***Abstract No: 83*** ***Life Science***

# CHARACTERISATION OF *RHIZOBIUM* SP. IN *MIMOSA PUDICA* L. FROM FIVE DIFFERENT DISTRICTS OF SRI LANKA

**R. Arrosan[1, 2], T. Tharshika[1, 2], K.W.T.R. Kularathna[2] and Sanath Rajapakse*[,1, 2]**

[1]*Postgraduate Institute of Science, University of Peradeniya, Peradeniya*

[2]*Department of Molecular Biology and Biotechnology, Faculty of Science, University of Peradeniya, Peradeniya.*

Biological nitrogen fixation is an important natural process widely used in agriculture and forestry. Legume plants have the ability to fix atmospheric nitrogen symbiotically with the association of *Rhizobium* that inhabits the root nodules of these plants. *Mimosa pudica* which belongs to the family Fabaceae is a weed that grows naturally in a wide range of soils and can successfully get nodulated even under harsh climatic and soil conditions. The present study was aimed at screening the Rhizobial strains of *Mimosa pudica* with the ability to tolerate high pH, high salinity, high temperature and drought and to identify and differentiate the best tolerant strains at a molecular level using PCR amplified Enterobacterial Repetitive Intergenic Consensus (ERIC) profiling. Plants were collected from five different districts in 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 pH from 2-10, NaCl concentrations 1-5%, temperature from 25ºC to 60ºC and PEG from 10-30%, separately. Growth of the cultures was tested by measuring the absorbance at 600 nm. Seventeen stress tolerant isolates were selected for ERIC profiling. Among these isolates T5, M5 and V3 exhibited significant growth in a temperature range from $25^0$C to $60^0$C, NaCl concentration range from 1-5% and pH range from 2-10. The isolates T3, V3 and K3 were tolerant to the above mentioned salinity, pH and temperature conditions. In addition, they were resistant to high drought stress as they could grow even at a 30% PEG concentration. The isolate V5 showed tolerance to the above mentioned salinity, temperature and drought conditions as shown by T3, V3, and K3. But V5 did not show a significant growth at extreme pH values as other isolates. Out of the 17 stress tolerant isolates, we were able to distinguish 8 different banding patterns using PCR amplified ERIC profiling. Rhizobial isolates from five different districts are diverse in their stress tolerance levels for different temperature, salinity, pH and drought conditions. Among the isolates of the five sites, isolates T4, T5, V2, V3, V5, M5 and K3 were tolerant to three different stress conditions. These isolates can be used for cross inoculation with agriculturally important legumes to improve their yield and for bio fertilizer production. Further molecular characterization of these strains can be carried out with DNA sequencing.

**Keywords:** *Mimosa pudica*, Molecular diversity, Rhizobia.