Propolis and the health of honeybees  
PART 2  
by Michael Simone-Finstrom and Marla Spivak

Summary: Propolis is an apicultural term for the resins when used by bees within a hive. Unlike pollen and nectar, propolis offers no nutritional benefit to the honeybee colony. It does play a valuable role, however. Within the hive it helps individual bees’ immune systems and provides social immunity for the colony. Current research on propolis’ antimicrobial properties is focusing on the activity of different sources of propolis against viruses and bacteria, with the goal of providing medical researchers with compounds that can be studied for their activity against human pathogens.

Sources of resin; the process of resin collection

In tropical climates, honeybees collect resins mainly from Clusia minor and Clusia rosea flowers and from alecrim plants. In temperate climates, poplar trees appear to be the primary source for resins. However, other trees—pine, birch, elm, alder, beech, horse chestnut—are adequate resin sources for temperate honeybees, especially when poplar species are unavailable.

Honeybees forage for resins from droplets appearing on the bark of the trunks or limbs of trees, from the surfaces of some fruits, or more typically on the vegetative apices. Resin foragers typically show a preference for young leaves and vegetative buds.

Once honeybees find the resin source—the cues they rely on to find resinous plant sources are unknown—their task is to collect it. The forager follows four steps: break off a particle of propolis with the mandibles, work it with the mandibles and take it with the forelegs, transfer it to the middle leg, and transfer it to the corbicula, or pollen basket, on the same side. The honeybee repeats this sequence until there is a full resin load on both corbiculae.

Once the honeybee has a full load, she returns to her colony to remove the resin from her corbiculae. This task requires assistance from nest mates, known as cementing bees. These bees immediately attach the resin to a site along the hive wall and then smooth the resin, which is now officially propolis. The resins may also be placed in a storage area where bees can grab chunks of propolis to later place in comb cells or other areas.

During the cementing process, the resins do not appear to be chemically modified. Honeybee resin forages follow a strict daily pattern in their foraging and

Continued on page 4
In her article, “Honeybee sanctuaries,” in the most recent (July-September 2011) issue of this Journal, Priscilla Coe asks, “What is the best thing we can do right now to support the bees?” In response, she eloquently lays out the steps that she and friends have taken in northern California. They are, for instance, offering bees a space that is theirs year after year, leaving adequate honey in each hive for the bees to feed on throughout the winter, and adopting holistic methods of beekeeping.

Here, at the opposite end of the country, in southeastern Connecticut, neighbors and I have been asking ourselves the same question. We’ve taken a particular look at pesticides, suspected as a major contributor to colony collapse disorder. We’ve considered how pesticides are used, how they’re harmful, and what we as beekeepers and environmentalists can do to mitigate this harm—and safeguard the health of honeybees, our allies in health and healing.

We started by looking at our lawns. Many of them are lush and weed-free, thanks to these very pesticides. But now we know that this result has come at an alarming price. Last spring several of us I learned that rather than using vacuum bags on our lawn mowers, we should simply mow the lawn and leave the clippings there. Apparently this can return around 50 percent of the nitrogen to the soil, leading to a healthier lawn. The result: a reduction in, even elimination of, the need for chemicals.

This fall brought awareness of another technique for growing healthier laws. Many of us expend energy (or money) ridding our lawns of fallen leaves; why not keep the leaves where they are? Nature can do its own recycling. Mowing leaves into—rather than removing them from—the lawn produces healthier soil. Admittedly, using a mower to break up leaves can be time-consuming if there are a lot of leaves, but new and improved mowers for doing the job are being developed.

We can all do our part. As a representative of the United Nations Environment Program recently commented, “Human beings have fabricated the illusion that in the 21st century they have the technological prowess to be independent of nature. Bees underline the reality that we are more, not less, dependent on nature’s services....”
Hello everyone,

A warm welcome to all the new AAS members who attended our annual CMAAC in New Orleans in November. And grateful thanks to the AAS board members, the teaching staff, and our guest speakers—Brad Weeks, M.D., and Allen Dennison, M.D.—who gave so generously of their time to share their expertise and passion for apitherapy. It was refreshing to experience the collaboration among apitherapists, beekeepers, complementary health care practitioners, and medical professionals pursuing the goal of providing optimal health and well-being through apitherapy.

