

## OCTOBER 2008

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### September's speaker

Good news and bad news...  
No guest speaker this month. HOWEVER, you can look forward to participating in our club's award-winning barbeque. Pot luck instructions for last names beginning with:  
A to G: desserts  
H to R: salads  
S to Z: veggie side dish

### HIGHLIGHTS OF THIS ISSUE

EPA is Hiding Colony Collapse Disorder Information.....	2
Pesticide Build-up Could Lead to Poor Honeybee Health.....	3
Elephants' Fear of Angry Bees Could Help Protect Them.....	4
Leaderless Bees Can Organize, Undergraduate Research Shows.....	5
Recipe of the Month.....	7
Classifieds.....	8
Miscellaneous.....	8
2009 Board Elections.....	8

For the second time in seven months, member Bill Cervanka was called upon to be an 11<sup>th</sup> hour speaker when our scheduled guest speaker had to bow out at the last minute.

Bill gave us an excellent general discussion and demonstration on bee equipment and various chemical controls for bee pests.

### **WAY TO GO, BILL!**

Now, if we can only get Bill to stand still for a second to take a portrait photo of him, which will undoubtedly grace a future front page of our newsletter, because he will surely be called upon, yet again, to save the day!

### Next Meeting

*Important DATE!*

Our next meeting is October 9 at **6:30 pm** at the Heather Farm Garden Center in Walnut Creek. Annual BARBEQUE (see food instructions, bottom left of this page) and election of OFFICERS!

### *Announcements*

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Please send interesting bee articles via email to:  
[ersten3@yahoo.com](mailto: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:

[Kdeem@caleng.com](mailto:Kdeem@caleng.com)  
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.

## EPA is Hiding Colony Collapse Disorder Information



**EPA Buzz Kill: Is the Agency Hiding Colony Collapse Disorder Information? Natural Resources Defense Council, via Common Dreams, August 18, 2008**

WASHINGTON - August 18 - The Natural Resources Defense Council filed a lawsuit today to uncover critical information that the US government is withholding about the risks posed by pesticides to honey bees. NRDC legal experts and a leading bee researcher are convinced that the US Environmental Protection Agency (EPA) has evidence of connections between pesticides and the mysterious honey bee die-offs reported across the country. The phenomenon has come to be called "colony collapse disorder," or CCD, and it is already proving to have disastrous consequences for American agriculture and the \$15 billion worth of crops pollinated by bees every year.

EPA has failed to respond to NRDC's Freedom of Information Act request for agency records concerning the toxicity of pesticides to bees, forcing the legal action.

"Recently approved pesticides have been implicated in massive bee die-offs and are the focus of increasing scientific scrutiny," said NRDC Senior Attorney Aaron Colangelo. "EPA should be evaluating the risks to bees before approving new pesticides, but now refuses to tell the public what it knows. Pesticide restrictions might be at the heart of the solution to this growing crisis, so why hide the information they should be using to make those decisions?"

In 2003, EPA granted a registration to a new pesticide manufactured by Bayer Crop Science under the condition that Bayer submit studies about its product's impact on bees. EPA has refused to disclose the results of these studies, or if the studies have even been submitted. The pesticide in question, clothianidin, recently was banned in Germany due to concerns about its

impact on bees. A similar insecticide was banned in France for the same reason a couple of years before. In the United States, these chemicals still are in use despite a growing consensus among bee specialists that pesticides, including clothianidin and its chemical cousins, may contribute to CCD.

In the past two years, some American beekeepers have reported unexplained losses of 30-90% of the bees in their hives. According to the U.S. Department of Agriculture (USDA), bees pollinate \$15 billion worth of crops grown in America. USDA also claims that one out of every three mouthfuls of food in the typical American diet has a connection to bee pollination. As the die-offs worsen, Americans will see their food costs increase.

Despite bees' critical role for farmers, consumers, and the environment, the federal government has been slow to address the die-off since the alarm bells started in 2006. In recent Congressional hearings, USDA was unable to account for the \$20 million that Congress has allocated to the department for fighting CCD in the last two years.

