Abstract

Clonal plants may be able to cope with spatial heterogeneity due to the physiological integration of ramets. Previous studies demonstrated that benefits of clonal integration increase with patch contrast between individual ramets. However, the same magnitude of contrast may be perceived differently in rich and poor environments. According to the theoretical work of Caraco and Kelly (1991), I expected these benefits to be the greatest in overall poor conditions and high between-patch contrast. To test this hypothesis, I conducted experiments with pairs of ramets of a stoloniferous grass, *Agrostis stolonifera,* grown in variously nutrient rich conditions.

The experiment with pairs of ramet of similar developmental age showed only very weak effect of integration on growth of ramets, although integration significantly improved survival of ramets and also affected root-shoot ratio of ramets. Nevertheless, there were considerable benefits of integration in the experiment with developmentally older mother ramets and their daughter ramets. Contrary to the predictions, the benefits of integration were bigger in rich conditions and they decreased with increasing between-patch contrast. In addition, effect of integration on root-shoot ratio of ramets was opposite to the expected specialization for acquisition of locally abundant resource. Plants responded to nutrients also in terms of morphological plasticity. In poor environment they produced less stolons with longer top stolon and higher intensity of branching. Morphological responses to patch richness were in accord with a concept of clonal foraging for resources.

The unexpected results may indicate translocation of assimilates rather than mineral nutrients between ramets of *A. stolonifera*. I further discuss that the experimental set up is of a great importance for possible results of experiments on clonal integration.