

# ARISTO PROJECT NEWSLETTER

Issue 1 – June 2022



## ARISTO

Academia Network for Revising and Advancing the Assessment of the Soil Microbial TOxicity of Pesticides.

It is a MSCA-ITN-EID-H2020 project funded by the European Commission under the Grant Agreement No. 956496.



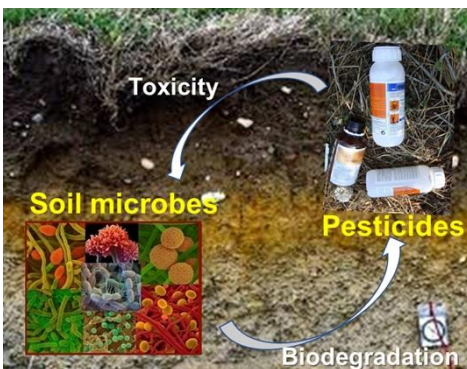
## ABOUT ARISTO

Pesticides are major environmental pollutants. However, their toxicity on soil microorganisms is still relying on an outdated protocol which fails to identify effects on key microbial functions and on microbial diversity. Soil microorganisms are an attribute to monitor during pesticides environmental risk assessment and the need for novel tests to assess the toxicity of pesticides on soil microorganisms has been recognized. The ARISTO project is addressing this scientific and regulatory gap on pesticides environmental risk assessment through a unique doctoral program, based on a strong interaction between academia and industry, aiming to train the next generation of Microbial Ecotoxicologists.

## EDITORIAL

Prof. Dimitrios Karpouzas – Coordinator ARISTO Project

Soil microorganisms constitute the growth engines of terrestrial ecosystems and therefore their diversity and function should be preserved. The application of pesticides in agricultural soils might be a threat to soil microbial integrity. Hence their potential effects on soil microbiota should be regulated using advanced and well standardized methods which are currently available. This has not been the case and the European Commission relies on outdated screening tests to assess the potential toxicity of pesticides on the soil microbiota. ARISTO is a MSCA-ITN-EID project which timely comes to address this regulatory gap and aims to revolutionize the assessment of the toxicity of pesticides on soil microorganisms providing all the needed knowledge and the workforce of the next generation of soil microbial ecotoxicologists that will achieve this goal. Through the ARISTO project 9 fellows will be trained in a multinational and multidisciplinary environment by 9 industrial and 7 academic partners. The ARISTO fellows will investigate the toxicity of pesticides on soil microbiota at different experimental scales, from in vitro to soil and eventually to ecosystem level, using advanced experimental setups and methods. Specific microbial groups like ammonia-oxidizing microorganisms and arbuscular mycorrhizal fungi, key soil functional microbial groups, will be the focus of ARISTO acting as bioindicators of the toxicity of pesticides on soil microorganisms. In addition, open issues in pesticide ecotoxicology like the toxicity of biopesticides, pesticide mixtures and pesticide transformation products will be also explored providing a holistic assessment of pesticides potential toxicity on soil microorganisms. The standardized assays, in silico tools and assessment schemes produced by ARISTO will benchmark the forthcoming revision of the relevant pesticide regulatory framework at EU level.



*The ARISTO project is addressing a scientific and regulatory gap on pesticides environmental risk assessment*

## MEET THE FELLOWS



### **Eleftheria Bachtsevani**

#### **ESR1. In vitro assessment of the toxicity of pesticides on AOM**

Ecole Centrale de Lyon – Dr. Graeme Nicol

NCIMB Ltd – Dr. Carol Phillips

Aims: (i) to establish, optimize and standardize in vitro assays for assessing the toxicity of pesticides on AOM, (ii) to identify toxicity on other microorganisms participating in the nitrification process, (iii) to explore pesticides toxicity mechanisms on AOM.