CMACC NOLA was a spectacular event, well attended and enjoyed by everyone, and our location,—New Orleans’ beautiful, historic French Quarter, was an added attraction.

We have received much positive feedback about the program. Especially popular was our decision to hold Levels 1 and 2 concurrently. Doing so enabled us to furnish enough material to satisfy the beginners and advanced apitherapy practitioners alike. Also at this CMACC we emphasized the science and practice of apitherapy by including all the products of the beehive, thus dispelling the common idea that apitherapy is limited only to bee venom therapy. This new, successful format will be adopted at future CMACCs. Another new feature this year was our ability to record many of the presentations. Once I have edited them they will be posted on the Members Only section of our website.

We have already chosen our next CMACC location: Portland, Oregon, in October 2012. The precise dates, to be determined by hotel and speaker availability, will be announced shortly on our website.

A major change we are undertaking to our website is the creation of a more dynamic home page, which will feature new social media tools like Facebook, Twitter, and YouTube where we can post videos for all to enjoy. We also plan to establish a series of apitherapy web-based seminars and presentations for which people can register online. In addition to serving a much-needed educational role, webinars can provide an additional source of income for the AAS. The subject of the first one will be chosen soon. I also would like to line up other speakers to give webinars on a monthly or bimonthly basis. As AAS members, your input is extremely valuable. I welcome ideas for topics that you would like to see.

AAS website gets a facelift

Coming apitherapy events

- Interactive Apitherapy Workshops
  8:30-10:00 a.m and 10:30-noon, Saturday, January 14, 2012
  North American Beekeeping Conference
  Rio All-Suites Hotel and Casino, Las Vegas, Nevada
  January 10-14, 2012
  www.nabeekeepingconference.com

- French Apitherapy Society
  “L’art de se soigner par les produits de la ruche” (“The art of healing with products of the beehive”)
  Lille, France
  January 21-22, 2012
  http://apitherapie-francophone.org

- First Turkish Congress, Expo and Workshops on honey and honeybee products with international participation
  Kayseri, Turkey
  February 22-26, 2012
  More information: Assoc. Prof. Sibel Silici, Erciyes University, Agricultural Faculty, Department of Agricultural Biotechnology

- 10th Apitherapy Congress, Expo and Workshops
  Passau, Germany
  April 12-17, 2012
  www.Apitherapie.de

- American Apitherapy Society Spring Symposium
  Meadowmere Resort, Ogunquit, Maine
  April 27-28, 2012
  Larry Pfeiffer, communications director of the York County Beekeepers Cumberland Group and vice president of the Maine State Beekeepers Association, is organizing this event in collaboration with the AAS. A program to include presentations and practical workshops will be established soon; see our website, www.apitherapy.org, for registration and other details. Come join us!

It’s holiday giving time

Please consider making a tax-deductible donation to the AAS directly on www.apitherapy.org. Although we appreciate generous donations, no amount is too small. Also consider shopping in our store. Be creative—give the gift of health! An apitherapy book plus a jar of your own raw honey or handmade salve for beekeepers makes a highly original present. And an AAS membership is ideal for someone who has everything.

I wish each of you and your families a happy, healthy winter!

Frederique Keller L.Ac.
Propolis and the health of honeybees

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cementing. Resin is typically collected most frequently in late summer through autumn, most likely the result of reduced nectar flows during that period.

**Stimuli for resin foraging**

Social insect foraging has been studied extensively in relation to individual mechanisms. It appears that certain bees are genetically programmed to forage for resin, analogous to honeybees that forage for pollen and nectar. Individual bees may detect the need for resin. These include the existence of gaps, crevices, or irregularities in the nest architecture that may allow the entry of microbes, intruders, air currents, and sunlight. In a completely dark environment, bees’ antennae, inserted into gaps in nest architecture, are an essential tool for information assessment. At the colony level, waggle dances near cementing sites deep within the hive are used as a recruitment signal.

