The Diablo Bee

Newsletter of the Mount Diablo Beekeepers Association

SEPTEMBER 2008

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www.diablobees.org

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September's speaker

Harry (Hyun) Chung of the Tahara Detox Weight Loss Center in Pleasanton. Mr. Chung is a practicing certified apitherapist, who will give a presentation on Bee Venom Therapy.

HIGHLIGHTS OF THIS ISSUE

We all appreciated our very own Mary Andre educating us on the theories and applications of top-bar hives!

Meetings

Important DATE!

Our next meeting is September 11 at 7:30 pm at the Heather Farm Garden Center in Walnut Creek.

Announcements

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Please send interesting bee articles via email to:
ersten3@yahoo.com

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Membership Dues

Your $15 yearly dues should be sent to:

Jeff Peacock, Treasurer
Mount Diablo Beekeepers Association
3341 Walnut Lane
Lafayette, CA 94549

Or…. you can give Jeff your check at any monthly meeting.

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If you have an active email address, you will receive this newsletter by e-mail unless you inform Kim Coleman at:
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that you wish to receive a hard copy.

Not receiving a hard copy? Contact Kim at the above e-mail address, or by calling her at 925-685-6849.

USING BEETLE BIOLOGY TO PROTECT HIVES

Science Daily

A new way to lessen damage from small hive beetles in honey bee colonies has been developed by Agricultural Research Service (ARS) scientists in Gainesville, Fla. Small hive beetles (Aethina tumida) began appearing in U.S. hives during the past 15 to 20 years and now infest bee colonies throughout the East.

Peter Teal, leader of the Chemistry Research Unit at the ARS Center for Medical, Agricultural and Veterinary Entomology in Gainesville, and his colleagues have developed an apparatus and attractant to help beekeepers protect their honey bees.

Honeybee on apple blossom

Small hive beetles release a yeast that's highly alluring to fellow beetles. When the yeast grows on pollen in the hive, it attracts more beetles and sets off a cascading effect. When the population of beetles explodes, the disturbed bees leave the hive, according to Teal. This leaves beekeepers without honey or their bee colonies.

To exploit the small hive beetle's biology, Teal installed traps baited with the yeast below test hives belonging to cooperating beekeepers. The traps were separated from hives by sliding doors drilled with conical holes that allowed the beetles to enter the traps, but not to exit.

The researchers believe these traps will solve the problem for small-scale beekeepers, which make up 60 percent of the industry. These small-scale bee keepers tend their hives daily and can clean their traps frequently. For large-scale beekeepers who maintain up to several thousand hives, Teal's team hopes to develop a new trap requiring less management.

If perfected, this trap could be a boon to the bee industry in Florida, which is a common overwintering destination for commercial bee colonies. A patent for the trap was filed in March 2005. Teal hopes to apply the same principle to reduce populations of Varroa mites, another significant pest in honey bee hives.

A paper on this research recently appeared in the Proceedings of the National Academy of Sciences

MEGABEE NOURISHES BELEAGUERED BEES

Science Daily

Bees busily ferrying pollen from one cream-white almond blossom to another in California orchards this winter might get some of their zip from a new food called MegaBee: The Tucson Diet.

Agricultural Research Service (ARS) entomologist Gloria DeGrandi-Hoffman created the research and development agreement that led to this new, convenient source of proteins, vitamins and minerals that bees need for good health. Bees can eat MegaBee as a meal or snack when days are too cold for venturing outside of their warm hive, for example, or when flowers—bearing pollen and nectar, the staple foods for adult bees—aren't yet in bloom.

Better nutrition might be a key to reversing the decline of honey bees, Apis mellifera, in the United States. A mostly mysterious colony collapse disorder is blamed for losses of once-thriving colonies, as are problems caused by mites, beetles, Africanized honey bees, diseases and pesticides.

A new diet that ARS researchers helped develop can provide a nutritional boost to help keep honey bees healthy and productive. (Credit: Stephen Ausmus, USDA)

DeGrandi-Hoffman, at the ARS Carl Hayden Bee Research Center in Tucson, Ariz., sought the expertise of Gordon I. Wardell, entomologist and owner of S.A.F.E. R & D, LLC, in Tucson, to develop a new, nutritious food for bees. The resulting MegaBee has now been on the market for about six months. It's manufactured by Castle Dome Solutions, LLC, in Yuma, Ariz., and sold by Dadant & Sons, Inc., of Hamilton, Ill., which supplies honey producers, beekeepers and candlemakers.