"This is a real mystery right now," said Dr. Gabriela Chavarria, director of NRDC's Science Center. "EPA needs to help shed some light so that researchers can get to work on this problem. This isn't just an issue for farmers -- this is an issue that concerns us all. Just try to imagine a pizza without the contribution of bees! No tomatoes. No cheese. No peppers. If you eat apples, cucumbers, broccoli, onions, squash, carrots, avocados, or cherries, you need to be concerned."

Chavarria has spent more than 20 years studying bees, and has published a number of academic papers on the taxonomy, behavior and distribution of native bees.

NRDC filed the lawsuit today in federal court in Washington DC. In documents to be filed next month, NRDC will ask for a court order directing EPA to disclose its information about pesticides and bee toxicity.

More information on CCD can be found at NRDC's [www.BeeSafe.org](http://www.BeeSafe.org) web site.

*The Natural Resources Defense Council is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has 1.2 million members and online activists, served from offices in New York, Washington, Chicago, Los Angeles, San Francisco and Beijing.*

## PESTICIDE BUILD-UP COULD LEAD TO POOR HONEYBEE HEALTH



August 18, 2008, Penn State, Andrea Elyse Messer

Honey bees industriously bring pollen and nectar to the hive, but along with the bounty comes a wide variety of pesticides, according to Penn State researchers. Add the outside assault to the pesticides already in the waxy structure of the hive, and bee researchers see a problem difficult to evaluate and correct. However, an innovative approach may mitigate at least some beeswax contamination.

The researchers present their analysis of pollen, brood, adult bees and wax samples today (Aug 18) at the 236th national American Chemical Society meeting in Philadelphia. Those results show unprecedented levels of fluvalinate and coumaphos — pesticides used in the hives to combat varroa mites — in all comb and foundation wax samples. They also found lower levels of 70 other pesticides and metabolites of those pesticides in pollen and bees.

"Everyone figured that the acaricides (anti-varroa mite chemicals) would be present in the wax because the wax is reprocessed to form the structure of the hives," says Maryann Frazier, senior extension associate. "It was a bit of a shock to see the levels and the widespread presence of these pesticides."

While the researchers expected the presence of the chemicals available to treat varroa mites in the hives, the other pesticides' levels were also surprising. All of the bees tested showed at least one pesticide and pollen averaged six pesticides with as many as 31 in a sample.

"We already had in place ways to test for viruses, bacteria and fungi, but it was difficult to find an analytical laboratory that could analyze for unknown pesticides," says Christopher A. Mullin, professor of entomology. "We needed them to take a comprehensive look at all pesticides, not just those associated with beekeeping."

They eventually turned to the National Science Laboratory of the U.S. Department of Agricultural Marketing Service that already tests commodities such as milk and fruits and vegetables to allow them to meet national and international standards.

"When we began doing this work, honey was not regularly analyzed, and bee pollen was not a commodity and so was not analyzed," says Mullin. "We decided to go with the types of screening the lab does for milk and apples which look at over 170 pesticides. Now, honey is included in the commodities to be analyzed."

The researchers, including Roger Simonds, a chemist at the National Science Laboratory decided on a modified QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe) method because it uses smaller samples. They coupled this with gas and liquid chromatography to develop methods of analyzing pollen, bees and wax.

"Simplicity was important because there were many people across the country sampling for us," says Maryann Frazier. "Now rather than having them collect 15 grams of pollen they need only collect 3 grams."

The researchers note that this method also uses less solvent and generates data in the parts per billion range.

While beekeepers will have a difficult time controlling pesticide exposure outside the hive, the researchers tested a method for reducing the acaricide load in beeswax. Using gamma radiation from a cobalt 60 source housed at Penn State's Breazeale Reactor, they irradiated the sheets of beeswax that beekeepers use as the structural foundation for the bees to build their combs. They used radiation levels at the high end of that used to irradiate foods. Irradiation broke down about 50 percent of the acaricides in the wax.

"Gamma radiation is often used to kill viruses and other disease causing agents," says James L. Frazier, professor of entomology, Penn State. "Commercial irradiation firms usually decontaminate medical instruments or foods."

