



## **A multimethod approach improves the description of the entomopathogenic nematode distribution in corn fields**

Elisabeth Depuydt, Jean-Claude Ogier, Lisa Cabre, Nusrat Ali, Patrice Mahieu, Cécile Villenave, Eric Nguema-Ona, Sophie Gaudriault

### **► To cite this version:**

Elisabeth Depuydt, Jean-Claude Ogier, Lisa Cabre, Nusrat Ali, Patrice Mahieu, et al.. A multimethod approach improves the description of the entomopathogenic nematode distribution in corn fields. XVI Meeting of the IOBC-WPRS WG “Biological and Integrated Control of Plant Pathogens”, Jun 2023, Wageningen, Netherlands. pp.157-158. hal-04192141

**HAL Id: hal-04192141**

**<https://hal.umontpellier.fr/hal-04192141>**

Submitted on 31 Aug 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## A multimethod approach improves the description of the entomopathogenic nematode distribution in corn fields

Elisabeth Depuydt<sup>1,2</sup>, Jean Claude Ogier<sup>1</sup>, Lisa Cabre<sup>2</sup>, Nusrat Ali<sup>3</sup>, Patrice Mahieu<sup>4</sup>, Cécile Villenave<sup>5</sup>, Eric Nguema-Ona<sup>2</sup>, Sophie Gaudriault<sup>1</sup>

<sup>1</sup>DGIMI, Univ Montpellier, INRAE, Montpellier, France; <sup>2</sup>Agro Innovation International TIMAC AGRO, Plant Nutrition Laboratory, Crop Management under Biotic and Abiotic Stress Team, Saint Malo, France; <sup>3</sup>Agro Innovation International TIMAC AGRO, Phys-Chem BioAnalytics Department, Saint Malo, France; <sup>4</sup>Chamber of Agriculture, Pau, France, 5ELISOL Environnement, Congénies, France

**Abstract:** Entomopathogenic nematodes (EPNs) are ubiquitous since they are distributed in all continents except in Antarctica. In agricultural soils, they offer a high potential for crop protection against insect pests. In France, few studies have so far described their distribution in field crops. The objective of this study is to combine several methods to improve the detection of EPNs in cultivated soils (Figure 1). We have first used multiple *Galleria mellonella*-baiting cycles on soil samples collected in 43 fields cultivated in corn during early summer (2021) in Southwestern France. The emergent nematodes were identified by sequencing of the ITS region. We obtained 28% of positive plots and baited 78 isolates belonging to three species: *Steinernema carpocapsae*, *Steinernema feltiae*, *Heterorhabditis bacteriophora*. We showed that the multiple *G. mellonella*-baiting cycle method during a period of time extending to 90 days, doubles the number of positive plots and increases the number of isolates by plot. On these 43 soil samples, we also performed soil-direct nematode extraction by Oostenbrink elutriation followed by water attraction of alive nematodes. After morphometric identification of EPNs in these nematode-extracted samples, we obtained 9.3 % positive plots. We are currently carrying out quantitative PCR tests for specific detection of EPNs in these nematode-extracted samples. With the combination of those different methods, we hope to describe a more accurate inventory of EPNs present in cultivated soils. This approach may allow improvement of our knowledge on the distribution of autochthonous EPNs in cultivated soils and their potential use to control insect pests.

**Key words:** entomopathogenic nematodes, biological control, France, multiple *Galleria mellonella*-baiting cycles, quantitative PCR

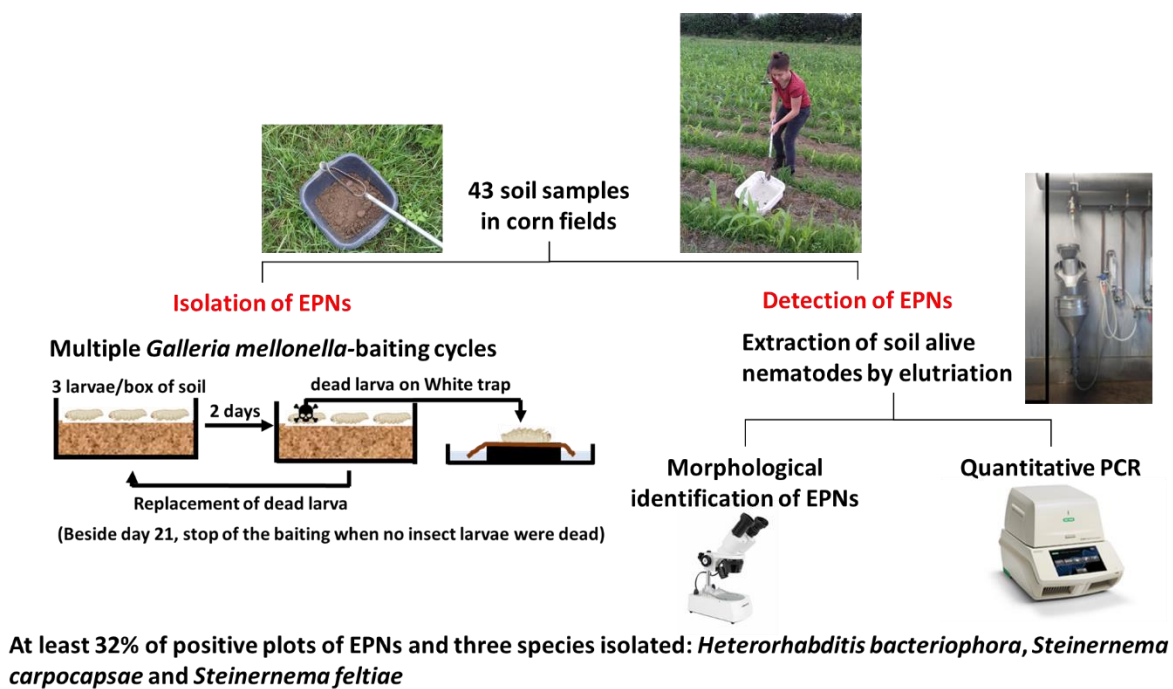


Figure 1. Experimental procedure to isolate and detect entomopathogenic nematodes (EPNs) in the 43 plots cultivated in corn.