Abstract

Plant-soil feedback has been a well-studied mechanism in recent years of the success of invasive plants, the shift of species in succession, and the structure of plant communities in general. It is a process during which the plant affects the soil with its growth and these changes are reflected in the growth of other plants. Despite the large number of previous studies, relatively little attention is paid to the interaction of plant-soil feedback with other factors, which I consider important for understanding its role in natural plant communities. The aim of the work was to clarify the influence of plant-soil feedback on model species *Arrhenatherum elatius* and *Centaurea scabiosa* and to compare its influence with other factors - interspecific competition and herbivory (simulated loss of aboveground biomass). The influence of factors was investigated using biomass and changes in plant physiology, specifically chlorophyll fluorescence and the content of elements in aboveground biomass. The plant-soil feedback mechanism of the model species was assessed using the content of elements in the soil after cultivation. In the biomass of the species *Arrhenatherum elatius*, the factors of plant-soil feedback and competition manifested themselves in mutual interaction, when the presence of a competitor changed negative feedback to positive. *Arrhenatherum* was a strong competitor in the experiment, whose success was probably due to the efficient use of nitrogen and mycorrhizal symbiosis. However, his competitive efforts in biomass production have led to an increase in stress levels in response to environmental conditions, as shown by the negative trend in chlorophyll fluorescence values. *Centaurea scabiosa* needed cultivated soil for its growth, preferably cultivated by the early successor species *Arrhenatherum elatius*. Besides *Arrhenatherum*, this species was a weak competitor. In the biomass of *Centaurea scabiosa*, the plant-soil feedback and competition factor acted strongly separately, while in the species *Arrhenatherum*, the factors acted only in mutual interaction. The effect of the observed factors in plant communities is therefore likely to depend on the species studied and the intensity of these factors. However, to more accurately determine the mechanisms that may be responsible for plant responses to given factors, it would also be appropriate to analyze the composition of soil communities, for example to rule out or confirm mycorrhizal symbiosis.