

Abstract No: BO-35

## Development of a potting medium enriched with *Acetobacter xylinum*, for growing the bush variety of *Centella asiatica*

H. W. K. Perera\* and B. T. S. D. P. Kannangara

Department of Plant and Molecular Biology, University of Kelaniya, Sri Lanka

\*wathsalakperera1993@gmail.com

Plant Growth Promoting Rhizobacteria (PGPR) can enhance plant growth by biological processes. The potential of PGPR in agriculture has steadily increased as it offers an attractive way to replace the use of chemical fertilizers and other growth supplements. Among the PGPR bacteria, *Acetobacter xylinum* colonizes the rhizosphere of many plants and promotes plant growth through the increased supply of nitrogen during their association with the host plants. The effect of *Acetobacter* spp. on the growth of maize, sugar cane and sweet potato were studied by conducting many field experiments. The present study was carried out to develop a potting medium enriched with *Acetobacter xylinum* suitable for vegetative growth of *Centella asiatica* (Gotu kola) bush variety. *A. xylinum* strain was grown in Hestrin and Schramm medium and the identity was confirmed by observing morphological and biochemical characteristics. The potting medium (green manure: core dust; 3:1) was collected from the Regional Agricultural Research and Development Centre-Makandura. *C. asiatica* samples at bedstraw stage were split from mature stage nursery and transplanted in plastic pots containing the prepared potting medium. Two weeks old transplanted samples were distributed into six treatments as control (without treatment) and treated samples containing  $10^3$ ,  $10^5$ ,  $10^7$ ,  $10^9$  and  $10^{11}$  Colony Forming Units (CFUs) of *A. xylinum* inoculum via soil application in five replications. All treated and control samples were maintained at the plant house, University of Kelaniya. The Kjeldhal digestion method was used to analyze the total nitrogen contents of the medium before and after planting and after harvesting. After 50 days of growth, parameters related to vegetative growth of Gotu kola (number of leaves per bunch, leaf area, chlorophyll content, length of petiole, fresh weight of shoot and root biomass, and dry weight of shoot and root biomass) were measured. The highest mean values for leaf area ( $10.6 \text{ cm}^2$ ), the chlorophyll content (62.1 %), the length of petiole (14.5 cm), the fresh weight of shoot biomass (9.02 g/plant) and root biomass (1.53 g/plant) and the dry weight of shoot biomass (2.15 g/plant) and root biomass (0.613 g/plant) were obtained for the treated plant sample with  $10^7$  CFUs of bacteria, compared to the control. The potting medium with  $10^5$  CFUs recorded the significantly higher value of mean total nitrogen content at 50<sup>th</sup> day after the application of *A. xylinum* (0.53 %) than the control (0.49 %). The above results demonstrated that *A. xylinum* has increased the amount of available total nitrogen in the potting medium. Present study indicated that the inoculum size of  $10^7$  CFUs of *A. xylinum* could be successfully used as a bio-fertilizer for a better vegetative growth of *C. asiatica*.

**Keywords:** *Acetobacter xylinum*, Plant growth promoting bacteria, *Centella asiatica*