



FA1203: Sustainable management of *Ambrosia artemisiifolia* in Europe (SMARTER)

Short Term Scientific Mission Report

Insect on ragweed across habitats and regions

STSM details

COST STSM Reference Number: COST-STSM-FA1203-17445

Timing of STSM: 12-08-2014 to 08-09-2014

Applicant details

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Host details

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Summary of the STSM

This STSM was focused on field explorations of *Ambrosia artemisiifolia* in South Switzerland and North Italy. Native European herbivore sampling and *Ophraella communa* non-target survey were realized at six sites. Sweeping plants, plant dissection and visual observations were used for the survey. STSM yielded to the great collection of native insect which will be compared with Slovak insect guilds. Ragweed infestation by Eryophid mite and non-target host's infestation by *O. communa* were especially remarkable. The field observations shed light on *O. communa* potential for biological control. This STSM opened also the door for deeper cooperation with the Host institution.

Purpose of the STSM

The aim of this STSM was to do the field explorations and investigate arthropod herbivore communities associated with *Ambrosia artemisiifolia* in South Switzerland (Ticino) and North Italy (Lombardy) to be in turn compared with the situation in Slovakia. We have wanted to quantify and compare composition and structure of the herbivore communities among populations over large geographical areas and different habitats in order to elucidate the lack of a biotic limit that can facilitate invasion. In particular, we assessed the level of attack by specialist versus generalist natural enemies among

populations. In the same time, the potential of ragweed leaf beetle, *Ophraella communa*, to affect and develop on non-target hosts surrounding ragweed populations in the field was investigated. The beetle may provide a powerful natural solution to the ragweed problem, but it may also have negative effects on other plants. Therefore one of the most important purposes of this STSM was shed light on this item.

Description of the work carried out during the STSM

During the first short week, the work was focused on preparation of the detailed timetable, working material and sampling protocols of the field work in Switzerland and Italy. Six sites, Rovio (CH), Corbetta (I), Magenta (I), Magnago (I), Abbiategrasso (I) and Busto Arsizio (I) were selected for native European herbivore sampling as well *Ophraella* non-target survey. All of these sites were visited two times in 7-10-day intervals. In addition some other sites were visited once. The base during the field work was Corbetta with few breaks in Fribourg (plant and insect transfer etc.). Daily activities were divided (depending on weather) into independent field trips. The previously obtained and current data were regularly discussed with other members of the field team from University of Fribourg.

A. The key work carried out during the STSM involved:

- 1, Sweeping/beating plants into a sweeping net at each selected site and each date to survey arthropod community on ragweed – 2x30 sweeps into sweeping net for a total of 2 samples per site – samples were killed by Ethyl Acetate, placed as dry to plastic vials and transported for analysis to Slovakia after STSM.
- 2, 30 *A. artemisiifolia* plants per site were pulling out and stems and roots dissected to search for potential arthropods boring within.
- 3, Visual observation – to scout ragweed population/site for any signs of insect damage or fungal infection
- 4, Non-target survey - the most examined non-target plants were *Artemisia vulgaris*, *Conyza canadensis*, *Helianthus annuus*, *H. tuberosus*, *Inula graveolens*, *Persicaria maculosa*, *Xanthium strumarium* and *Zea mays*. The 50 selected plants were visually scouted to determine potential occurrence of any developmental stages and feeding symptoms of *O. communa*.

B. Extra work carried out during the STSM involved

- 1, Help with transportation, outplanting and managing of plants within plots including of *Ophraella* adults, larvae and egg collections and redistribution – Briese and Interspersion experiments and No-choice cage experiments – collections of adult beetles and larvae was done also for establishment of the new rearing in the quarantine at University.
- 2, Assistance in filming – Swiss TV (SRF) was preparing a document about ragweed harmfulness, distribution and control including and highlighting importance of *O. communa*; the field and lab research carried out within this context was filming as well.

