Olfactometer and GC/MS Evidence for (E)-2-hexenal as a Semiochemical in the Defensive Secretions of the Kudzu Bug, Megacopta cribraria

Williams, Abigail

Onnink, Carly

Megacopta cribraria is a newly invasive stink bug species significantly reducing soybean crop yield across the southeastern United States. Chemical pesticides are a limited method of control and scientists are currently exploring biological control options. This study is the first reported attempt to identify M. cribraria pheromones that could be utilized in an insect trap for environmentally friendly monitoring or integrated pest control. Initial olfactometer tests found M. cribraria females to be significantly attracted to disturbed M. cribraria specimens. While little is known about the pheromones of the Plataspidae family, a study of Tessaratoma papillosa, another species in the Pentatomoidea superfamily, yielded GC/MS evidence of tridecane in their undisturbed and disturbed volatiles and [E]-2-hexenal in only their disturbed volatiles. Based on the pervasiveness of pheromone sharing, this study investigates those chemicals in the M. cribraria defensive secretions, hypothesizing that [E]-2-hexenal will illicit a semiochemical response. Open Y-track olfactometer assays were conducted to evaluate the M. cribraria behavioral response to E-[2]-hexenal and tridecane. Females were significantly attracted to [E]-2-hexenal while males were indifferent, and both genders showed indifference to tridecane. GC/MS was performed to analyze the chemicals within the M. cribraria disturbed volatiles. Tridecane was detected in the disturbed and undisturbed volatiles, while [E]-2-hexenal was a component of only the disturbed volatiles. This data supports that [E]-2-hexenal is a semiochemical in the defensive secretions of M. cribraria that could be used as a pheromone trap bait.

Awards Won: