

## **Characterisation of *Rhizobium* sp. in *Cletozia ternatea* L. from five different districts of Sri Lanka**

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Legume plants have the ability to fix atmospheric nitrogen symbiotically with the association of *Rhizobium* that inhabits the root nodules. *Cletozia ternatea* L. is a legume, which grows naturally in dry and less fertile lands. It has the ability to fix nitrogen even under harsh environmental conditions. The present study was aimed at screening the Rhizobial strains of *Cletozia ternatea* L. which have the ability to tolerate high salinity, high temperature, drought, and a broad pH range and, identifying and differentiating the best tolerant strains at molecular level using PCR amplified Enterobacterial Repetitive Intergenic Consensus (ERIC) profiling. Bacterial colonies were isolated from root nodules, which were collected from five different districts of Sri Lanka, namely, Jaffna (J), Trincomalee (T), Vavuniya (V), Mannar (M) and Kandy (K). Fresh nodules were collected and pure cultures were obtained by using ½ Lupin agar medium. Total of 25 pure colonies representing the five districts (5 from each district) were selected. These cultures were grown in ½ Lupin broth ranging the temperature from 25°C to 60°C, NaCl concentrations 1-5%, pH from 2-10, and PEG from 10-30%, separately. Growth of the cultures was tested by measuring the optical density at 600 nm. From physiological characterization, fourteen best high tolerant strains were selected for ERIC profiling. Among these 14 isolates, M3, and V3 isolates exhibited good tolerance to the temperature range from 25°C to 60°C, NaCl concentration range from 1-5%, pH range from 2-10 and PEG concentration 10-30%. The isolates J1, T1, K1 and K3 were tolerant to the same temperature range, salinity and pH conditions. J2 and K3 exhibited high tolerance to 30%PEG concentration. Out of 14 stress tolerant isolates, we were able to distinguish 5 different banding patterns using PCR amplified ERIC profiling. The high tolerant M3 and V3 were showing different polymorphic banding patterns suggesting that they are different strains. These high tolerant strains can be used for cross inoculation with commercially important legume crops to improve their yield under harsh environmental conditions and for bio fertilizer production.