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Diversity of nitrogen fixing bacteria associated to the new Caledonian ubiquitous tree Acacia spirorbis

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The New Caledonian endemic tree species Acacia spirorbis is able to grow and to present invasive traits on a wide range of soils (e.g.: ultramafic, calcareous coral, siliceous, aluminium enriched) in a large range of pH. Acacia spirorbis is also adapted to poly-metallic toxicity, especially Ni, to an unbalanced Ca/Mg ratio in strong favour of Mg and to poor N, P and K availability. The goal of this study was to improve our knowledge concerning the influence of bacterial symbionts on A. spirorbis adaptation to different soil conditions. Firstly, bacterial symbiots were isolated from field collected nodules or nodules obtained by trapping method and characterized by phylogenetic analysis of housekeeping genes (recA, dnaK and glnII) and symbiotic genes (nodA and nifH). A strong preference of A. spirorbis for different species of Bradyrhizobium has been noted ; Rhizobium species has been isolated only from nodules collected from a plantation located out of its natural area of distribution. A selection of representative rhizobial strains isolated from diverse soils was tested to compare their symbiotic efficiency with A. spirorbis in nursery conditions. Results are presented in function of soils diversity and in perspective of A. spirorbis adaptation to extremely diverse and adverse soil conditions.