CENTRAL COAST BEEKEEPERS NEWSLETTER

April 2022

Issue number 69

NEXT MEETING May 25, 2022

PRESIDENT'S MESSAGE

By Pat Wackford

What a difference between this spring and last spring. With current high temps in the in the 40s, I don't see many bees flying. Whenever there is a rain break, I try to get out to make a quick check of the sugar syrup feeders. All seems to be well so far but it's definitely too cold to do an assessment of the colonies.

Some of you may have gotten your package bees or Nucs by now or will very soon. Be sure to start feeding them immediately. Be sure the Queen is laying eggs in a couple weeks and do mite checks and medicate 4 weeks before the honey flow You should check the hives every 8-12 days

Good news is my knee is doing better with Physical Therapy and I should be able to do a hive check as soon as the temps get into the 50s. Hopefully by next week. The fruit trees in the yard are on hold and there is very little blooming in my area, although the Big Leaf Maple is producing a lot of pollen between rain storms.

March Meeting Highlights

Our second in-person meeting of the year was last month. (Remember, we are meeting in odd numbered months this year and the next meeting is May 25th.) Here are a few of the topics we discussed.

1. Types of bees and members experience with them: Italians build up quickly, Carniolans are slower. Buckfast does well in the cold. Russian/Caucasian need more attention because they move faster.
2. Spring inspection:
    a. Do the bees have enough food
    b. Is brood spotty – a new queen may be warranted
    c. Check for mites before honey flow
    d. Check the location of your brood – if it is ALL in the top box, move it to the bottom and put an empty box on top
3. Swarm control
    a. Give the bees plenty of room
    b. Look for queen cells and queens (see next article)
    c. Set up a catch hive
4. Volunteers needed for upcoming events:
    a. Florence Garden Club plant sale: May 7
    b. Lincoln County Fair: July 1-3
    c. To volunteer, contact the club by sending an email to: centralcoastbeekeepers@gmail.com

Two queens in one hive

by Rusty from Honey Bee Suite

Although we are taught that two queens can't survive in one hive, it happens frequently. It occurs most often when a supersedure cell hatches while the original queen is still alive. The virgin daughter hatches, mates, and begins to lay eggs right alongside her mother. This is usually a temporary situation, but it can persist for weeks or even months.

Based on my own experience, I think it happens more frequently than we realize. We often search for the queen and then quit looking once we find her—assuming there is only one. With that assumption, it is easy to miss the second one.

The photos below came from a hive getting ready to swarm. Many swarm cells were lined up on the combs and some had already hatched. It's possible that one of these

is a newly-hatched virgin. The more yellow of the two (the first photo) was both smaller and quicker, signs of a possible virgin. Although a hive usually swarms before the virgins hatch, cold and rainy weather may have kept the swarm from leaving on time.

The first queen I found in this hive. She was small with a light-colored abdomen.

The second queen was larger with a darker abdomen.

A new breed of honey bees provides a major advance in the global fight against the parasitic *Varroa* mite

The invasive mite, which has spread to all continents except Australia and Antarctica, has been the prime threat to honey bees since its initial expansion 50 years ago.

In the study -- by the universities of Louisiana and Exeter, and the Agricultural Research Service of the US Department of Agriculture (USDA) -- "Pol-line" bees, bred for resistance to the mite in a rigorous 20-year breeding program, were trialed alongside a standard variety in a large-scale pollination operation.

The mite-resistant bees were more than twice as likely to survive the winter (60% survival compared to 26% in standard honey bees). While the standard honey bees experienced high losses unless extensive chemical miticide treatments were used.

"The *Varroa* mite is the greatest threat to managed honey bee colonies globally," said Dr Thomas O'Shea-Wheller, of the Environment and Sustainability Institute at Exeter's Penryn Campus in Cornwall.

"So far, new methods to control the mites -- and the diseases that they carry -- have had limited success, and the mites are becoming increasingly resistant to chemical treatments. It's a ticking time-bomb.

"By selectively breeding bees that identify and remove mites from their colonies, our study found a significant reduction in mite numbers, and crucially, a two-fold increase in colony survival.

