**P33**  
**Rhizobia-bean interaction under different environments in the Northwest of Spain**


Plant Genetic Resources Department, Misión Biológica de Galicia (MBG-CSIC), P. O. Box 28. 36080 Pontevedra, Spain

Common bean (*Phaseolus vulgaris* L.) is an important world grain legume and vegetable in the south of Europe where it is grown in small farms and gardens during the warm season. Moreover, common bean is a relevant source of protein in human diet for centuries, where animal protein is very expensive and sometimes unsafe or unhealthy. Reduced soil fertility occurs as a consequence of poor soil management, and nitrogen is often the nutrient most limiting to crop growth, where the situation is frequently aggravated by the chemical fertilizers, which have indirect cost, related by the consumption of non-renewable energy necessary for ammonia synthesis, as well as environmental implications. The symbiotic nitrogen fixation (SNF) provides an ecologically acceptable alternative to the high applications of nitrogenous fertilizers, especially in Europe, and an economic alternative to the limited access to these fertilizers of the developing countries (Egamberdiyeva, 2007). It seems that there is an important genotypic variability associated with SNF potential and amount of N$_2$ fixing that emphasizes the need to explore the potential of indigenous rhizobial strains for improving the symbiotic performance of *P. vulgaris*. The objective of this work was to study the effect of the soil environment on the ability of rhizobia to form nodules and the need for rhizobial inoculation when introducing common bean into different soil environments. The experience was conducted in acid soils derived from granites or schist with loamy sand texture. Thirty bean accessions from the Iberian Peninsula were chosen for the field trials and the experimental design was a randomized complete block with two replications. Symbiotic parameters, nodule dry weight, shoot dry weight and yield were measured on each plant individually. The analyses of variance and regressions were performed using the general linear model procedure of the Statistical Analysis System package. Significant differences among the different environments were noted for all agronomic and symbiotic characters evaluated, indicating the existence of variation in the studied germplasm. This variation in the interaction nodulation-bean in different environments could be exploited in breeding programs for enhanced nodulation and N$_2$ fixation in each bean market class. Obtaining sufficient knowledge on the population characteristics of indigenous rhizobia populations in Spanish soils will be valuable for developing strategies to improve SNF and thus increase bean yields at low cost (Abaidoo et al. 2007). Results from the present study reinforce the importance of conducting trials in multiple environments, to provide strong support for recommending the use of inoculants.