



Ethnobotanical Leaflets



Bees, Herbs and Biological Controls for Varroa Mites

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Bees have been important to man for thousands of years. They provide honey and pollen used for food, cosmetics and healing. But most important is their role as pollinators. Many of today's crop plants will not produce fruit unless they are visited by European honey bees (*Apis mellifera*). The cost of finding and using alternative pollinators for crops would be staggering and would affect the cost and availability of food not only in the United States but the ability of American farmers to continue to provide enough surplus to share with the rest of the world. Varroa mites (*Varroa jacobsoni*), tiny arachnoids which look somewhat like ticks or lice, are infesting and killing bee populations around the world at a fierce rate. The threat of food shortages due to a lack of bees is compounded by the international nature of the varroa epidemic.

Bees depend on their relationship with wild plants to tide them over when crop plants are not in flower, and as relief from sprayed crops. Some believe that the health of bees is also dependent on phytochemicals found in these wild plants. Julia Morton (1964) pioneered the use of these arguments to justify preservation of wild areas in Florida agricultural districts.

One thing is sure. Bee keepers around the world are losing their bees to varroa mites. These insects are becoming resistant to nearly all approved pesticides which have been used to treat them in the past. As a result, several researchers are experimenting with alternatives to insecticides. The world wide web has a number of pages on research and development of these alternatives which may be of interest to EBL readers.

Treat bees with herbs. Sounds good, but how? Researchers including James W. Amrine, Jr. at West Virginia University have been working out treatments using essential oils. Detailed instructions on their methods are available at <http://www.wvu.edu/~agexten/varroa/varroa2.htm>.

Two organic acids, formic acid found in ants and oxalic acid found in a number of plants are also being

used to treat varroa mites. For more information on these efforts, check out <http://www.internode.net/honeybee/Formic/Default.htm>. This site also includes a link to a vendor of pheromones for control of the mites, but no independent research information on varroa pheromones.

Fungi are being studied as biological controls for varroa mites. The British and their European collaborators are particularly active in this area. Selection and trials for specific fungi to feed on the mites looks promising. For a brief overview see: <http://www.iacr.bbsrc.ac.uk/res/depts/entnem/research/briangrp/kshaw/tkshaw.html>.

Bee breeders are also tackling the varroa mite problem. All bees have the ability to clean their hives. Some bees, called hygienic bees, have been shown to have genes which help them sense the presence of diseased brood bees and remove them from the nest before a specific bacteria or fungus has a chance to infest the entire hive. The Asian honey bee, *A. cerana*, thought to be the original host of varroa mites, has evolved the ability to both groom these mites off of adult bees and to remove infested pupae, maintaining both mite and bee populations in a natural balance. Marla Spivak, an entomologist in the College of Agriculture, Food and Environmental Sciences at the University of Minnesota (UM), is working on selection for hygienic bees among *A. mellifera*, which can sense and remove pupae infected with *V. jacobsoni*.

A brief overview on Dr. Spivak's work is available at: <http://www.extension.umn.edu/extensionnews/1998/JO1191.html>. More detailed information is available from Dr. Spivak at <http://www.msstate.edu/Entomology/v8n1/art15.html>. For more information on bee varieties, beekeeping and other information go to the University of Florida's newsletter, Apis: <http://www.ifas.ufl.edu/~mts/apishtm/apis.htm>.

Literature Cited:

Morton, J. F. 1964. Honeybee plants of south Florida. Proceedings of the 77th Annual Meeting of the Florida State Horticultural Society 77: 415-436, Miami Beach.

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