

QUESTION CORNER

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Arabidopsis thaliana (Thale Cress) | Photo Credit: Getty Images

Animals often use highly specific signals to warn their herd about approaching predators. Surprisingly, a similar behaviour is also observed in plants. Shedding more light on this phenomenon, Tokyo University of Science researchers have discovered one such mechanism. Using *Arabidopsis thaliana* as a model system, the researchers have shown that herbivore-damaged plants give off volatile chemical 'scents' that trigger epigenetic modifications in the defence genes of neighbouring plants. These genes subsequently trigger anti-herbivore defence systems.

Prior studies have shown that when grown near mint plants, soybean and field mustard (*Brassica rapa*) plants display heightened defence properties against herbivore pests by activating defence genes in their leaves, as a result of "eavesdropping" on mint volatiles. Put simply, if mint leaves get damaged after a herbivore attack, the plants in their immediate vicinity respond by activating their anti-herbivore defence systems in response to the chemical signals released by the damaged mint plant. To understand this mechanism better, a team led by Tokyo University of Science, studied these responses in *Arabidopsis thaliana*, a model plant used widely in biological studies (*Plant Physiology*).

First, researchers exposed the plants to beta-ocimene, a volatile organic compound often released by plants in response to attacks by herbivores like *Spodoptera litura*. Next, the researchers tried to determine the exact mechanism of action of volatile-chemical-activated plant defence. They found that the volatile chemicals released by the damaged plants enhanced histone acetylation and the expression of defence gene regulators. The team found a specific set of enzymes were responsible for the induction and maintenance of the anti-herbivore properties, a press release says.

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