



FA1405: CAMo Interactions

ANNUAL MEETING ON CROP-ARTHROPOD- MICROORGANISM INTERACTIONS

‘Systems biology approaches to identify mechanisms underlying crop-arthropod-
microbe interactions’

Hotel Slon, Ljubljana, Slovenia
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HANDS-ON SYSTEMS BIOLOGY TRAINING SCHOOL

Faculty of Computer and Information Science, Ljubljana, Slovenia
February 3rd, 2017

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From virus resistance to arthropod susceptibility

Session 2

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Breeding programs have selected new citrus varieties based on fruit quality and resistance to viruses. Unfortunately, pest resistance has been missconsidered. The selection for virus resistance in citrus lead to a series of resistant rootstocks that are spread along the Spanish critculture. However, CTV (Citrus Tristeza Virus) resistant genotypes has triggered the increase of many pests such as *Tetranychus urticae*, the two spotted spider mite.

Thus, *T. urticae* has become a serious pest in the last years. In the resent research we show that the *Citrus aurantium* (sour orange) displays enhanced resistance compared with the commercial genotype *Citrus unshiu* (Cleopatra mandarin). To unveil the role of the volatiles in the defence against *T. urticae*, we have carried out volatile analyses and two-choice assays in resistance and susceptible citrus genotypes. Sour orange infested plants exerted antixenotic effect and released higher amounts of volatile compounds related to terpenoids while Cleopatra mandarin infested plants did not. Some selected volatiles act as repellents and prime defences in the susceptible neighboring plants triggering reduced oviposition.

Regarding to systemic resistance, Sour orange sustained reduced oviposition by *Tetranychus urticae* (less than 50%) when the plant was previously infested by conspecifics. Graftings experiemnts showed that this resistance can be systemically transmited. Systemic uninfested leaves showed increased expression of glutamate receptors and higher amounts of JA and OPDA in plants that were previously infested.

Volatiles released affect both direct and indirect defences. In fact VOCs not only affect mite performance and behaviour but also the attractiveness to predatory mites such the generalist *Euseius stipulatus* and the specialist *Phytoseiulus persimilis*. Both predators behave differently in a rootstock-dependent manner. All these results suggest antagonistic resistance mechanisms between virus and arthropods what establishes an increasing challenge for crop protection in the field.