HOST SELECTION BY EMERALD ASH BORER: CHEMICAL ECOLOGY AND BEHAVIORAL STUDIES

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ABSTRACT

We compared host selection and feeding behavior of the emerald ash borer, *Agrilus planipennis* Fairmaire, on its native host (Manchurian ash) and on North American ash species exotic to the beetle (green, black, white, blue, and European ash). We examined whether beetles could locate hosts by olfaction and investigated chemical differences in volatile profiles of native and exotic hosts. In a multiple-choice assay, beetles preferred to land and feed on three (green, black, and white ash) of the five exotic host species tested. While beetles consumed every ash species offered to them, the native Manchurian ash and the exotic blue ash were least preferred in feeding bioassays. The six ash species in our study differed significantly in relative amounts of chemical compounds that elicited electrophysiological activity by beetle antennae, and beetles landed less frequently on visual silhouettes of artificial trees, suggesting that olfactory cues are used to locate and discriminate among host species in nature. North American ashes exotic to the beetle are more palatable and probably less resistant than Manchurian ash, which coevolved with the beetle in its native range. Physical and/or chemical characteristics of blue ash might render it less preferred than other North American ashes. Attractive volatiles from North American ashes can be used as blends to trap beetles in flight. Similarly, less attractive odours, potential antifeedants, and genes for resistance in blue and Manchurian ash can be explored for methods to control *A. planipennis* populations.