



# **Future IPM 3.0 towards a sustainable agriculture**

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Future IPM 3.0

## **BOOK OF ABSTRACTS**



## **Assessment of new trap designs and liquid baits improved with lactic acid bacteria for capturing *Drosophila suzukii* Matsumura**

**Giuseppe Maddalena, Raffaele Guzzon, Valerio Mazzoni, Claudio Ioriatti, Daniel Dalton, Vaughn Walton, Gordana Đurović, Amani Alawamleh, Sonia Ganassi, Antonio De Cristofaro, Gianfranco Anfora**

*First, seventh, eighth, ninth and tenth authors: Department of Agricultural, Environmental and Food Sciences, University of Molise, 86100 Campobasso, Italy; second and fourth authors: Technology Transfer Centre, Fondazione Edmund Mach, 38010 San Michele all'Adige, Italy; third, seventh and tenth authors: Research and Innovation Centre, Fondazione Edmund Mach, 38010 San Michele all'Adige, Italy; fifth, and sixth authors: Department of Horticulture, Oregon State University, 97331 Corvallis, Oregon; eleventh author: Centre Agriculture Food Environment, University of Trento, 38010 San Michele all'Adige, Italy*

E-mail address: peppemad@hotmail.com

### **Highlights**

- Improvement of the attractiveness of *D. suzukii* commercial baits with the addition of different lactic acid bacterial strains thanks to the volatiles released during the fermentation process
- Combined effect of trap design and liquid baits to enhance the trap performance in field conditions

### **Introduction**

The spotted-wing drosophila (SWD), *Drosophila suzukii* Matsumura (Diptera: Drosophilidae), native of Eastern Asia, is an invasive alien species in Europe and the Americas and is one of the main emerging pests of valuable crops, including soft fruits and wine grapes (Cini et al., 2012).

The conventional approach to handle infestations of SWD involves the use of commercially available insecticides, but these do not seem able to ensure effective results. Consequently, alternative strategies are strongly required. Monitoring and control methods based on effective traps combined with attractive lures are among the most promising for the integrated management of *D. suzukii*. Consequently, an improvement in the bait composition is beneficial to guarantee reliable attractivity to SWD. This study was therefore aimed to investigate and improve upon one of the best commercial liquid baits for SWD, the “Droskidrink” (DD) (Tonina et al., 2016).

The experiments were focused on the exploitation of lactic acid bacteria as a biological catalyst in the production of organic volatile molecules attractive to SWD, thanks to the fermentation of sugars and organic acids present in the liquid bait.

### **Material and methods**

We chose strains of lactic acid bacteria usually involved in the fermentation of wine and vinegar, the most attractive fermenting liquids for drosophilids. A series of preliminary field trials was coupled with laboratory tests to describe the behaviour and performance of various preparations



of lactic acid bacteria.

Afterwards, we focused our analysis on different biotypes of the bacterium *Oenococcus oeni* (Garvie) Dicks et al. that revealed a high resistance to stressful environmental conditions of the liquid bait and, at the same time, the emission during malolactic fermentation of volatiles known for their olfactory activity to SWD.

Subsequently a new model of trap able to produce a combined effect with the attractive mixture was evaluated in open field.

## Results and discussion

Our results showed that the attractiveness of DD was greatly increased by the addition of *O. oeni* to the standard mixture. The new trap-bait combination provided excellent results, increasing the number of catches, especially with regard to female individuals and particularly during the cold seasons, when SWD has low population density. In addition, this new trap design is simpler and faster to service, compared to the traps used previously.

The long-term goal is to accelerate research and technology transfer toward the development of mass trapping and attract-and-kill strategies based on the use of traps baited with this new attractant. Catching a large number of insects is crucial to obtaining a reduction in the damage caused by SWD to the fruits (Rossi-Stacconi et al., 2016).

## References

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