

CHARACTERIZATION OF *RHIZOBIUM* STRAINS NODULATING SOME LEGUMES ENDEMIC TO SRI LANKA

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Plants belonging to the family Fabaceae perform well in N-depleted soil by converting atmospheric N₂ into available forms of nitrogen. Preliminary research has revealed that there are approximately 326 species of leguminous plants in Sri Lanka including 14 endemic species. However, hardly any information is available on their rhizobiology. In the present study, isolation, purification and characterization of rhizobia from root nodules of certain endemic and native dinitrogen fixing tree legumes were attempted.

Five species of lesser known legumes; (*Abarema abeywickramae*, *Abarema bigemina*, *Acacia lankaensis*, *Adenanthera bicolor* and *Entada pusaetha*) were sampled from the Sinharaja Forest Reserve, Hunnasgiriya and Madamahanuwara. Rhizobia were isolated from root nodules of *A. abeywickramae*, *A. bigemina*, *A. lankaensis*, and *E. pusaetha*. These were purified and characterized along with those from a non-endemic legume species, *Pongamia pinnata*.

For preliminary characterization, colony characters when grown on Yeast-Mannitol Agar (YMA) were observed. Acid and gas production were tested by growth on Yeast-Mannitol Agar with Bromthymol blue (BRYMA) and broth culture growth in Durham tubes. The purity of the isolates was confirmed by Gram staining and spore staining. For biochemical characterization, culturing on different organic substrates was done. Four heat labile sugars (dextrin, inulin maltose and xylose) and four heat stable sugars (glucose, lactose, mannitol and sucrose) were used. For physiological characterization, pH tolerance of the isolates in the range pH 4 – 11 was checked.

A. bigemina is an abundant nodulator where as *A. bicolor* is a non-nodulator. Other species were moderate nodulators. Rhizobial isolates of *A. abeywickramae* and *A. lankaensis* were fast growers, whereas strains of *A. bigemina* and *E. pusaetha* were slow growers. A high degree of sugar utilization was seen with rhizobial strains of *A. abeywickramae* and *A. lankaensis*. *A. bigemina* and *E. pusaetha* rhizobial strains showed a low degree of sugar utilization. While *A. abeywickramae* and *E. pusaetha* rhizobial strains were capable of utilizing a wider range of carbohydrates, *A. bigemina* and *A. lankaensis* rhizobial strains were capable of utilizing a narrower range of carbohydrates. Rhizobial strains of *A. abeywickramae*, *A. lankaensis* and *E. pusaetha* were more tolerant to basic pH levels (11) whereas, strains from *A. bigemina* showed a narrow range of pH tolerance (5-9).