

Ashley Groves, Biological Sciences

University: University of Missouri

Year in School: Senior

Hometown: Country Club Hills, Illinois

Faculty Mentor: Dr. Reginald Cocroft, Biological Sciences

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Determining whether mate-searching males use directional information from female signals in *Umbonia crassicornis*

Ashley Groves, Jennifer Hamel, and Reginald Cocroft

Vibrational communication is widespread in insect social and ecological interactions. In fact, it has been estimated that thousands of insect species use vibrational signals as a primary source of communication. During many interactions, such as courtship and predator encounters, it is necessary for individuals to locate the source of the vibrational signal. Although localization of this sort is important, the mechanisms that small insects use to locate the source of the vibrational signal are not known. We are studying mate localization in thornbug treehoppers, *Umbonia crassicornis*. These are small sap-feeding insects in which mate-searching males produce vibrational signals that are transmitted along the stems and leaves of their host plant during courtship. First, the male produces a vibrational signal that is detected by the female. The female responds with her own vibration, creating a duet which is repeated until the male reaches the female. We hypothesize that the female's vibrational signals provide directional information to searching males. In order to test this hypothesis, we recorded the routes traveled and decisions made by mate-searching males as well as audio of the male-female duets. Our preliminary data suggest that female signals do influence the paths that males take to find females. Our results will guide future research on the actual mechanisms used by treehoppers to determine the direction of a substrate vibration and will continue to provide important insights into insect social behavior, ecology, and evolution.