



European Network for the durable exploitation of crop protection strategies

IA3 Activity: Human resource exchange

ENDURE - Internal Mobility

Final activity report

(This form has to be completed and sent to the activity leader – the message should be sent to his p.a. elisa.scanzi@ibaf.cnr.it – within 15 days of the end of the visit)

Topic of the visit

The ultimate goal of the visit is to conduct molecular analyses on *Mycosphaerella graminicola* isolates collected in experiments evaluating selection pressure on pathogen population exerted by different wheat quantitative resistance loci combinations.

1. Information about researcher and sending partner

Name and surname: Pawel Czembor

Professional status: Senior Scientist

Sending partner: Plant Breeding & Acclimatization Institute (IHAR)

Institute/Department/Research Unit: Plant Pathology Department

Address: Radzikow, 05-870 Blonie, Poland

E-mail and phone number of the researcher: p.czembor@ihar.edu.pl, (+48) 22 7253611 extn. 302 or 250

Supervisor name*:

Supervisor e-mail*:

Supervisor phone number*:

* Supervisor information only for PhD student, post-doc and junior researchers

2. Information about hosting partner

Hosting partner: Rothamsted Research

Institute/Department/Research Unit: Department of Plant Pathology and Microbiology

Address: Rothamsted Research, Harpenden, Hertfordshire, AL5 2JQ, UK

Supervisor name*: Hai-Chun Jing

Supervisor e-mail*: hai-chun.jing@bbsrc.ac.uk

Supervisor phone number*: + 44 (0) 1582 763 133

* For senior scientist indicate the name of the collaborating colleague

3. Information about the visit

Duration: 2 months

Start date: June 7, 2008

End date: August 7, 2008

4. Description of the activities and outcomes

Background and context:

Plant genetic resistance is one of the means to improve crop protection against pests and diseases. Resistance durability is a key aspect to be considered in crop protection strategy. This can be measured by changes in pathogen population under selection pressure exerted by host resistance.

In Liwilla wheat cultivar several QTLs associated with resistance to *Mycospahaerella graminicola* (Septoria tritici blotch) have been detected. QTLs located on chromosomes 7A and 1B are effective both at seedling and adult plant stage. Each of these QTLs explained phenotypic variation in range 20-30%. We would like to assess selection pressure on defined pathogen population (5 isolates) exposed to different combinations of quantitative resistance loci (four QTL combinations and two parental lines).

Objective:

Few parameters were used to describe results of the experiment, among them frequency of each isolate in the derived collection of isolates. The ultimate goal of the visit at Rothmasted was to select suitable molecular technique and genotype set of the *M. graminicola* isolates collected in the experiment.

Activities carried out:

Set of 274 *M. graminicola* isolates collected in the experiment carried out in Poland, was increased on suitable media and DNA extracted. Five isolates used in the experiment (inoculation with defined pathogen population) were first examined for DNA polymorphism using set of 21 microsatellites (SSRs) markers amplified in PCR (Goodwin et al. 2007). PCR products were separated and detected using LI-Cor 4300 instruments. Combination of two SSRs (loci ac-0007 and tcc-0008) could distinguish 5 original isolates. These SSRs were used to genotype 271 isolates (three isolates were accidentally lost).

Reference

Goodwin S.B., T.A.J. van der Lee, J.R. Cavaletto, B. te Lintel Hekkert, Ch.F. Crane, G.H.J. Kema 2007. Identification and genetic mapping of highly polymorphic microsatellite loci from an EST database of the septoria tritici blotch pathogen *Mycosphaerella graminicola*. Fungal Genetics and Biology 44: 398–414

5. Links between visit activity and ENDURE

Visit was related to the 2nd Joint Programme of Activity running under RA4.2 – Exploitation of plant genetic resistance. During my stay at Rothamsted I complemented results of experiments carried out in Poland for task TR 4.2a – Selection Pressure (see details above).

6. Impact

Added value for the researcher:

In the Department of Plant Pathology and Microbiology (PPM, Rothamsted) scientists carry research on many topics ranging from fundamental work on how pathogens cause disease, using the latest genomic approaches to identify genes and processes involved in pathogenicity, to applied projects on the diagnosis and practical management of diseases in the crop. It was great opportunity to interact with PPM scientists and discuss topics related to my pathosystem wheat-*Mycosphaerella graminicola* (I had internal seminar providing information on my research). During my stay I could work in the laboratory to accomplish my experiments that gave me possibility to exchange information on new molecular techniques and acquire practical tips never published. Finally, I have found invaluable personal relationships established that foster possible future cooperation on currently running and future projects.

Added value for sending partner and hosting partner:

All experiences described for the researcher can be transferred on partner's level. For partners cooperation the most important are experience of scientists and common research questions to answer. Working together on common pathosystem gave unique chance to explore possibility to setup new common projects for both partners.

Date of submission

September 19, 2008



Dr. Maurizio Sattin
IA3 activity leader

Approved