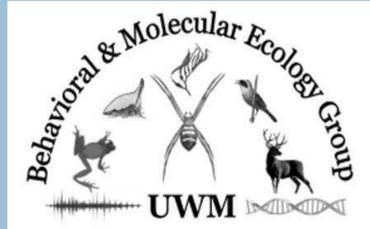


The Impact of Interspecies Interaction on Adult Male Treehoppers Signaling Behavior

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Introduction

- Mate choice is an important cause of signal evolution that can promote speciation
- Mate choice takes place in complex social environments where male signals are compared to each other
- Social environments and interactions are often important causes of variation in mating signals and mate preferences
- Theory suggests that some forms of social plasticity may enhance differences between diverging populations, facilitating speciation (Bailey & Moore 2012)

Hypotheses and Predictions

- **Social plasticity hypothesis** predicts that individuals developing in mixed aggregations will have more divergent mating signals than individuals that develop in homogeneous aggregations
- **Reinforcement hypothesis** predicts that the above pattern will only be seen with individuals from sites where both diverging populations occur in sympatry, but not in sites where only one or the other population occurs (allopatry)



Methods

- We tested these hypotheses with two recently diverged species of plant-feeding insects: to members of the *Enchenopa binotata* species complex (Hemiptera: Membracidae)
- We collected *Enchenopa* nymphs from a sample of sympatric and allopatric sites in Wisconsin
- Separated by location and high or low frequency as nymphs onto potted *Viburnum lentago* growing in the UWM greenhouse sample size of 40 until the treehoppers reached maturity
- We reared the nymphs in treatments of mixed or single-species aggregations on their host plant, *Viburnum lentago*
- Laser vibrometry was used to record the calls of mature male treehoppers
- Recordings of treehoppers were analyzed for their call duration, frequency, pulse rate, and quantity of calls



Results

- *Enchenopa* males expressed no change in signal frequency nor signals per bout when in a sympatric as opposed to allopatric environments
- Males with high frequency calls did not change frequency to adapt

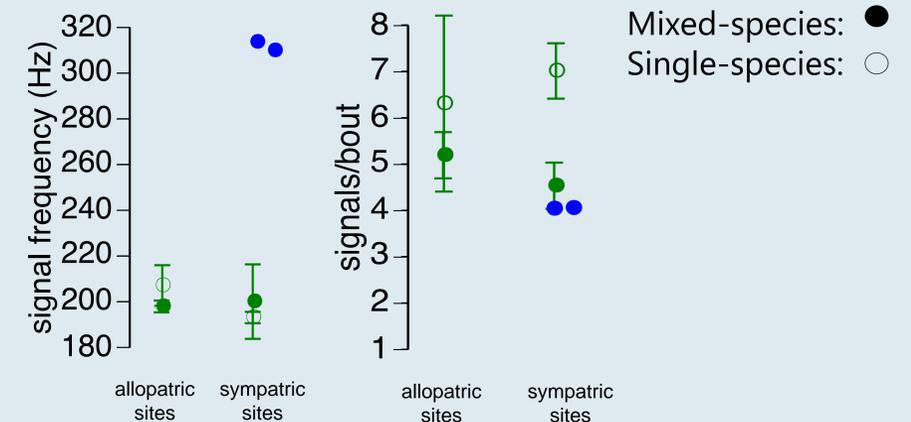


Figure 1. Treatment- and population-level mate preference functions for male signal frequency for the two *Enchenopa* species

Discussion

- Results were not able to prove either hypothesis
- Further sampling would provide necessary information about how female signal preference is affected by social plasticity

References

- Bailey, N.W., A.J. Moore. 2012. Runaway Sexual Selection Without Genetic Correlations: Social Environments and Flexible Mate Choice Initiate and Enhance the Fisher Process. *Evolution* 66-9: 2674-2684.
- Cocroft, R.B., Rodríguez, R.L. 2005. The Behavioral Ecology of Insect Vibrational Communication. *BioScience* 55: 323-334.