

P173. Non-destructive methods for detection of fruit flies' infestation in fruits

E. Anastasaki*, A. Psoma, I. Lytra, M.V. Giakoumaki, S. Toufexi, S. Antonatos, D. Papachristos, P. Milonas
Scientific Directorate of Entomology and Agricultural Zoology, Benaki Phytopathological Institute, Kifissia, Greece

*Corresponding author: e.anastasaki@bpi.gr

Monitoring and detection of insect infestation in fruits and vegetables is critical for sustainable agriculture. Infestation by true fruit flies (TFF) at early stages is difficult especially at early stages of infestation. Inspection for infestation is usually destructive for a large proportion of the commodity. Since, insect herbivory can elicit changes in host plant chemistry and so in volatile emission, in this study, the aim was to determine infestation-specific volatile organic compounds (VOCs)-indicators emitted by fruits (peaches, pears, apples, oranges and mandarins) after the infestation by TFF, namely *Ceratitis capitata* (Wiedemann), *Bactrocera dorsalis* (Hendel) and *B. zonata* (Saunders) (Diptera: Tephritidae). VOCs emitted from non-infested and TFF-infested fruits were collected by the dynamic headspace sampling technique, analyzed by Gas Chromatography-Mass spectrometry (GC/MS). VOCs were also used as a training and validation set for the e-Nose system in order to be evaluated as a potential technology for detection of hidden infestation. Results showed that specific esters were TFF species specific for peaches. In case of pome fruits, esters increased along with the procession of fruit ripening and quantitative differences were observed between non-infested and infested fruits. In citrus, the monoterpene, limonene and the sesquiterpene, valencene were the main VOCs detected in both non-infested and infested fruits. *E*-(β)-ocimene and homoterpene *E*-4,8-dimethylnona-1,3,7-triene (DMNT) were found in significant quantities in infested fruits. Different statistical models were developed from the results of e-Nose, that required validation both in laboratory and in field on the potential for adoption of this non-destructive method for detection of tephritid infestation.

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 818184.

Keywords: fruit flies, VOCs, E-nose, *Ceratitis capitata*, *Bactrocera dorsalis*, *Bactrocera zonata*
