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My plants miss me when I'm not around

Research shows that plants respond to their environment, can react to sounds and may even communicate with each other

By Neema Pathak Broome

Research has established that young roots of corn make regular clicking sounds.

I have a small garden in my balcony where plants come up as they please from the kitchen vegetable waste that I put in the pots. I recognise each one of them and spend a few moments every day talking quietly to these potted friends. I notice that they look a bit sad when I've been away for too long.

I wonder whether they miss me as much as I miss them. As a child I had read that Jagdeesh Chandra Bose was the first scientist to draw a parallel between plants and animals suggesting that plants could display behaviour similar to animals. Wanting to find out more I decided to bring this up with Deepak who is a scientist – with a bit of hesitation though – wondering if he would scoff at me!

"It's interesting that you bring this up as I've been reading about how plants actively perceive their environment, integrate this information with their own internal state, and respond accordingly... pretty much as we would do. How do you think they can do this if they don't have intelligence?" was Deepak's response. I was jubilant when I realised he wasn't pulling my leg but was dead serious. Yes! My plants miss me!

Suitable habitats

"Just like animals, plants also have to find food and suitable habitats, avoid predators, tolerate stressful situations, find potential mates, reproduce and propagate.

To do this they have to sense and respond to changes in their environment appropriately, perhaps even more intelligently than animals as plants can't move," Deepak said.

How do plants deal with such complex situations I wondered. "Scientists are only just beginning to understand the complexities of plant behaviour. It's now known that plants have memory, can learn, and are intelligent – not in the way you and I think, but in a slightly different manner. Plants can even choose who they mate with, recognise their neighbours, communicate with them and establish relationships of competition or cooperation."

Watch animals

By this time I had began to equate my potted friends with my dogs...strange how different they looked and behaved and yet how similar they suddenly seemed to be! What makes me think so? Well, let me share some bits of information with you. You'll find out...

Plants recognise each other. Susan Dudley at McMaster University in Canada demonstrated this point. Using their roots, plants can actively differentiate whether their neighbours are related to them or not! They can respond accordingly by reducing root growth and hence, competition in the case of related neighbours, or increasing root growth and competition in the case of unrelated neighbours.

Dr Uma Shaankar and her colleagues at the University of Agricultural Sciences, Bangalore, have shown that seeds developing within a fruit sired by different pollen compete with each other for resources. The degree of competition goes down with increasing relatedness between the seeds. This means that seeds sired by related pollen are less competitive with each other!

Talk about nepotism!

Plants talk, give out alarm calls, and cry out for help! Dogs bark when they sense danger and other animals give alarm calls but did you know that plants do the same? Plants release volatile compounds (gases) when attacked by insects that feed on them.

These compounds are perceived by other parts of the plant and by neighbouring plants as a warning, helping them to get ready for an attack. Ian Baldwin and his colleagues at the Max Planck Institute in Jena, Germany, have found that these volatile compounds not only repel the insect attackers, but also attract other insects that are the natural enemies of the attacker!

Interestingly, plants even appear to react to sounds and may even make clicking noises to communicate with each other as is being currently researched upon by post-doctoral research fellow, Monica Gagliano from Australia and her team mates.

Really, plants don't seem very different from us. So next time you are near a plant, recognise that it is aware of you just as any friend or any animal pet would be...perhaps not exactly in the same manner but in its own unique way.

The author, a member of Kalpavriksh, works on issues of conservation.

(Inputs from Deepak Barua of the IISER, Pune.)

Rivalry in jamun seeds

An extreme case of sibling rivalry is seen in the common jamun tree (Syzygium cumini). Thirty seeds compete for survival in a fruit and ultimately only one prevails. This intense competition between seeds sired by different parents is mediated by the production of a 'killer chemical' by dominant seeds which inhibits growth and ultimately kills the subordinate seeds.

Jamun tree.
PHOTO: DEEPAK BARUA

Recruitment

Tobacco plants recruit help as defence against attacking caterpillars (moth: Heliothis virescens) which commonly feed on tobacco plants. Once attacked, the plant releases airborne chemical cues which attract a parasitic wasp which kills the caterpillar. These chemicals also signal other plant parts and neighbouring plants to get ready for any imminent attack by the caterpillar.

Tobacco plant.