



# The Diablo Bee

Newsletter of the Mount Diablo Beekeepers Association

## AUGUST 2008

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### August's guest speaker

*Our very own Mary Andre will do a presentation on top-bar hives.*

### HIGHLIGHTS OF THIS ISSUE

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We all appreciated Nathaneal Beach's informative, yet sobering, discussion on the perils of the inevitable invasion of the small hive beetle into California, and how to prepare and defend our beehives against this persistent invader.

### Meetings

*Important DATE!*

Our next meeting is August 14 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](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.

\*\*\*\*\*

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.

## Stopping, but Can't Smell the Roses?



### TWO ARTICLES ON THIS RECENTLY DISCOVERED PHENOMENON

## Scentless Spring? Flower Smells Blocked by Pollution

Brian Handwerk for [National Geographic News](#) April 11, 2008

Soon it may be harder to stop and smell the roses.

Growing levels of air pollution from power plants and automobiles have reduced the potency of flower fragrances by up to 90 percent as compared with pre-industrial levels in the United States, a new study has found.

The trend is unpleasant for human noses, but may be life-threatening for pollinators such as bees and butterflies.



"Many insects find flowers by detecting the scent produced by those flowers," said study lead author Jose D. Fuentes, an environmental scientist at the University of Virginia in Charlottesville.

"This [pollution] makes it increasingly difficult for pollinators to locate the flowers [and feed on their nectar]."

Flowers also stand to suffer when this symbiotic relationship falters.

If insects can't find enough flower-based food to survive, their movements won't pollinate plant species.

## Overwhelming Ozone

Flowers produce volatile scent molecules that bond with pollutants such as ground-level ozone, in the process breaking down the plants' sweet smell.

With more pollution in the air, the aromatic molecules don't remain potent as long and travel shorter distances on the wind.

The new study's model suggests that in the mid-19th century, when pollution levels were first recorded, scent molecules would have been able to travel some 3,300 to 3,900 feet (1,000 to 1,200 meters).

Today, in the polluted air found downwind of large metropolises, scents may only make it some 650 to 980 feet (200 to 300 meters).

The impact is especially pronounced during high-pollution "code red" days in summer.

"Lots of vehicles are releasing nitrogen oxides," Fuentes said. "When [the gases] are in the presence of sunlight they are converted into these molecules that we call ozone -- one of the main pollutants that we find in the eastern U.S. in the summer months.

"Fragrances are overwhelmed by it."

Fuentes and colleagues published their findings recently in the journal *Atmospheric Environment*.

## Bad News For Bees?

With bee populations dropping dramatically in many parts of the world, could these missing scents be a factor?

Scientists trying to pinpoint the cause of bee declines have variously blamed viruses, mites, bacteria, pesticides, and even cell-phone radiation.

Jay Evans, an entomologist at the U.S. Department of Agriculture's bee research laboratory in Beltsville, Maryland, was intrigued by the new study but hasn't seen bee behavior that suggests trouble with scents.

"Over the last couple of summers I don't think the bees in this area were bringing in much less food," he said.



"It might be that they had to work harder, but it seems like as long as there were bees to collect food they were finding flowers somewhere."

Evans also noted that beekeepers didn't report big drops in their honey yields, which would have occurred had food been harder to find.

But lead author Fuentes fears that the fading smell of flowers may stress insects already faced with an array of other threats.

"The [effects shown in] these studies will simply exacerbate whatever the bees are going through right now," he said.

"It's something that is really worthwhile paying attention to."

## Flowers are Losing Their Smell

By LeeDye April 16, 2008

Air pollution is killing the smell of flowers, possibly eliminating the "scent trail" that helps guide those terribly important pollinators, like bees, to the plants that depend upon them for survival, scientists believe.

The discovery could be one of several factors in the "colony collapse disorder" that is wiping out honey bees around the world.

While it is still too soon to determine the full impact of air pollution on the symbiotic relationship between insects and the flowers they pollinate, researchers at the University of Virginia are confident they have shown that pollutants are killing the scent trail, and that could turn out to be extremely significant.

Before the industrial revolution, the trail extended at least half a mile from the flower, but today at that distance "it's almost completely destroyed," said Quinn McFrederick, a doctoral candidate in biology at the university and lead author of a study that in the current issue of the journal *Atmospheric Environment*.

