

A day in a life of a bug linguist

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Substrate-borne sound (vibrational) communication is used by more than 200.000 arthropod species [1]. Most of them communicate on plants and in a complex biotic landscape that contains other conspecific and heterospecific signallers, as well as rivals and exploiters [2]. In nature animals often communicate in situations when several individuals emit signals at the same time. For animals communicating acoustically, in such situations the problem of perceiving signals is equivalent to the human ‘cocktail party problem’ formulated as “How do we recognize what one person is saying when others are speaking at the same time” [3]. However, for animals the problem is compounded by signals of other species present in the same environment.

In some species, silent partners approach continuously signalling individuals and for them species- and sex-specific song rhythm is the most crucial parameter for mate recognition [4]. While on one hand, species-specific temporal pattern enables partners to find each other, on the other hand relying exclusively on song rhythm often leads to identification and localization errors, when songs from several singing individuals combine to form an unattractive rhythm [5].

In other species, communication is based on a precisely coordinated duet formed by species- and sex-specific vibrational signals [6,7]. The species-specific duet structure plays an important role in mate recognition and location [8] and despite its deceptively simple form, vibrational duetting entails more complex interactions than just temporal coordination [9].

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