ARIMNet2 Young Researchers Seminar

“How to better involve end-users throughout the research process to foster innovation-driven research for a sustainable Mediterranean agriculture at the farm and local scales.”

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Vulnerability Analyses of Tunisian cork oak forest to climate change: Understanding community dynamics, Conservation and sustainable use of forest genetic resources

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CONTEXT & CHALLENGES

- Cork oak forests are the lungs of the environment, the economy and the society of Mediterranean countries. They have such an important role for nature.

- Cork oak forest provide a wide range of environmental activities, biodiversity conservation, soil, resilience to climate change and desertification.

According to climate simulations, until 2050, average temperature is expected to rise between 1.6° and 2.7° C and average precipitation rate is expected to decline between 10% in the northwest and 30% in the extreme south.

Rising temperatures without increase in precipitation or with decreasing rainfall can lead to drought.

The situation of climate and demographic change renders these ecosystems vulnerable to several pressures, risks and threats that need to be combated with concrete management strategies.
OBJECTIVE & HYPOTHESES

Objective(s)
- This study compiles and summarizes the existing knowledge about observed and projected impacts of climate change on cork oak forests in Tunisia and reviews options for forests and forestry to adapt to climate change.

Hypotheses
- The spatial and temporal variability of the climate (seasonal distribution of the precipitation) influences the growth and the productivity of the ecosystems.

Conceptual framework
- This document for decision makers shows the potential of cork oak forests regarding two strategies to combat climate change: mitigation and adaptation.
METHODOLOGY

- Application of knowledge of the ecophysiology in laboratory + sampling (LAI, LMA, COV...) = Ground ecophysiology

- Application of new indicators of vulnerability: - Flow of sap, measures water in the ground.

- To look further into modeling, Future climatic scenarios for Tunisia? Impact of the climatic changes on the ecosystems?

- Genetic Diversity Analysis to identify genetic differences between populations
IN Volvement of Stakeholders

- Food and Agriculture Organization of the United Nations FAO
- Mediterranean Programme Office WWF
- Forest services
EXPECTED RESULTS / IMPACT
(INNOVATION)

- The results of this project will enable to assess the influence of environmental conditions (climate and altitudinal gradient) on the distribution of cork oak
- This relationship has implications also in reforestation (mainly for the selection or Forest reproductive material, and the transfer of seeds).
- The results will enable to classify our populations along a gradient of fertility in a perspective of reforestation and to estimate the vulnerability of these populations and to target those most sensitive and resistant to face a possible future climate hardening

**Differentiation and genetic variability in cork oak populations**

- A high intra-population variability; might be able to rapidly respond to environmental changes.
PROPOSED PARTNERSHIP

Partner 1: Tunisia
- National Institute of Metrology (INM Tunisia)
- National Bank of Genes (BNG, Tunisia)

Partner 2: France
- Centre of Evolutionary and Functional Ecology, CNRS Montpellier,

Partner 3: Spain
- National Institute for Agricultural and Food Research and Technology (INIA, Madrid)
Thank you for your attention!