Description of the main results obtained

There are many very interesting data retrieved during this STSM:

1, Native European Herbivores

- Great collections of herbivore samples were obtained by regular sweepings at six different sites - 24 vials with big collection of dry insect guilds were taken to Slovakia for analyses and determination
- Native European guild of herbivores will be compared with Slovak guilds – there are already visible interesting differences, e.g. less herbivores (out of *O. communis*) and more predators as in Slovakia. This is probably because of incredible amount of *O. communis* adults and larvae.
- *Ambrosia artemisiifolia* plants with eriophyid mite symptoms were found in several places; gall samples were taken and placed in vials filled with ETOH 70% and 96%, respectively for morphological and genetic studies; vials were taken to Slovakia for next analyses and determination.
- Surprisingly no stem and root boring insect (except of one lepidopteran larva) was found during regular dissections (together 220 plants)

2, Non-target *Ophraella* hosts survey

The most examined non-target plants were *Artemisia vulgaris*, *Conyza canadensis*, *Helianthus annuus*, *H. tuberosus*, *Inula graveolens*, *Persicaria maculosa*, *Xanthium strumarium* and *Zea mays*. Some of the most interesting and entomologically exciting data during STSM attendant upon this topic:

- *O. communis* is able to feed (as larva and adult) under field condition on *Artemisia vulgaris* (not *A. annua*), *Inula*, Sunflower, Topinambur and *Xanthium*. There are also some negligible records from sweepings over *Conyza* and *Persicaria*. No records out of corn.
- *A. vulgaris* was affected especially as young/fresh plant; it was possible to see larvae (even very young) and adults to feed on *Artemisia* especially at Rovio and Magnago. Adults were presented on several places. No eggs on *Artemisia* were found yet, but we can expect this.
- Sunflower: we found only one site (Altavilla Monferato) with *O. communis* feeding on sunflower in the field (just few adults and larvae, also younger one...); this search should be enhanced next year.
- *Xanthium* was heavily infested and damaged!!! Many adults, larvae and even eggs! Especially along Po River, site Frascarolo. *Ophraella* eggs and larvae were found also at other site (site Bruno).
- *Inula*: almost all plants were infested and damaged!!! at Balerna site - adults, larvae and eggs found...!

Future collaboration with the host institution

Collaboration with the host institution will continue and it will be even enhanced in coming years. All of the topics of this STSM will be still in the spotlight. In addition *Ambrosia* population dynamics survey will open other horizons for fruitful scientific cooperation and joint publications. There is also a good potential to create/strengthen a multidisciplinary “ecology” striking force to deal with *Ambrosia*.

Foreseen publications/articles resulting from the STSM

Part of the results of this STSM research in Switzerland and Italy will be presented at the next NEOTOMA 2014 - 8th International Conference on Biological Invasions, which will be held in Antalya, Turkey in 03-08 November 2014. Joint research and future collaboration is expected to bring a few peer review publications (e.g. Natural herbivores of *Ambrosia* across habitats and regions, Population dynamic survey, Host preference of *O. communis* etc.).

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

Copy of the e-mail sent to the Training Coordinator of the COST Action FA1203 is given below.

Vrable, 15 September 2014



Peter Tóth

Copy of an e-mail sent by Host Institution to the Training Coordinator of the COST Action FA1203

Vymazať | Odpovedať | Preposlať | Presmerovať | Zobraziť viákno | Zdrojový text správy | Uložiť ako | Tlačiť | Hlavičky

Dátum: Mon, 22 Sep 2014 16:58:26 +0000 [18:58:28 CEST]
Od: MUELLER Heinz <heinz.mueller@unifr.ch>
Pre: maurizio.vurro@ispa.cnr.it <maurizio.vurro@ispa.cnr.it>
Cc: Peter TOTH <petery@nextra.sk>
Predmet: Confirmation for STSM at our institution by Peter Toth

Zobraziť toto HTML v novom okne?

Dear Maurizio,
It is with pleasure to confirm successful completion of the STSM of Peter Toth " **Insect on ragweed across habitats and regions**".

We greatly appreciated this collaborative research with Peter Toth and are looking indeed forward to joint contributions and publications that will come out of this. We also are looking forward to future collaboration,

Best wishes, Heinz

Prof. Dr. Heinz Müller-Schärer

Have a look at our new iPhone App at: <https://itunes.apple.com/sb/app/smarter-ambrosia-reporter/id826442411>

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