**Topics to consider**

Resins are produced by a large variety of plants around the world. Honeybees collect and use resins as propolis for sealing cracks in the nest, creating a smooth surface for the attachment of a comb, entombing parasites and predators, and reducing in-hive microbes.

An area of particular interest to the beekeeping community is the presence of contaminants in hive products like propolis. Information is needed on the residues that remain in commercial hives that are given chemical treatments to control hive diseases and parasites.

Most current studies on propolis focus on chemically identifying its components while incorporating descriptions of the biological activity of samples. One goal is to identify specific components and mixtures of components required for activity against various microbes.

While it is known that biological activity can often be correlated with phenolic content, it is not clear whether these compounds work in synergy with other compounds or whether some are antagonistic. Biological activity has also shown to be equivalent, regardless of the race of the honeybee, or the geographical region or season, even though the chemical profiles may be dissimilar. However, some studies show that while propolis is generally active against most gram-positive bacteria and some fungi, the level of activity depends on location, itself possibly the result of differences in plant sources. One hypothesis is that wet-tropical and lower-latitude ecosystems may have plants with generally higher levels of antimicrobial compounds or at least access to a larger variety of plants that may differ in antimicrobial properties. This in turn would lead to increased biological activity of propolis samples from those climates.

It is clear that numerous options exist for future research on propolis and resin use. These include pharmacological opportunities for improving health, a better understanding of the individual and colony-level mechanisms of resin foraging, and the possible applicability for propolis as a treatment against bee pathogens and diseases. At a minimum, information on resin use and its incorporation into the honeybee nest architecture is a promising area of research integrating environmental impacts, disease resistance, and social immunity.

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Buenos Aires, Argentina, was the site in September of rich opportunities to hear about international research, experiences, and ideas about apiculture, including apitherapy. The 42nd International Apicultural Congress of Apimondia featured three symposia on apitherapy, with presentations by attendees from 15 countries—notably Romania, Brazil, and Argentina.

Propolis, the topic of 12 papers, was the star! Several papers concentrated on the healing power of propolis: it can be successfully used to treat diabetics’ wounds, in oral and maxillofacial surgery, and in healing methicillin-resistant Staphylococcus aureus, known as MRSA. Other papers discussed bee venom and pollen for treating fibromyalgia, and apitherapy for the treating alcoholism.

As in recent Apimondia Congresses, attention has been given to stingless bees; in one apitherapy session in Buenos Aires, a project on the evaluation of the honey from specific Melipona bees was analyzed to better understand the medicinal use of their honey.

One author presented a new way of producing royal jelly (the results are termed “N Chromosome Royal Jelly”). Benefits include improved hormone production and increased libido. The new product was also shown to have a positive healing effect on ulcers and to cure or modify metabolic diseases.

Of the more than 50 posters from around the world, subjects included the chemical and biological activities of various honeys, the use of bee products for ulcerous veins and for dermatological conditions, and bee products for animal diets and for ameliorating animal diseases.

Several AAS board and general members have attended Apimondia many times, and they highly recommend this event. AAS vice president Theo Cherbuliez, president of the Apitherapy Commission of Apimondia, has for 12 years been organizing the apitherapy presentations at the Congresses. In 2007 AAS board member Glenn Perry was awarded an “innovative use” medal for his hydro-ionization process of propolis. And AAS president Frederique Keller was to speak at this year’s Congress on using the unique isoflavonoid factor of Brazilian red propolis in the treatment of menopause; unfortunately, she injured her shoulder and was unable to travel to Buenos Aires.

Attendees at Apimondia are able to learn of bee-related activities throughout the world, and also to connect with old and new friends in the bee world. These connections often take place at gatherings, small and large alike, where the host country provides entertainment. In Argentina, the music, dance, and sightseeing were central to the sense of adventure and overall enjoyment.

The next Apimondia Congress, in 2013, will be held in Ukraine; the 2015 Congress is scheduled for South Korea. Details may be found on the Apimondia website: www.apimondia.com.

To obtain abstracts of apitherapy presentations from this year’s Congress, please feel free to contact Theo Cherbuliez at tcherbuliez@gmail.com.

