Genetic Stock Identification Of Production Colonies Of Russian Honey Bees

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In 2008, the USDA-ARS Honey Bee Breeding, Genetics, and Physiology Laboratory (USDA-ARS HBB Lab) fully released the Russian honey bee stock to the Russian Honey Bee Breeders Association (RBBA). Each year, members of the RBBA are required to have their breeding stock genetically certified, to conduct tests of honey production, and assess pest and pathogen (Varroa mites, tracheal mites and *Nosema ceranae*) status.

When the stock was released the stock diversity was characterized and a suite of genetic markers was identified that would be used for later stock certification (Bourgeois and Rinderer 2009, Bourgeois *et al.* 2010). A summary of the procedures used to certify breeding stock is given below. The members of the RBBA often use different times and mating apiaries to produce the production queens that they use in honey production apiaries and market to other beekeepers. We were curious about the genetic nature of their production queens. Hence, in Autumn 2009 and Spring 2010, we asked beekeepers of the RBBA to submit samples of worker bees from their production queens to determine the level of Russian alleles in the production colonies.

A total of 5 of the 8 certified members of the RBBA submitted samples for this study. All bees were submitted as live bees and were frozen upon receipt. DNA was then extracted according to published protocols (Bourgeois *et al.* 2010). Russian and non-Russian alleles were identified as previously described in Bourgeois *et al.* (2010). Briefly, 8 individual bees per colony were genotyped with 12 microsatellite and 5 single nucleotide polymorphism (SNP) markers. These markers created a genetic fingerprint of each bee. After genotyping was completed, the data were visually inspected to identify bees that had "drifted" into the colony. This was done