PheVar

Variabilité phénotypique d'espèces végétales du sous-bois le long de gradients environnementaux / Phenotypic variability of forest herbaceous species along environmental gradients

Project leader: Clémence CHAUDRON, UMR Silva 1434

LabEx partner: SilvaTech

Collaborations: Sandrine CHAUCHARD, Jean-Luc DUPOUEY & Vincent BADEAU

Summary

Context — Changes in environmental conditions can influence the persistence of plant species, some species being expected to strongly decline in their core area in response to current environmental changes. One way species have to adapt or acclimate to new environmental conditions is through their phenotypic variability, i.e. the ability of genotypes to express different phenotypes in response to the environment. Phenotypic variability is particularly important in the current context of climate change for species with low dispersal abilities.

Objectives — We will study the phenotypic variability of two understorey plant species which have low colonization abilities (*Anemone nemorosa* and *Lamium galeobdolon*), in response to fine-scale environmental heterogeneity.

Approaches — Twenty populations of each species growing along 6 steep-sided valleys located in northeastern France will be studied. Phenotypic variability will be expressed by the variability of several functional traits involved in adaptation / acclimation of species to changes in environmental conditions. A total of 12 traits will be studied: 6 characterized in 2022 and 6 that will be characterized in 2023 (foliar isotopes $\delta^{13}C$ and $\delta^{15}N$, foliar C/N, number and mass of seeds, seed viability). These traits will be put in relation with several environmental factors already characterized (e.g. soil type, air temperature) complemented in 2023 by soil chemical analyses and light intensity measures.

Expected results and impacts — We assume that phenotypic variability: differs among species and traits, increases with environmental heterogeneity (e.g. temperature variability), and decreases with stress (e.g. decreasing soil fertility). Our project will enhance our knowledge concerning the adaptation / acclimation of plant species under environmental spatial variability, and therefore the adequacy of our decisions in terms of management / conservation of biodiversity in the current context of climate change.