Susan Cherbuliez
South Freeport, ME
scherbuliez@comcast.net
RESEARCH ROUNDUP

Propolis

May be beneficial as a mouthwash

With evidence that propolis may actively protect against oral disease, this product has recently become a subject of dentistry research.

Researchers in Uttar Pradesh, India, investigated the effectiveness of a propolis-containing mouth rinse in inhibiting plaque formation and improving gum health. A total of 30 subjects were randomly assigned to three groups, who received, respectively, a propolis-containing mouth rinse, a negative control (saline), and a positive control (Chlorhexidine 0.2%). Plaque index and gingival index were assessed at baseline and at a five-day interval. Chlorhexidine mouthwash was found to be superior to propolis and saline in inhibiting plaque formation. Propolis was found to be only marginally better than chlorhexidine in improving gingival scores.

The investigators conclude that propolis might be used as an alternative to chemical mouthwashes and recommend long-term trials to produce conclusive evidence.


Honey

May help treat gluteofemoral fistulas

Perianal fistula, a small tunnel starting from the anus or rectum and reaching the outer skin, is a common disease typically inflammatory in origin. It affects certain patients who have inflammatory bowel disease.

A patient with persistent fistulas who failed to respond to conventional medical and surgical therapy was given six months’ treatment with honey. Subsequently most of the fistulas in the gluteofemoral region (buttocks and thighs) were completely healed and closed. Honey also reduced inflammation, pain, and hardening of the affected region.


Potential role in improving short-term memory

Researchers in Malaysia have found that tualang honey may help improve short-term memory among postmenopausal women.

The study randomly assigned 102 postmenopausal women to three groups: those taking tualang honey, those receiving estrogen plus progestin therapy, and those receiving no treatment. Their verbal learning and memory performances were measured before and after 16 weeks of intervention.

Major differences appeared in the overall mean scores of total learning between both the estrogen-plus-progestin therapy and the tualang-honey groups when compared with the untreated control group. The women who received tualang honey showed improvement in their immediate memory but not in immediate memory after the intervention and delayed recall. This is comparable with the improvement seen in women receiving estrogen plus progestin therapy.


Can reduce inflammation after eye surgery

Endophthalmitis following eye surgery, though rare, is a serious complication. A topical form of one class of antimicrobials, fluoroquinolones, has been used prophylactically. However, ocular pathogens are developing a resistance to these agents.

Investigators in Bratislava, Slovakia, conducted a pilot study to determine whether 25% honey solution might help eradicate bacterial ocular pathogens in the perioperative period among patients scheduled for cataract surgery or vitrectomy. They also wanted to compare honey’s efficacy with that of .3% ofloxacin, a second-generation member of the fluoroquinine class.

A total of 101 patients were randomly assigned to treatment with either honey or ofloxacin. Both groups had eye drops administered five times a day for seven days before and five days after surgery. Before these agents were administered, 18 and 25 isolates were detected in the ofloxacin and honey group, respectively. After seven days of administration, 4 isolates were detected in each group. No significant difference in antibacterial effect was found between the two groups.

The investigators suggest that honey may serve as a prophylactic agent of endophthalmitis and recommend further studies to characterize its ocular penetration properties.

Treating equine wounds with Manuka gel

Veterinarians in Australia have found that Manuka honey gel can reduce wound retraction and overall healing time.

Eight horses were seen with full-thickness skin wounds on both metacarpi. Wounds on one forelimb were covered with horse feces for 24 hours, while wounds on the contralateral limb were left uncontaminated. The wounds were randomly assigned five different treatments: Manuka honey, Manuka honey gel applied for 12 days, Manuka honey gel applied through healing, gel control applied for 12 days, and untreated control. The wounds treated with Manuka honey and Manuka honey gel were smaller than those with gel control and untreated control until day 35. Wounds treated with Manuka honey gel throughout healing healed faster than all other wounds. However, Manuka honey had no effect on the healing of contaminated wounds.

The investigators note that the use of Manuka honey gel precludes the need for a bandage, thus reducing complications and costs associated with long-term bandaging.


Manuka variety may prevent A specific dermatitis

Radiation dermatitis is a common side effect in patients undergoing irradiation of the breast or chest wall. However, no single topical agent has been shown to prevent this condition, which is due in part to an acute inflammatory response characterized by the release of cytokines, serotonin, and histamine as well as elevated levels of reactive oxidative species.

