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

Short Term Scientific Mission Report

Seasonal variations in the amount airborne ragweed pollen in Milan in relation to environmental factors

STSM details

COST STSM Reference Number: COST-STSM-FA1203-16674
Timing of STSM: 12-05-2014 to 22-05-2014

Applicant details

Dr. Branko Sikoparija
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Host details

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Summary of the STSM (max 100 words)

This STSM gathered aerobiologists (Dr Lukasz Grewling, Dr Branko Sikoparija, Dr Matt Smith), in order to determine whether a significant decrease in airborne concentrations of *Ambrosia* pollen witnessed in the northwest of the Province of Milan in Northern Italy in 2013 can be explained by environmental factors such as meteorology, or whether there is evidence to support the hypothesis that the decrease was related to the presence of large numbers of *Ophraella communa* leaf beetles in the area. The first draft of the publication was prepared. Fruitful discussion about expanding SMARTER related activities were carried out during stay in Poznan.

Purpose of the STSM

The purpose of this STSM was to determine whether a significant decrease in airborne concentrations of *Ambrosia* pollen witnessed in the northwest of the Province of Milan in Northern Italy in 2013 can be explained by environmental factors such as meteorology, or whether there is evidence to support the hypothesis that the decrease was related to the presence of large numbers of *Ophraella communa* leaf beetles in the area..

Description of the work carried out during the STSM

During my stay in Poznan, daily activities were divided into independent collection and analysis of data and joint meetings with Dr. Lukasz Grewling and Dr. Matt Smith. The meetings enabled knowledge exchange on previously obtained results and discussion about further analytical procedures.

During the first week, the work was focused on collecting and analyzing airborne pollen data and meteorological data from Po Valley (Milan), Pannonian Plain (Novi Sad) and Rhone Valley (Lyon), known as centers of ragweed European distribution. The analysis was performed fallowing the methodology used for analysis Milan airborne pollen data (Bonini et al., 2014). This STSM included correspondence with Dr. Maira Bonini (IT), the aerobiologist from Milan.

During the second week, the work was focused on writing the first draft of the manuscript that will present obtained results. Besides this, we have discussed our further collaboration in the frame of SMARTER WG4:

(1) Data analysis techniques and options for studying spatial and temporal variations in airborne *Ambrosia* pollen were discussed.

(2) This project is closely related to the Quality Control survey that has been initiated by the European Aerobiology Society, which invites technicians involved in monitoring airborne pollen across Europe to examine test slides. This includes a training module, whereby the technicians are supplied supporting material that provides information about *Ambrosia artemisiifolia* pollen and other anemophilous Asteraceae pollen grains commonly isolated from aerobiological samples.

(3) Different approaches for collecting aerobiological data needed for parameterization pollen release have been discussed. Special attention has been given to experiments planned to collect data for parameterization of ragweed pollen release in the frame of SCOPES JRP “Identification of key factors governing *Ambrosia* pollen emission by field experiments and their implementation in the numerical pollen dispersion model COSMO-ART” (Pannonian plain) and “Ophraella task force” (Italy).

Description of the main results obtained

The observed decrease in airborne *Ambrosia* pollen concentrations recorded in the Milan area is significant.

This study has shown that amount of airborne *Ambrosia* pollen in Milano area is influenced by meteorology conditions before and during the main flowering period of ragweed. This does not support the hypothesis that the observed decrease in airborne *Ambrosia* pollen was solely related to the presence of large numbers of *Ophraella communa* in the area. However, it is important to note that results of regression analysis suggest that the drastic decrease in AP in 2013 cannot be explained by meteorology alone.

Airborne pollen data from Cannabaceae and Urticaceae were also examined. Cannabaceae and Urticaceae species tend to grow in similar habitats as *Ambrosia* (e.g. *Cannabis* on ruderal habitats and agricultural land, and *Urtica/Parietaria* on ruderal habitats). As a result, Cannabaceae and Urticaceae populations could be affected by *Ambrosia* eradication measures. Although this is likely to be more evident in Urticaceae because regular eradication plans usually do not include agricultural fields. Trend analysis showed that there was a significant decrease in the amount of Urticaceae pollen recorded in the Milan area, but this was not seen in Cannabaceae. Such a decrease in the amount of airborne Urticaceae pollen could be related to the implementation of *Ambrosia* management programmes. *Ophraella communa* is unlikely to have caused the decreases in Urticaceae pollen as it tends to feed on plants belonging to the Asteraceae family.

Future collaboration with the host institution

Short-term goals include finalizing and submitting the manuscript presenting the direct scientific results of this STSM. Long-term goals include the continued collaboration on mapping *Ambrosia* pollen levels and their trends across Europe, examining the long distance transport of the major *Ambrosia* pollen allergen (Amb a 1), and the parameterisation of *Ambrosia* pollen emission.

Foreseen publications/articles resulting from the STSM

In addition to publishing the direct results of this STSM (e.g. in Aerobiologia) future collaboration is expected to bring at least one publication in a peer reviewed journal for each of the discussed topics (i.e. the spatial distribution and trends in airborne *Ambrosia* pollen over Europe, the long distance transport of Amb a 1).

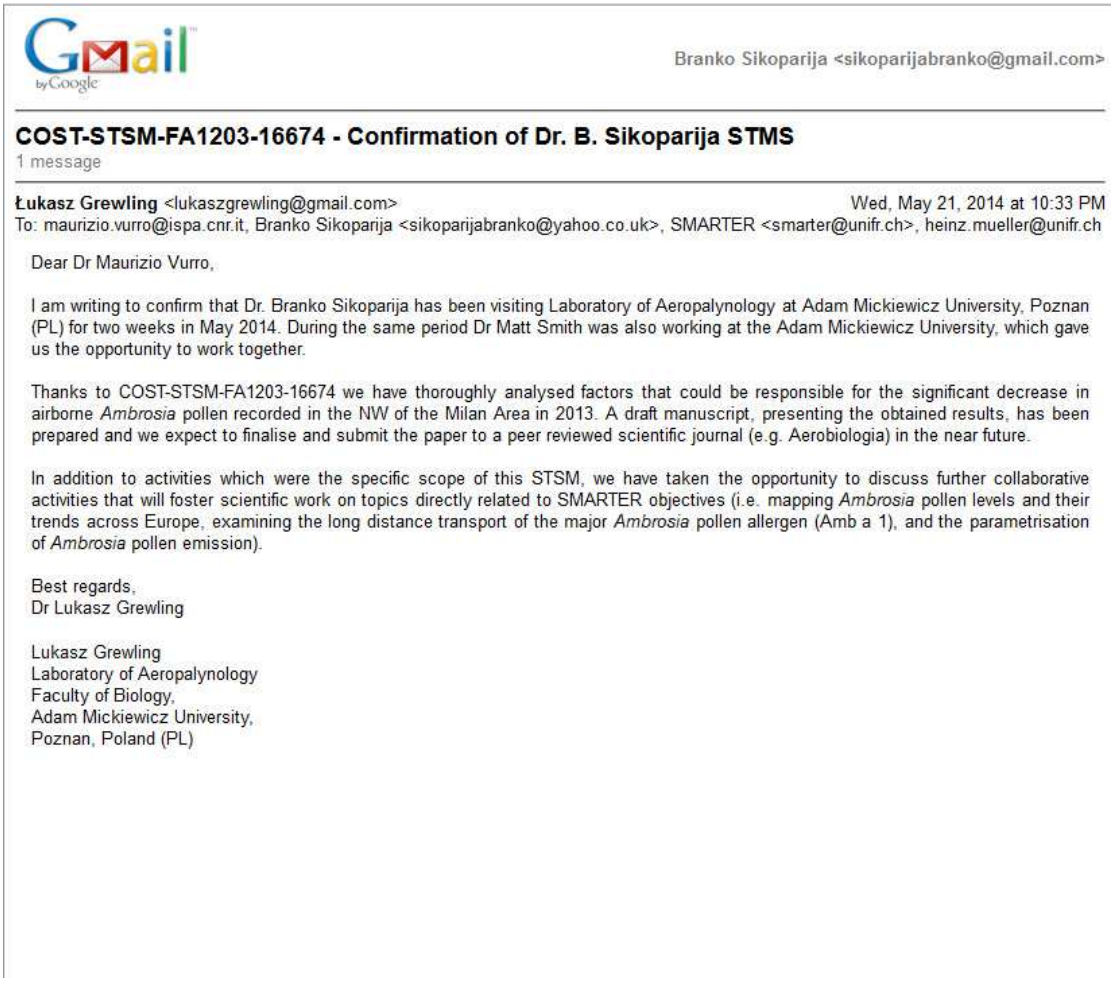
Confirmation by the host institution of the successful execution of the STSM

Copy of the e-mail sent to the Training Coordinator of the COST Action FA1203 is given in Appendix 1.

Novi Sad, 23th May 2014

Dr Branko Sikoparija

APPENDIX 1: Confirmation of the successful execution of the STSM



Gmail by Google

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COST-STSM-FA1203-16674 - Confirmation of Dr. B. Sikoparija STMS

1 message

Łukasz Grewling <lukaszgrewling@gmail.com> Wed, May 21, 2014 at 10:33 PM
To: maurizio.vurro@ispa.cnr.it, Branko Sikoparija <sikoparijabranko@yahoo.co.uk>, SMARTER <smarter@unifr.ch>, heinz.mueller@unifr.ch

Dear Dr Maurizio Vurro,

I am writing to confirm that Dr. Branko Sikoparija has been visiting Laboratory of Aeropalynology at Adam Mickiewicz University, Poznan (PL) for two weeks in May 2014. During the same period Dr Matt Smith was also working at the Adam Mickiewicz University, which gave us the opportunity to work together.

Thanks to COST-STSM-FA1203-16674 we have thoroughly analysed factors that could be responsible for the significant decrease in airborne *Ambrosia* pollen recorded in the NW of the Milan Area in 2013. A draft manuscript, presenting the obtained results, has been prepared and we expect to finalise and submit the paper to a peer reviewed scientific journal (e.g. Aerobiologia) in the near future.

In addition to activities which were the specific scope of this STSM, we have taken the opportunity to discuss further collaborative activities that will foster scientific work on topics directly related to SMARTER objectives (i.e. mapping *Ambrosia* pollen levels and their trends across Europe, examining the long distance transport of the major *Ambrosia* pollen allergen (Amb a 1), and the parametrisation of *Ambrosia* pollen emission).

Best regards,
Dr Lukasz Grewling

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APPENDIX 2: Used references

Bonini, M., Šikoparija, B., Prentović, M., Cislaghi, G., Colombo, P., Grewling, L., Müller-Schärer, H., Smith. M. 2014: Seasonal variations in the amount of airborne ragweed pollen in Milan in relation to environmental factors. 3rd International Ragweed Conference, Milan, Italy.