Scientists have known for some time that airborne chemicals like ozone, hydroxyl and nitrate radicals -- major components of smog -- alter the chemicals produced by flowers that give them a specific smell. But it had not been known how that affected the trail that helps lead insects to the flowers.

Scents that could travel for more than half a mile in the 1800s now probably travel less than about 600 feet, according to Jose D. Fuentes, professor of environmental sciences at the university and a co-author of the study.

"This makes it increasingly difficult for pollinators to locate the flowers," Fuentes said.

In a telephone interview, McFrederick said that the scent trail deteriorates even very close to the flowers, and that could discourage insects, especially bees and moths, from even sampling the flower to see if it contains the nectar they need for survival. And if they pass up the flower, it will not receive the pollination it needs. So both the pollinator and the pollinated suffer.

At this point the research consists of a mathematical model into which the researchers inserted the known impact of various pollutants on the molecules carrying the scent. They then extrapolated out to various distances to see how much of an impact that would have. But the findings haven't been tested in "the real world,"

McFrederick said. He and his colleagues hope to do that soon.

The findings are intriguing, but no one knows just yet how significant they really are.

"We don't know an awful lot about how insects actually use these scent trails," he said. It's unknown how much of a scent is required for the insect to detect it, and no one knows yet if new chemicals produced by the reaction between scent molecules and air pollution can also be detected by insects. But what is known is that scent is important in the overall pollination process.

Bees and many other insects depend primarily on vision to find flowers. But the researchers believe that scent, detected at a considerable distance from the flowers, may tell the insects the general direction of the flowers. So insects travel in that direction until they actually see the flowers, and then depend on scent somewhat to decide which flowers to visit. Some other insects, like nocturnal moths, must depend very heavily upon scent, McFrederick said.

And if that's the case, "plants that don't depend on animal pollinators would do better than plants that do depend on animal pollinators," he added. "Plants that can be pollinated by the wind, or plants that can pollinate themselves, might be expected to do better and their populations to be proportionally larger in areas where there is lots of pollution."

Two years ago an international team reported that a 25-year study had found just that in the Netherlands and parts of Great Britain. When the bee population declined, so did the plants that the bees pollinate.

"In Britain, pollinator species that were relatively rare in the past have tended to become rarer still, while the commoner species have become even more plentiful," Stuart Roberts of the University of Reading said at the time. "Even in insects, the rich get richer and the poor get poorer."

That trend has not been documented yet in the United States, but there is no debate about the decline in pollinators. In the last 50 years the bee population that farmers depend upon for pollination has declined by 50 percent, according

to one study. The decline in bees has been blamed chiefly on diseases spread by mites and viruses, as well as pollution and pesticides.

Now, scientists may be able to add another element to the equation. The sweet aroma coming from flowers isn't as strong as it once was, and that's probably happening all over the globe.

## Detecting Poisons In Nectar



Though many spring flowers have bright advertisements offering sweet rewards to honeybees, some common flowers have not-so-sweet or even toxic nectars.

Why plants would try to poison the honeybees they wish to attract is a scientific mystery. The honeybee, which accounts for the pollination of at least 1/3 of the world's crop plants, may encounter such poisoned nectar in common crop and garden plants such as rhododendrons and almond trees.

Can honeybees learn whether nectar contains toxins, and does this influence their ability as pollinators? Dr Geraldine Wright (Newcastle University) presented data on how toxins in nectar affect a honeybee's willingness to eat floral nectar at the Society for Experimental Biology's Annual Meeting in Glasgow.

Honeybees are very clever and can learn to associate almost any color, shape, texture or scent with food. The newly-sequenced honeybee genome has revealed that honeybees do not have as many genes for taste receptors as other animals of a similar size, such as flies and mosquitoes. This prompted scientists to think that perhaps honeybees had a reduced need to detect and learn about toxins, despite the fact that some floral nectar contains toxins. Work carried out by Dr Wright and colleagues suggests that honeybees may have the ability to react to toxins, even if they cannot taste them.

