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ABSTRACTS



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O DSU I-1

Current status of the *Drosophila suzukii* management in Trentino, Italy, and research perspectives for sustainable control

G. Anfora¹, A. Grassi¹, V. Mazzoni¹, M. V. Rossi Stacconi¹, O. Rota Stabelli¹, V. Walton², C. Ioriatti¹

¹Fondazione Edmund Mach, Sustainable Agroecosystems and Bioresources, San Michele all'Adige, Italy

²Oregon State University, Department of Horticulture, Corvallis, United States

gianfranco.anfora@fmach.it

Unlike other *Drosophila* species, *Drosophila suzukii* is an economically damaging pest because the females have a serrated ovipositor enabling them to infest ripening fruit before harvest. In September 2009 in Trentino, Italy, for the first time in Europe both oviposition on wild hosts and economically important damage on soft fruits were reported. The increasing use of insecticide against this species augments the pesticide residues on the harvested fruits and jeopardises the results obtained with IPM on soft fruits. Development of alternative control methods is therefore urgent to ensure an economic future for the concerned fruit industry. Researchers and technicians of Fondazione Edmund Mach responded rapidly to this new threat. We considered that possible solutions would only arise from a coordinated and international network of diverse expertises, from molecular biology and neurophysiology to pest management techniques. Accordingly, we have determined the genome sequence of Italian *D. suzukii* in order to assist both basic and applied research and to provide information about genes involved in processes such as intra- and inter-specific communication and overwintering. Considerable efforts have been also made at the understanding of basic ecology of this pest. The population dynamics in different natural and agroecosystems have been followed and temperature-dependent fecundity and survival data were integrated into a matrix population model in order to forecast pest's phenology. Mass trapping and physical crop protection by using anti-insect nets are under experimental evaluation and seems the more promising alternative control strategies accessible in the near future. Improvement of the attraction efficiency of the available baits is hence one of our main objective. Several indigenous parasitoids of larvae and pupae were found in Trentino and are under investigation as possible biocontrol agents.

O DSU I-2

***Drosophila suzukii*: foraging, mating and host-finding in response to chemical signals**

P. G. Becher, B. Mori, S. Revadi, P. Witzgall, T. Dekker

Swedish University of Agricultural Sciences, Plant Protection Biology, Alnarp, Sweden

paul.becher@slu.se

Introduction: The damage to fruit caused by the spotted-wing drosophila, *Drosophila suzukii* can be seen as a consequence of insect behaviour. Foraging, mating and host-finding behaviours are basic for survival and reproduction of the fly. Such behaviours are the output of chemosensory processes mediated or modulated by chemical signals.

Objectives: Our objective is to identify chemical signals of behavioural and ecological relevance for *D. suzukii*. In this context we are interested to identify sex specific differences in odour-mediated behaviours like host attraction. We furthermore want to know to which extent behavioural responses are modulated by internal factors like mating state of the flies. In addition we want to understand the meaning of chemical signals for *D. suzukii* reproductive behaviour.

Materials and methods: We applied wind tunnel tests and mating assays to study odour mediated behaviour of male and female *D. suzukii*. Fermentation odours and host odours were tested to study responses in the context of feeding and egg-laying. Mating assays were performed to study the role of social signals on fly reproductive behaviour. Antennal recordings in response to behavioural active odours and chemical analyses assisted the identification of chemical signals.

Results: We found distinct odour-mediated behavioural responses to fermentation compounds, fly odours and fruit cues. Mating state has an effect on fly behavioural responses. We could identify a number of antennal active fruit and fermentation compounds. The behavioural activity of synthetic blends of the identified odour compounds is under investigation. Flies were studied for emission of sex specific signals and behavioural response to fly pheromones. Analyses of cuticular hydrocarbons indicated that differences between sexes are small.

Conclusion: Chemical signals play important roles in the behavioural ecology of *Drosophila suzukii*. Behaviour-modifying chemicals are potential tools to attract or confuse insects in their natural environment. Tests on the attraction to fermentation products in the field are ongoing.