The researchers tried irradiation at a commercial plant and though some modifications were necessary to irradiate the wax sheets, it is possible. Some beekeepers already irradiate their equipment to get rid of any disease causing agents. However, it might be more efficient if the wax sheet supplier irradiated their product before sale to the beekeepers.

Beekeepers cannot manage the environmental pesticide contamination as easily as the wax contamination. The U. S. Environmental Protection Agency does regulate and monitor pesticides, but they do not have the ability to monitor the interaction of these chemicals. With the large number of pesticides found in bees and pollen, interactions are likely.

"We are finding fungicides that function by inhibiting the steroid metabolism in the fungal diseases they target, but these chemicals also affect similar enzymes in other organisms," says James Frazier. "These fungicides, in combination with pyrethroids and/or neonicotinoids can sometimes have a synergistic effect 100s of times more toxic than any of the pesticides individually."

For CCD, bees are not dying in their hives, but are not returning to their hives. James Frazier notes it is difficult to observe bees outside the hive. The U.S. EPA only looks at acute exposure to individual pesticides, but chronic exposure

may cause behavioral changes that are unmonitored.

"We do not know that these chemicals have anything to do with Colony Collapse Disorder, but they are definitely stressors in the home and in the food sources," says Dr. Frazier. "Pesticides alone have not shown they are the cause of CCD. We believe that it is a combination of a variety of factors, possibly including mites, viruses and pesticides."

The researchers, who also include Sara Ashcraft, research assistant, have a team uniquely suited to looking at the honey bee pesticide problem because they combine a toxicologist in Mullin, a physiologist in James Frazier and someone with connections to beekeepers across the country in Maryann Frazier.

"We now want to look at small versus large operations and organic versus non-organic operations to see if there are differences," says Maryann Frazier.

**ELEPHANTS' FEAR OF  
ANGRY BEES COULD  
HELP PROTECT THEM**



*Science Daily*

At a time when encroaching human development in former wildlife areas has compressed African elephants into ever smaller home ranges and increased levels of human-elephant conflict, a study in *Current Biology*, suggests that strategically placed beehives might offer a low-tech elephant deterrent and conservation measure.

The researchers found that a significant majority of African elephants fled immediately after hearing the sound of bees, providing "strong support" for the idea that bees, and perhaps even their buzz alone, might keep elephants at bay. By contrast, the elephants ignored a control recording of natural white-noise, the authors reported.

"We weren't surprised that they responded to the threatening sound of disturbed bees, as elephants are intelligent animals that are intimately aware of their surroundings, but we were surprised at how quickly they responded to the sounds by running away," said Lucy King of the University of Oxford. "Almost half of our study herds started to move away within 10 seconds of the bee playback." King is also affiliated with Save the Elephants, a Kenya-based organization that aims to secure a future for elephants.

Earlier studies had suggested that elephants prefer to steer clear of bees. For instance, one report showed that elephant damage to acacia trees hosting occupied or empty beehives was significantly less than in trees without hives, the researchers said. In Zimbabwe, scientists have also seen elephants forging new trails in an effort to avoid beehives.

In the new study, the researchers tested the response of several well-known elephant families in Kenya to the digitally recorded buzz of disturbed African bees. Sixteen of the 17 families tested left their resting places under trees within 80 seconds of hearing the bee sound, the researchers reported, and half responded within just 10 seconds. Among elephants hearing the control sound, none had moved after 10 s, and only four families had moved after 80 s. By the end of the 4 min sound playback of bee buzz, only one elephant family had failed to move, whereas eight families hearing the control sound had not moved.

This behavioral discovery suggests that bees might very well be a valuable addition to the toolbox of elephant deterrents used by farmers and conservation managers across Kenya, King said. She added that such innovative approaches are sorely needed "to avoid extreme solutions such as shooting problem animals."

She cautioned that the use of beehives to shoo elephants away might prove to have limited application and that more research is needed if we are to understand its effectiveness. "But if we could use bees to reduce elephant crop raiding and tree destruction while at the same time

enhancing local income through the sale of honey, this could be a significant and valuable step towards sustainable human-elephant coexistence."

