

STMS Report

COST STSM Reference Number: COST-STSM-FA1203-14780-210713-033947

Period: from 21-07-2013 to 26-07-2013

COST Action: FA1203

STSM type: Regular (from Italy to Serbia)

STSM Applicant: Dr. Massimo Cristofaro, ENEA, UTAGRI-ECO, Rome, ITALY

STSM Topic: Regular (survey of ragweed populations in Central Serbia)

Host: Radmila Petanovic, University of Belgrade, Zemun (Belgrade), SERBIA

Budget Request: Travel: 500 €, Subsistence (hotel/meals): 300 €, Total: 800 €

Purpose of the STSM.

During a recent visit in Serbia, prof. Radmila Petanovic and dr. Biljana Vidovic (both from the Department of Entomology and Agricultural Zoology, Faculty of Agriculture, University of Belgrade, Serbia) informed Massimo Cristofaro (Research Entomologist, ENEA C. R. Casaccia, UTAGRI-ECO, Rome, Italy) about an interest to be involved in the COST SMARTER FA 1023, because they previously recorded the presence of a population of *Aceria* sp. associated with ragweed in Serbia. The symptoms of the eriophyid mite infestation on *A. artemisiifolia* indicated an important impact on the fitness and biomass of the target weed: infested plants were smaller, with a significant loss in number of seeds and a clear decline of their germination rate.

The idea to have a potential new candidate agent (already established in Europe) was considered as a very important aspect for the biological control program on this target weed: for this reason, a 5-day STSM was set up to get additional field data on the distribution of the mite in the territory near Belgrade.

Description of the work carried out during the STSM.

The STSM was organized by an Italian team (one Research Entomologist and one Research Assistant), travelling together with 2 Research Entomologists and one Research Assistant of the Serbian team. Here below you can find the list of the participants:

Massimo CRISTOFARO (ENEA C.R. Casaccia- UTAGRI-ECO, Rome, Italy)

Francesca DI CRISTINA (BBCA-onlus, Rome, Italy)

Radmila PETANOVIĆ (Univ. of Belgrade, Serbia)

Biljana VIDOVIĆ (Univ. of Belgrade, Serbia)

Dragica SMILJANIĆ (Univ. of Belgrade, Serbia)

During the 5-day short mission, several locations in North and Central Serbia have been visited, collecting ragweed plant samples showing some eriophyid mite symptoms. Material was brought to the laboratory and mite samples were extracted and analyzed for further morphological and genetic determinations. Below are listed the field and lab activities during the STSM.

Monday, July 22. Drove northern of Belgrade in the direction of Kovacica and Zrenjanin. Collected plant material in 3 sites: 1. Kovačica-Tomaševac (45°11'10,3."N; 020°37'05.9"E; 92m), 2. Botoš-Banatski Dvori; (45°17'38.4"N; 020°37'43.8"E; 81m) 3. Sutjeska (45°22'46.8"N; 020°41'32.7"E; 84m). Recorded in the third site (SRB0713-03), near the town of Boto (pict. 1), black flea-beetles on ragweed (collected 3 samples). In all the sites recorded on *Ambrosia artemisiifolia* first symptoms of eriophyid mite attack (see pict. 2 and 3). Eriophyoid mites, *Aceria* sp. (for the time being, not identified at the species level) were recorded, numerous and causing early symptoms, only on the 3rd locality, Sutjeska. The others samples, collected in other sites, were free of mites (we suspect that mites were present but, extraction was too fast and probably the (not-expert) PhD student selected the “wrong” tips for the extraction- for the short timing he did the extraction during our absence!)

Tuesday, July 23. Drove southern of Belgrade, towards Kragujevac. Collected ragweed plant material in 3 sites: 1. Čumići, road Mladenovac-Topola (44°06'15.6"N; 020°50'53.5"E; 291m); 2. Mladenovac-Topići (44°18'01.9"N; 020°41'46.3"E; 171m); 3. Ušće-Raška (43°39'39,6."N; 020°33'56.2"E; 1290m). In all sites first symptoms of eriophyid mite attack has been recorded on *Ambrosia artemisiifolia*. At first site only *Aceria* sp. (it seems the same species like in other localities) was recorded, while -at the second site- two species i.e. *Cecidophyes* sp. and *Aculus* sp. have been recorded (according to the low number of individuals we suspect that there were resting on *Ambrosia* by chance).

