American Honey Producers Association

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PLEASE REPORT!

There have been reports of bee shortages for almond pollination and above average bee losses in California

Please report any above average bee losses to USDA leadership. They have teams collecting samples in California over the next few weeks.

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DNA Research Finds Low Genetic Diversity Among U.S. Honey Bees

Contact: Autumn Canaday
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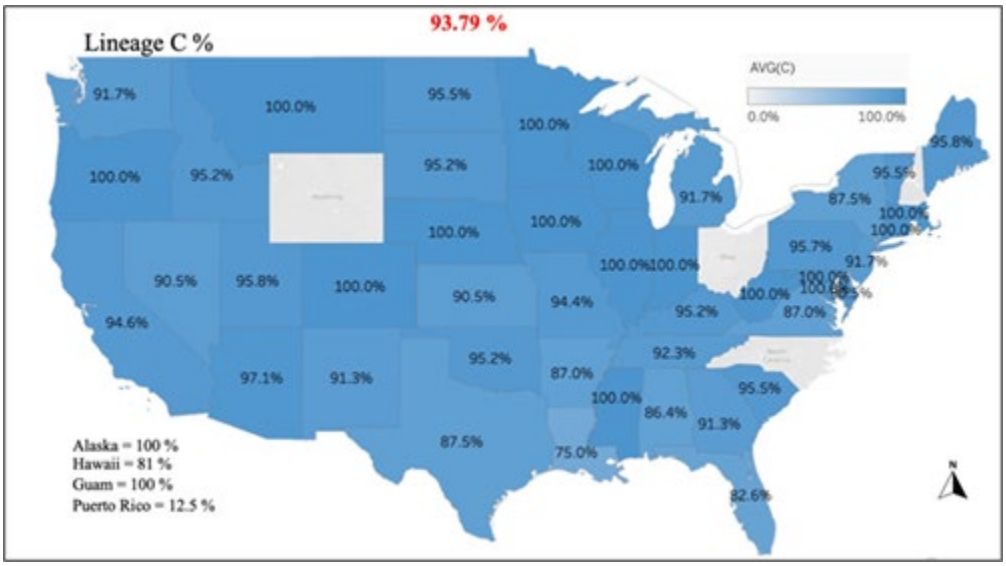
February 15, 2023

U.S. agriculture owes many thanks to the honey bee (Apis mellifera L.), as it plays the crucial role of pollinator within the nation's food supply. Some of the nation's food industries rely solely on the honey bee, and it's estimated that the economic value of its pollination role is worth well over $17 billion each year. With this fact in mind, ARS researchers recently studied the U.S. honey bee's genetic diversity to ensure that this crucial pollinator insect has sufficient diversity to overcome the growing number of stressors such as parasites, diseases, malnutrition, and climate change.
What they found is alarming: the U.S. honey bee population has low genetic diversity, and this could have a negative impact on future crop pollination and beekeeping sustainability in the country.

The research, recently highlighted in Frontiers, was accomplished by analyzing the genetic diversity of the U.S. honey bee populations through a molecular approach, using two mitochondrial DNA (mtDNA) markers (DNA specifically from a mother). Researchers studied approximately 1,063 bees from hobbyist, and commercial beekeepers in 45 U.S. states, the District of Columbia (D.C.), and two US territories (Guam and Puerto Rico). The data showed that the nation's managed honey bee populations rely intensively on a single honey bee evolutionary lineage. In fact, 94 percent of U.S. honey bees belonged to the North Mediterranean C lineage. Data reflected that the remainder of genetic diversity belongs to the West Mediterranean M lineage (3%) and the African A lineage (3%).

"It's important that we have a realistic and accurate estimation of the honey bee's genetic diversity because this indicates the insect's ability to respond to disease, adaptation to environment, and productivity," said ARS Research Entomologist Mohamed Alburaki. "Without this pollinator insect, we will witness a drastic decrease in the quantity and quality of our agricultural products such as almonds, apples, melons, cranberries, pumpkins, broccoli and many other fruits and vegetables that we're used to purchasing. We can't wait until a domino effect slowly takes place and affects our food supply."



