

## HOW VIBRATIONAL SIGNALS CAN GUIDE MATING BEHAVIOUR IN *SCAPHOIDEUS TITANUS*

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The development of sustainable control methods of insects requires detailed knowledge about the biology of the pest and how it communicates with conspecifics. For example when creating a mating disruption strategy to control vibrational communicating species, it is important to understand the mechanisms of the mating behaviour in such pests. We have studied the leafhopper *Scaphoideus titanus*, which is a serious pest of grapevine where it is a vector of the phytoplasma grapevine disease *flavescence doreé*. In laboratory experiments, males and females were positioned on different plant parts of the same grapevine cutting and the searching behaviour of the male was recorded with laser vibrometry. The communication started with an identification phase in which there was an increased male pulse period and random walking after female reply. Thereafter followed a location phase, in which male calls became shorter, with more regular pulse period and correct directional decisions were recorded towards the female leaf. When a searching male reached the leaf with the female the perceived intensity of female reply increased significantly and a courtship phase was shown until copulation. With these experiments we have shown for the first time that intensity is an important parameter in vibrational communication of plant-dwelling insects. Different phases of mating behaviour are associated with different levels of perceived signal intensity and accordingly, males adjust the emission of vibrational signals and searching behaviour. Consequently, may external interferences result in loss of information necessary either for identification or location and thus preventing mating. It is possible that mating disruption with vibrations has a successful target in the more susceptible behavioural phases of *S. titanus*.