

# APIS



## Apicultural Information and Issues

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## Megameeting in Colorado Springs

WHAT IS BECOMING something of a tradition continues in January next year. The American Beekeeping Federation (ABF) and American Bee Research Conference (ABRC) will come together in a megameeting in Colorado Springs. The ABF meeting begins January 14 and continues through the 18th. The ABRC will be Friday and Saturday, January 16 and 17, sponsored by the American Association of Professional Apiculturists (AAPA). This provides opportunity for scientists to present their current work; the resulting abstracts are published in *American Bee Journal*. One session will be included as part of the ABF's general meeting.

Also on the schedule will be a reactivated American Farm Bureau Federation Honey Bee Committee and the National Honey Packers and Dealers Association (NHPDA). All meetings are at the Doubletree Hotel/World Arena, 1775 E. Cheyenne Mountain Blvd., Colorado Springs. The discount rate for the convention is \$75 and there is a free shuttle from the airport. To reserve, call 800/733-5466 and be sure to indicate you are with the Federation. For more information, contact the ABF, P.O. Box 1038, Jesup, GA 31598, ph 912/427-4233, fax 912/427-8447, e-mail: [convention@abfnet.org](mailto:convention@abfnet.org) and/or see <http://www.abfnet.org>. ■

### Ridge Honey Bee Seminar

The Florida Ridge Beekeepers Association will host a Honey Bee Seminar on January 24, 1998, from 9 A.M. to 3 P.M. at the Florida Cooperative Extension Service Stuart Conference Center, 1700 U.S. Hwy 17 South, Bartow, FL. Registration fee is \$20 in advance (\$25 at the door), which also includes a BBQ lunch. Make check payable to Ridge Beekeepers Association and mail to Ralph V. Russ, P.O. Box 398, Haines City, FL 33845, e-mail: [Rvruss@juno.com](mailto:Rvruss@juno.com). ■

# Focus on Propolis

TRAVELS TO BRAZIL last year revealed huge interest in an up-and-coming, new, yet old, honey bee product, propolis. The word means “before the city,” and presumably originates from the habit of some honey bee colonies that erect curtains of the material at their nest entrance. This presumably reduces the opening, weatherproofing a colony against cold winds and rain. *Apis mellifera caucasica* has a reputation for gathering the largest amount of the material, but all other races collect it as well.

Propolis is “bee glue,” and is the bane of beekeepers because it often causes headaches in inspecting and manipulating hives. In the hot summer it is sticky and difficult to remove from clothes, gloves and tools. In cooler weather it becomes hardened and easily cracks during manipulation, which can increase defensive behavior.

Honey bees use propolis to caulk cracks in and varnish the interior of their hive. This is not lost on the violinmakers in Cremona, Italy, who, like the famous Stradivarius before them, continue to use the material in finishing their instruments.

For the honey bee, propolis serves other purposes. Dr. Justin Schmidt in the 1992 edition of *The Hive and the Honey Bee* (pp. 943-952), says it is used, among other things, as an antimicrobial agent, a defense against other insects like ants and a possible hive moisture barrier. An often-cited use is to encase large objects in hives that the bees cannot physically remove, such as a dead mouse. Here, too, the antibiotic use of the material keeps the hive from being affected by decomposing bacteria. Propolis has also been found to be active toward *Paenibacillus larvae*, which causes American foulbrood.<sup>1</sup> A most recent

use of the material was described at the latest beekeeping seminar in the Florida Panhandle. When added to melted beeswax, propolis can be easily incorporated into foundation. This not only produces a more-pliable, less-brittle wax foundation, but may provide some antibacterial properties to the bees in the bargain.

**P**ROPOLIS IS A collected material like nectar and pollen. Generally, the best sources are resinous plants such as poplar, beech, birch, oak and pines. According to Dr. Schmidt, propolis is a mixture of miscellaneous substances including resins, terpenes and volatile oils. The latter give the product its fragrant odor. It is the pharmacologically active constituents, however, that have attracted the most attention as useful in human health. These include flavanoids, phenolics and aromatics. The former are considered beneficial in scavenging free radicals (see October 1997 *APIS*).<sup>2</sup> So-called “bioflavanoids” are also thought to be responsible for human access to vitamin C and other benefits.<sup>3</sup> Phenolics, according to Dr. Schmidt, include caffeic acid, which is anti-inflammatory, and along with luteolin and quercetin show activity against herpes virus.

Propolis has a long history in human health, according to Dr. Schmidt, going back to the time of the Roman Pliny and Aristotle the Greek. It has been employed against a large array of ailments including colds, sore throats, skin problems, stomach ulcers, burns, hemorrhoids, gum diseases and wounds.<sup>4</sup> P. Cheng and G. Wong documented the prospects of propolis in modern medicine (*Bee World*, Vol. 77(1): pp.8-15, 1996). These authors conclude that, although not generally approved by many phy-

sicians, the benefits of therapy using propolis are difficult to ignore.

