

15 MONTH RESEARCH POSITION IN MONTPELLIER (FRANCE)

Centre d'Ecologie Fonctionnelle et Evolutive - CNRS

Population genetics of ectomycorrhizal fungi

Fields of interest of our team: we focus on ectomycorrhizal fungi in temperate ecosystems. We are interested in plants that rely on the carbon provided by their mycorrhizal fungi (mixotrophy, mycoheterotrophy), impact of global change on ectomycorrhizal communities, and population genetics of ectomycorrhizal fungi. We are interested in the structure of these populations (gene flow, mating) and factors explaining their diversity, such as geographic distance, host species, and local soil conditions.

The present research position is funded by CNRS, and the **European Evoltree program** (<http://www.evoltree.org/>) will contribute to experimental expenses.

Working project in which the associated researcher would be involved: We have completed the genome sequencing of *Laccaria bicolor*, a model species for ectomycorrhizal symbiosis, and *Tuber melanosporum*, a prized edible species. The sequencing was performed under supervision of a joint team (Francis Martin, INRA Nancy) that is also involved in this project. The sequence data provide useful tools to design microsatellites and to identify genes under selection in ectomycorrhizal fungal populations. The applicant is free to choose his favourite model, and will be involved in the supervision of a PhD student on the other model.

For these two species, we aim at **obtaining neutral markers (microsatellites) and describing population structure over Europe (+ America for *L. bicolor*)**. Here, the available genomes allow us to prepare an optimal marker set to analyse populations of fruiting body and ectomycorrhizae, their differentiation by distance (gene flow over Europe at least) and reproduction by allogamy *versus* autogamy (linkage disequilibrium). We will also **search for fingerprints of species-level selection among candidate genes** (involved in soil exploitation, symbiosis, or in sexuality), considering related species as outgroups. We will investigate balance of synonym versus non-synonym substitutions, and, at the population level, compare the geographic structure of polymorphism (if any) with that obtained for neutral markers.

Our team is part of larger a team focusing on co-evolution and population genetics in several models, including orchids, plants (especially domesticated), figs and their pollinators, ants and plants. We are part of the Centre d'Ecologie Fonctionnelle et Evolutive (*ca* 150 researchers on ecology and evolution). Montpellier is near the Mediterranean Sea, in a scientifically rich environment for plant and fungal sciences, evolutionary ecology and especially population genetics.

Our team contributes to the organization of a New Phytologist meeting in Montpellier, in December 2008 (<http://www.newphytologist.org/mycorrhizal/default.htm>) on ecology of ectomycorrhizal fungi.

Requested experience: applicants should not have the French nationality. They should be experienced (as demonstrated by published papers) in at least three of the following areas:

- 1 – population genetics
- 2 – genomic sciences
- 3 – microsatellites & molecular ecology
- 4 – fungal ecology
- 5 – evolutionary genetics

Duration: 15 months, starting in Aug. / Sept. 2008. Salary ranges from 2 020 euro/month to 2 762 euro/month (level: associate researcher), depending on applicant's experience and diploma.

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Applications will be received until May 15th. In your first email/letter, please list your fields of experiences using the numbers (1-5) listed above as well as the name and e-mail address of two referees.