

## Exploitation of insect vibrational signals for pest management

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Sustainable management strategies for insect pests should include methods that are targeted to disrupt such interactions as reproductive behaviour. While exploitation of chemical communication is recognized as an indispensable part of integrated pest management, it is often overlooked that numerous insect pests do not rely exclusively on pheromones for finding a mate and one of the future challenges is to identify appropriate alternative approaches to control them. Leafhoppers, planthoppers and stink bugs, that together comprise more than 35.000 species, are the best known pests which use substrate-borne sound (vibrational) communication to recognize and locate the partner. These insects are currently managed primarily by insecticide treatments. Exploitation of vibrational signals in pest management is a new approach and in the lecture two model pest species, the southern green stink bug *Nezara viridula* and the leafhopper *Scaphoideus titanus* will be discussed. Detailed investigations of mating behaviour in these two species have revealed differences in the role of vibrational signals in bi- and unimodal communication systems. Furthermore, new insights into fundamental mechanisms of vibrational communication revealed that, contrary to the prevailing perception, this channel is open to interference. Recently, effective mating disruption based on vibrational signals was achieved in the field. Exploitation of vibrational signals can provide an efficient new environmentally friendly approach in pest management that in the near future can transform many farming systems.

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## The contribution of olfaction for spatial orientation

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In animals, the sense of smell (i.e. olfaction) provides an important vector for the assessment of the surrounding environment. Odors dissolved in the atmosphere can carry information on food sources, conspecifics, predators, and other dangers. These odors also invoke the recall of storage episodic memories, and therefore, from an evolutionary point of view, olfaction is proposed to be one of the most ancient senses in animals. Within this vast range of information that odors can offer, they are also claimed to provide "map" information (i.e. give geographic position information) used by animals during the navigational process. Recent experiments were conduc-