Researchers found that both the sugar content and the toxins in nectar affected a honeybee's memory for learned odors. Honeybees learned not to respond to odors associated with toxins within 20 min of eating toxins, and would retain this ability up to 24 hours after eating a toxin. This suggests that honeybees can react to toxins in nectar, but that this ability may mainly be after they have ingested the toxins.

## The Cost of Long Tongues



Orchid bees use their extraordinarily long tongues to drink nectar from the deep, tropical flowers only they can access. Researchers have long suspected that this kind of exclusive access came with a mechanical cost. According to common sense and a classic law of fluid mechanics, it's just plain hard to suck thick, viscous nectars up through a long straw.

Now, Brendan Borrell at the University of California, Berkeley has confirmed this prediction for the first time: orchid bees with long tongues suck up their nectars more slowly than bees with shorter tongues.



Borrell spent three years collecting bees in forests all over Costa Rica and Panama and measuring their feeding rates at artificial flowers. He found that the smallest bees sometimes had the longest tongues and the largest bees

sometimes had the shortest tongues. But after taking into account all that variation in body size, he says long tongues really do impose a mechanical cost on bees. Everyone knows just how busy bees can be, but orchid bees are basically sacrificing speed at flowers for exclusive access to them. Borrell thinks this may be because the rewards at these flowers can be tremendous, up to ten times the quantity of nectar provided by typical bee flowers.

## Honeybee Dance Breaks Down Cultural Barrier



Asian and European honeybees can learn to understand one another's dance languages despite having evolved different forms of communication, an international research team has shown for the first time.

The nine species of honeybees found worldwide separated about 30 to 50 million years ago, and subsequently developed different dance 'languages'. The content of the messages is the same, but the precise encoding of these languages differs between species.

Now researchers from Australia, China and Germany have discovered that the two most geographically distant bee species -- the European honeybee *Apis mellifera* and the Asian honeybee *Apis cerana* -- can share information and cooperate to exploit new food sources.

"We know that the members of a honeybee colony routinely exchange information via dance about the location of newly discovered locations, like feeding places, water or new nesting sites," explains Dr Shaowu Zhang from the Research School of Biological Sciences at The Australian National University.

"The scouts perform the so-called bee dances inside the nest. The coordinates of distant locations are encoded in the waggle phase of this ballet, with the direction and distance to the food source indicated by the orientation and

duration of the dance. This duration differs across honeybee species, even if they fly the same distance in the same environment. It's these differences which we can think of as distinct languages."

The research team is the first to successfully study the behavior of a colony containing a mixture of two different species of bees. One of the first findings of this novel approach was that Asian and European honeybees, after some time of adjustment in the mixed colony, could share information and work together to gather food. Asian honeybees followed the dances of European forager bees, and deciphered the encoded information correctly.



*The yellow circle indicates the Acc queen. Blue and green arrows indicate Aml and Acc workers, respectively. The mixed-species colony was organized as follows: we put two sealed Aml brood frames with about 5,000 pupae into a healthy Acc colony containing two frames, honey, pollen, brood, ~5,000 workers and one queen. The mixed-species colony had around 5,000 workers each of Acc and Aml after 12 days.*

"The dance language of honeybees is among the best studied communication systems in the animal kingdom. Nevertheless, surprises are still possible, as we have shown," Dr Zhang said.

"This work has potentially major implications for our understanding of animal communication. Next we plan to study exactly to what extent variation is a factor between different bee dance languages."

The research was carried out by an international collaborative team. In addition to the work done at ANU, the research team included Dr Shenglu Chen and Songkun Su from Zhejiang University

in China and Dr Jürgen Tautz from Würzburg University in Germany.

## Beekeepers of the Bay Area



An open letter to our members by author Judith Adamson:

I'm writing a book called *The Backyard Beekeepers of the Bay Area*. It originally started as *The Rogue Beekeepers of Kensington* because beekeeping is illegal in Kensington, but there are a devoted bunch of beekeepers there, anyway. One beekeeper led to another and I decided to expand the book to the whole East Bay and San Francisco.

The book is an attempt to raise awareness about pollinators and specifically honeybees. It will talk about all aspects of bees -- the history of beekeeping, how honeybees came to CA, CCD, the fascinating social structure of the hive, architectural wonder of the physical hive, health benefits of honey, etc. I've also interviewed eight beekeepers from Oakland, Berkeley, El Cerrito, Kensington and San Francisco, and will put their personal stories about how they became beekeepers and any philosophical observations they've had, into the book to really personalize it.

