Propolis, Propolis Everywhere

Tony Jadczak, former State Apiarist October 14, 2010

The 2010 honey harvest is complete and many beekeepers report a good summer crop and a disappointing fall harvest. In many areas of the state the honey flow shut off like a spigot during the early part of August due to the drought conditions during the summer. Plants resumed nectar production after some late summer rain, but it was too little, too late. In general the goldenrod honey flow didn't materialize like it did in 2009, but the bees worked clover well into September and foraged on Japanese knotweed and aster when weather permitted.

One of the most notable honeybee behaviors observed this year concerned the excessive amount of propolis gathered during the summer honey flow and during the months of August and September. The summer propolis was quite sticky and of a light gray putty color while the fall propolis was tacky, more brittle and reddish-brown in color. Both types gummed supers, frames, hands, bee suits and jeans. Rubbing alcohol and the oils from Lays Potato Chips worked best at removal from clothing and hands respectively. When asked by beekeepers about the significance of the excessive propolis, I suggested that we start a rumor that the bees are predicting a cold winter, substantiated by the fact that the bald-faced hornets were building their nests higher in tress than last year. It should be noted that this prediction (rumor) was made prior to the release of this year's Farmer's Almanac!

Propolis is a resinous plant-derived substance gathered from the leaves, bark and buds of certain trees and plants such as poplar, aspen and pine. Bees also gather it from the sap associated with plant wounds and will dance in order to recruit additional propolis foragers. The word propolis comes from the Greek language, combining pro (before) and polis (city) due to the deposition of the substance at the hive entrances and its use to fortify the walls and cracks of hives. All cells are varnished with propolis before the queen lays her eggs into them and it is also deposited on all of the interior parts of hives as a thin varnish. Sometimes propolis is a major component in the wax cappings of honey at the periphery of the hive. Propolis is considered to be a contaminant in beeswax and is one of the major components of slum gum (a by-product of rendered wax). Years ago, famous violin makers in Italy such as Stradivarius used propolis from rendered wax as a component in violin varnish.

Propolis is a highly complex mixture of waxes, resins, balsams, oils and a small amount of pollen, and its chemical composition varies depending upon the plants from which it is gathered. One of the most significant traits of propolis concerns its biological and pharmacological properties. Propolis has bactericidal, bacteriostatic and antibiotic properties that have been known since the time of Aristotle and Pliny. These medicinal properties have been documented over the centuries and until recently the Europeans have taken the lead in the therapeutic use of propolis. Common ailments treated with propolis include cold sores, sore throats, gum disease and stomach ulcers. More recently, the chemical components within propolis have also been investigated for anti-viral and cancer-inhibition properties. Pharmacological aspects include topical anesthesia effects and spasmodic activity (inhibition of smooth muscle contraction in the digestive system).

The active components of propolis are flavonoid and phenolic compounds. Over 30 chemicals have been identified within propolis and nearly half have demonstrated bio-activity. Actions include anti-bacterial, anti-fungal, anti-viral, tumor inhibition, local anesthetic, spasmolytic, strengthening capillaries and healing gastric ulcers. A major challenge regarding treatment of various ailments with propolis is the inability to control what plants and substances bees are foraging upon. Propolis types differ in apiaries only one mile apart and bees often contaminate propolis with man-made materials of similar consistency such as road tar, caulking compounds, drying paint and adhesives. Perhaps the active compounds within propolis can be synthesized in laboratories, or bees can be confined to enclosed foraging areas or placed in monocultures of plants known to produce specific flavonoid or phenolic chemistries.

During the 1980s and 1990s, the national beekeeping journals featured a series of articles on propolis that included its medicinal value, collection and tincture preparation methods. A few articles were also published that questioned the medicinal value of propolis and whether it was the latest snake oil cure for human maladies. This September's American Bee Journal has an article concerning Dr. Marla Spivak that mentions the possible role of propolis in combating honey bee ailments and whether sick bees collect propolis in order to "self-medicate."

So the next time you are wrestling with frames cemented to hive bodies and you stain your new jeans and gum-up your manicure, remember that the bees may be self-medicating and one day a cure for a major bee or human disease may be found within propolis.