ISCE

2024
PRAGUE

39th Annual Meeting of the International Society of Chemical Ecology

Prague, Czechia

BOOK OF ABSTRACTS

ÚOCHB AV ČR
IOCB PRAGUE

Faculty of Forestry and Wood Sciences

INTERNATIONAL SOCIETY OF CHEMICAL ECOLOGY

Volatile organic compound patterns emitted by *Halyomorpha halys*, and herbivory interact to alter volatile emissions in plant hosts

Ali Karimi, Jürgen Gross
Institute for Plant Protection in Fruit Crops and Viticulture, Julius Kühn-Institut, Federal Research Institute for Cultivated Plants, Dossenheim, Germany

The brown marmorated stink bug (BMSB), *Halyomorpha halys*, is a polyphagous plant pest with negative effects on agricultural crops. A strategy to detect the BMSB in shipping containers or field sites is monitoring this species using volatile organic compound (VOC) emitted by the insect and its plant hosts. This study aimed to investigate VOCs from BMSB and its plant hosts to identify species-specific signatures. Using an innovative dynamic headspace collecting device, VOCs emitted by BMSB from its different developmental stages including egg, nymphal stages, nymphal exuvia, and adults were collected on thermal desorption tubes and analyzed using ATD-GC-MS. Besides, we assessed the effects of BMSB feeding on VOCs emitted by pear and apple trees. According to our results, forty-five VOCs were identified in the BMSB samples, mainly consisted of tridecane, *E*-2-decenal, 2-undecenal, and *E*-4-*oxo*-2-hexenal. The random forest analysis revealed three different chemical patterns among BMSB life stages samples. Furthermore, our results indicate that feeding by BMSB adults induced changes in specific amounts of VOCs emitted by plant hosts. Pear trees exposed to the BMSB emitted copaene and α-muurolene at a higher concentration than control trees. Methyl salicylate and α-farnesene were emitted by apple trees in higher concentrations after BMSB feeding. In conclusion, this information may be used for identifying specific chemical signatures as biomarkers for on-site detection of this pest e.g. in shipping containers or agricultural areas.

Acknowledgments: This work was funded by the European Union (Horizon 2020 Farm2Fork) under the PurPest project through grant agreement 101060634.