"While this is the first large-scale trial, continued breeding and use of these bees has shown consistently promising results.

"This kind of resistance provides a natural and sustainable solution to the threat posed by *Varroa* mites, and does not rely on chemicals or human intervention."

The study took place across three US states (Mississippi, California, and North Dakota), where commercial beekeepers move tens of thousands of colonies annually to provide pollination for large-scale agriculture.

Varroa mites originated in Asia, so European honey bees (the most common species kept for pollination) have not evolved alongside them, and therefore lack effective resistance.

Like humans, managed bees are largely "decoupled" from natural selection, Dr O'Shea-Wheller said, so they cannot develop resistance like they might in the wild.

However, managed bees sometimes respond to mites (which reproduce in the cells of bee larvae) by expelling infested larvae -- killing both the larvae and the mites, in a behavior known as *Varroa*-sensitive hygiene (VSH).

By selectively breeding for this trait, colonies can be produced that automatically protect themselves from infestation, while maintaining large colony sizes and ample honey production.

"The great thing about this particular trait is that we've learned honey bees of all types express it at some level, so we know that with the right tools, it can be promoted and selected for in everyone's bees," said research molecular biologist Dr Michael Simone-Finstrom, of the USDA Agricultural Research Service.

Colony survival over the winter is particularly important for beekeepers, because honey bees are in high demand in the early spring -- a key time for pollinating high-value crops such as almonds.

The study also examined levels of viruses associated with *Varroa* mites in bee colonies.

The colonies bred for *Varroa* resistance showed lower levels of three major viruses (DWV-A, DWV-B, and CBPV).

Interestingly however, when examined separately from levels of mite infestation, these viruses were not strong predictors of colony losses.

"A lot of research is focused on the viruses, with perhaps not enough focus on the mites themselves," Dr O'Shea-Wheller said.

"The viruses are clearly important, but we need to take a step back and be rigorous in delivering the best practical outcomes, because if you control the mites, you automatically control for the viruses that they transmit."

Dr O'Shea-Wheller said bee breeding and testing is expensive and takes time, but that breeding mite-resistant bees is cost-effective in the long term, and is likely to be the only sustainable solution to deal with the *Varroa* pandemic.

The study was funded by USDA.

Story Source:

Materials provided by **University of Exeter**. *Note: Content may be edited for style and length.*

More on Asian Hornets

The world's largest hornet has been the focus of extensive news coverage of late due to its menacing appearance and expanding footprint in North America.

But while the "murder hornet" label attached to the Asian giant hornet (*Vespa mandarinia*) may be an overdramatization of its danger, researchers agree that the invasive species is destructive and threatens North American bee populations and millions of dollars in crop production. Because honey bees offer few defenses, giant hornets can rapidly destroy entire bee colonies.

"My usual plea is that people should stop calling them 'murder hornets' because they are large and perhaps frightening but not truly murderous," said James Nieh, a Division of Biological Sciences professor and bee researcher at the University of California San Diego. "They are amazing social insects, but they don't belong in North America and harm our critical bee populations, so we should remove them."

But *how* to eliminate them is not clear. Even knowing where they occur -- thus far reported in Canada and the Pacific Northwest -- has been difficult to determine.

As one possible solution, Nieh his colleagues in China have developed a method for identifying the Asian giant hornet's presence and possibly accelerating its removal. In the journal *Current Biology*, the researchers reveal the identification of three major components of the Asian giant hornet queen's sex pheromone, an achievement that could be used as bait to trap and track the insects. Using gas chromatography and mass spectrometry, along with experiments spanning two years, Nieh and his colleagues identified the major chemicals in the sex pheromone as hexanoic acid, octanoic acid and decanoic acid, compounds that can be readily purchased and deployed immediately in the field.

In a previous study, Nieh and his colleagues used a comparable approach to identify the female sex pheromone of a related Asian hornet species (*Vespa velutina*). In their new study, the researchers placed traps near hornet nests, locations where they typically mate, and captured only male hornets, but no females or other species. During their experiments the scientists tested the hornet's neural activity and found that male antennae are highly sensitive to the pheromone.