I learned at the Eleventh Brazilian Beekeeping Congress in Teresina, Brazil (November 1996) that propolis became a major commercial product in Brazil after the 1985 Apimondia congress in Nagoya, Japan.<sup>5</sup> Production boomed subsequent to a presentation by Dr. Matsuno, titled “Fractionation and Purification of Anticancer Substances in Propolis,” at the 50th Conference of the Japanese Cancer Society. Research in Japan continues along this vein.<sup>6</sup> Some 60 tons of Brazilian propolis are now exported each year, José Alexandre Silva de Abreu, of CONAP in Belo Horizonte, Minas Gerais State, reported at the Teresina meeting (*Proceedings of XI Congresso Brasileiro de Apicultura*, p. 203). He concluded this is just the tip of the iceberg with reference to the Japanese and other southeast Asian markets.

Another paper in the proceedings (pp. 205-208) by M.C. Marcucci, Biological Chemistry Laboratory, Rio Claro, presented information on constituents of Brazilian propolis. These included di-terpenes, flavanoids, amino acids, and other complex compounds. Studies are progressing using antibacterial assay. A comparison of

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Brazilian and Hungarian propolis showed the former to be more active, presumably due to increased amounts of phenols. Propolis from Brazil is being promoted in many venues.<sup>7</sup>

Propolis is complex stuff. O. Malaspina and M.S. Palma of the biology department, Biosciences Institute, Rio Claro, provided an in-depth analysis of various samples in the Teresina proceedings (pp. 199–202). The authors recommended that certain standards be developed for the two major ways propolis is exported: raw state, as collected from colonies, and in alcoholic solution. Some 40 samples in alcohol showed a range of solids from 9.40 to 34.96 percent. The presence or absence of beeswax contamination contributed to this variability and is problematic in analysis. The ethanol index ranged from 56 to 93. A minimum of 45 is suggested in the standards. The amount of flavanoids ranged from 2.5 to 13.1 milligrams/milliliter.

Although it is quite variable in makeup, Dr. Schmidt says propolis also exhibits a surprising similarity among samples. Nevertheless, P. Cheng and G. Wong in their *Bee World* article discuss the material's inherent variability as a major problem in being accepted by most physicians. They state that only through a “reductionist viewpoint” will there be any progress

in applying natural products in scientific medicine. For propolis, this means not only defining a uniform, consistent product, but also its mode of action. Without this information, adequate dosages and side effects cannot be determined, nor can possible synergies of the individual active constituents be predicted. One of these is the real possibility of allergic reaction in some individuals. Although a natural substance, this does not necessarily mean using propolis or any honey bee product, for that matter, is risk free in humans (see May 1996 *APIS*).<sup>8</sup> And in the next article, there is evidence that many substances found in propolis might also harm bees in high concentrations.

**O**THER AREAS that need investigation, according to these authors, include uses of derivatives or analogues of propolis's active ingredients. These might be synthesized and become more effective than propolis itself in some cases. On the other hand, exclusive use of certain components might lead to microbial resistance. None have yet been tested on live subjects, nor have there been investigations about long-term use.

The scientific reductionist study suggested by Cheng and Wong is ex-

pensive and restrictive. And, unfortunately, it flies in the face of thousands of years of effective propolis use in folk medicine. Thus, in spite of the above considerations that limit its use in conventional, modern medicine, the material continues to be used by many people around the world.<sup>9</sup> Other information on bee-product therapy can be found on the American Apitherapy Society's home page (also see the February 1994 *APIS*).<sup>10,11</sup> A discussion list for apitherapy can be accessed by sending a SUBSCRIBE APITHER message to [LISTSERV@BEENET.PP.SE](mailto:LISTSERV@BEENET.PP.SE).

Like that for many bee products, propolis collection must concern itself with quality of the end result. Bee supply stores now sell specially constructed plastic inserts or screens that encourage bees to deposit relatively pure propolis; when cooled, the material is easy to harvest. Hive scrapings are generally not acceptable, as they will probably be contaminated with beeswax. As is true for all bee products, the beekeeper contemplating propolis production should ensure that a market exists and that it is possible to produce a uniform substance that satisfies the end customer (see August 1984 *APIS*).<sup>12</sup> For other considerations of bee products, see the *APIS* World Wide Web site topical index.<sup>13</sup> ■

<sup>1</sup> <http://www.ifas.ufl.edu/~mts/apishtm/threads/afb.htm>

<sup>2</sup> <http://www.ifas.ufl.edu/~mts/apishtm/apis97/apoct97.htm#3>

<sup>3</sup> [http://www.healthlink.com.au/nat\\_lib/htm-data/htm-supply/supps71.htm](http://www.healthlink.com.au/nat_lib/htm-data/htm-supply/supps71.htm)