93.79 percent of U.S. honey bees belonged to the North Mediterranean C lineage. The percentage of this lineage is displayed for each state

The lack of genetic diversity creates a vulnerability for U.S. honey bees to survive in shifting climates that are now wetter or drier than usual. There is also concern that a honey bee's inability to fight off disease or parasitic infection could negatively impact beekeeping sustainability. The challenge of U.S. honey bees' weakened immunity has become an economic burden to bee producers and beekeepers. In the past, U.S. beekeepers suffered less honey bee colony losses and treated against varroa mite (a ferocious honey bee parasite) once per year. In 2023, colony losses and winter mortality are at a high peak and varroa mite requires multiple treatments per year to keep it under control.

"As a honey bee researcher, what worries me the most is that 77 percent of our honey bee populations are represented by only two haplotypes, or maternal DNA, while over hundreds of haplotypes exist in the native range of this species in the Old World, or the honey bees' native land of evolution," Alburaki said. "Many of these haplotypes have evolved over millions of years in their native lands, and have developed astonishing adaptation traits that we should consider incorporating in our US honey bee stocks before it is too late."

These complex factors are driving Alburaki and his ARS research team to develop a solution that's sustainable for the entire nation. The research team is currently evaluating the paternal diversity of the previously analyzed populations to acquire a full and accurate picture of the overall genetic diversity of the U.S. honeybee populations. Researchers are also interested in the possibility of diversifying breeding stations with honey bee queens from various genetic backgrounds.

Alburaki's research also identified and named 14 novel haplotypes in the three evolutionary lineages. These haplotypes have never been reported before and can provide new insights into the U.S. honey bee's evolution since its importation to North America in the 1600s. There is hope that the researchers can use this information to locate and enhance the numbers of these rare and novel US haplotypes, which could speed the process of reaching a healthier diversity within the nation's honey bee population.

The Agricultural Research Service is the U.S. Department of Agriculture's chief scientific in-house research agency. Daily, ARS focuses on solutions to agricultural problems affecting America. Each dollar invested in U.S. agricultural research results in $20 of economic impact.

https://www.ars.usda.gov/news-events/news/research-news/2023/dna-research-finds-low-genetic-diversity-among-us-honey-bees/

The function and evolution of a genetic switch controlling sexually dimorphic eye differentiation in honeybees

by Arne Claussen, Heinrich-Heine University Duesseldorf

February 13, 2023

A comparison of male and female bees clearly shows the sexual dimorphism in the eyes: The male (left) has significantly larger compound eyes than the female (right), which is attributable to the different tasks of the eyes. Credit: HHU/Institute of Evolutionary Genetics

Bee researchers at Heinrich Heine University Düsseldorf (HHU) headed by Professor Dr. Martin Beye have identified a new gene in honeybees, which is responsible for the dimorphic eye differentiation between males and females of the species. The researchers have now presented this gene and the evolutionary genetic conclusions they have drawn from it in the journal Nature Communications.

Differences between males and females are very common in animal organisms. They are not limited solely to morphological differentiation—i.e., differences in the form and structure of the animals—but also affect physiology and behavior. This applies equally to invertebrates and vertebrates. This "sexual dimorphism" contributes to the biological diversity of the organisms, with examples including the colorful plumage and tails of male peacocks or the coloration of butterflies.

However, our knowledge about the developmental and evolutionary mechanisms governing this dimorphism is still limited. A developmental regulator gene, the "dsx gene," has been identified in genetic model organisms. But this gene alone cannot specify sexual dimorphism in other organisms. Furthermore, it was unknown how a sex-specific developmental function emerged during the course of evolution as the advantage in one sex generates a disadvantage in the other sex.

The specialist field of the working group headed by Professor Martin Beye from the Institute of Evolutionary Genetics at HHU is the honeybee (Apis mellifera), which exhibits pronounced dimorphism in the eyes of males and females: Males have extremely large compound eyes, which enable them to locate the queen during mating flights. The females have small compound eyes, which are however sufficient for orientation purposes and finding flowers.

Together with colleagues from Wageningen University in the Netherlands, Professor Beye and his team examined the entire genome of the bee for possible sex-specific developmental regulator genes and identified what they have named the "glubschauge gene."

This gene regulates the sex-specific eye morphology. The researchers proceeded as follows: Using the CRISPR/Cas9 method, they switched the gene off in females, which resulted in the animals developing the eye form of the males of the species. Conversely, they added the gene to males, resulting in them developing eyes like the females. In so doing, they identified a new developmental gene which has emerged over the course of evolution, also known as a "transcription factor."

