

EFFECT OF ECO-FRIENDLY NURSERY MANAGEMENT MEASURES OF *Camellia sinensis* ON SOIL MICROBIAL DENSITY AND DIVERSITY

G.L.T.A. Bandara¹, D.M.De Costa², G.D.N. Menike³, and
T.D.C. Priyadarshani¹

¹Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

²Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya, Sri Lanka.

³National Institute of Post harvest Management, Anuradhapura, Sri Lanka.

Nursery management plays a vital role in producing healthy and vigorous tea plants for field establishment. Present study was conducted to determine the effect of eco-friendly nursery management practices on the density and diversity of microorganisms in nursery soil of tea. Soil samples were collected separately from soils, treated with two types of management practices (i.e. eco-friendly and existing) at *Kataboola* estate, *Nawalapitiya*. Composite samples were used for quantification of total bacterial and fungal counts by dilution plate technique. Bacterial diversity was determined in terms of Gram status, the ability of spore-formation, nitrogen- fixing and fluorescent pigment production using standard biochemical tests and diagnostic media. Bacteria having distinct colony morphology were subjected to molecular identification by PCR of the rRNA region, DNA sequencing and homology search. Soil pH, electrical conductivity (EC) and total dissolved solids (TDS) of the samples collected from two management practices were measured. The diversity and density of Bacteria were than that of fungi in soils under both management measures. Soils managed under eco-friendly measures resulted in higher colony diversity of bacteria (19) than the soil under existing management practices (14). Density and diversity of Gram-positive and spore- forming bacteria were higher in soils managed under eco-friendly measures (15) than in the soils under existing management (9). Diagnostic media identified *Rhizobium* spp.in both types of soils and *Azotobacter* spp. in soils under only eco-friendly management while fluorescent producing *Pseudomonads* were not detected in both soils. The soil pH, EC and TDS of the soil of the fields managed under eco-friendly measures were 6.00, 44.60 μscm^{-1} and 20.98 mgL^{-1} , respectively, while, in the existing management those were 4.0, 106.1 μscm^{-1} and 49.7 mgL^{-1} , respectively. As conclusion of the study, eco-friendly management practices could be recommended for tea nursery management in Sri Lanka.

Keywords: Diagnostic media, Dilution plate technique, Nitrogen fixing bacteria, Spore forming bacteria