Séminaire Biologie des Plantes

Les séminaires ont lieu sur le Campus Montpellier SupAgro/INRA de La Gaillarde (2, place P. Viala Montpellier)

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Jeudi 20 octobre 2011
Amphi 208 (Cœur d'Ecole) à 14h00

François Vasseur
(Doctorant-Laboratoire d'Ecophysiology des Plantes sous Stress Environnementaux)

Pleiotropy and ecological laws: the same genes govern leaf functional trade-offs and plant allometry

Understand the genetic source of variation in resource-use strategy of plant is a challenging prospect for plant scientists and agronomists. In this perspective, recent studies argued for cross-disciplinary approaches, notably by using the advances in genetics and molecular biology of model species such as *Arabidopsis thaliana* for testing ecological and evolutionary theories. Among those, metabolic scaling theory (MST) and the leaf economics spectrum (LES) investigate the relationships between growth-related traits or leaf-level physiological trade-offs, respectively. Here we assessed the genetic determinisms of both theories in a segregating population of *Arabidopsis thaliana*. We show that (*i*) MST and LES are inextricably linked via two pleiotropic loci; and that (*ii*) the cross of genetic variants can generate within a generation a large fraction of the worldwide variation in LES traits; which then (*iii*) can generate much of the observed variation in the scaling functions described by MST. We validated two candidate genes, *CRY2* which codes for a photoreceptor, and *HUA2*, a floral homeotic gene, as responsible for the phenotypes observed. Our results identify the genetic bases that unify MST and the LES within a species, and provide crucial insights into the understanding of the evolutionary processes at the origin of many botanical scaling relationships.

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