Professor Beye stated, "Our findings indicate how the diversity of secondary sexual characteristics can be regulated during development. We were able to demonstrate the following principle: Use a separate genetic instruction program for each characteristic. There is no general instruction for the organism as a whole in the bees."

The researchers were also interested in the evolutionary history of the "glubschauge gene": How did this gene come to have its sex-determining function? Professor Beye says, "Our findings solve a longstanding mystery in evolutionary biology. No evidence has been found to date of instances where the positive effect in the evolution of a sexual characteristic does not lead to a disadvantage in the other sex. We are now able to show how this can work."

Using evolutionary sequence analyses, the research team established that this sex-specific function has only emerged during the evolution of hymenoptera. They found that the sex-specific expression newly evolved first, while the developmental function emerged subsequently. "The initial sex-specific regulation limits the subsequent developmental change to just one sex. So we have demonstrated a molecular path through which sexual dimorphism can evolutionarily originate," says Beye.

https://phys.org/news/2023-02-function-evolution-genetic-sexually-dimorphic.html

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Beewise Launches the BeeHome 4 to Save Bees at Scale

Feb 14, 2023, 08:27 ET

Smaller, lighter, and upgraded technology will help to secure pollination for a stable food supply

Oakland, Calif., Feb. 14, 2023 /PRNewswire/ -- Beewise, the climate tech, AI-powered robotics company on a mission to save bees, today announced the release of its newly-designed BeeHome 4, which is both smaller and lighter than previous iterations, fits on a conventional forklift, and fits into existing beekeeping workflows by accommodating standard bee hive frames. These new design features will increase hive mobility, enabling farmers to effortlessly care for millions of bees and ensure seasonal crop pollination.

Beewise was founded with a mission to save the pollinators that are vital to life on our planet: bees. While bees have thrived for millions of years, climate change, especially the extreme weather conditions caused by it, as well as other threats like Varroa mites are causing bee colony losses as high as 30% each year.

These stressors are exacerbating the challenges, skilled labor shortages and high transportation costs, that beekeepers are already facing. The newly updated BeeHome 4 is a sustainable solution for pollinating crops and supporting bee colonies. BeeHome 4 helps beekeepers pollinate and produce honey all while protecting their bees; the holistic solution provides advanced hardware for bees in the field and software for beekeepers and growers to manage operations from their desk or mobile phone. When compared to traditional beehives, BeeHomes reduced bee mortality 80%, which has resulted in increased yields of at least 50%, while reducing manual labor needs by ~90%.

BeeHomes seamlessly detect fatal threats to a honeybee colony including pesticides and the presence of pests, and immediately defends against them. Its automatic robotic system responds to threats in real time and requires almost no human intervention. In addition to protecting and defending, Beewise affirmatively helps honey bees thrive and flourish by reversing the trend of colony collapse. To help combat the detrimental effects of climate change on bees, BeeHomes are thermally regulated; protect from fires, flooding, and Asian Wasps (murder hornets); and provide enhanced feeding techniques for when bees' food supply is not readily available.

Beewise solves the three main challenges that prevent beekeepers from helping bees deal with stressors effectively:

- The distance gap: Hives are situated far apart from each other and from beekeepers, sometimes hundreds of miles away. As a result, beekeepers spend most of their time traveling to and from hives—sometimes up to 60% of their time.

- The time gap: Because of the distance, beekeepers typically visit their hives every few weeks. So, hives are treated in broad strokes, rather than with precise solutions.

Beekeepers are rarely able to treat a problem just in time—oftentimes they're too late.

- The experience gap: Commercial beekeepers manage thousands of hives—a typical medium-sized US beekeeper has a few thousands of hives, with a labor ratio of one person per several hundred hives. This leads to generalized care that is not necessarily done by an experienced beekeeper.

"We've listened to beekeepers and growers, and BeeHome 4, is the culmination of their feedback," states Saar Safra, CEO and cofounder of Beewise. "BeeHome 4 is the perfect "vaccine" for colony collapse disorder and is optimized to save bees and address the needs of growers and beekeepers, at scale. Despite unfounded claims to the contrary, saving bees is not achievable with invalidated IoT sensors; it requires significant technology addressing the root issue: the adverse effects of global warming and urbanization on the bee population. The newly released Beehome 4 makes significant strides towards the mission of saving the world's bees."

