

Symbiotic and molecular characterisation of the rhizobia associated with *Acacia mangium* x *Acacia auriculiformis* hybrids and both parental species

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ABSTRACT

In the context of an increasing utilisation of the interspecific hybrid *Acacia mangium* x *A. auriculiformis* as a plantation tree for pulp production in Southeast Asia, the symbiotic characterisation of this hybrid was carried out in comparison with that of its both parental pure species. Rhizobium strains of diverse geographical origins were isolated from *Acacia mangium*, *Acacia auriculiformis* and the hybrid *A. mangium* x *A. auriculiformis*. Two types of strains could be distinguished according to their growth rate in pure culture, the *Acacia* hybrid strains having a fast growth conversely to the strains isolated from both parental species which had a far lower growth. The inoculation experiments performed in *in vitro* or greenhouse conditions showed that all rhizobium strains isolated from both parental species and their hybrid were infective and effective with these same three species, except one that formed unefficient nodules in *A. mangium*. However, although no specificity in strain infectivity was observed, they showed very variable effectivities according to the species tested. Thus, the strains isolated from the hybrid *A. mangium* x *A. auriculiformis* had a higher effectivity than strains isolated from *A. mangium* or *A. auriculiformis* when all these strains were inoculated to the *Acacia* hybrid. Conversely, the strains isolated from the hybrid *A. mangium* x *A. auriculiformis* generally exhibited a lower effectivity than *A. mangium* or *A. auriculiformis* strains when inoculated to each pure parental species. Then, the rhizobium strains were genetically characterised through partial sequencing of the intertranscript space region 16S-23S of the ribosomal DNA (ITS). The resulting phylogenetic tree

showed that, except for few ones, all strains isolated from the hybrid *A. mangium* x *A. auriculiformis* were grouped within a same branch phylogenetically close to *Bradyrhizobium japonicum* reference strains whereas all strains isolated from *A. mangium* and *A. auriculiformis*, regardless of their geographic origin, were grouped in another branch including *Bradyrhizobium elkanii* reference strains. Since all the *A. mangium* x *A. auriculiformis* hybrid strains of our study originated from Malaysia, other ones from more diverse origins should be isolated and characterised in order to confirm this differentiation between them according to the hybrid or pure species status of the host plant of isolation.

KEYWORDS : *Bradyrhizobium*, legume trees, nitrogen fixation, phylogeny