

Title of the internship : *Investigating the relationship between species and genetic diversity in forest metacommunities*

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Summary :

Background

As a result of habitat loss and subsequent fragmentation, the present day forest resembles a mosaic of patches characterized by different quality, age, size, and isolation. Whatever the processes that led to such patchy landscapes, their interacting effects influence biodiversity. In particular reduction in population size and changes in species interaction affect genetic and species diversity through neutral, adaptive and environmental forces. Whereas increasing number of studies revealed a positive correlation (C) between species (S) diversity (D) and genetic (G) diversity (SGDC), fewer ones retrieved no correlation or even a negative relationship between both diversities. Various hypotheses put forward to explain such conflicting results include differences in organism's life history, confounding effects of habitat disturbance as those of non-neutral mechanisms (selection), sampling bias, etc.

This project is part of a multispecies approach which targets European temperate forests. It aims at (ii) exploring the respective roles of forest metacommunity vs landscape matrix features on the SGDC, (ii) filling the gaps of knowledge to better understand the floating relationships between both components of diversity.

The protocol was designed to enable assessing the importance of time, latitude, fragmentation and matrix permeability on SGDC responses. In 8 European regions along an latudinal gradient, 3 contrasted landscapes windows - a lowly vs intensively managed landscapes plus a big unfragmented forest – have been previously investigated:

- i. to inventory vascular plant species (SD)
- ii. to sample individuals of the species *Geum urbanum* and *Oxalis acetosella* used here for population genetic analyses (GD). In each window, specimens of both plants were collected in 15 forest fragments for further genotyping of SNP (*O. acetosella*) and microsatellite (*G. urbanum*) loci.

From the genetic data generated in that project, the species-genetic diversity relationships as the role of landscape vs community features on SGDC will be assessed by means of correlative approaches.

Duration: 6 months; starting date (flexible): January 2021

Salary: traineeship grant (600.6 €/month)

Required study level: We seek a highly motivated and curious candidate. Strong interest in molecular biology, population genetics, landscape ecology, evolution and biostatistics are recommended, meaning that a good background in those domains is desired, but not mandatory. Those skills will be developed during the internship.

Other informations :

Insertion within an ongoing research project: the project is within the FLEUR network (<http://www.fleur.ugent.be/>)

Publications on the field of research:

Decocq G, Guiller A., Kichey T. Van de Pitte K, Gallet-Moron E., Honnay O. , Closset-Kopp D. Drivers of species and genetic diversity within forest metacommunities across agricultural landscapes of different permeability (submitted in *Landscape Ecology*).

Vellend M. & Geber M.-A. (2005). Connections between species diversity and genetic diversity. *Ecology letters*, 8: 767-778.