



**European Network for the durable exploitation of crop protection strategies**

**IA3 Activity: Human resource exchange**

**ENDURE - Internal Mobility**

***Final activity report***

*(The form has to be filled in and sent to the activity leader – message should be sent to his p.a. [elisa.scanzi@ibaf.cnr.it](mailto:elisa.scanzi@ibaf.cnr.it) – within 15 days after the end of the visit)*

**Topic of the visit**

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**1. Information about researcher and sending partner**

**Name and surname:** Zoltán Pálincás

**Professional status:** PhD student

**Sending partner:** Szent István University, Hungary

**Institute/Department/Research Unit:** Plant Protection Institute

**Address:** 1, Páter K. Street, Gödöllő, Hungary

**E-mail and phone number of the researcher:** Palinkas.Zoltan@mkk.szie.hu

**Supervisor name\*:** Prof. Jozsef Kiss

**Supervisor e-mail\*:** [Jozsef.Kiss@mkk.szie.hu](mailto:Jozsef.Kiss@mkk.szie.hu)

**Supervisor phone number\*:** +36309772552

**2. Information about hosting partner**

**Hosting partner:** Agroscope Reckenholz-Tänikon Research Station ART

**Institute/Department/Research Unit:** Biosafety

**Address:** Reckenholzstrasse 191 CH-8046 Zurich, Switzerland

**Supervisor name\*:** Dr. Franz Bigler / Dr. Joerg Romeis

Supervisor e-mail\*: : [franz.bigler@art.admin.ch](mailto:franz.bigler@art.admin.ch)

Supervisor phone number\*: 0041 44 3777299

### **3. Information about the visit**

Duration: 1 month

Starting date: 5 April 2010

Ending date: 5 May 2010

### **4. Description of the activities and outcomes**

#### **Background and context:**

Most commercialized genetically modified (GM) crops protected against insect pests contain genes that encode insecticidal crystalline (Cry) proteins derived from *Bacillus thuringiensis* Berliner (Bt). European regulations require environmental risk assessment of GM crops prior to their placing on the market.

I have been working on the environmental risk assessment of GM maize hybrids containing events conferring resistance to *Diabrotica virgifera virgifera*, to certain lepidopteran pests and tolerance to the herbicide glyphosate for two years. My PhD research topic is the field assessment on the impact of above GM maize hybrids on non-target organisms.

The adverse impact of cultivation such maize hybrids on non-target arthropods is a major concern. Since Agroscope Reckenholz-Tänikon Research Station and its Biosafety Unit is one of the world leaders in this field and has excellent laboratory facilities as well, this mobility offered me to improve my research view and capacity through my stay there.

#### **Objective:**

The objective of my mobility program was to study, learn from and participate in laboratory and field testing of Non-Target Organisms related to selected GM plants to be potentially cultivated in Europe.

#### **Activities carried out:**

During my mobility period we assessed the effect of an inorganic stomach poison, Potassium arsenate, and the protease inhibitor E-64 on the survival and development of *Coccinella septempunctata* (as important non-target insect, preying on aphids in almost all agricultural crop plant stands) using dietary exposure assays. Aim of the experiments was to develop a protocol that allows the testing of insecticidal proteins.

Individual *C. septempunctata* larvae were kept in a 30-ml plastic cup with ventilated cover. A primary stock solution of Potassium arsenate or protease inhibitor was prepared with sucrose. Subsequently, different concentrations of the toxin were provided. Thirty-five *C. septempunctata* larvae were tested for each concentration of the Potassium arsenate or E-

64 treatments and were monitored two times per day until they attained the adult stage. Larval mortality and development were recorded. After each moult of the larvae, the test insects were provided two droplets of the sucrose solution containing either Potassium arsenate or E-64. After 24 hours, the droplets were removed and larvae were fed eggs of *Ephestia kuehniella* (Lepidoptera: Pyralidae) until development to the next larval stage. The insects were placed in an environmental chamber with controlled temperature, photoperiod and humidity.

## **5. Links between visit activity and ENDURE**

Maize is a key crop in Europe and in Hungary, too. One of the Crop Case Studies under ENDURE was related to maize (coordinated by the hosting institute), in which I was involved. Following an IPM approach, the ENDURE activity terminating the work with Maize Case Study has been continued as Maize Based Cropping System Case Study, coordinated by my Institute. Adoption of GM plants is one of the potential innovative IPM tools. Therefore, the risk assessment of GM plants and the harmonisation of laboratory and field testing methods is an important task. In our case, I could improve my capacity in terms of laboratory testing methods.

## **6. Impact**

### **Added value for the researcher:**

I could profit from the professional atmosphere at the hosting institute, and from the wide research experience of my supervisors. I learned new methods and improved my research skills in:

- Laboratory testing methods
- Valuation methods in Biosafety
- Environmental Risk Assessment of GM plants
- ERA for GM Maize

In addition to this I received deeper knowledge in Swiss culture and the English language. I had a nice experience with the colleagues at the Agroscope Reckenholz as well.

I would like to express my thanks to the hosting partner for the support.

### **Added value for sending partner and hosting partner:**

Sending Partner, SZIE Plant Protection Institute

Z. Pálincás has improved his personal and professional skills through working in an international atmosphere and team. He has also developed his interactions with research staff at Agroscope. All above achievements are important for the sending institute.

The hosting partner, Agroscope Reckenholz Tänikon (ART) Research Station, will benefit from the work done by Zoltan Pálincás. The bioassay conducted by Z. Pálincás during his stay in ART is part of a project to develop a laboratory protocol to test insecticidal compounds on the non-target ladybird beetle *Coccinella septempunctata*. As it has been mentioned before, two different compounds, potassium arsenate and the protease inhibitor E-64, were tested against larvae of *C. septempunctata*. The results from this bioassay have provided us very useful information as they will serve us to select appropriate

concentrations of both compounds to be used as positive controls in further laboratory assays.

**Date of submission**

12/June/2010



Dr. Maurizio Sattin  
IA3 activity leader

Approved

