

## SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

**Action number: CA17108 - Aedes Invasive Mosquitoes**

**STSM title: Surveillance of mosquitoes and vector-borne helminths, rearing methods and taxonomy of invasive and native mosquito species**

**STSM start and end date: 03/02/2020 to 07/02/2020**

**Grantee name: Ioanna Lytra**

### **PURPOSE OF THE STSM:**

The main purpose of this STSM was to gain experience with the surveillance of vector-borne helminths and the techniques for the diagnosis of filarioid helminths in mosquitoes at the Department of Parasitology and Parasitic Diseases, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca.

Another important objective was to be trained with the native and invasive mosquito surveillance equipment that has the Department as well as to understand the techniques that the staff uses for optimising the results of the equipment's use.

In order to find the optimum techniques and parameters for mosquito colonies I collaborate with the Department's researchers for exchanging our opinions and ideas about practices and practical solutions to problems that we everyday face in the insectaries.

Secondly, another purpose of this STSM, was to train researchers on mounting techniques and morphological keys for mosquito's taxonomy (adults and larvae).

Our aims are fulfilled and will significantly contribute to further involvement of the Benaki Phytopathological Institute in WG1 activities under the umbrella of AIM COST Action.

Finally, this STSM provided the opportunity for me to acquire a set of practical skills for the laboratory and field work and improve my dexterity. I consider gaining more experience in this field will help my future development as a researcher. Not only this STSM allowed me to do better my practical work but also offered me the possibility to really understand the theoretical aspects behind each step of the process I was interested in.

In conclusion, I firmly believe that this Short Term Scientific Mission at the **Department of Parasitology and Parasitic Diseases, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca under the guidance of Professor Andrei Mihalca** will help me to perform and implement Molecular methods for mosquito screening for filarioid helminths and also increase the quality of my scientific work.

### **DESCRIPTION OF WORK CARRIED OUT DURING THE STSM**

The training at the **Department of Parasitology and Parasitic Diseases, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca** was divided into two parts: a theoretical and a practical one, which were included on an everyday basis; additionally, after the completion of the scheduled tasks for the day, time was allowed for background research or documentation on the tackled topics. Below I am including a detailed work plan for the week of my stay.

In the first two days (03.02-04.02.2020), the focus was mainly on the surveillance of native and invasive mosquitoes as well as vector-born helminths. I started the practical session by watching and controlling the traps (CDC light traps and BG-sentinel traps), discussing with the people that make the surveillance for the Department and I studied previous years' data.

Half the second day, third and fourth (04.02-06.02.2020) were dedicated to techniques for the diagnosis of filarioid helminths in mosquitoes performing molecular analysis on samples of the Department. The first step of this procedure was to group and pool mosquitoes according to species, capture date and sampling site. The second step was the DNA extraction and we continued with PCR amplification. Sequences from already analyzed mosquitoes were compared to those available in the GenBank database using Basic Local Alignment Tool (BLAST) analysis.

The last day (07.02.2020) I trained researchers of the Department on mosquito mounting (mostly adults) and taxonomy. During the identification session I gave a lecture on basic taxonomy of mosquitoes and then I used specimens of Greek mosquito species (e.g. *Culex tritaeniorhyncus*, *Aedes caspius*, *Culex theileri*, *Uranotaenia unguiculata*) and several taxonomy keys on adult females for identify them. We used larvae from the *Aedes albopictus* and *Culex pipiens* colonies for study the larvae anatomy and be familiar with the terms of taxonomy keys for larvae ID.

Moreover, every day I went to the mosquito's colonies of the Department and I was dealing with the procedures required for colony routine rearing (keeping the larvae clean, feeding them, sugar feeding adults, collecting eggs, hatching eggs, sorting larvae and pupae). I discussed with the researchers about different techniques and practical solutions for optimal larval growth in order to build maintain and finally upscale the colony.

#### **DESCRIPTION OF THE MAIN RESULTS OBTAINED**

During my stay at the Department of Parasitology and Parasitic Diseases, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca I believe that I have accomplished the main goal of my Short Term Scientific Mission, which was to get familiar with surveillance of native and invasive mosquitoes and vector-born helminths as well as molecular methods for mosquito screening for filarioid helminths, using the equipment, data and the experience of their researchers as well as best practices and practical solutions of mosquito rearing. Moreover, I trained researchers on mosquito mounting and taxonomy, using morphological keys and mosquito specimens of adult and larvae.

During my Short Term Scientific Mission I gained experience and knowledge in molecular methods for mosquito screening for filarioid helminths, which I consider the most important part of this experience, because I had the opportunity to learn everything about how to use a protocol, how to perform PCR and all the additional information that I need to start working with vector-born helminths back at our Institute.

#### **FUTURE COLLABORATIONS**

I received some advice for my work with mosquito projects in Greece about the trapping methods of the invasive mosquito species and molecular analysis. Taking into consideration this, we will start collaborating in analysis of Greek mosquitoes. Moreover, we continue to collaborate by exchanging ideas about rearing techniques and I will continue to help in mosquito taxonomy. Hopefully we will establish collaboration for further research on these topics between our Institute and the researchers team involved in this STSM from the Department of Parasitology and Parasitic Diseases, University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca.

#### **The STSM grantee**

Ioanna Lytra

University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca

Date: 02/03/2020

Signature:

