Adaptive responses of the nitrogen-fixing Medicago truncatula - rhizobia symbiosis to nitrogen acquisition limitation

PERSPECTIVES

Various studies have shown that the host plant preferentially associated with certain bacterial genotypes from the genetic diversity available in the in the free-living soil populations. However, recent studies indicate that the population structure changes in the nodules during the vegetative cycle, varies according to changes in nodule development, and may vary with nutritional constraints experienced by the plant (Depret and Laguerre, 2008, New Phytol 179:224-235; Kiers et al., 2007, Proc. R. Soc. B 274:3119-3126). These results suggest that the various components of the rhizobial populations can be differentially mobilized by the symbiotic interaction in response to environmental conditions or plant development and thus contribute to the plasticity of plant adaptation to a changing environment for N supply. Therfore, our current work now aims to determine whether the plant, according to its nitrogen demand, is able to select the most effective bacteria for the formation of nodules and / or to favour the growth of existing nodules formed by the most effective strains. In the longer term, according to the results obtained, it is planned to develop a project to decipher the molecular basis of these adaptive responses.

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