Tests conducted in California by Wardell and ARS scientists in the winter of 2007 showed that bees ate MegaBee at about the same rate as natural pollen. But MegaBee-fed bees helped produce more brood, or young, than did their pollen-fed hivemates.

Ongoing research, in orchards and in laboratories at the Carl Hayden center, should reveal even more about bees' year-round nutrition needs.

Nutrition investigations, a special emphasis at the Carl Hayden laboratory, are part of a new, nationwide program of ARS-led scientific research on honey bee health.

OZONE = CLEANER AND SAFER HIVES?

Science Daily

Ozone, which is already used to sanitize drinking water and swimming pools, might help make hives cleaner and safer for America's beleaguered honey bees. That's according to results from preliminary laboratory tests by Agricultural Research Service (ARS) entomologist Rosalind R. James. She leads the agency's Pollinating Insects Biology, Management and Systematics Research Unit at Logan, Utah.

James tested ozone's effects on two pesticides, coumophos and tau-fluvalinate, both widely used by beekeepers to control varroa mites, a major enemy of bees. Studies elsewhere indicate that residues of these chemicals can accumulate in hives, including in the honeycomb. Beekeepers typically reuse the honeycomb after the honey has been extracted.

Ozone may make hives safer for honey bees by breaking down pesticide residues and killing certain insect and disease pests. (Credit: David Cappaert, Michigan State University, Bugwood.org.)

For the experiment, she placed glass vials of the pesticides in a small, tightly sealed chamber, then exposed the chemicals to a flow of ozone gas. Keeping the chamber at 50 percent relative humidity, she tested different temperatures and different ozone and pesticide concentrations.

Applying 500 parts per million of ozone in an approximately 93 degree Fahrenheit chamber for 10 to 15 hours degraded low concentrations of both pesticides, but 20 hours were needed to break down higher concentrations of tau-fluvalinate.

James also looked at ozone's ability to zap the greater wax moth, a honeycomb pest, in all of its life stages, from egg to adult. Wax moths attack bee young and damage the honeycomb.

Young wax moth larvae and adults were killed by just a few hours of ozone exposure. However, eggs, the most resistant life stage, had to be exposed to the gas for a few days.
Further tests are needed to find out whether the breakdown products of the degraded pesticides pose a hazard to bees, James noted.

In related work, James is finding that ozone can destroy microbes that cause major bee diseases such as chalkbrood and American foulbrood, but much higher ozone concentrations and longer fumigation times are needed.

ARS, along with the National Honey Board, headquartered in Firestone, Colo., and O3Co., Inc., of Idaho Falls, Idaho, provided research support.

HOW DRONES FIND QUEENS

Science Daily

The mating ritual of the honey bee is a mysterious affair, occurring at dizzying heights in zones identifiable only to a queen and the horde of drones that court her. Now a research team led by the University of Illinois has identified an odorant receptor that allows male drones to find a queen in flight. The receptor, on the male antennae, can detect an available queen up to 60 meters away.

This is the first time an odorant receptor has been linked to a specific pheromone in honey bees.

The "queen substance," or "queen retinue pheromone," was first identified decades ago, but scientists have only recently begun to understand its structure and role in the hive. The pheromone is a primary source of the queen's authority. It is made up of eight components, one of which, 9-oxo-2-decenoic acid (9-ODA), attracts the drones during mating flights. It also draws workers to the queen and retards their reproductive growth.

The morphological characteristics of the three castes of honeybee reflect their different roles. The antennae of the male drone (bottom right) are larger than those of female workers (bottom left) and queens (top) due to their specialized role in detecting a queen that is ready to mate. (Credit: Image provided by Kevin Wanner, Axel Brockman and Edwin Hadley)

Principal investigator Hugh Robertson, a professor of entomology, said the research team pursued the receptor for the queen retinue pheromone because it was the "lowest hanging fruit" of the known honey bee odorant receptors. Robertson was among the research group that last year published the entire honey bee genome, a feat that allowed his lab to identify 170 odorant receptors in honey bees.

