

biostimulators. Chemical analysis of the leaves injured by spider mites and treated with biostimulators showed changes, in comparison with check plants, in the content of primary metabolites (sugars and proteins) as well as in secondary compounds (phenols) which can be important in mite – plant interactions. The treatment of plants with biostimulators decreased phenol concentration in older leaves of both mite-infested and uninfested leaves. However, the young leaves of infested plants treated with Siapton SL had the highest concentration of phenols and low concentration of sugars as compared to control plants. High increase in peroxidase activity was found in all plants infested by spider mites. An application of both biostimulators on cucumber plants caused, however, significant increase in peroxidase activity in both uninfested and mite-infested plants. The spider mite populations in all plants treated with biostimulators were lower as compared to control.

Behavioral Ecology and Life History

Predation of two Mediterranean phytoseiid species (Parasitiformes, Phytoseiidae) upon eggs of tetranychid mites (Acariformes, Tetranychidae)

H. Tsolakis¹, R. Jordà Palomero¹, S. Ragusa¹

¹Department DEMETRA, Laboratory of Applied Acarology "Eliahu Swirski", University of Palermo, Viale delle Scienze, 90128 Palermo, Italy. Email: salvatore.ragusadichiara@unipa.it

Laboratory trials were carried out to verify the predatory capacity of two generic phytoseiid predators upon eggs of the two most important tetranychids damaging *Citrus* orchards in Sicily: *Tetranychus urticae* and *Panonychus citri*. Both *Typhlodromus laurentii* and *Typhlodromus rhenanoides* are autochthonous and common species on spontaneous and cultivated plants. The research aimed at investigating the predatory behaviour of the phytoseiids upon the prey stage considered more vulnerable. The predation rates of the two phytoseiids were different on the two prey eggs, both on each observation day and for the whole observation period. Both phytoseiids clearly preferred *T. urticae* eggs, on which the predation rate was significantly higher for *T. laurentii* (12.5±0.28 preyed eggs/female/day), than for *T. rhenanoides* (9.7±0.21 preyed eggs/female/day). On the contrary, the predation upon *P. citri* eggs was very low, without significant differences for both phytoseiids: 0.5±0.09 and 0.2±0.04 eggs/female/day for *T. laurentii* and *T. rhenanoides* respectively. The predatory activity, naturally, influenced the oviposition rate of the two phytoseiids. *T. laurentii* was the most prolific species with 2.1±0.08 eggs/female/day, when eggs of *T. urticae* were supplied as food, while upon *P. citri* eggs only 0.3±0.05 eggs/female/day was laid by the predator. The oviposition rate of *T. rhenanoides* on *T. urticae* eggs (1.3±0.06 eggs/female/day) was significantly lower, if compared to that of *T. laurentii*. However, no significant differences were found when the phytoseiid preyed upon *P. citri* eggs.

Evolutionary Biology and Phylogeny

Phylogenetic relationships of *Aceria* spp. (Acari, Eriophyoidea) from different *Cirsium* spp. in Serbia, based on mitochondrial COI sequences

B. Vidović¹, T. Cvrković², R. Petanović¹

¹Department of Entomology and Agricultural Zoology, University of Belgrade, Faculty of Agriculture, Belgrade; 11080 Zemun, Nemanjina 6, Serbia; ²Institute for Plant Protection and Environment Belgrade, Banatska 33, Zemun, Serbia. Email: magud@agrif.bg.ac.rs

Plants of the genus *Cirsium* are invasive weeds that cause major ecological and economic damage in North America, Australia and New Zealand. The eriophyid mite *Aceria anthocoptes* (Nal.) has been investigated so far as a potential candidate for biological control of *Cirsium arvense* (L.) Scop. Detailed investigations have primarily focused on researching

specificity to the host plant, and the effect on the plant vigour. It has so far been recorded on *Cirsium arvense*, *C. heterophyllum* (L.) Hill. and *C. lanceolatum* (L.) Scop. Here we present mitochondrial COI gene sequence data from *Aceria* spp collected on different host plants of the genus *Cirsium*: *C. arvense*, *C. eriophorum*, *C. heterophyllum*, *C. creticum* and *C. rivulare*. Sequence divergence (uncorrected p-distance) among *Aceria* spp. populations from different *Cirsium* spp. ranged from 11.3 to 23.7%, while for the outgroup it was 68.7%. The highest sequence divergence of more than 20% was recorded for *A. cirsi* from *C. rivulare* compared to the other four *Aceria* spp. populations. Sequence divergence of *Aceria anthocoptes* from *C. arvense* compared with *Aceria* sp. from *C. heterophyllum* was 17.5%, compared with *Aceria* sp. from *C. creticum* was 18.1% and compared with *Aceria* sp. from *C. eriophorum* was 11.3%. Sequence divergence of *Aceria* sp. from *C. heterophyllum* in regards to *Aceria* spp. from *C. eriophorum* and *C. creticum* was more than 15%, while between *Aceria* spp. from *C. eriophorum* and *C. creticum* it was 17.3%. Phylogenetic analyses of DNA sequences (COI) confirmed the monophyly of the *Aceria* spp. from *Cirsium* spp. Considering the previous research of phenotypic differences, and these results of genetic distances, we suggest that *Aceria anthocoptes* represents a complex of four cryptic species inhabiting different host plants: *Aceria anrhocoptes* s.s. ex *Cirsium arvense*, *Aceria* cf. *anthocoptes* ex *Cirsium heterophyllum*, *Aceria* cf. *anthocoptes* ex *Cirsium eriophorum* and *Aceria* cf. *anthocoptes* ex *Cirsium creticum*.

Population and Community Ecology

Phenology of *Cecidophyopsis malpighianus* (Acari: Eriophyidae) on *Laurus nobilis* in Belgium: first year results

J. Witters¹, H. Casteels¹

¹Institute for Agricultural and Fisheries Research (ILVO), Plant-Crop Protection, Burg, Van Gansberghelaan 96, 9820 Merelbeke, Belgium. Email: johan.witters@ilvo.vlaanderen.be

The gall mite *Cecidophyopsis malpighianus* is a new pest for the pruned *Laurus nobilis* in Belgium. This eriophyid mite causes bud malformation (hypertrophy), which leads to i) growth lag during propagation, ii) unequal development of the pruned shape and iii) an aesthetic appearance which results in a depreciated value of the plants. Because worldwide less is known about the biology and control of this mite a study of the phenology of *C. malpighianus* was performed in 2010–2011, in order to obtain a sustainable control program. For monitoring the population dynamics, 50 highly infested plants were observed weekly and mites were extracted and quantified from injured buds every fortnight. The migration was determined by using double sided adhesive tapes which were checked weekly during the period February-August. *Cecidophyopsis malpighianus* has a deuteroyny life form but the role of its deutogynes needs more attention. The number of generations is unknown but all stages were noticed during the entire year. Males are rare but present in the population. Mites enter the new flower buds in July-August. The population increases with a maximum in February (an average number of more than 970 individuals/bud). In 2011 the migration starts in March till May. From May to June/July the migrated gall mites reproduce on young shoots and under the bracts from where they infest the newly formed flower buds. As mentioned in the title, these are preliminary results, further research is needed to fully understand the behavior of this gall mite.