"The males are drawn to the odors of the females since they typically mate with them near their nests," said Nieh. "In two field seasons we were able to rapidly collect thousands of males that were attracted to these odors."

Scientists are not clear how Asian giant hornets first came to North America. In recent years they have been documented in British Columbia and Washington state, while modeling simulations indicate they could rapidly spread throughout Washington, Oregon and possibly the eastern U.S.

Although the experimental pheromone hornet traps were set close to bee colonies, Nieh hopes they can be deployed in multiple field locations to evaluate whether they can chemically attract the hornets over distances of a kilometer or more.

"Because these pheromone-based traps are fairly inexpensive I think they could be readily deployed for sampling across a large geographic range," said Nieh. "We know where they have been found, so the big question is whether they are expanding. Where is that invasion front?"

Instead of patenting the identification of the sex pheromone, Nieh and his colleagues decided to publish their findings as quickly as possible in hopes of providing a possible solution to help document the hornet's spread. As more pheromone bait traps are deployed, a map could emerge along with predictive models to assess where and how rapidly they are spreading.

"We hope that others, especially in invaded areas, will take the protocol we have established and test this method," said Nieh. "We've described the chemical blends needed for these traps, which could reduce the number of males available to mate with females to help depress the population but primarily would help us figure out where they are."

Nieh's coauthors on the *Current Biology* study include Shihao Dong and Ken Tan of the Chinese Academy of Sciences and Aili Sun of Yunnan Agricultural University.

Video of honeybees forming heat ball defense: https://youtu.be/vdald3H5c90

Story Source:

Materials provided by **University of California - San Diego**. Original written by Mario Aguilera. *Note: Content may be edited for style and length.*

Wallace's Giant Bee

By Oliver Milman

WHILE WORKING AS A curatorial assistant at the American Museum of Natural History, Eli Wyman learned about a very unusual bee that was presumed to be extinct. The bee, *Megachile pluto*, also known as Wallace's giant bee, is a massive unit. It is the largest bee in the world, four times larger than a honeybee and measuring about the length of a human thumb.

Huge mandibles hang like dastardly garden shears from its head. Or, at least, did — the bee hadn't been seen alive since 1981 and was feared lost. "I just thought 'someday I've got to go to look for this bee.' It's a sort of unicorn in the bee world," Wyman says. "If you love bees, as I do," he added, "this is the greatest possible adventure to have."

WHAT I LEFT OUT is a recurring feature in which book authors are invited to share anecdotes and narratives that, for whatever reason, did not make it into their final manuscripts. In this installment, author Oliver Milman shares a story that didn't make it into his latest book "The Insect Crisis: The Fall of the Tiny Empires That Run the World" (W. W. Norton & Company, 272 pages).

In 2019, Wyman teamed up on an expedition with Clay Bolt, a natural history photographer, and two other researchers who had similar ambitions of rediscovering the bee in its last-known stronghold in the Indonesian islands of North Maluku. Plans to take samples of the bee for genetic testing were ditched due to permitting problems, so the team settled on the singular mission of being the first to see the giant in 38 years.

The bee liked to make its home in termite nests so the modern-day adventurers took a boat to Halmahera, the largest of the North Maluku islands, and met with the head of the village where the bee was last seen to help locate the most likely nests. The next five, futile, days were spent trudging around fragmented forest looking for nests and "almost dying of heat stroke," Wyman recalls.

By this point the men had almost resigned themselves to not finding the bee and were forlornly discussing whether they should take pictures of some birds instead, Wyman says. Then, at the end of the fifth day, they were ambling back to their car when the group spotted a termite mound located off the path. Reluctantly, an exhausted Wyman volunteered to take a close look.

A quick scan of the towering nest revealed nothing, Wyman says, but then a dark spot caught his eye and he realized it was an entrance hole. “My heart started pumping then,” he says. The hole was around 7 feet off the ground so Wyman propped up a branch, clambered upon it, and looked inside. He saw that the tunnel was lined with resin, which is what the Wallace’s giant bee does to seal its nest off from the termites.

