Nectar Quest: The ‘Bees and Flowers Mutual Admiration Society’ Under Threat

Plants and bees have a symbiotic relationship. Flowering plants depend on an outside source to 'spread the love' through pollination, and bees are happy to fill that need, receiving nectar (which they convert into honey) for the service they provide.

But how do bees manage to be so efficient in their quest for nectar? And is it true this delicately balanced relationship is under threat?

Scientists at Britain's University of Bristol have spent 30 years trying to figure out exactly how bees know which flowers will give them the most bang for their buck, so to speak. The recent discovery is that bees and flowers participate in a mutually beneficial electromagnetism that results not only in the pollination and proliferation of the plants, but the nourishment of the bees and the hives they call home.

Research reveals that bees rely on an array of visual and sensory clues such as humidity level, shape, pattern and color to discern whether flowers have something to offer. In fact, it is known that bees have three times the color recognition ability of humans, but the electrical aspect, and the fact that it can last up to a few hours is new information.

Electrical Allure: Bees Can Tell Which Flowers Spark the Most Interest

Scientists have been aware for years that plants emit a weak, negatively charged electrical field. They also knew that in flight, the wings of bees can generate up to 200 volts of positive electrical charge, which helps pollen adhere to the fine hairs on the bees' legs.

What they didn't know until now was that bees can sense "come hither" electrical vibes that flowering plants exude, similar to the way sharks also sense electrical fields. Bumblebees, too, participate in this electrically charged phenomenon.

Bees can sense the weak electrical charge emitted by flowers in order to determine if they have nectar, the new study revealed. Even better, scientists say bees are capable of altering the electrical charge of the blossoms they come into contact with to help them choose which ones contain the most nectar and pollen.

Bees also can tell which blooms have already been divested of their sweet ambrosia by their pollinating competitors. This serves to improve their resourcefulness as they reconnoiter their nectar prospects. As they approach for a landing, the bee transfers some of its charge to the plant stem and keeping it positive for as long as two minutes. According to lead researcher Dominic Clarke:

"Animals are just constantly surprising us as to how good their senses are. More and more we're starting to see that nature's senses are almost as good as they could possibly be."
As Old as Time, the 'Animal Magnetism' Between Bees and Flowers is Threatened with Ecological Disaster

Unfortunately, the delicate balance nature has provided since time immemorial is collapsing, exposing a threat to the bee population that is becoming increasingly catastrophic. The delicate ecological and environmental balance is being threatened by a number of man-made factors that affect more than where flowers bloom and how much honey is produced.

The world as a whole has come under some alarming statistics over the last decade. Environmental scientists are concerned that a phenomenon CCD – Colony Collapse Disorder – reflects a far more serious problem than suboptimal pollination, and may be an ominous indicator that the shifts in the ecosystem may lead to a collapse in how we propagate our crops. Bees have busily carried out that task for us for millennia, but unless something changes, farmers may find themselves pollinating their crops by hand.

More Than Honey – Bees Deliver Amazing Therapeutic Properties

To a very large degree, bees have been taken for granted. Not only do they supply us with honey, which is possibly the most healthful natural sweetener in the world, and is also used to manufacture wax for cosmetics, food and medicine. But the age-old harmony between plants and animals may hinge on the behavior of bees and whether they're able to do what they've always done.

Propolis, the substance honeybees use to patch holes in their hives is an ancient healing remedy for soothing a sore throat and topical burns and relieving allergies. It has antioxidant and antimicrobial activity. It's also an analgesic, anesthetic and anti-inflammatory. Bees actually use propolis as a disinfectant themselves and even "embalm" invaders too large to pull out of the hive presumably so that they will not decompose and spread infection.

An experiment by scientists in India found that the decimated bee population in Kerala was caused by electromagnetic waves emitted immediately after the installation of mobile phone towers and cell phones throughout the state. The electromagnetic waves essentially crippled the "navigational skills" of worker bees, according to lead researcher Dr. Sainuddin Pattazhy. The worker bees simply didn't return to their hive when a cell phone was placed near it, leaving the queens alone with the eggs. This was a simple experiment, but with devastating results, as the entire colony collapsed within ten days. Adding to the mystery, parasites, wildlife and other bees, which would normally raid the abandoned hives, would not go near the collapsed colonies.

Radiation has also been found to cause damage to the nervous system of the bee, impeding its ability to fly. Cell phones may create a resonance effect that interferes with the movement patterns bees use as a kind of language. That's a serious problem since, in the US alone, bees contribute $15 billion in annual agriculture revenue and a third of the county's food supply depends on bees to pollinate crops.

Pesticides are Killing More Than Bees – They're Killing Humans
That's just one example of how the ecological balance can be interrupted. Why is this happening? Several factors have been identified, including:

- Pesticides and insecticides
- Genetically modified crops
- Malnutrition of the bee population
- Viruses and fungi
- High-fructose corn syrup (HFCS) used to feed bees in managed hives

One poignant example of the pesticide problem comes with a lawsuit filed by The German Coalition against Bayer Dangers against Werner Wenning, chairman of the Bayer Board of Management, after losing thousands of hives due to poisoning by the pesticide clothianidin. Bayer was accused of marketing dangerous pesticides that allegedly caused the mass death of bees all over the world. In fact, apple orchards require at least one bee colony for every acre to be adequately pollinated. So, unless this devastating trend is reversed, the world could be in for some major food shortages.

Even more alarming may be the rate at which wild bees are dropping from sight, particularly regarding crop yields, according to a worldwide study. Coffee, onions, almonds, tomatoes and strawberries were among 40 fruits and vegetables in 600 fields examined by scientists to determine which would win the pollination race. The report returned that wild bees were twice as effective as honey bees in this endeavor.

Scientists studied the pollination of more than 40 crops in 600 fields across every populated continent and found wild pollinators were twice as effective as honey bees in producing seeds and fruit on crops including oilseed rape, coffee, onions, almonds, tomatoes and strawberries. Furthermore, trucking in managed honey bee hives did not replace wild pollination when that was lost, but only added to the pollination that took place.

One of every three bites of food you eat depends on the honey bee. They pollinate at least 130 different crops in the US alone, including fruits, vegetables and tree nuts. That bees can actually sense and respond to electrical fields emitted by flowering plants is remarkable, says bee biologist and author Mark Winston from Simon Fraser University in Burnaby, B.C. He adds: "[B]ees perceive the world around them, and it adds another wonderful story that continues to deepen our understanding the co-evolved relationship between bees and flowers."

Only a change in the status quo will cause a turnaround of this tragic situation that threatens not only bees all over the world, but the world's entire, increasingly unsustainable food system.