

## Plant growth promoting rhizobacteria: evaluation of their diversity in different crops of South Brazil

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Plant growth promoting rhizobacteria (PGPR) can stimulate host plant growth through the production of plant-growth substances, suppression of deleterious organisms, promotion of the availability and uptake of mineral nutrients and other activities. These bacteria have been the object of studies due to the effects produced in commercially important crops. Several strains of nitrogen-fixing bacilli were isolated from seven distinct rice production zones of the Rio Grande do Sul State (RS), Brazil. They were evaluated for their diversity and for the presence of some PGPR characteristics. Shannon diversity indexes varying from 2.27 to 5.51 were obtained and soil pH was the soil parameter most closely related to bacilli diversity. Of 296 isolates, 148 produced between 0.1 and 30  $\mu\text{g IAA ml}^{-1}$  *in vitro* after 144 h of incubation; 22 were able to solubilize phosphate; and 32 produced siderophore. *Paenibacillus* and *Bacillus* genera were the most prominent groups in the rhizosphere and soil populations analyzed. *P. borealis* was the most frequent species in both locations. Another work investigated the diversity of bradyrhizobia populations, as the massive inoculation of Brazilian soils with few bradyrhizobia strains recommended for soybean has resulted in an established population in most soils cropped with this legume. Five bacterial populations from distinct regions of RS State were analyzed by rep-PCR and AFLP methodologies. A high level of genetic diversity within populations was observed, with diversity indexes varying from 3.95 to 6.17 in the different areas. In these fields pH, clay and organic matter contents were the major soil factors affecting diversity. The above studies emphasizes that there are a high level of genetic diversity in PGPR populations in Southern Brazilians fields. This information could be useful in the formulation of new inoculants containing strains better adapted to the local environmental conditions, resulting in the improvement of the cropping systems into which these inoculants can be most profitably applied, increasing significantly the productivity of grain crops in Brazil.