



## ***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](mailto:elisa.scanzi@ibaf.cnr.it) – within 15 days of the end of the visit)*

##### **Topic of the visit**

**Improvement of the efficiency of natural enemies of plant pests through characterization of foraging behaviour. Volatiles involved in long-range and short-range attractiveness towards insect parasitoids in a tritrophic contest**

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

**Name and surname:** Laura Cristina Rosso

**Professional status:** Assegnista di ricerca

**Sending partner:** CONSIGLIO NAZIONALE DELLE RICERCHE (CNR).

**Institute/Department/Research Unit:** ISTITUTO PER LA PROTEZIONE DELLE PIANTE  
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#### **2. Information about hosting partner**

**Hosting partner:** ROTHAMSTED RESEARCH

**Institute/Department/Research Unit:** PLANT PATHOLOGY AND MICROBIOLOGY  
(PMPP).

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

**Duration:** 3 months (8 weeks funded by Endure)

**Start date:** 06/02/2008

**End date:** 07/05/2008

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

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

The fungus *Pochonia chlamydosporia* has potential as a biological control agent against root-knot nematodes (Kerry *et al.*, 1982; 1984). Root-knot nematodes are widespread and important pests in both annual and perennial crops worldwide. Control of these pests in perennial crops or in rotations with nematode susceptible crops is difficult as nematicides must be applied several times during a growing season, which is often not practicable or economic. There is, therefore, a need to develop alternative methods to control populations of root-knot nematodes. Specific isolates of *P. chlamydosporia* have shown potential against root-knot and significantly reduced populations (Morton *et al.*, 2003). These isolates were developed and tested in an integrated pest management system for the control of root-knot nematodes (De Leij and Kerry, 1991; De Leij *et al.*, 1992; Atkins *et al.*, 2003).

#### **Objective:**

Aim in this study was to develop an approach that could be used to simultaneously identify genes that are differentially regulated across a range of time-points during nematodes and *Pochonia* interaction

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

Development of molecular biology studies about the fungus and nematode interactions. Study of cDNA-AFLP techniques, performed using RNA sampled from a range of time-points throughout the infection events. Transcript derived fragments (TDFs) were screened to identify both up and down-regulated genes across the infection process, by running samples in adjacent tracks. Fragments showing differential expression patterns were excised from the gels and re-amplified by PCR. Amplified TDFs were sequenced and the most probably function assigned by homology to known sequences present in GenBank.

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

Development of molecular tools and technologies based on gathering DNA data and biochemical signals in the plant rhizosphere, to increase knowledge about the role of soil biological control agents, to reduce soil pesticides use in the integrated management of soil nematodes. Specific ENDURE activity(ies) and sub-activity(ies) involved: RA4.2, IA2.2

## **6. Impact**

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

cDNA AFLP was a powerful technique for the isolation of genes that are important for establishing interactions between *P. chlamydosporia* and root-knot nematodes. This knowledge of differentially regulated gene expression will help to elucidate the molecular mechanisms associated with physiological functions during the parasitism process.

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

The identification of specific genes will lead to a greater understanding of the molecular signalling leading to the establishment and maintenance of biological control agents in the host plant rhizosphere.

### **Date of submission**

21/05/2008



Dr. Maurizio Sattin  
IA3 activity leader

Approved