I saw the article in the West Contra Costa Times today and thought that I'd contact the Mt. Diablo Beekeepers Association. I actually had e-mailed Stan Thomas months ago when I started this project but never heard back from him. Perhaps I had the wrong email address. I'd like to open the book up to more beekeepers if they have any interest in writing a short piece (1000-1500 words) about their experience. I'm looking for the unique, the poetic, the philosophical, the awesome, the inspirational.

For example, one beekeeper told how he had called someone to take away a swarm, got roped into holding the box while the swarm remover knocked the swarm down, how they swarmed on him and how he stood frozen

between fear and awe. The swarm finally followed the queen into the box and his experience changed his life forever.

Or the beekeeper who longs for the time she'll try extracting the honey without wearing her bee suit. She's heard from other beekeepers that the feel of the bees on your skin is just the softest, gentlest of feelings.....and she wants to feel that.

Is there a way I could send an email to your members? Or could you forward this to them?

I can be reached at [jkadamson@comcast.net](mailto:jkadamson@comcast.net) or 510-528-4346.

Thank you very much,  
Judith Adamson

## NEWBEE NUGGETS

### PRESERVING POLLEN

Unlike honey, pollen will spoil. All pollen should be frozen to kill wax moth eggs and larvae. If you are using pollen for personal use, frozen is best. It has twice the kick of dried pollen. If you plan to sell it, it is best to freeze it then dry it to avoid spoilage, including botulism. You can collect and freeze the pollen, then dry it in a food dehydrator with a sheer strainer cloth on the trays (thermostat set at 95 degrees F). The pollen is then poured between 2 vessels (a small bowl into a large salad bowl) works well), with a fan blowing over the lower bowl. The fan will blow away chaff and pollen dust leaving you nice granules to bottle and sell. You can clean 15 lbs or so an hour this way. Once you do it you can adjust the fan speed and angle to work pretty efficiently for you.

One of the most interesting facts about bee pollen is that it cannot be synthesized in a laboratory. When researchers take away a bee's pollen-filled comb and feed her manmade pollen, the bee dies even though all the known nutrients are present in the lab-produced synthesized food. Many thousands of chemical analyses of bee pollen have been made with the very latest diagnostic equipment, but there are still some

elements present in bee pollen that science cannot identify. The bees add some mysterious "extra" of their own. These unidentifiable elements may very well be the reason bee pollen has been reputed to work so spectacularly against so many diverse conditions of ill health.

## RECIPE OF THE MONTH

### HONEY LEMON JELLY

-Makes 2 pints-



Ingredients:

- 5 to 6 lemons
- 2-1/2 cups honey
- 1 package (3 oz.) liquid pectin

Directions:

Grate rind from lemons to measure 4 teaspoons; set aside. Squeeze juice from lemons to measure 3/4 cup. Pour lemon juice through fine strainer, discarding seeds and pulp. Combine the rind, juice and honey into a 6-quart saucepan, stirring well. Bring the mixture to a rolling boil over high heat, stirring constantly. Quickly stir in the pectin. Return the mixture to a rolling boil, and boil, stirring constantly, for 1 minute. Remove from the heat and skim off the foam with a metal spoon, if necessary. Pour the jelly quickly into 2 hot, sterilized pint jars, filling to 1/4 inch from the top. Wipe the jar rims and cover immediately with metal lids and screw-on bands. Process the jars in a boiling water bath for 5 minutes. Cool the jars on wire rack.

## 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.

## SEEKING NEW BOARD MEMBERS

Gary Lawrence and Gary Eubanks, the Nominating Committee for the 2009 MBDA Board, are developing a slate of officers to present at the September meeting, with elections to follow at the October barbecue meeting.

The following board members have agreed to continue serving in 2009: President, Rick Kautch; Secretary, Lois Kail; VP Community Education, Judy Casale; and VP Member Education, Rich Coleman. The following board members are retiring: 1st VP, Tom Lewis; Treasurer, Jeff Peacock; VP Membership, Kim Deem; and VP Newsletter, Ersten Imaoka.

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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