A local guide then climbed up for a look, Wyman says, made a hand gesture that resembled an antennae and quickly helped build a platform from branches and vines to enable the group to view. At this point Wyman could clearly see the head and mandibles of the bee. Wyman’s nine-year itch had been scratched. “We were just hugging and high fiving each other,” he says. “I was so beaten down by the heat and the work and suddenly I felt light on my feet.”

The rediscovery of the Wallace’s giant bee, a rare slice of good wildlife-related news, was splashed across media outlets around the world, illustrated with pictures of a delighted Wyman and his colleagues holding a vial with the hefty insect inside. (They released it after taking photos.) Government officials in Indonesia pledged there would be a thorough survey of the bee, Wyman says, opening the way for it to be protected properly.

Wyman hoped the local population would take proud ownership of the bee in order to protect it, too, but the conversations tailed off, the momentum spluttered, he says. “That was a real bummer for us.”

Natural history photographer Clay Bolt examines the termite nest while perched atop a makeshift platform. *Visual: Simon Robson/Re:wild*

Clay Bolt takes the first ever photos of a living Wallace's giant bee at its nest. "We were just hugging and high fiving each other," Wyman recalls. *Visual: Simon Robson/Re:wild*

With mandibles akin to garden shears, *Megachile pluto* is the world's largest bee, coming in approximately four times times larger than a European honey bee (composite image). *Visual: Clay Bolt/claybolt.com/Re:wild*

Bees win in survival wars (click on heading to read more)

Posted: 05 Apr 2022 06:27 AM PDT

Like diseases affecting humans, parasites can wage a deadly evolutionary 'arms race' against their hosts. But can hosts and parasites upgrade their weapons at the same rate?

Scientists develop a recyclable pollen-based paper for repeated printing and 'unprinting' (click on heading to read more)

Posted: 05 Apr 2022 06:27 AM PDT

Scientists have developed a pollen-based 'paper' that, after being printed on, can be 'erased' and reused multiple times without any damage to the paper.

Honey holds potential for making brain-like computer chips (click on heading to read more)

