

11- Nitrogen-fixing legumes and their partners in Brazil: from the lab to the field, from the forest to the mine tailing

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Leguminosae, the third largest family of angiosperms, are of major agricultural, ecological and economic importance. Several recent studies allowed to clarify the taxonomic and phylogenetic relationships among the 19,400 species that constitute this family. Except for the sub-family Papilionoideae, most species of the Leguminosae are trees of tropical and sub-tropical regions. With 62% percent of its 8.6 M km² covered with forests, Brazil is a privileged partner to study the diversity of legume symbioses. Having to cope with an intense demographic, agricultural and industrial development, Brazil also has an urgent need to identify local plant species with a high potential in revegetation purposes on post-agricultural or -industrial depleted soils. Despite their major interest for this purpose, native legume species remain relatively poorly exploited.

For over a decade, LSTM has been collaborating with Embrapa in Seropedica through different joined projects to address this question. More than 10 joined publications in peer-reviewed journals attest this partnership and we shall illustrate here some of these results, regarding both academic research like evolution of legume symbioses both on plant and bacterial sides, nodulation status of unexplored Amazonian legumes or more applied ones like ecological restoration of mine sites.

These data evidenced the diversity of nodulating legumes in Amazonia, with more than 60 plant species as new records of nodulation, one new genus, and 12 new non-nodulating species. A closer examination across the mimosoids species allowed to show the dominance of the β -Proteobacteria, with several species of the genus *Burkholderia* among their bacterial partners. The use of these local legume species in restoring a diversified forest ecosystem on bauxite mine tailings in Amazonia will be illustrated.

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