

Italian Society of Soil Science  
School of Soil Biodiversity and Bioindication  
XI cycle

# BIODIVERSITY AND BIOINDICATORS IN MONITORING AND MANAGEMENT OF CONTAMINATED SOILS

4 - 7 JUNE 2019

Department of Agricultural Sciences  
University of Naples Federico II, Portici, Italy



## SECOND ANNOUNCEMENT

### SCHOOL TOPIC AND AIMS

The incoming edition of the School of **Soil Biodiversity and Bioindication** organized by the Italian Society of Soil Science will focus on the relationships between biodiversity and soil contamination. In the recent World's Soil Resources Report (SWSR), pollution has been identified as one of the main processes of degradation that threaten the soil and its ecosystem services. Soil pollution reduces food security by either reducing crop yields due to toxic contaminant levels or by producing foods that are unfit for human and animal consumption. Many contaminants are transported from the soil to the air and to surface and groundwater, causing environmental damage and direct human health problems. Moreover, the pollutants directly damage the micro and macro soil organisms and therefore influence the biodiversity of the soil and the services provided by the living organisms involved. The risk assessment approaches aim at identifying and assessing whether natural or man-made substances are responsible for soil pollution and the extent to which such pollution poses a risk to the environment and to human health. In this perspective, a need to move from measuring concentrations to measuring effects exists as well as to standardize terms, indicators and methodologies.

The school will involve a combination of lectures and laboratory/field activities. Appropriate study tools will be presented to highlight the role played by edaphic organisms and plants in monitoring and recovery of soil quality. The reclamation of polluted soils is essential and the use of biological remediation methods based on microbial degradation of organic contaminants or on the use of plants for phytomanagement purposes will be proposed.

Introductory lectures on the concept of soil contamination and bioremediation, biodiversity and soil quality bioindicators will follow other specifications for the different aspects that link soil biodiversity to contamination. The main objective is to make all participants familiar with the key aspects of soil contamination and its effects on soil biodiversity.

## FULL PROGRAM

Tuesday, 4th June (afternoon)			
14.00 - 14.30		Organizing Committee	Welcome and Introduction to the School
14.30 - 14.50	Lecture 1	Paola Adamo	Soil contamination
14.50 - 15.10	Lecture 2	Massimo Fagnano	Soil bioremediation
15.10 - 16.10	Key note 1	Invited speaker Guenolà Perés Rennes, France	Bioindicators suitable for soil quality monitoring and risk assessment
16.10 - 16.40	Coffee break		
16.40 - 17.00	Lecture 3	Maria A. Rao	Biochemical indicators of soil under bioremediation
17.00 - 18.30	Interaction time 1	Organizing Committee	Participant presentations (participant education/scientific interests and what does he/she want to learn by the school)
Wednesday, 5th June (full day)			
9.00 - 9.45	Lecture 4	Edoardo Puglisi	Isolation, characterization and application of soil micro-organisms useful for the degradation of recalcitrant pollutants and for the stimulation of plant growth
9.45 - 10.30	Lecture 5	Valeria Venterino, Olimpia Pepe	Microbial biodiversity of contaminated soils and identification of microbial bioindicators for the assessment of soil health: from cultural methods to Next Generation Sequencing
10.30 - 11.00	Lecture 6	Loredana Canfora	Traceability and monitoring of target microorganism species in soil
11.00 - 11.30	Coffee break		
11.30 - 12.15	Lecture 7	Cristina Menta, Sara Remelli	Soil fauna as good tool for soil quality assessment. The application of the Soil Biological Quality QBS-ar index at international and regional scale
12.15 - 13.00	Lecture 8	Lucia Santorufo, Giulia Maisto	Focus on collembolans: their role in ecosystem and their use as bioindicators of soil quality – Case studies from Europe and Campania region
13.00 - 14.30	Lunch		
14.30 - 18.30	Practical activity 1	Edoardo Puglisi, Valeria Venterino, Olimpia Pepe	<ul style="list-style-type: none"> <li>Isolation techniques of microorganisms from the ground</li> <li>Observation of different microbial morphologies by optical microscope</li> <li>Extraction of microbial DNA from the soil</li> <li>Molecular biology approaches for the assessment of microbial biodiversity in soils</li> </ul>
14.30 - 18.30	Practical activity 2	Cristina Menta, Lucia Santorufo, Carlos Lozano Fondón	<ul style="list-style-type: none"> <li>Extraction of soil arthropods</li> <li>Observation and classification of soil arthropods extracted from different land uses</li> <li>Application of soil quality indices</li> </ul>
Thursday, 6th June (full day)			
9.00 - 10.00	Key note 2	Invited speaker Rafael Clemente, Murcia, Spain	The use of organic and inorganic amendments in the phytoremediation of contaminated soils and their effect on biodiversity
10.00 - 10.45	Lecture 9	Giancarlo Renella	Assessment of chemical and biological methods for determining bioavailability of trace elements in soils
10.45 - 11.15	Coffee break		
11.15 - 12.00	Lecture 10	Antonio G. Caporale	In-vitro and in-vivo testing to assess human bioaccessibility of trace metals in soil
12.00 - 12.45	Lecture 11	Nunzio Fiorentino	Use of vegetation for cleaning (phytoextraction) or securing (phytostabilization) contaminated sites: study cases in Southern Italy
12.45 - 13.30	Lecture 12	Vincenza Cozzolino	Soil <i>microbiohumeome</i> : feed the microbes for restoring soils, increasing resource-efficiency and stress resistance of agroecosystems
13.30 - 14.45	Lunch		
14.45 - 17.30	Introduction to case studies and field excursion	Simona Vingiani, Nunzio Fiorentino, Diana Agrelli, Antonio G. Caporale, Valeria Venterino	<ul style="list-style-type: none"> <li>Geo-pedological classification of study areas</li> <li>Description of environmental surveys</li> <li>Explanation of bioremediation strategy, aims and phases</li> </ul>
17.30 - 18.30	Interaction time 2	Organizing Committee	Student feedbacks
Friday, 7th June (morning)			
8.00 - 14.30	Field excursion	Organizing Committee and Participants	Field excursion to polluted rural and industrial sites under bioremediation. The purpose of the trip will be to examine the pollution that had occurred on the sites, and discuss the remediation strategies being employed.
		Organizing Committee	General discussion and closing ceremony

