INVERTEBRATE SOUND & VIBRATION

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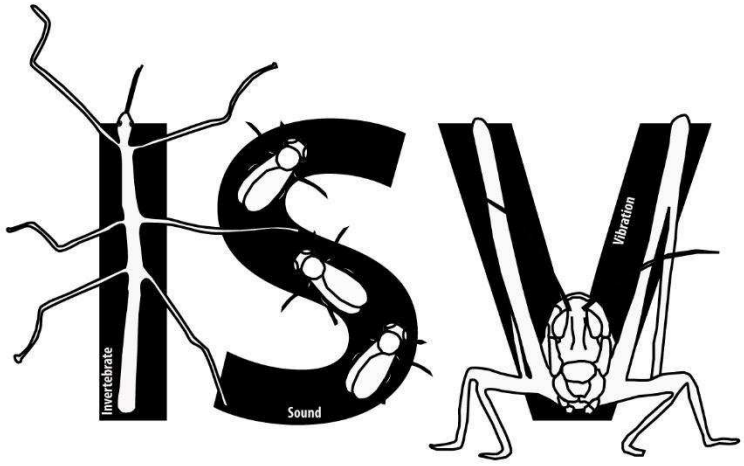

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Conference Organizers:
Manuela Nowotny & Reinhard Lakes-Harlan

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Talk 45

Can vibrational playback improve the Brown Marmorated Stink Bug control?

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The Brown Marmorated Stink Bug *Halyomorpha halys* (Stål 1855), or BMSB, is currently one of the most notorious invasive insect pests worldwide. Its growing economic impact and devastating potential spurred hundreds of studies in the past two decades, yet vibrational communication remained completely ignored.

We approached the question of whether behavioural manipulation using vibrational playback is feasible by first describing the basic sexual behaviour, in which vibrational signals should play a prominent role as in all known species of Pentatomidae. In our observations, males initiated vibrational communication with long, narrowband vibrational signals to which the nearby females replied with their own vibrational signals, which in turn triggered male searching. The animals then emitted several song types in various combinations until they came into physical contact. The final male song type, emitted only in direct contact and featuring tremulation in addition to abdominal vibration, was followed by either copulation or female's rejection of the male.

Male signals did not attract other individuals, whereas female signals showed clear attractiveness to males. This opened an avenue for devising a playback method for trapping the BMSB. We tested the attractiveness of one female signal type – the pulsed FS2 – reproduced by a minishaker in three different laboratory scenarios: potted bean plants, arenas and net cages. We measured various behavioural parameters and confirmed a clear attractive effect in all performed tests.

A prototype of a vibrational trap has then been built, tested in a laboratory, and set in a pear orchard in Northern Italy during summer 2017. The female signal was played in a loop from within the inner part of the trap to attract males lured in the vicinity with aggregation pheromone.

This trap featuring bimodal signals constitutes the first example of pheromone based traps complemented with vibrations. Test results show promise for practical development of a more efficient trapping technique against *H. halys* in both agricultural and urban environments.