

# New research: audible flowers and the flapping of bee wings make honey more sweet

According to scientists, the flowers can listen to bees and make their honey sweeter to lure the bees to pollinate.

Even on quiet days, the whole world is full of sounds: the sound of birds singing, the sound of wind blowing through the foliage, the sound of insects ringing about their daily work. The ears of predators and prey are designed to recognize each other's presence.

Sound is an essential element for life and survival, which has prompted researcher Lilach Hadany to ask: If not only animals, but also plants that can listen, how? Information about the first experiment to test this hypothesis was published on the bioRxiv uncensored research site. According to it, there is at least one case that plants can hear and that gives an evolutionary advantage to the plants.

Hadany's team studied the evening primrose (*Oenothera drummondii*) and found that after only a few minutes feeling the vibrations on the wings of the pollinators, the plants temporarily increased the amount of sugar present in the nectar. In fact, the petals act like ears, listening to the bee's vibrational frequency and ignoring extraneous sounds like wind.



Mr. Anh Thao

**Sweet sound**

As an evolutionary theorist, Hadany says her doubts arise when she realizes that sound is a popular natural resource - plants will waste it if they don't take advantage of it the way animals usually do. She thinks if the plants have a way to listen and respond to sound, it will help them survive and pass on this ability to the next plant life.

Because pollination is an important factor for a plant to reproduce, Hanady's team studied the flower department first. Primrose growing wildly on the beaches and parks around Tel Aviv University is a good candidate. This is because it has a very long hatching time and produces just enough honey to measure.

To test the flower, Hanady's team exposed it to five types of sounds: complete silence, honey bee sound recordings, computer-generated low, medium and high frequencies. . The plants exposed to the silence were placed in anti-vibration glass jars, which did not significantly increase the amount of sugar in the bile. This result is similar to trees exposed to high frequency sound (158 to 160 kilohertz) and medium frequency (34 to 35 kilohertz).



**But for plants exposed to the sound of bees (0.2 to 0.5 kilohertz) and similar low frequency sounds (0.05 to 1 kilohertz), after only three minutes, the amount of sugar in the nectar increase from 12 and 17 percent to 20 percent.**

According to the hypothesis of scientists, sweeter nectar can attract more pollinating animals and increase the likelihood of successful pollination. When looking at real-world examples, the researchers found that pollinators will be heavily planted on visited plants within the past six minutes.

*"We were quite surprised to find it really works , " Hadany said. "After repeating this phenomenon under different conditions such as other seasons, trying on outdoor and indoor plants, we became more confident with the results . "*

### **Petals like ears**

When the whole group thought about the method of transmission and the vibration of sound, the role of the petals suddenly became very interesting. Flowers come in a variety of varieties, varied in shape and size, a large number in the shape of a basin or bowl. This natural design is like satellite dishes, capable of receiving and

amplifying sound waves.

Lilach Hadany, co-author of the Marine Veits report and a graduate student together measure the vibrations per minute of evening primrose. With the purpose to test the vibration effect of each sound frequency group. The group will then compare the vibrations of ordinary flowers with those that were exposed to different sounds.

*"This flower is shaped like a bowl. So according to the theory of acoustics, it makes perfect sense if this structure vibrates and is able to increase the vibration on itself,"* Veits said.

Yes, it does, but the petals only respond to the frequency of the animal's pollination. Hadany said that seeing the frequency of flowers matching the bee's wavelength is very interesting.

*"You will immediately see that it works,"* Veits said.



Most flowers are pan-shaped

To make sure the flower was the listening unit, Hadany's team tested on the flowers that lost one or more petals. Those flowers are no longer able to receive sounds from low frequencies.

### **Flowers can hear anything?**

Hadany confirms that there are still many questions surrounding the ability of plants to respond to new sounds. Are some flowers better able to receive some sound frequencies than others? Why did evening primrose make the sugar in honey so much increase when only 1 to 3 percent of the bees realized it?

Moreover, does this ability bring other advantages besides impacting on the production of nectar and pollination? Hadany assumed that plants could alert each other when they heard the sound of herbivores. Or they can create fascinating sounds for animals that help disperse the seeds.

*"We have to take into account that flowers evolved with pollinators in a very long time,"* Hadany said. *"They are living things and they also need to survive. The ability to sense the environment is very important to plants,*

*especially because they cannot move . "*



In addition to bees, butterflies are also an insect pollinator

This scientific report has opened up a whole new field of research. Hadany named it phytoacoustics.

Veits want to know more about the mechanism of this phenomenon. For example, which molecular or mechanical process plays a role in response to vibration and nectar? She also hopes the report will confirm the hypothesis that it doesn't always need a sense to sense the world.

*"Many people would think, how can plants hear and smell?" Veits said. "I want people to understand that listening is not just for the ears . "*

Richard Karban is an expert on the interaction of plants and insects at the University of California Davis. He has his own doubts, especially about the evolutionary advantage of plants when they respond to sound.

*"The ability for them to sense the presence of other surrounding plants is feasible and they will evaluate whether the surrounding plants are fully fertilized , " he said. "There is no evidence of any such phenomenon happening, but this report has set the first step . "*

*According to National Geographic*

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