3391: Pheromones of Pentatomoidea: New discoveries for application to pest management

Thursday, September 29, 2016
02:00 PM - 02:15 PM
Convention Center - Chapin Theater

Semiochemicals are central to success of the Pentatomoidea, as the name “stink bug” implies. Pentatomoid semiochemistry includes sex, aggregation, and alarm pheromones; allomones; kairomones used by parasitoids and predators of stink bugs; and tritrophic interactions. Of the ~45 pentatomoid species with identified pheromones, all are male-produced; approximately half are sex pheromones (attracting females only), and half are aggregation pheromones (attracting both sexes and, where tested, nymphs). The pheromone chemical structures are very diverse, ranging from acyclic straight-chain and terpenoid molecules with typically one functional group, to cyclic sesquiterpenoids with up to 4 chiral centers, posing significant analytical and synthetic challenges. Most stink bug pheromones probably consist of 2 or more components: of 32 species with clearly defined pheromones, 14 have multiple components; 7 species apparently have a single component; the remaining 11 may be single or multiple, requiring further stereochemical analysis, synthesis, and/or behavioral bioassays. Detailed studies of pheromone emissions indicate complex variation by individual, age, population density, time of day, and other environmental stimuli. The cross-attraction of several species to pheromones of other species occurs for both adults and nymphs. In some cases, it represents known or probable overlap in pheromone chemistry; in other cases, it does not, for reasons that are not yet clear. Pentatomoid pheromones can potentially be exploited for detection or monitoring, and in attract-and-kill or other pest control tactics, but are currently used almost exclusively for monitoring a few important species. We assess the requirements and prospects for expanded use in future pest management.

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