Electroantennogram Assays to Determine Megacopta cribraria Response to [E]-2-hexenal, Tridecane, and [E]-2-decenal

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Megacopta cribraria is an invasive stink bug species that is devastating soybean crops across the Southeastern United States. Pheromone traps are an effective and environmentally friendly method for control in insects; however, no research had been reported on the M. cribraria pheromone prior to our work. This is a third year continuation study on M. cribraria response to components of their defensive secretions, which previously indicated female attraction to [E]-2-hexenal, male indifference to [E]-2-hexenal, and male/female indifference to tridecane. The purpose of this year's study was to construct an electroantennogram (EAG) for a more effective, direct, and time efficient method to determine M. cribraria response to volatiles. An electrode was inserted into the base of the insect head and another electrode was attached to the tip of one antennae. A test chemical/paraffin oil solution was introduced in an airstream to the antennae while an electrocardiogram and Vernier Labquest recorded the response. The voltage response to the chemical solution was compared to the voltage response to pure paraffin oil, used as a control. EAG measurements detected a statistically significant response from females to [E]-2-hexenal, and no significant response from males to [E]-2-hexenal. Neither males nor females had a significant response to [E]-2-decenal or tridecane. This data supports that [E]-2-hexenal is an active component in M. cribraria communication and has potential as an effective pheromone trap bait. In addition, the newly designed EAG is an affordable option now available for further research into insect pheromones.

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