Effect of the temperature increase and the neighbourg density on the development of two invasive species: Ludwigia hexapetala and Ludwigia peploides.

Gabrielle Thiebaut*[1]

[1]UMR 6553 ECOBIO – université Rennes 1 – France

Abstract

Global warming and invasive species have been recognized as two of the major threats to biodiversity in freshwater ecosystems. Temperature and species interactions are two factors that may influence the success or failure of an invasion. Field observations noticed a displacement of *L. peploides* by *L. hexapetala*. To test the effect of temperature increase and competition on the plant development, we ran an experiment in outdoor mesocosms setting up a 5 different competition scenario between *Ludwigia hexapetala* (Lh) and its conspecific species *L. peploides* (Lp). The experiment spanned from may until mid-october. We studied the effects of a small temperature increase (*ca.* 1◦C) of ambient temperature and of varying density of each species. The experimental setup included two controls with only one species, and 5 experimental treatments with varying densities of each specie, keeping a constant density of 6 plants. We used a split-plot design with 5 replicated mesocosms for each temperature (ambient *vs.* heated). Experimental treatments effects were tested on the plant vigour, by measuring morphological traits as, biomass, main shoot length, the production and length of lateral branches and roots, the number of flowers and capsules. Additionally, four physiological traits (Chlorophyll a, NB index, Flavonols and Anthocyans) were also measured upon leafs. Density treatment did not have significant effect on none of both species morphological traits. On the other hand, *L. hexapetala* increased significantly its growth in the heated mesocosms, but *L. peploides* growth was not affected by temperature treatment. Only *L. peploides* produced fruits with viable seeds. There was no significant effect of plant density and temperature increase on the physiological leaf traits. Our results pointed out that *L. hexapetala* better performed than *L. peploides* under rising temperature scenario, therefore temperature may play an important role in driving the invasive potential of all two species

*Speaker