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pH AND SALINITY TOLERANCE AND GENETIC DIVERSITY OF RHIZOBIA IN *Pueraria phaseoloides* FROM THREE CLIMATIC ZONES OF SRI LANKA

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Many agriculturally important plants in the legume family can use atmospheric nitrogen for growth through Biological Nitrogen Fixation. It involves symbiosis between legume plants and *Rhizobium* spp. that live in nodules of the legume roots. *Pueraria phaseoloides* is an agriculturally important, perennial, deep-rooted cover crop legume. It is mainly used for coconut and rubber plantation as green manure and a cover crop. The successful growth of *P. phaseoloides* is due to its remarkable ability of forming root nodules. This ability is possible even when they are grown under harsh conditions. Therefore, it would be very important to find out the genetic diversity of the rhizobia nodulating *P. phaseoloides* as a preliminary step towards the identification and cross inoculation of these strains in crop legume plants to improve their yield and to reduce the use of nitrogen fertilizer.

Root nodules of *P. phaseoloides* were collected from Rathnapura, Mawathagama and Puttalam representing the wet, intermediate, and dry zones, in Sri Lanka. These sites exhibited different soil and environmental conditions. To identify the genetic diversity of rhizobia, PCR-amplified ERIC (Enterobacterial Repetitive Intergenic Consensus) profiling was used. In combination with assessing genetic diversity, their pH and salinity tolerance were also determined.

From ERIC profiling, 16 different polymorphic banding patterns representing 16 different rhizobial strains were obtained. In association with genetic diversity, pH and salinity tolerant strains were identified. All the strains showed best growth around optimum pH range of 5 - 8. The strains PT1 – PT6 showed low pH tolerance while the strains, RP1, MW1, MW3, MW6, PT1, PT3, PT5 and PT6, showed high pH tolerance. The strains, PT2, PT3, PT5 and PT6, were highly tolerant for salinity while the strains, RP3, MW3, MW6, PT1 and PT4, were moderately tolerant for salinity. All the other strains were less tolerant to salinity. Among the identified tolerant strains, PT3, PT5 and PT6 were tolerant to a broad pH range as well to a high salinity. High pH and salinity tolerant strains were found in Puttalam compared to Mawathagama and Rathnapura. Strains from Rathnapura and Mawathagama exhibited similar tolerance for tested pH and salinity levels. The tolerant strains which were identified would be useful to cross inoculate with edible grain legumes for the development of future agricultural productivity without using nitrogen fertilizer.