Adriana Puentes, Doctoral student

Tel. +46 18 471 28 82
Fax +46 18 55 34 19
E-mail adriana.puentes@ebc.uu.se

Local adaptation in *Arabidopsis lyrata*: Herbivore resistance and flowering time

I am interested in studying the evolution and ecology of local adaptation in plants. In my work I use *Arabidopsis lyrata*, a close relative of the very famous *Arabidopsis thaliana*. Unlike *A. thaliana*, *A. lyrata* is an out-crossing, perennial plant that has a scattered distribution in Europe. *A. lyrata* individuals can exist as one of two morphs: Trichome-producing or glabrous (no trichomes). Trichomes are hair-like structures that occur mostly on the rosette leaves of the plant but can even be found on the flowering buds. Trichomes are known to play a role in drought resistance, UV-protection and especially herbivore deterrence.

As sedentary individuals, it is critical for plants to be well adapted to their herbivores. Not only is there a wide range of herbivores that they must defend themselves against, but they must also cope with herbivory being a variable agent both in space and time. As perennials, *A. lyrata* individuals can experience varying degrees of herbivory from year to year in an unpredictable fashion; thus, understanding the evolutionary consequences of this changeable selective pressure is of great interest. For *A. lyrata* flowering at the right time and for the right amount of time is also of critical importance. As an out-crosser, it must ensure the pollination of as many flowers as possible in order to maximize its fitness. Therefore, in this species I have an excellent opportunity for investigating the ecology and evolution of important fitness traits associated with flowering and herbivore defense.

The questions I am currently addressing are:

1. Are there differences in fitness and resistance to herbivory, between individuals with different genotypes at the GL1 locus (locus responsible for trichome production)?
2. Do individuals from monomorphic (only glabrous plants) and polymorphic (both trichome-producing and glabrous plants) populations respond equally to different levels of herbivore damage?
3. Are the fitness effects of herbivory affected by pollination?
4. What is the within-population genetic variation in different fitness traits associated with flowering time?

My supervisors are Jon Ågren and Jenny Hagenblad, both from the Plant Ecology department.

Previous work

For my Masters' degree project I worked on the interaction between fungal endophytes and grasses. I conducted research both in Canada and Sweden on how the symbiosis between fungus and grass behaves under different conditions in the greenhouse and in the field. I continue to have an active interest in this research field.

Arabidopsis lyrata in Höga Kusten, Sweden.

Freezing in the field with my assistant Lina.

Hand-pollinations in the greenhouse.

Publications

Puentes, A., Bazely, D.R. and Huss-Danell, K. 2007. Endophytic fungi in *Festuca pratensis* grown in Swedish agricultural grasslands with different managements. Symbiosis, 44: 121-126.

Granath, G., Vicari, M., Bazely, D.R., Ball, J.P., Puentes, A. and Rakocevic, T. 2007. Variation in the abundance of fungal endophytes in fescue grasses along altitudinal and grazing gradients. Ecography, 30 (3): 422-430.