

# Scientists decoding language of plants

By Elizabeth Preston, Nautilus

Entomologist Richard Karban knows how to get sagebrush talking. To start the conversation, he poses as a grasshopper or a chewing beetle – he uses scissors to cut leaves on one of the shrubs. Lopping off the leaves entirely won't fool the plants. So he makes many snips around the edges and tips of the leaves – “a lot of little bites.”

A few months later, Karban, a professor at UC Davis who studies plant defense communication, returns to the sagebrush and examines its leaves, many of which now have damage from real grasshoppers or beetles. However, within about two feet of the branches he clipped, leaves have been spared the worst ravages of the hungry insects. That's because Karban's cuttings convinced those damaged leaves they were under insect attack, so they sent chemical alarms into the air. Neighboring leaves intercepted and deciphered the code messages, and began prepping their own defenses against the bugs.

If plants seem silent to us, it's only because we're oblivious to their chatter – we are just beginning to tap into their cryptograms. Plants emit codes into the air all the time, helping them defend against insects and other threats, and in some instances serving as warnings to their neighbors. Moreover, plants can send “SOS” calls for rescue missions and summon predators to feed on insect invaders.

Plants speak in chemical codes – carbon-containing molecules called volatile organic compounds (VOCs). Characterized by the ease with which they enter the air, VOCs are a diverse group: plants alone make more than 30,000 varieties. Some VOCs produce familiar herbal or flower smells. Others are released

only in response to a specific cue. Within seconds of being damaged, plants send out green leaf volatiles (GLVs), which we can detect too – for example, as the smell of a newly mown lawn.

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