<sup>4</sup> <http://www.vrp.com/propolis.htm>

<sup>5</sup> <http://www.ifas.ufl.edu/~mts/apishtm/papers/teres.htm>

<sup>6</sup> <http://www.cancerprev.org/meetings/meet94/abs/abs300/ses309/94i0652.htm>

<sup>7</sup> <http://www.usinter.net/propolis/index2.html>

<sup>8</sup> <http://www.ifas.ufl.edu/~mts/apishtm/apis96/apmay96.htm#3>

<sup>9</sup> <http://www.euroshel.co.uk/propolis.html>

<sup>10</sup> <http://www.beesting.com>

<sup>11</sup> <http://www.ifas.ufl.edu/~mts/apishtm/apis94/apfeb94.htm#1>

<sup>12</sup> <http://www.ifas.ufl.edu/~mts/apishtm/apis84/apaug84.htm#1>

<sup>13</sup> <http://www.ifas.ufl.edu/~mts/apishtm/threads/products.htm>

## More on Oils of Essence in Mite Control

TWO PUBLISHED STUDIES in the *Journal of Economic Entomology* (Vol. 90, Number 5, October 1997) reveal interesting tidbits about use of plant extracts or oils of essence in honey bee mite control (see January 1997 *APIS*).<sup>14</sup> N. Calderone, W. Wilson and M. Spivak (pp. 1080–1087) studied three blends of thymol, with linalool, cineole and citronellal, for effectiveness on both tracheal and Varroa mites. Thymol is a major ingredient in the Italian product called Apilife/VAR®, which is being used in Europe.<sup>15</sup>

The authors stated that although thymol-based products have received considerable attention as alternatives to synthetic acaricides (e.g. fluvalinate), reports vary greatly. They appear to depend on prevailing environmental conditions. In this study, for example, mortality in Texas and Virginia was greater than in Minnesota, probably because of temperature differentials. The higher the temperature, the more the material diffuses into the colony. Results also varied based on the number of hive bodies. In Minnesota, where double and triple brood chambers are standard, there is often more volume to fumigate than in Virginia (two brood chambers) and Texas (a single full-

depth body). In any case, in the current study, the level of mortality for Varroa was “probably insufficient to effectively control the mite population,” according to the authors. This was probably due to presence of brood, which protects the mites from fumigation effects.

The most active blend against tracheal mite in the study was thymol and citronellal. This provides encouragement that such a treatment would help control populations of internal mites as well as external Varroa, especially when brood is not present. The authors concluded that the use of thymol blends may play an important part in integrated pest management for both mites (see October 1996 *APIS*).<sup>16</sup> However, they do not go as far as recommending such a treatment, preferring instead to call their results only preliminary.

M. Ellis and F.P. Baxendale (pp. 1087–1091) compared the toxicity of several components of oils of essence to bees and tracheal mites. Thymol and menthol were found to be most problematic. Low toxicity of menthol to tracheal mite eggs and larvae, but relatively high to honey bees, means risks are high in employing this product. Thymol did a good job controlling

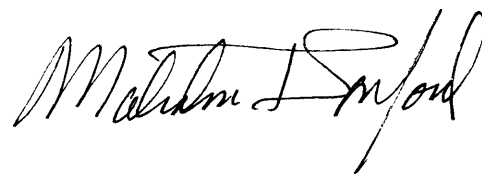
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Applying oils of essence and related chemicals carries considerable risk and should be approached with extreme caution.

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mites, but it was the most toxic to honey bees. Much more research is required, the authors concluded, to find an optimal treatment using this material. The take-home message to the would-be experimenter, therefore, is that applying oils of essence and related chemicals carries considerable risk and should be approached with extreme caution. ■

Sincerely,



<sup>14</sup> <http://www.ifas.ufl.edu/~mts/apishtm/apis97/apjan97.htm#3>

<sup>15</sup> [http://www.ifas.ufl.edu/~mts/apishtm/letters/aix2\\_11.htm](http://www.ifas.ufl.edu/~mts/apishtm/letters/aix2_11.htm)

<sup>16</sup> <http://www.ifas.ufl.edu/~mts/apishtm/apis96/apoct96.htm#3>

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**Malcolm T. Sanford**  
**P.O. Box 110620, Building 970**  
**University of Florida**  
**Gainesville, FL 32611-0620**

Phone: (352) 392-1801, Ext. 143  
Fax: (352) 392-0190  
Internet: [MTS@GNV.IFAS.UFL.EDU](mailto:MTS@GNV.IFAS.UFL.EDU)

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