The researchers include Lucy E. King of the Department of Zoology, University of Oxford in Oxford and Save the Elephants in Nairobi; Iain Douglas-Hamilton of Save the Elephants in Nairobi; and Fritz Vollrath of the Department of Zoology, University of Oxford in Oxford and Save the Elephants in Nairobi.

This work was supported by ESRC/NERC, The Wingate Foundation and Save the Elephants.

LEADERLESS BEES CAN  
ORGANIZE, UNDER-  
GRADUATE RESEARCH  
SHOWS



*Science Daily*

Undergraduate education generally involves acquiring "received knowledge" -- in other words, absorbing the past discoveries of scholars and scientists. But University of North Carolina at Charlotte senior biology major Andrew Pierce went beyond the textbooks and uncovered something previously unknown.

Pierce's discovery has to do with detecting a significant new detail concerning the behavior of the European honeybee -- perhaps the most studied and economically important insect on Earth. Beyond agriculture, the finding may also have key implications for understanding the dynamics of all social animals, including man.

Pierce's recently reported his research in an article appearing in the behavioral biology research journal *Ethology*, with co-authors Lee Lewis and UNC Charlotte biology professor Stanley Schneider, Pierce's mentor. Pierce was first author on the paper -- a rare achievement for an undergraduate.

"It was a very good work and an impressive achievement for a student researcher -- he got a

publication as an undergraduate," Schneider noted. "I really like working with our undergraduate honors students -- they are so bright."

Pierce, age 22, has been working as a researcher in Schneider's lab for the past two years through a UNC Charlotte Honors College program that fosters research experiences for undergraduates.



*Using an ingeniously designed experiment, Pierce and his co-authors were able to document details of bee social behavior that fundamentally confirm the hypothesis that major colony activities are initiated by the cumulative group actions of the colony's older workers, not by the queen's individual decision. (Credit: iStockphoto/Simon Smith)*

Using an ingeniously designed experiment, Pierce and his co-authors were able to document details of bee social behavior that fundamentally confirm the hypothesis that major colony activities are initiated by the cumulative group actions of the colony's older workers, not by the queen's individual decision.

What Pierce and colleagues found was that older workers gave signals to the queen and to the rest of the colony that it was time to swarm and leave the hive. Later, they were able to observe inside the swarm itself and see workers give the queen a signal, known as "piping" that tells her to fly.

"Researchers have never reported worker piping being done on the queen before, so some of what we found was exciting," Pierce said. "It was generally surprising to see the level of interaction that the older bees have with the queen. This doesn't normally happen in the hive," he noted.

"It's interesting because it shows that though the queen has a tremendous impact on the colony, she's not the decision maker," Schniieder said. "The colony is not a dominance hierarchy and, from a human perspective, this is unusual. Our human society is very dominance hierarchy structured --we have centralized systems of control. But bee colony systems of control are very different -- they are totally de-centralized."

Schneider's lab studies the honeybee and its behavioral ecology. Like humans, honeybees are remarkable for living in large organized groups where highly developed social behaviors coordinate the efforts of thousands of individuals to accomplish complex tasks -- manufacturing, community defense, environmental control and maintenance, food production, brood-rearing and education. Like human civilizations, bee societies follow organizational principles, such as following social rules (like human customs and laws) and division of labor.

But here the similarity ends. Bees do not have large brains and are not capable of complex thought like humans. Though the bee colony is centered around the queen and her reproductive capabilities, findings by Schneider and others indicates that she does not exactly "rule." Instead, the colony appears to be controlled by the anonymous consensus of the colony's workers.

Though it is of great interest to researchers studying social behavior, a great mystery still remains regarding how bee societies effectively direct and coordinate complex operations without a central controlling intelligence. Pierce's finding is part of an ongoing research effort in Schneider's lab aimed at understanding the mechanisms of leaderless societal management -- in particular, the importance of two communication-related behaviors known as the "vibration signal" and "worker piping."