Manuka honey (a monofloral honey made by bees that frequent Leptospermum scoparium) has demonstrated wound healing and anti-inflammatory properties, possibly related to its significant levels of antioxidants. A group of researchers in Hamilton, New Zealand, studied women with invasive breast cancer or ductal carcinoma in situ who were undergoing adjuvant external beam radiation therapy. Their non-blinded study, using a range of radiation schedules, randomly assigned 81 patients to treatment either with a standard aqueous cream or with Manuka honey.

Treatment was given twice a day, starting on the first day of radiation therapy until ten days after the completion of radiation therapy. The honey formulation was a pure sterilized product, unique Manuka factor 18. Toxicity was scored by visual inspection using the Radiation Therapy Oncology Group acute toxicity scale and digital photography. Independent assessment of the photographs was also performed.

Results showed a lower incidence of dermatitis in the honey-treated group compared with the group receiving the aqueous cream. There was a tendency toward a lower incidence of dermatitis lasting longer than one week in patients treated with honey compared with those treated with aqueous cream. However, ratings for the ease of application, comfort, and overall acceptability were significant, in favor of the aqueous cream over honey.

The investigators recommend a larger, phase 3 trial to further examine the effectiveness of honey among breast cancer patients who develop radiation dermatitis.


Medihoney can relieve chronic pressure ulcers in patients with spinal cord injury

Chronic pressure ulcers, also known as pressure sores, refer to wounds developed over bony prominences. They are a major health problem, occurring mainly in elderly persons and patients with debilitating illness that render them immobile.

In the attempt to find a cost-effective treatment that decreases pressure ulcers’ healing time and severity, a group of researchers in Germany studied 13 men and 7 women. Six of the patients were quadriplegic, and 14 were paraplegic. Five patients had grade IV ulcers; 15 patients had grade III ulcers. The study sought to determine the effects of Medihoney—a branded form of Leptospermum honey and gelling agents—on bacterial growth, wound size, and stage of healing in pressure ulcers.

After one week of treatment, all swabs were clear of bacterial growth. Overall, 90 percent of the patients showed complete wound healing after one month, and scars were soft and elastic. No negative effects were noted from the treatment. The scientists recommend that the medical-honey approach to wound care be part of a comprehensive, conservative surgical wound-care concept.


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Tradition and novelty at CMACC

A wide variety of fields were represented at this year’s CMACC, held in November in New Orleans. These included beekeeping, farming, teaching, art, music, sewing and pattern making, web design, sales, management, and electrical inspection. In addition we welcomed several attendees with a background in health: a pain specialist, a psychiatrist, an apitherapist, a retired nurse, a homeopath-nutritionist, and three massage therapists.

The course and conference drew 40 participants from 15 states and from Australia and Ecuador. Five attendees had participated in one or more previous CMACCs. In addition to those wanting to develop skills in apitherapy, acupuncture, and treatment of chronic pain, several participants were motivated by the desire to be able to heal themselves of such conditions as osteoarthritis, rheumatoid arthritis, chronic pain, and postherpetic neuralgia.

CMACC’s presentations and discussions were supplemented by informal sessions and events, including the demonstration of the production of honey wound treatment, hands-on bee stinging and wound healing, and a silent auction of apitherapy materials to which many participants contributed.

Comments from participants were overwhelmingly positive (see also the sidebar on this page, and the article on the facing page). Reactions included the following:

- “A lot of work and thought”
- “Excellent material”
- “Friendly, helpful, and competent”
- “Intense interchange of knowledge and skills”
- “Opportunity to talk to classmates about their plans.”

Much of the enthusiasm resulted from the new organization for CMACC. For the first time the course was presented in two levels, held simultaneously. Level 1 was directed at participants who were new to apitherapy or who wanted a basic review, while Level 2 was for those who were experienced and were seeking more advanced information.

