



Leafhoppers: tiny but mighty- power of diversity

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Leafhoppers (Hemiptera: Auchenorrhyncha: Cicadellidae) are small (0.2-1 cm) phytophagous insects and are with more than 22 000 described species one of the most speciose groups. They communicate in a complex biotic landscape that contains other conspecific and heterospecific signallers, as well as rivals and exploiters. Since in this group, mate recognition and location are mediated exclusively via vibrational signals, leafhoppers provide an ideal model system to study interactions shaping the evolution of this communication channel. More detailed work on such diverse, but hitherto largely neglected groups, is likely to provide invaluable empirical data to address some questions that are central to our understanding of communication in general. Sexual communication is based on a coordinated exchange of species- and sex-specific vibrational signals and species from the genus *Aphrodes* with their highly divergent male calls, similar female replies and divergent duet structures served as a model group to study the role of vibrational signals and duet structure in reproductive isolation. Studies revealed that the species-specific duet structure plays an important role in mate recognition and location and despite its deceptively simple form, vibrational duetting may entail more complex interactions than just temporal coordination. We used these leafhoppers also to explore direct and indirect costs of vibrational signalling. While a higher calling rate increases the probability of locating the female, it also has a detrimental effect on male survival, due to eavesdropping predators and indirect costs arising from high energy expenditure. Leafhoppers are also among the most important vectors of plant diseases. The grapevine pest *Scaphoideus titanus* was chosen as a model species for developing an environmentally friendly approach to manage insect pests based on playback of species-specific disruptive vibrational signals used by males to interfere with the courtship of the rivals.
