PhD Course in "Models and Methods for Material and Environmental Sciences" – XVIII Cycle PhD

PhD Student: Cristina Ricucci

Tutor: prof. Assunta Florenzano
Co-tutor: Dr. Gabriel Servera Vives

A PALYNOLOGICAL APPROACH FOR ASSESSING LONG-TERM PLANT BIODIVERSITY CHANGES UNDER CLIMATE AND HUMAN IMPACTS IN ITALIAN HIGH-NATURALISTIC-VALUE AREAS

Abstract

This PhD project involves the use of palynological approach to reconstruct the long-term changes in plant diversity related to past climate events and anthropic perturbations in Italian biodiversity hotspots.
A particular focus will be given to the study of key vulnerable or threatened endemic taxa. More specifically, we will attempt to answer: what variations have they undergone over time? When did their decline begin? To which factors (natural or anthropic) can any variations be related? Which lessons can we learn from the past to better manage current biodiversity and threatened taxa?

Holocene biostratigraphic sequences from natural and protected areas will be analyzed in order to investigate the main changes in flora composition. Palynological evidence from selected peat bogs and lake basins across some Italian regions (e.g., Liguria, Latium, Basilicata/Calabria) will provide the main distribution trend in plant species over time.
Additionally, pollen data from the Vulci archaeological site (VT, Etruscan period), compared and integrated with those from a nearby off-site sequence, will be used to assess the impact of ancient civilization's activities (arboriculture, crop cultivation, grazing, water management) on the surrounding biodiversity. Moreover, this research will be integrated with further archaeological sites with available pollen data (e.g., BRAIN network - http://brainplants.successoterra.net/) for large scale paleoenvironmental data elaboration and to better understand socionenvironmental co-evolution through time.
Using mapping software (GIS), niche modeling techniques and microcharcoal analysis applied to pollen records, this project will provide insights into the reconstruction of Italian biodiversity variations and their relationship with climate, fire history and human activities.