Effect of Dissolved Oxygen Concentration on *Echinodorus beleheri* Growth in Hydroponics

B. Narthaky[1]*, T. Mikunthan[1], V. Jegathambigai[2] and A. Swinningen[2]

[1]Department of Agricultural Engineering, Faculty of Agriculture, University of Jaffna, Kilinochchi, Sri Lanka
[2]Green Farms (pvt) Ltd, Marawila, Sri Lanka
*sakthinarththu@gmail.com

Hydroponics system is an easy and environmentally good approach where plants are grown without the support of soil media. The system is mainly affected by water quality parameters, especially, dissolved oxygen (DO), pH and temperature. *Echinodorus beleheri* was selected for this study because of its fast growth rate and availability. The objective of this study was to determine the effect of DO concentration on *Echinodorus beleheri* in hydroponics. The different DO concentrations were maintained by giving aeration by pumping at four different time durations such as 10, 20, 30 and 40 min and DO concentration was measured daily using DO electrode. Simultaneously, a control experiment was carried out without aeration. Each treatment was used in four replicates (four tunnels). The rate of growth of *Echinodorus beleheri* was measured by counting the number of runners, baby plants and leaves weekly and length and width of leaf and plant height by non-destructive method at weekly interval. The experiment was carried out in Completely Randomized Design (CRD) and the data were analyzed using SAS package. The highest DO concentrations were observed in the growth medium aerated at 30 and 40 min intervals and there was no significant difference (p>0.05) among these two values. The growth medium aerated at 10 min interval showed lowest DO concentration. The highest yield as measured by runners, number of baby plants and leaves was observed in the growth medium aerated at 40 min interval. Recommended DO level of growth medium should be higher than 8 mg/L. Recommended DO level was obtained in treated tunnels. DO levels were increased and DO reduction was prevented by the all aeration treatments. Frequent aeration had positive impact on plant productivity. Plant growth and productivity increased after the continuous pumping treatment.

Keywords: Dissolved oxygen, *Echinodorus beleheri,* hydroponics, nutrient mixture