### **Marjan Roshanfekrrad**

#### **ESR2. In vitro assessment of the toxicity of pesticides on AMF**

Universite Catholique de Louvain – Prof. Stephane Declerck

Phytohreptiki – Dr. Myrto Tsiknia

Aims: (i) to establish, optimize and standardize a fast-track in vitro assay to evaluate the toxicity of a broad-range of pesticides on AMF, (ii) to explore the impact of pesticides on functional attributes (i.e. transport of minerals) of AMF, (iii) to explore the mechanisms of toxicity.



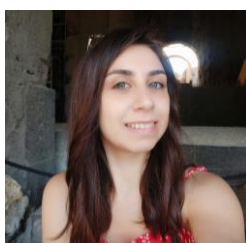
### **Laura Johanna Müller**

#### **ESR3. Studying the toxicity of pesticides on AOM, and other nitrifiers, in soil**

Swedish University of Agricultural Sciences – Prof. Sara Hallin

SAYENS – Dr Abdelwahad Echairi

Aims: to establish methods and standardized procedures to assess the toxicity of pesticides on the function and diversity of AOM, and on other functional groups involved in nitrification in soil, at microcosm and field scale level.



### **Anna Manukyan**

#### **ESR4. Assessing the toxicity of pesticides on natural soil and plant assemblages of AMF**

University of Thessaly – Dr. Kalliope Papadopoulou

INOQ – Dr. Caroline Schneider

Aims: to establish and standardize methods and procedures for assessing the toxicity of pesticides on natural assemblages of AMF under lab and field conditions.



### **Cara I. Meyer**

#### **ESR5. Studying the toxicity of pesticides on soil microbial networks**

INRAE – Dr. Laurent Philippot

SYNGENTA – Dr. Claudio Screpanti

Aims: to characterize the impact of pesticides on potential interactions within microbial networks by focusing on total bacterial and fungal communities and selected N-cycling microbial guilds.



**Marta E. Pérez-Villanueva**

**ESR6. Pesticides toxicity at the soil food-web level: Defining effects on microbial predator-prey systems**

UFZ – Leipzig – Prof. Antonis Chatzinotas

HYDREKA – Dr. Cedric Malandain

Aims: To determine the impact of pesticides on interacting microbial predators (protists) and prey (bacteria) and the thereof resulting consequences for carbon transfer and ecosystem functioning.



**Camilla Drocco**

**ESR7. Assessment of the toxicity of pesticide mixtures on soil microorganisms**

INRAE – Dr. Fabrice Martin-Laurent

ECT Oecotoxicologie – Dr. Jorg Roembke

Aims: (i) to develop methods, procedures and tools to assess the toxicity of pesticide mixtures on soil microorganisms (ii) to assess the toxicity of pesticides on soil microorganisms and potential interactions with terrestrial macro-organisms.



**Alexandre Pedrinho**

**ESR8. Assessing the toxicity of bio-pesticides on soil microorganisms**

University of Thessaly – Prof. Dimitrios Karpouzias

Metabolic Insights Ltd – Dr. G. Wittenberg

Aims: (i) to examine the hypothesis that bio-pesticides are non-toxic to soil microorganisms (ii) to assess the overall soil microbial toxicity of bio-pesticides on functional microbial endpoints.



**Kunyang Zhang**

**ESR9. Development of tools for in silico prioritization of pesticide TPs for soil microbial ecotoxicity testing**

EAWAG – Dr. Kathrin Fenner

ENVIPATH – Tim Lorshbach

Aims: (i) to optimize EnviPath for prediction of pesticide TPs, and analytical verification for selected pesticides, (ii) to integrate structural alerts to prioritize TPs for soil microbial ecotoxicity testing.



## UPCOMING EVENTS

3rd Training week – Measuring and predicting pesticides biotransformation pathways.

27.06.2022 – 01.07.2022

4th Training week – Meet the AMF.

04.07.2022 – 08.07.2022

5th Training week – Microbial Interactions and the soil food web

11.07.2022 – 15.07.2022

Project meeting

07.07.2022 – 08.07.2022

## Academic beneficiaries



UNIVERSITY OF  
THESSALY



## Industry beneficiaries



## Third-party partners



Universität  
Zürich

WESTERN SYDNEY  
UNIVERSITY



## CONTACT US:

