# Effect of the Legume Plant Host on Rhizobial Soil Population Dynamics

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*Rhizobium leguminosarum* bv *viciae* (Rlv) is a soil bacterium able to establish specific root-nodule symbioses with legumes of four different genera: *Pisum*, *Vicia*, *Lens* and *Lathyrus*. Rlv isolates from nodules of any of these legumes can nodulate any of them; however, it has been shown that plants select specific rhizobial genotypes from those present in the soil (1,2). We have previously shown this at the genomic level by following a population genomics approach. Pool genomic sequences from 100 isolates from each of four plant species: *P. sativum*, *L. culinaris*, *V. faba* and *V. sativa*, show different, specific profiles at the single nucleotide polymorphism (SNP) level for relevant genes. In this work, the extent of Rlv selection from a well-characterized soil population by different legume plant hosts: *P. sativum*, *L. culinaris*, *V. faba* and *V. sativa*, after a medium-term mesocosm study is described. Direct soil isolates from each of these mesocosm studies have been tested for specific rhizobial genes (*glnII* and *fnrN*) and symbiotic genes (*nodC* and *nifH*). Different populations were characterized further by Sanger sequencing of both the *rpoB* phylogenetic marker gene and the symbiotic genes *nodC* and *nifH*. The distribution and size of the rhizobial population for each legume host showed changes during the medium-term mesocosm study. Particularly, a non-symbiotic group of rhizobia was enriched by all four hosts, in contrast to the symbiotic rhizobia profile, which was specific for each legume plant host.

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1) G. Laguerre et al. 2003. App. Environ. Microbiol. 69(4): 2276
2) L. Mutch & P.W. Young. 2004. Mol. Ecol. 13(8): 2435-2444