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Want to control a Venus' flytrap with your cellphone? There could soon be an app for that

Gareth McGrath USA TODAY NETWORK

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Long a favorite of horticulturalists and Hollywood, the Venus' flytrap has mesmerized people ever since it was discovered in the bogs of Southeastern North Carolina chomping down insects.

But has anyone ever tried communicating with the pop-culture icon that only grows naturally within 75 miles of Wilmington (and Seymour talking to Audrey II in “Little Shop of Horrors” doesn’t count)?

That’s exactly what researchers on the other side of the world recently accomplished. And yes, they used a smartphone for that.

Scientists with Nanyang Technological University (NTU) in Singapore have developed a device that can deliver electrical signals to and from the plant, allowing researchers to “communicate” with the carnivorous flytrap.

In an email exchange, Dr. Chen Xiaodong, director of the Innovative Center for Flexible Devices at NTU, said the flytrap was chosen for the experiment because it’s fairly easy to detect the electric signals which it and all plants generate.

“In nature, they have a very smart system to capture insects using their lobes,” he said. “The reason that they can act so quickly to prey is because they use electrical signals as its alarming system. When an insect touches its surface, electrical signals will be generated. Hence, Venus flytrap is a very good model plant to study plant electrical signals.”

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Using electrodes attached to the flytrap, researchers were able to make the plant’s trap close with the push of a button.

“The experiment confirmed two goals: First, the soft electrodes that we specifically designed for plants can successfully measure electrical signals from and deliver artificial electrical signals to plants,” Xiaodong said. “Second, that electrical ‘communication’ with plants is possible. Such electrical communication allows us to understand plants (measure their signals) or control plants (deliver signals to them).”

Researchers also removed one of the plant’s traps and attached it to a robotic arm. The trap was then used to grab a thin wire, with the idea they could also be used to capture small, soft objects.

“When the technology matures, the robot-plants may see applications in capturing insects or fruits harvesting,” Xiaidong said.

He added that the researchers’ goal isn’t to facilitate a world dominated by cyborg plants, but to see if they could be used as environmental sensors to recognize stresses on crops from pests, drought or other ailments. For example, having sensors on numerous plants connected with miniaturized wireless circuits could allow the plants to be connected to the internet, forming an “Internet of Plants” to communicate with farmers.

“The concept of plant-based robots, or cyborg plants is still at its infancy,” Xiaodong said, noting researchers also have experimented with other plants, including tobacco and sunflowers. “To convert plants into a robot-like device of practical use, there are still a lot of scientific and technical challenges.”

As the researchers began working with the Venus' flytraps, doctorate student Li Wenlong said most of the team’s information about the plant came from literature and science.

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Then they discovered the diminutive plant's larger-than-life persona.

“As we went through the experiments, we learned more about flytrap in popular culture,” Wenlong said. “It has appeared in movies and is discussed by many on YouTube or blogs. This is an interesting learning process for us.”

Or as Audrey II said in "Little Shop of Horrors," “I’m a mean green mother from outer space, and I’m bad.”

While definitely near the top of the food chain in the plant kingdom, the Venus flytrap hasn't been as lucky in the real world. Loss of habitat and poaching has prompted federal regulators to classify the plant as "vulnerable," but it has no federal protection. North

Carolina lists the flytrap as a plant of "special concern," and in 2014 the N.C. General Assembly made the poaching of Venus' flytraps a felony.

Reporter Gareth McGrath can be reached at GMcGrath@Gannett.com or @GarethMcGrathSN on Twitter.