## Requirements

The course is a training opportunity for graduating, post-graduated and Ph.D. students, researchers and any professional interested to develop skills on soil biodiversity and bioindicators issues for pollution assessment and remediation. Basic knowledge on soil science, biology and ecology is a requirement.

## Application

Candidate participants have to communicate their intention to take part at the course sending an email to Dr. Antonio G. Caporale (ag.caporale@unina.it) and in cc to segretario@scienzadelsuolo.org at any time and not later than 15<sup>th</sup> April 2019, taking care to attach their registration form, provided in the next page. Maximum number of accepted participants is 30. Upon the ascertainment of the requirements, Italian candidates will be accepted on the basis of the first arrived first served rule, while non-Italian candidates will be accepted with priority up to 10 candidatures.

## Fees

Participation in the school is free of charge for members of the Italian Society of Soil Science ([www.scienzadelsuolo.org](http://www.scienzadelsuolo.org)) or candidates who become members of the Italian Society of Soil Science within 30<sup>th</sup> May 2019. Alternatively, it will cost 50 EURO per person, to be paid by each participant on being informed of their acceptance.

## Location

The Department of Agricultural Sciences of the University of Naples Federico II (DiA-UniNA: <http://www.agraria.unina.it/>) is at Portici, a town 8 km far from Naples.

How to reach Portici from main train station of Naples:

- First option -> by Circumvesuviana-train (<https://www.eavsrl.it/web/>) departing from Naples to Sorrento or Poggiomarino, getting off the train at Portici Via Libertà station;
- Second option -> by Trenitalia-train (<https://www.trenitalia.com/>) departing from Naples to Salerno, getting off the train at Portici-Ercolano FS station.

The Department is located in the Royal Palace and is close to the Archeological Site of Herculaneum: <http://www.visitercolano.com/en/main-attractions/royal-palace-portici-and-museumherculaneum>

## Accommodation

Suggested hotels and B&B in Portici-Ercolano:

Fabric Hostel & Club, Via Bellucci Sessa 22, Portici (<http://fabrichostel.com/>), 500 m. far from DiA-UniNA main entrance Hotel Villa Signorini, Via Roma 43, 80056 Ercolano (<http://www.villasignorini.it/it/home/>), 500 m. far from DiA-UniNA main entrance.

## School Secretariat

Antonio Giandonato Caporale (ag.caporale@unina.it) and Simona Vingiani (segretario@scienzadelsuolo.org)

## Local Organizing Committee

Paola Adamo (chair), Antonio Giandonato Caporale (co-chair), Massimo Fagnano, Nunzio Fiorentino, Olimpia Pepe, Maria A. Rao, Valeria Ventorino, Simona Vingiani, Adriana Forlani.

## Scientific Committee

Paola Adamo, Anna Benedetti, Sara Marinari, Simona Vingiani, Vito Armando Laudicina, Claudio Zaccone, Giuseppe Lo Papa, Livia Vittori Antisari, Claudio Colombo, Loredana Canfora, Antonello Bonfante, Giuseppe Corti.



UNIVERSITÀ DEGLI STUDI  
DI NAPOLI FEDERICO II



DIPARTIMENTO DI  
AGRARIA



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### **Registration form**

Send it by email to Antonio Giandonato Caporale ([ag.caporale@unina.it](mailto:ag.caporale@unina.it)) and Simona Vingiani ([segretario@scienzadelsuolo.org](mailto:segretario@scienzadelsuolo.org)) **within 15<sup>th</sup> April 2019**, with the following email subject:  
Registration\_form\_SISSBioBioSchool2019\_Surname\_Name

Surname	
Name	
Current position	
Affiliation	
Email address	
Telephone	

Brief *curriculum vitae* (Max 250 words; Font: Calibri 11)