About Beewise
Beewise is a company with one mission in mind: saving the bees. This focus is manifested in the company's first solution, the Beehome, the world's first autonomous beehive with an integrated robotic beekeeper. Beehome reduces bee mortality by up to 80%, saving bees at scale to secure pollination for a stable food supply. Learn More About Beewise

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MONGABAY
NEWS & INSPIRATION FROM NATURE'S FRONTLINE

Indigenous women record age-old knowledge of bees in Colombia's Amazon

by Astrid Arellano on 8 February 2023 | Translated by Maria Angeles Salazar

- A team of Indigenous Yucuna women in the Colombian Amazon are rescuing and documenting the remaining oral knowledge on bees and their roles in the ecosystem, along with the traditional classification system of diverse bee species.
- With the help of nine elders, they are documenting and sketching tales and songs to gather bee names, characteristics, behaviors, roles in their crop fields and the places where bees build beehives.
- Biologists part of a bee inventory program and the women from the reserve are working to compare each other's findings on bee species in the Indigenous territory, where researchers say bees are better protected than other regions of Colombia.
- Some of the traditional tales and knowledge are even surprising to the women documenting it; they say the details and scientific information will be shared with the communities and local schools to raise awareness on the importance of protecting bees.

A mununumú bee (that produces honey), one of the species the women drew. Image courtesy of Conservation International Colombia.

Je'chu, a god, first created bees so that their wax would cure the world. So goes the spiritual testament of the Yucuna Indigenous peoples of Colombia.

"He is our god and creator — our grandfather," narrates Carmenza Yucuna Rivas, leader of the Miriti-Parana Indigenous Reserve in Colombia, located in the Amazon Rainforest. "And he created bees because there had to be a species protecting life."

Therefore, during rituals, elders take a small piece of the beehive and, with the permission of its tiny inhabitants, they conjure an invocation over it. They then light it on fire so the emerging smoke blowing in the wind covers humanity, protecting us and helping us live well. This smoke is a sign of the harmony and peace that keeps nature balanced, according to their religious beliefs.

“Wind is the biggest connection between the beehive and nature, as it helps expand this knowledge and wisdom,” says Carmenza. “Beehives also help regulate the climate, drive sickness away, give us the opportunity to create chakras [food gardens typically using an agroforestry model with diverse plant species] and make them productive. They let us have something to cultivate or extract from nature in the first place.”

To rescue and document the remaining oral knowledge of the origin of bees in their culture and their importance to their ecosystems and territory, Carmenza is leading research about these species with 36 women from the 12 communities part of the Indigenous reserve.

“For thousands of years, they’ve been sacred species in our culture but no one had done this exploration,” says Carmenza. “We got interested in investigating the biodiversity we have as the bee species provide many ecosystem services and help conserve biodiversity.”

Since the second half of 2020, Carmenza and her colleagues have been going to each of the communities and speaking to elders to gather information, such as tales and songs that talk of the origin of the bees. They also draw to document the information. Each of them has taken the task of sketching the stories on paper to describe the insects.
Their aim is to classify the bees according to the cultural system of the Yucuna-Matapí, Tanimuca-Letuama, and Tuyuca-Macuna peoples, including their names, characteristics, and the places where they build the beehives.
The classification of bees

Carmenza describes one by one the most relevant bees in the territory. The mununú are the Melipona, that is, the bees that produce honey; the mapa or mapachara are the ones that produce the wax that is used for healing and rituals; the mapakayuna are small and live next to the crops to guarantee their productivity; and the jiñuna “are a great species,” says Carmenza. They live in the Yavarí coconut trees on the river shore where they build huge yellow beehives.

Read the rest of the story here: https://news.mongabay.com/2023/02/indigenous-women-record-age-old-knowledge-of-bees-in-colombias-amazon/

Raw Honey from Argentina, Brazil, India, and Vietnam Injures U.S. Industry, Says USITC

May 11, 2022
News Release 22-058
Inv. No. 731-TA-1560-1562 and 731-TA-1564 (Final)
Contact: Jennifer Andberg, 202-205-1819

Raw Honey from Argentina, Brazil, India, and Vietnam Injures U.S. Industry, Says USITC

The United States International Trade Commission (USITC) today determined that a U.S. industry is materially injured by reason of imports of raw honey from Argentina, Brazil, India, and Vietnam that the U.S. Department of Commerce (Commerce) has determined are sold in the United States at less than fair value.

