

54. *Bradyrhizobium* from tropical rain forest trees: genetic diversity and use as inoculant in nursery to increase the development of leguminous tree species

Antonio Munive[‡], Anne Willems[‡], Moussa Diabate[¶], Christine Le Roux[†], Philippe de Lajudie[†], Bernard Dreyfu

[†]Laboratoire des Symbioses Tropicales et Méditerranéennes (LSTA)

UMR 1063 IRD/INRA/CIRAD/AGRO-M/UM-II, Montpellier, France

[‡]Laboratorio de Microbiología del Suelo, Departamento de Microbiología, Instituto de Ciencias

Benemérita Universidad Autónoma de Puebla, Puebla, México

[‡]Laboratorium voor Microbiologie, Faculteit Wetenschappen, Universiteit Gent, Gent, Belgium

[¶]Institut de Recherche Agronomique de Guinée (IRAG), Sérédou, Guinée

The tropical rain forests are characterized by year-round high temperatures, abundant moisture, mineral element poor soils and a high vegetal diversity, with a high proportion of trees belonging to the Leguminosae family. A main advantage of members of this family is their ability to establish a symbiotic interaction with rhizobia (nitrogen-fixing soil bacteria). The objective of this study is to characterise and to compare the diversity of rhizobia isolated from tropical rain forest trees in three distant regions of the world (Guinea, Guyana and Madagascar). We report here, for the first time, the nodulation of 20 tropical rain forest tree species. We describe the genetic diversity of 73 root nodule bacteria from 27 tropical forest tree species (9 tribes spread all over three subfamilies of the Leguminosae). We performed partial 16S-23S rDNA intergenic spacer sequencing. Results showed that the 62 slow-growing isolates belonged to the genus *Bradyrhizobium*, whereas the 11 fast-growing isolates belonged to the genera *Rhizobium*, *Mesorhizobium*, *Sinorhizobium*, *Azorhizobium* and *Burkholderia*. Between the *Bradyrhizobium* isolates, we found several genospecies that correspond to the 11 already described species and at least 5 other new ones. The isolation of two particular bacteria genera was especially surprising: *Azorhizobium*, previously described as stem nodule symbionts of *Sesbania rostrata* in Senegal and of *S. virgata* in Brazil, has been identified as a symbiont of *Dalbergia*; and *Burkholderia*, belonging to the β -subclass of Proteobacteria, was isolated from *Machaerium* in Guyana. Nitrogen-fixing trees are very useful to restore fertility in forest disturbed soils. Therefore, we have selected the most performant strains to be inoculated in forest nurseries. The inoculation in nursery of different tree species with *Bradyrhizobium* selected strains resulted in an increased development of plants.

22nd Latin-american Conference on Rhizobiology

1st Brazilian Conference on Biological Nitrogen Fixation



PROGRAMME AND ABSTRACTS
MIGUEL PEREIRA - RIO DE JANEIRO
BRAZIL
13th - 15th SEPTEMBER 2004