Wednesday, July 24. Drove North-West to Belgrade towards Stari Slankamen (along the Danube River). Collected ragweed with mite symptoms in one site: Koševac (44°09'30.3"N; 020°12'22.6"E; 236m). No mites were recorded.

Thursday, July 25. Drove South-West of Belgrade, in the direction of Uzice. Collected ragweed plant material in 2 sites: 1. Dići (44°11'55,7.7"N; 020°16'54.4"E, 202m), 2. After Ljig : (44°12'02,3."N; 020°15'16.8"E; 187m). In the site 2, close to the town Ljig recorded a large ragweed population with an important attack of eriophyid mite on the tip of the plant.

Friday, July 26. Drove western of Belgrade, direction Sremska Mitrovica. Only one stop along the road at the Special Nature Reserve Zasavica (44°57'32.2"N; 019°31'32.7"E; 87m): Recorded a large ragweed population.

Besides, dense population of *Aceria* sp. mites were recorded before, on July, 4th 2013 in Zemun (Kvantaš) (GPS data will be provided soon). Besides *Aceria* sp., also *Aculus* sp. was recorded. Still we do not know if the last species is related to *Ambrosia* or not.



Pict. 1 & 2. July 22: second and third sites where we collected mites on ragweed.



Pict 3 & 4. Eriophyid mite early symptoms on *Ambrosia artemisiifolia*.



Pict 5 & 6. Eriophyid mite early symptoms on *Ambrosia artemisiifolia* (site 09).

Description of the main results obtained.

Aceria sp. associated with ragweed is widely distributed in Central Serbia. First symptoms (Pict. 5 and 6) are showing an important impact on the meristematic part of the stem, even if most important effects on the weed fitness will be expressed later in the season (end of August- early September) by the mite impact on flowers and seeds. The hypothesis is to set up a host range test for next year in both open field and laboratory conditions. To reach this target, it will be crucial to finish within this year the work on the mite determination, confirming that i) there is only one *Aceria* sp. in all the Serbian samples collected on *A. artemisiifolia*; ii) the *Aceria* sp. sampled in Serbia is the same species recorded in North America associated to ragweed. Morphological and genetic bioassays are in progress with the Serbian material: USDA contacts hopefully will provide soon mite populations from USA (in ETOH 70% and 95%, respectively for morphological and genetic screening).

Future collaboration with the host institution.

Future plans are considering the involvement of a multidisciplinary team, to work at the same time in 3 aspects: the biology of the mite (performing periodic field and lab observations), identification (by morphological and bio-molecular tools) and host range studies. At the moment, we can address the identification screening mainly to the Serbian Team, while the biological observations and the host range screening will include several activities that should be shared between the Serbian team, the Italian Team and CABI.

Foreseen publications/articles resulting from the STSM.

The results of this first year of research in Serbia will be presented at the next ISBCW, which will be held in South Africa in 2014.

Confirmation by the host institution of the successful execution of the STSM.

The results of the STSM organized by the Italian team confirmed our (Serbian team) previous observations about the potential important impact of *Aceria* sp. (Acari: Eriophyidae) mites on generative organs (both female and male flower clusters) of *Aceria artemisifolia* from the very beginning developmental stage to the maturation. Dense colonies of these mites provoke pale green color and curling of the tips of plants in early stage. Mites can be seen also on foliage, but there are not numerous as on generative organs. STSM broadened our knowledge about the distribution of this mite in Serbia. The early symptoms were observed on plants in crops as well as on rural sites. Collection of slides and/or samples for DNA analysis is deposited at the Department of Entomology and Agricultural Zoology, University of Belgrade-Faculty of Agriculture, for further research activities.