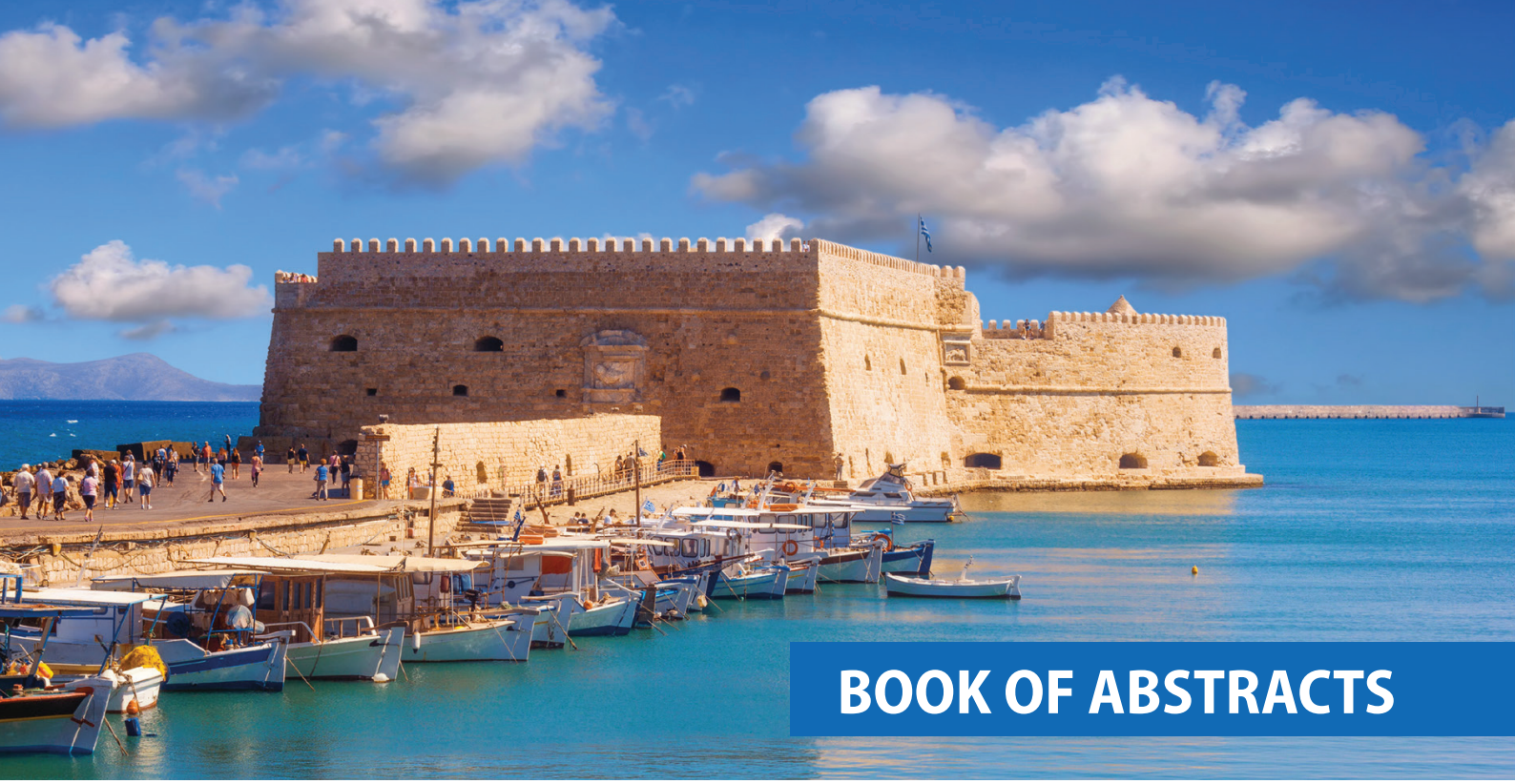

# BOOK OF ABSTRACTS

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

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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*

## P174. *Bactrocera dorsalis* (Diptera: Tephritidae) in the Indian Ocean: a tale of two invasions

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An increasing number of invasive fruit fly pests are colonizing new grounds. With this study we aimed to uncover the invasion pathways of the oriental fruit fly, *Bactrocera dorsalis* into the islands of the Indian Ocean. By using genome wide SNP data and a multi-pronged approach consisting of PCA, ancestry analysis, phylogenetic inference and kinship networks, we were able to resolve two independent invasion pathways. A western invasion pathway involved stepping-stone migration of *B. dorsalis* from the east African coast into the Comoros, along Mayotte and into Madagascar with a decreasing genetic diversity. The Mascarene islands (Reunion and Mauritius) on the other hand were colonized directly from Asia and form a distinct cluster. The low nucleotide diversity suggests that only a few genotypes invaded the Mascarenes. The presence of many long runs of homozygosity (ROH) in the introduced populations are indicative of population bottlenecks, with evidence of a more severe bottleneck for populations along the western migration pathway than on the Mascarene islands. More strict phytosanitary regulations are recommended in order to prevent further spread of *B. dorsalis*

Keywords: *Bactrocera dorsalis*, phylogeography, invasive species, Indian Ocean, pest species

## P175. Using socioeconomic variables to predict the distribution of invasive termite species in the Asian Pacific region?

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Invasive species are a growing concern to ecologists and ecological managers. Economic losses are massive and will keep increasing in the decades to come through three drivers: climate change, global trade and socioeconomic changes. The Asia-Pacific region (APAC) is a major driver of the global economic growth. It is also one of the biggest exporters of invasive alien species. The high level of trade with and within the APAC region promotes the spread of invasive species, including termites worldwide. If termites play an important role in ecosystems, several species are also significant economic pests, mainly in urban areas by attacking the wooden structure of buildings, but also crops, production forests and natural forest habitats. Acting before invasion drastically reduce ecological and economic costs associated to the introduction, establishment and spread of invasive species, but it is difficult to predict effectively which species will invade which regions. Species distribution models (SDMs) are a valuable statistical approach for both understanding species distribution and predicting range expansion after introduction. Out of 18 invasive termite species present in the APAC, twelve of them were selected based on their data availability and their intensity of damages. The SDMs all show that these twelve invasive species present in the APAC could currently settle in many densely populated regions in tropical, subtropical and to a lesser extent in temperate regions. Adding general circulation models for different scenarios and periods show that climate change will increase the distribution of most species, especially in a fossil-fueled world.