Robertson and his colleagues knew that male drones probably had little use for most of these receptors. The drones don't forage and so do not need to detect the subtle scents of flowers. Their social role within the hive is virtually non-existent. They have only one task: to find and mate with a queen. Once they have accomplished this, they die.

Using a functional genomics approach, entomology postdoctoral researcher Kevin Wanner was able to determine which odorant receptors were more dominant in males than females. He found four receptors that were expressed in much higher quantities in males than females.

"These proteins are expressed in the membranes of the olfactory neurons way up in the tips of these little sensilla in the antennae of these males," Robertson said. "A neuron goes all the way from there to the brain. Now the brain gets a signal that says, 'I've smelled this chemical.' If the chemical is 9-ODA, for the drone that means one thing and one thing only: 'There's a queen somewhere! Go get her!' "

Determining which of the four primary receptors in males was actually responding to 9-ODA was a formidable challenge.

"That's where we were very, very lucky," Robertson said.

By chance, at a conference on the science of olfaction, Wanner met Charles Luetje, a neuroscientist at the University of Miami who had expertise with precisely this type of problem. Luetje had perfected a technique for expressing mammalian odor-sensing receptors on the outer membranes of frog oocytes (eggs) and testing them to see which compounds activated them. When he heard of Wanner's work in honey bees, Luetje offered to use this technique to test the four primary odor receptors of honey bee drones.

After refining and testing the technique in insects, Luetje's graduate student Andrew Nichols exposed each of the drone odorant receptors to 9-ODA. Only one of the four receptors responded. When it bound 9-ODA, the protein receptor's conformation changed, setting off a measurable shift in the membrane potential.

None of the four primary male odorant receptors responded to the other components of the queen pheromone. Only the 9-ODA elicited a response in one of the four, said Robertson, a discovery he called, "thrilling."

"We grabbed the lowest hanging fruit and we got it," Robertson said. "Of course, ultimately, we've got another 169 receptors to go."

Scientists have spent decades exploring the mysteries of insect smell, but the newest tools make such research much more promising, Robertson said.

"Like so many biologists, we are wonderfully caught up in the genomic revolution," he said. "We can sequence genomes. We can use functional genomics to narrow it down. We've got these assays, such as the frog oocyte, and other assays. And the genomic revolution has opened up this black box of the molecular biology of insect smell. Finally now we can peer inside."

The findings appear in the Proceedings of the National Academy of Sciences.

QUELLING BEE-KILLING CHALKBROOD

Science Daily

From rabbits to horses to cows, many animals love alfalfa. America's premier pollinator of that crop, the alfalfa leafcutting bee (Megachile rotundata), is vulnerable to a deadly fungal disease called chalkbrood. But the bees might be best protected from chalkbrood if their leafy nests are sprayed with an iprodione fungicide, according to Agricultural Research Service (ARS) entomologist Rosalind R. James.

Caused by the Ascosphaera aggregata fungus, chalkbrood kills bees while they're larvae -- wormlike young that hatch from eggs laid in nests by female bees.

Healthy larvae spin cocoons within those nests, and later emerge as young bees.

But chalkbrood-infected larvae may die before cocooning, according to James. She leads the ARS Pollinating Insect Biology, Management and Systematics Research Unit in Logan, Utah.

An alfalfa leafcutting bee (Megachile rotundata) on an alfalfa flower. This bee is widely used for pollination by alfalfa seed growers. ARS scientists in Logan, Utah, are always on the lookout for wild bees that can be recruited to help the honey bee with the huge job of pollinating the nation's crops. (Credit: Photo by Peggy Greb)

Microscopic spheres, called fungal spores, on dead larvae serve as potent reservoirs of the disease. A healthy female alfalfa leafcutting bee may—after emerging from her cocoon and nest in spring—inadvertently pick up some of those spores. If she spreads them to nests that she makes for her eggs, she may doom her young.

James worked with alfalfa seedgrowers in Washington to determine how to best protect alfalfa leafcutting bees from chalkbrood. The disease is so pervasive in the United States that these seedgrowers buy at least 50 percent of their alfalfa leafcutting bees each year from Canada, where chalkbrood is less prevalent.

In experiments, James sprayed an iprodione fungicide on the leafcutting bees' nests in spring, shortly before the adult bees left their cocoons and nests. The treatment reduced the incidence of chalkbrood in the bees' next generation by up to 50 percent, with no measurable loss of young, James reported.