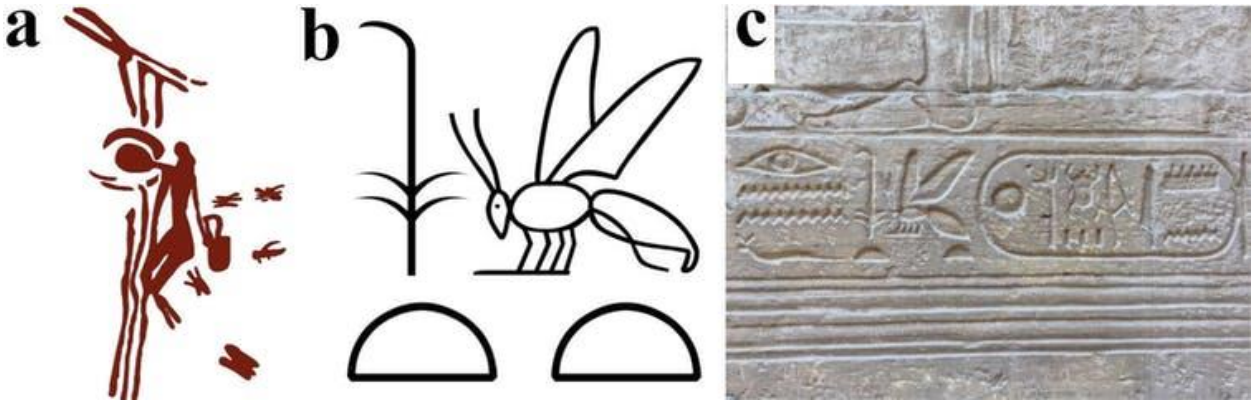
Posted: 05 Apr 2022 05:46 AM PDT

Honey might be a sweet solution for developing environmentally friendly components for neuromorphic computers, systems designed to mimic the neurons and synapses found in the human brain. Hailed by some as the future of computing, neuromorphic systems are much faster and use much less power than traditional computers. Engineers have demonstrated one way to make them more organic too by using honey to make a memristor, a component similar to a transistor that can not only process but also store data in memory. They created the memristors by processing honey into a solid form and sandwiching it between two metal electrodes, making a structure similar to a human synapse. They then tested the honey memristors' ability to mimic the work of synapses with high switching on and off speeds of 100 and 500 nanoseconds respectively. The memristors also emulated the synapse functions known as spike-timing dependent plasticity and spike-rate dependent plasticity, which are responsible for learning processes in human brains and retaining new information in neurons.

Bee art throughout time and cultures

Excerpt from The Conversation written by Adrian Dyer et al

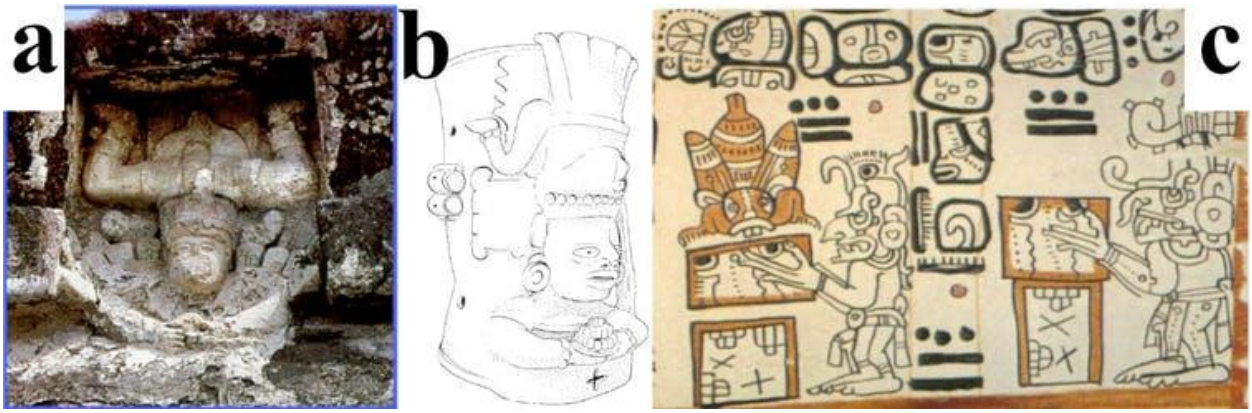
Bees have been depicted in carvings, jewelry, coins, songs, tools and sculptures for thousands of years. One of the first known depictions of bees is in the form of rock art from 8000 BCE in the Spider Caves (Cuevas de la araña) in Spain. It shows a person climbing a ladder to collect honey from a hive.



Bees in the ancient world are represented in a) cave art, and in b-c) hieroglyphics of ancient Egyptian names and architecture. Image by Jair Garcia. Reproduced under creative commons license 4.0.

We examined the history of bees in culture and art from China, Central America, South America, and Australia. Centuries before the introduction of European honeybees, human societies in Central and South America had a close relationship with native stingless bees (Meliponini).

Advanced agricultural societies like the Mayans developed apicultural techniques (The raising and care of bees for commercial or agricultural purposes) and kept native bees in their homes. Some gods in their pantheon were consecrated as protectors of the hives, while others were often represented in postures resembling landing bees in sculptures adorning temples.



Stingless bees in Mayan culture. Image a by Dr Enrich Legner reproduced under creative commons license 4.0

While Chinese art has a long history of representing plants, it was during the Tang Dynasty (618-907) that honeybees started to be

represented in poetry and painting, when formal beekeeping and the use of bee products in traditional medicine increased.

Prior to the Tang Dynasty bees were regarded with suspicion due to the capacity of some bees to sting, revealing how a positive aesthetic representation of bees developed with an improved understanding of the value of bees to our environment and well-being.

Club Info

Visit our website at: https://www.ccbaor.org/

Address: POB 1916 Newport, OR 97365

Email: centralcoastbeekeepers@gmail.com

facebook: CCBA meta