

By Sharanya Pillai

Decoding the secret language of plants

While scientists eavesdrop on plant banter, some muse if we're torturing our green friends

AH, THE sweet smell of freshly-cut grass. But wait. Is the grass actually... screaming?

That distinct scent could in fact be a loud distress signal. When a plant is being chomped on by pests, that same "cut grass" smell summons parasitic wasps to attack the pests, a 2014 paper in *The Plant Journal* found.

Scent is believed to be just one of the many secret languages of plants. Trees can't humblebrag on LinkedIn, but they have the Wood Wide Web, an underground network of roots, fungi and bacteria that could be transmitting information. While plants lack a brain and neurons, they send electrical signals, like our own nervous system.

I learned these mind-bending facts from a simple Google search: "plant psychology". Like many plant-obsessed millennials, I've been trying to nurture a variety of houseplants, from turmeric to holy basil and four o'clock flowers. And like a parent with teenagers, I've been trying to better make sense of their behaviour.

Some plants are stoics, while others are divas. A colleague once described her peace lily as a drama queen that "flops and looks like death" when it misses just a single watering. These visual cues help plant-rents, but imagine if we had deeper insight into what plants are expressing – we would always be in the loop on how exactly they're feeling, or even what they're sensing in the environment.

Singapore's plant whisperers

How do we bridge this language gap? It turns out that Singapore researchers Luo Yifei and Li Wenlong, from the Agency for Science, Technology and Research, have been obsessed with this question.

Working with Chen Xiaodong, a materials science and engineering professor at Nanyang Technological University, they have been investigating how humans and plants can "communicate" with each other – via electrical signals.

Many plants generate weak electrical signals to communicate with other plants or respond to environmental changes. These signals can be likened to a language, Luo explained over a Zoom call. However, they are very hard to pick up, given the waxy and hairy surfaces of plants.

In 2021, the team developed a solution: a 3-mm device that can deliver electrical signals to and from plants. Attaching an electrode to the surface of a Venus flytrap, the researchers were able to not only monitor the plant's electrical signals, but even send it new signals, triggering it to close its jaw-like leaves in 1.3 seconds.

Li candidly admits that he was initially weirded out by the Venus flytrap when starting on this project in 2017. But that also piqued his curiosity.

"It's a pretty horrible plant, it looks like it will cut your finger. I didn't have a good feeling about it," he said with a laugh. "But we are scientists – you realise that if you are afraid of something, you probably don't know it very well."

The team has since gained an intimate understanding of



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PHOTO: BT FILE

the Venus flytrap's electrical signals, and expanded its research into other plants, namely choy sum and tobacco. There is immense commercial potential. For instance, plants in the future could be engineered to produce certain signals that induce resistance to pests.

Plants are probably much smarter than we think, and technology – through genetic engineering or nanomaterials – could make them "even smarter", mused Li. But there is still a long way to go. Said Luo: "We have to understand (plants') language, but now, I think we cannot their decode their language. That's the biggest challenge in the field."

Is mowing the grass mass torture?

The possibility of plant communication has captured the imaginations of not just scientists, but philosophers too. If plants can communicate, are they more intelligent than we think, or perhaps even sentient?

Several books have been written on the topic, most recently one called *Planta Sapiens: Unmasking Plant Intelligence*. Its co-author, Paco Calvo, specialises in the philosophy of plant behaviour and signalling – a rather unconventional, and somewhat controversial, field dubbed "plant neurobiology". Calvo believes that plants aren't just reactive beings, but in fact "plan ahead to achieve goals" and "proactively engage with their surroundings".

However, not many are convinced. "Proving that these behaviours are evidence of cognition, rather than being automatic reflex responses, albeit impressive ones, is a tough hurdle to clear, and Calvo doesn't quite make it over," said a review of the book by *The Guardian*.

For now, the idea of plants being sentient is still controversial. But it has opened up all kinds of thought experiments – if plants are conscious, can they feel pain? And if they do, should we stop eating them? Some even question: Is mowing the grass the equivalent of mass torture?

No one knows for now, and the mysteries of plant language have yet to be uncovered. But I guess a lot of people have gained an excuse not to mow their lawns.

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Plant language is just one of many weird and wonderful phenomena out there that can teach us plenty about the world we live in. Every month, this column will go off tangent from the news and look into more curiosities in various fields, from finance and economics to science and psychology, or even beyond.

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