Different from the famous "waggle dance" that foraging worker bees perform to tell other bees where to find a food source, the vibration signal appears to be a more general, multi-purpose form of communication. Schneider has concluded that this signal, which consists of one bee grabbing another bee (worker or queen) and

then vibrating its body, does not convey a specific message, but instead is a form of "modulatory communication" that alters existing bee behaviors (making bees perform their jobs more actively, perhaps) or changes bees response to other signals.

Pierce and Schneider have documented in their current paper how workers use the vibration signal to prepare the queen for swarming by making intrusions into her "court" and vibrating her hundreds of times an hour. She responds by changing her behavior -- reducing her food intake, slowing egg laying and becoming more active. At this point, the workers begin to send a second signal that researchers call "worker piping" at a fevered pitch. Piping, which consists of bees making contact and vibrating their wing muscles rapidly, appears to be a general instruction to fly.

The researchers document that the workers stop using the vibration signal when the queen flies and leaves the nest with the swarm. Piping, however, continues in the swarm, as the bees need to make the queen fly again once a new nest site has been selected.

"Drew Pierce did this project last summer," Schneider explained. "We constructed a special observation stand where we could actually see how workers were interacting with queens inside a swarm cluster, where they are hanging in a tree. That was really interesting, because nobody had ever really been able to look at that before," he noted.

"What was interesting was how little attention the workers pay the queen -- until it became time to go -- to become airborne. Then they started interacting with her at very high rates, and performing the 'worker piping' signal on her. This interaction is a behavior that nobody had described before," Schneider said.

Contrary to the popular conception of a colony controlled by instructions from its breeding queen mother, the research shows a picture of the queen as a passive egg layer whose own behavior is programmed, with changes dictated by signals delivered by older workers.

This does not mean, however, that the colony is controlled by a key group of experienced bees either. The worker bees that deliver the critical signals have short life-spans and tiny brains incapable of managing the colony the way a human village might be managed by a council of elders. Instead, critical strategic choices, such as the assessment that it is time to divide the colony and swarm, appear to be decided by the dynamics of the group itself. Social interactions, environmental pressures or group dynamics in some still-unknown way initiate a string of behaviors that effectively manage complex group activities.

"It is a real challenge to understand how bee colonies work, but it is also fascinating because they are so different. Evolutionarily, they got to the same point as humans -- living in these highly organized societies that function with remarkable efficiency -- but they are organized so differently when you start digging into them," Schneider said. "It's interesting that these major differences can result in the same emergent social properties. It may tell us something about ourselves."

## RECIPE OF THE MONTH

### Chicken Fingers with Honey Sauce

- 1 cup honey
- 1 cup prepared spicy brown mustard
- 1 cup all-purpose flour
- 1 cup fresh bread crumbs
- 1 teaspoon salt
- 1/2 teaspoon pepper
- 1/2 teaspoon garlic, granulated
- 4 lb. boneless, skinless chicken breasts, cut in 3x1x1/2-inch strips

Combine honey and mustard; mix well. Combine flour, crumbs, salt, pepper and garlic; mix well. Dredge chicken strips in flour-crumbs mixture; shake off excess. Deep-fry in 375°F oil about 1-1/2 minutes or until completely cooked and golden brown.

## CLASSIFIEDS

Top Bar Beehives for sale, \$200/hive during October only. Contact Peter at 707-577-0589, or email at [pmfallon@hotmail.com](mailto:pmfallon@hotmail.com) for photos and info.

## MISCELLANEOUS

**BARBEQUE RAFFLE:** As always, the best raffle occurs at this meeting! Contact Lois Kail at [lkail@juno.com](mailto:lkail@juno.com) if you have items to donate. They don't have to be bee-related. This evening is going to be such great fun for both new and experienced members!

Currently, only one of three of our club's honey extractors is operational. Contact Stan Thomas at [honeymanstan1@netzero.net](mailto:honeymanstan1@netzero.net) if you need it.

## 2009 BOARD ELECTIONS

Voting will occur at the October General Meeting. Nominees are:

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

If you would wish to put your name in for any position as a write-in candidate, please contact Gary Lawrence at 925-932-2458, or Gary Eubanks at 925- 875-1871 prior to the October General Membership meeting.

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