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# Research Interests



**Phylogeography  
of  
Mediterranean  
birds**

**Functional Biodiversity in Agroecosystems:**  
characterization of microbes and fauna assemblages in rice paddy soils through eDNA metabarcoding

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## Introduction

Biodiversity conservation is a crucial target in many international policies. The loss of organisms' diversity is a global emergency and a consequence of human activities, such as the intensification of agricultural practices. Biodiversity provides ecosystem services for humans and ensures the resilience of natural, semi-natural and artificial environments. Rice agroecosystems have gained great interest in recent decades, deriving from the harmful changes undergone by rice fields, with the consequent banalization of the agricultural landscape, less suitable to support life forms, including rare or endangered species. Rice paddies are vicariant to temporary natural wetlands and subject to periods of flooding and dryness. At the subsoil level, diversity is represented by organisms belonging to Prokaryotes and Eukaryotes, whose interaction with crops and animal species ensures the balance of the soil ecosystem.

## METHODS:

- Sampling the rhizosphere of plants in paddy fields subject to different types of cultivation practices;
- Extraction of eDNA from the soil samples;
- Library preparation;
- NGS sequencing;
- Bioinformatic analysis.



**Environmental  
DNA in  
agroecosystems**

## Expected Results

The set of data collected will lead to the development of a survey dedicated to the microbial and animal biodiversity of rice fields in the province of Vercelli, through comparisons between different experimental groups included in the study. The data will lead to the functional description of the organisms' diversity, an important indicator of soil health, with great influence on the primary productivity of crops and on trophic networks, key factors that determine the composition of communities.

## Future Perspectives

- Formation of a soil biobank in support of future studies;
- Extending the metabarcoding analyses to the entire soil diversity and to the diets of specialized animals of paddy field environments.