Most participants applauded this change. Among the advantages noted were the ability of experienced people to move to more in-depth topics and of participants to ask basic questions in Level 1 and be able to anticipate Level 2. In fact, several people mentioned that this structure provided an incentive to attend our next CMACC—scheduled for Portland, Oregon, in October 2012.
My perspective on apitherapy is that of a farmer-beekeeper. Most beekeepers fall into simple categories. We keep bees because they are interesting and a pleasure to watch. We enjoy the honey they provide. As environmentalists, we keep bees to help make the world a healthier place to live. Farmers especially appreciate bees for increased crop production, like my very good cucumber crop this summer. These reasons worked for me for many years. Now I’ve added apitherapy to this list.

Bee venom therapy (BVT) is the apitherapy application that causes most people to say, “You must be crazy.” (They’re not necessarily wrong.) BVT is letting or making bees sting yourself, with the belief that it is doing you good. I started stinging myself as a teenager following a knee injury, which produced years of surgery, swelling, and pain. When I was frustrated with the swelling, I’d pick up a dandelion with a bee on it and press the flower to my knee. Within hours the pain was less. I repeated the sting only occasionally when other applications failed to relieve the swelling and pain. Yes, the bee sting area hurt, itched, got swollen—but that pain was temporary and lessened the constant knee pain. Bee stings did not cure me, but they did improve my quality of life.

Despite apitherapy’s reputation in the U.S. as a new type of medical voodoo, the use of bee products dates back to some of the earliest medical writings. Apitherapy actually resembles folk medicine, and some consider it a form of green medicine: environmentally friendly and holistic. It cannot replace modern medicine, but it should be considered in certain applications. Just as herbal medicine, hypnosis, chiropractic, and acupuncture can improve the lives of some people, so can the proper use of products from the bee hive.

Honey is the most accepted hive product; it’s tasty in many recipes. Apitherapy takes honey’s use beyond that of a sweetener, yet to live up to all its claims, honey must be raw. But much of the honey found in large grocery stores won’t work, except as a sweetener. Not all the honey found on roadside markets is of the necessary quality. If you want to use honey for medical purposes, it’s best to raise your own bees. Strain your own honey without the use of heat (heating kills raw ingredients that are necessary for proper healing). Those little microbes that kill bacteria die quickly under the normal heat often used to make bottling easier.

Now that you have some good, all-natural, raw-bees-spit honey, you can put it to some old uses. Minor burns, scrapes, scratches, and old scabs will respond to raw honey’s anti-bacteria agents. The natural sugars will feed the body’s healing processes while removing pain, reducing swelling, and preventing scab formation with less scarring.

Because putting honey on your body makes your body sticky, you should cover the area with light gauze after application and leave it on so that these bee-spit microbes can do their jobs. A 1-to-1 mixture of honey and Aquaphor® makes a good ointment. The lanolin and mineral oil holds both together to treat a wound without the drips of just honey when it gets warm on the body.

If you can handle the idea of using honey medically, moving up to propolis may be of interest. I’ve scraped propolis from inside the hive, but it requires a lot of cleaning before using—removing dead bee parts, wood shavings, and other debris. Since bees use propolis to smooth, fix, and disinfect their hives, it’s simple to provide a surface on which they will deposit clean propolis that is easily harvested.

Propolis is “anti” everything: anti-cancerous, anti-inflammatory, anti-parasitical, antiviral, antibacterial, anti-fungal, anti-oxidant. It is also used for tissue regeneration and radiation protection. If minor wounds are acute, chronic, painful, infected, burned, or ulcerated, use propolis. Propolis ointments’ restorative properties are stunning. Cleaned propolis may be taken internally for hypertension, stomach ulcers, inflammatory bowel disease, hemorrhoids, and gum/mouth pain, and for immunity against hay fever.

Pollén, the protein of life for the bee, is ideal for allergy sufferers. Pollen granule casings are actually indigestible, but their porous nature allows the contents to be absorbed. Except for the absence of vitamin B12, it is considered a “complete” food for humans. There are numerous major indications for taking pollen internally. Some seem to be directly opposed to each other; it is the manner in which the pollen is used that creates the difference. For example, pollen mixed with honey stimulates the appetite (thus promoting weight gain), while pollen used without honey suppresses it (thus treating obesity). A simple way to prepare and take pollen is to place some in water and let it soak overnight. The water dissolves the granules’ content and improves absorption into the human system.