Now, James and her colleagues are looking for fungicides that may be even more effective.

The research is part of ongoing studies to discover more ways to safeguard wild bees, so they can help America's harried honey bees with pollination chores.

NEWBEE NUGGETS

Know your Beeswax

- To help prevent food from sticking to fry pans or waffle irons, rub beeswax on a hot pan, and wipe with a clean cloth.
- Beeswax dissolved in cleaning fluid to the consistency of a thin paste makes the finest floor and furniture wax. Beeswax makes needles easier to sew with. Toughens and preserves thread and makes it easier to thread sewing needles.
- Helps keep sewing machine, vacuum cleaner and other power belts from slipping.
- Beeswax on irons helps prevent sticking to starched clothing. To apply: rub on heated iron, wipe clean with a cloth.
- Waterproofs fish lines, clotheslines, shoes and leather articles; eases sticking doors and windows.
- Lubricates and rust-proofs metal cutting tools, particularly saws and wood bits.
- Makes screws easy to drive into hard or green wood.
- Use for polishing and waxing toboggans, snowboards, skis, etc.
- Archers use it on bow strings.
- Seals tree wounds, grafts and budding.
- Stops plumbing leaks.
- Indispensable for wood grainers, auto-body and fender repairmen, yachtsmen, cobblers, sail makers, and many others.
- Beeswax melts at 145 degrees F. and Flashes at 563 degrees F.

RECIPE OF THE MONTH

HONEY GRANOLA SQUARES

Kids will enjoy the mixing and measuring activities in this recipe. Parents should handle heating the honey.

- Makes 9 servings -

INGREDIENTS

- 3 cups low-fat granola
- 3/4 cup dried fruit (apples, apricots, cherries, cranberries or pears), finely chopped
- 1/2 cup honey
- 1/4 cup vegetable oil
- 3/4 teaspoon vanilla extract
- 3 egg whites, lightly beaten

DIRECTIONS

In a large bowl, mix together granola and dried fruit. In a small saucepan, heat honey, oil and vanilla over medium heat, stirring until honey is dissolved. Pour honey mixture over granola and mix until thoroughly coated. Pour egg whites over granola mixture; mix well. Pack mixture firmly into an 8-inch square nonstick baking pan. Bake at 325°F for 40 minutes or until deep golden brown. Place pan on a cooling rack; cool completely before cutting into squares, approximately 2-1/2-inches each.

NUTRITIONAL INFORMATION (PER SQUARE)

Protein: 4.54 g
Fat Total: 8.13 g
Sodium: 81.6 mg
Carbohydrates: 48.1 g
Calories from Fat: 26%
Cholesterol: 0 mg
Calories: 265
Dietary Fiber: 2.55 g

CLASSIFIEDS

Major Branzel has nucs for sale. He can be reached at 707-643-9433.

Judy Casale (510-881-4939) has a four-frame electric extractor and stand she's selling for $250.

MISCELLANEOUS

Lois Kail has kindly offered her renowned seamstress services to repair members' bee suits. Lois will donate the money she collects to the club. The only thing Lois asks is that before giving her your suits for repair, please wash them (wow, shouldn't that be obvious to us all?!). Contact her at 925 356-2602, or lkail@juno.com.

Steve Gentry (925-254-8063) is looking for help to sell his bee products (honey, creams, lotions, candles, etc) at several farmers markets.

BEEKEEPER TEACHER PREACHER

Where O Where Could My Mentor bee? Looking for a beekeeper interested in mentoring. I have one beehive in Danville and would like a mentor to do a hive inspection with me. In return, I will gladly participate in a hive inspection at their hive(s), help with honey harvesting, etc. Contact Karla at 925.200.0314 or email at giraphic@mac.com.

2009 BOARD NOMINATIONS

Here is the latest on the nominees:

President: Rick Kautch
Vice President: Bob Kelly
Secretary: Lois Kail
Treasurer: Jay Todesco
VP Community Ed: Judy Casale
VP Member Ed: Annie Bisbee
VP Membership: Richard Coleman
Past President: Stan Thomas
VP Newsletter : pool established

What are your talents and skills? If you would like to volunteer for an office, please contact Gary Lawrence at 925-932-2458, or Gary Eubanks at 925- 875-1871.

The Diablo Bee
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