Chair Jason E. Kearns, Vice Chair Randolph J. Stayin, and Commissioners David S. Johanson, Rhonda K. Schmidtlein, and Amy A. Karpel voted in the affirmative.

As a result of the Commission's affirmative determinations, Commerce will issue antidumping duty orders on imports of this product from Argentina, Brazil, India, and Vietnam.

The Commission made a negative critical circumstances finding with regard to imports of this product from Argentina. The Commission made an affirmative critical circumstances finding with regard to imports of this product from Vietnam.

The Commission's public report *Raw Honey from Argentina, Brazil, India, and Vietnam* (Inv. Nos. 731-TA-1560-1562 and 731-TA-1564 (Final), USITC Publication 5327, May 2022) will contain the views of the Commission and information developed during the investigations.

The report will be available by June 20, 2022; when available, it may be accessed on the USITC website at: *http://pubapps.usitc.gov/applications/publogs/qry_publication_loglist.asp*.

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, DC 20436

FACTUAL HIGHLIGHTS
Raw Honey from Argentina, Brazil, India, and Vietnam
Investigation Nos.: 731-TA-1560-1562, 1564 (Final)

Product Description: Honey is a sweet, viscous fluid produced from the nectar of plants and flowers which is collected by honeybees, transformed, and combined with substances of their own, and stored and left in honeycombs to mature and ripen. Raw honey is honey as it exists in the beehive or as obtained by extraction, settling and skimming, or straining.

Status of Proceedings:

1. Type of investigation: Final antidumping duty investigations.
2. Petitioners: American Honey Producers Association ("AHPA"), Bruce, South Dakota; and Sioux Honey Association ("SHA"), Sioux City, Iowa.
3. USITC Institution Date: Wednesday, April 21, 2021.
4. USITC Hearing Date: Tuesday, April 12, 2022.

5. USITC Vote Date: Wednesday, May 11, 2022.
6. USITC Notification to Commerce Date: Tuesday, May 31, 2022.

U.S. Industry in 2020:

1. Number of U.S. producers: approximately 30,000 to 60,000.
2. Location of producers' plants: North Dakota, South Dakota, California, Texas, Montana, Florida, Minnesota, and Michigan
3. Production and related workers: 1,360.
4. U.S. producers' U.S. shipments: $302 million.
5. Apparent U.S. consumption: $690 million.
6. Ratio of subject imports to apparent U.S. consumption: 42.8 percent.

U.S. Imports in 2020:

1. Subject imports: $296 million.
2. Nonsubject imports: $93 million.
3. Leading import sources: Argentina, Brazil, India, Vietnam.

https://www.usitc.gov/press_room/news_release/2022/er0511ll1935.htm

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What does this mean for beekeepers?

The decision will be transmitted to the Commerce Department, which will issue antidumping duty orders shortly. In addition, the Commission reached an affirmative critical circumstances determination against Vietnam. This means that U.S. Customs will collect antidumping duties on entries going back an additional 90 days prior to the preliminary antidumping duty determination—from August 28, 2020, forward. This is an important additional finding, and one that the Commission rarely makes.

These results should continue to ensure that the American honey producer gets the fair prices they deserve.

We truly appreciate all of the donations that we have received to cover legal fees.

The good fight isn't over yet, however, and we still need your support.

To donate to the Antidumping Fund, please contact
Cassie Cox: cassie@ahpanet.com
281-900-9740

Or donate on our secure website: https://www.ahpanet.com/donations-1

American Honey Producers Association

AHPA App

As AHPA continues to work on behalf of all beekeepers, one of our initiatives is advocating with the FDA in Washington D.C. to update honey labeling guidelines. As part of this effort, we need your help to collect pictures of honey labels from around the United States. Our goal is primarily to find honey that is mislabeled according to current FDA guidelines. Secondarily, we need examples of any labels which misrepresent country of origin or are purposefully confusing to consumers so that we can advocate for positive changes and updates.

Search the App Store or Google Play for "AHPA app". We need to collect as many pictures from honey on the store shelf as possible. Please take a few minutes to help collect this data.
