subsequently he taught apiculture and genetics then achieved his MS degree, guided by Dr. Ernesto Guzman-Novoa. Miguel moved to the U.S. in 1998. He is currently working with honey bee molecular genetics, mapping quantitative trait loci that influence the expression of guarding and hygienic behaviors. His wife, Carmen, is also a graduate student at Purdue. Miguel enjoys amateur radio, fishing and mountain climbing.

The AAPA Scholarship Award was based on his work on honey bee genetics. Miguel continues to be investigating the genetic makeup of bees who exhibit hygienic behavior by uncapping and removing dead pupae from the hive. Since hygienic behavior in honey bees could diminish the amount of chemical products used in hives, the genetics of this behavior need to be studied. One approach is to map the Quantitative Trait Loci (QTLs) in the genome that influence the expression of hygienic behavior. The objective of the study is to detect and locate QTLs that influence uncapping and removal of infected brood.

Two lines of honey bees will be used for the study, one hygienic and one non-hygienic. Twenty-four backcross colonies will be developed using single drone artificial inseminations. One colony from each backcross will be selected based on hygienic performance. Those workers will be emerged in an incubator and marked. Then the hygienic behavior will be tested using the brood freeze-kill method in observation hives. Records of uncapping and removing behavior will be taken. At the end of the assay the bees will be sacrificed and the DNA of each bee will be extracted. The genome will be screened using AFLPs markers. From this a genetic map can be constructed. A binary quantitative trait analysis will be performed to detect and locate possible QTLs that influenced hygienic behavior and to identify possible genetic markers.

Information gained from this work has future application in breeding programs. Hygienic behavior is a highly desirable economic trait that could contribute to reduce the negative effects of diseases and parasites and could diminish the amount of chemical products that are used for their control.