Royal jelly, the combination of honey and pollen that bees first feed to the larvae, is the sole food of the queen. Harvesting royal jelly poses problems: it requires killing queen larvae, since the royal jelly is removed from those cells. A raw royal jelly spoils rapidly! Its life can be extended by mixing with raw honey or freezing it immediately after harvest. The normal dose is 2-5 grams per day given under the tongue, where it is rapidly absorbed by the body. Like other bee hive products, royal jelly is antibacterial, anti-fungal, tissue repairing, and wound healing.

Despite these many applications, a word of caution is in order. We are not recommending that you avoid seeking good medical advice. If you have chest pain, consult a reputable doctor or call 911. Ideally you can find a doctor who is willing to work with you if you decide to explore the uses of apitherapy. Don’t try to hide your use of bee products. Share your successes and learn from your failures. Apitherapy is not a cure-all. But if sharing it helps improve one person’s life, then our time learning about apitherapy will have been well worth it.

Wayne Woosley
Pfaffton, NC
wayne@woosleyfarm.com

Journal of the American Apitherapy Society   October-December 2011
Apamin may assist development of drugs targeting specific areas of the brain

I on channels are proteins that act as pores in a cell membrane and help control the excitability of nerves. Like an electrical circuit, they allow the flow of “charged” potassium, sodium, and calcium ions to enter or exit cell membranes through a network of pores formed by the channels.

A subtype of ion channel, called SK channels, are thought to affect the plasticity of the nervous system’s synapses and may play a role in memory and learning. Apamin, the natural toxin found in bee venom, is known for its ability to block different types of SK channels. Now scientists in the United Kingdom and Belgium have found that apamin may be useful in developing therapies that can target specific cellular processes without causing adverse reactions in other areas of the nervous system.

A major difficulty in creating drugs to target cellular processes is the possibility that cell types distributed throughout the body all have the same ion channels. However, the investigators found that different nerves have SK channels made from different subunits. Because apamin is able to block one subtype of SK channel better than the others, it was possible to identify how three subtype SK channels could be selectively blocked.

These findings are expected to assist the design of drugs to block SK channels that consist of more than one type of SK channel subunit—in turn, more effectively targeting the symptoms of such disorders as dementia and depression.

Surging demand for propolis boosts its production—and its price

T he growing global popularity of propolis as an ingredient in pharmaceutical and cosmetic products is bringing new sales for beekeepers, at least in Kenya. It has been reported that farmers there are working overtime to keep up with the demand for propolis. Until recently, propolis’s uses were limited to food technology. With its expanded applications, the price of propolis has risen up to 70 percent in the international market since the 1990s.

Honey compound’s possible role in ensuring food safety

A s consumers increasingly favor “natural” food and ingredients, there is a shift away from foods containing synthetic preservatives. Numerous preserves—BHA, BHT, calcium sorbate, potassium benzoate, potassium sorbate, sodium benzoate, and sorbic acid—though technically legal, are now considered unacceptable by several stores in the United States.

At the same time, food safety remains a crucial issue, evidenced most recently by the outbreak of listeria in cantaloupes earlier this year. In addition to causing food-borne illness, certain bacteria can cause spoilage in raw milk or in food kept at improper temperatures.

Now researchers at the New York State Agriculture Experiment Station in Geneva, N.Y., have identified an antimicrobial compound in honey that shows promise as a natural preservative to prevent food-borne illness and food spoilage. After testing more than 2,000 strains of bacteria from eight varieties of honey from the United States and New Zealand, they found a variety of sunflower honey from South Dakota containing a compound effective against a range of Bacillus and Listeria, including Listeria monocytogenes, the bacteria responsible for the cantaloupe outbreak. They identified the compound as a bacteriocin—a class of antimicrobial peptides produced by bacteria to impede the growth of competing bacteria—produced by a strain of Bacillus thuringiensis (Bt), a common organic pesticide.

The scientists are now analyzing thurincin H’s mode of action, with the goal of developing it as an alternative to synthetic preservatives.

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