ID 84

Potential of using *Chlorella* sp. grown in parboiled effluent in combination with organic or inorganic fertilizers: Effects on growth and yield of brinjal (*Solanum melongina*)

K.H.G.L Ruwangi[1*], K. Jeyakumar[1], N. Gnanavelrajah[1] and B. Ketheesan[2]

[1] Department of Agricultural Chemistry, Faculty of Agriculture, University of Jaffna.
[2] Department of Civil Engineering, Faculty of Engineering, University of Jaffna.

Abstract

Present study was conducted to assess the potential use of *Chlorella* sp. grown in parboiled effluent as an organic nutrient source. *Chlorella* sp. was cultivated using parboiled effluent in a raceway reactor for 14 days continuously with constant light intensity (200 µmol photons $m^{-2} s^{-1}$) and constant mixing. The algal biomass was washed in distilled water and the nutrient content (N, P, and K) was determined. A pot experiment was conducted to find the response of brinjal (*Solanum melongina)* for different inorganic or organic fertilizer combinations with *Chlorella*, balancing the total nitrogen in each treatment except control (T1). The design was CRD with eight treatments and three replicates. The treatments were T1 - Control, T2 - 100% Inorganic Fertilizer (IF), T3 - 100% Cattle Manure (CM), T4 - 30 g *Chlorella* + 100% Inorganic Fertilizer except N (IFEN), T5 - 15 g *Chlorella* + 50 % IFEN, T6 - 15 g *Chlorella* + 50% CM, T7 - 20% *Chlorella* Foliar Spray (FS)+ 50% IFEN, T8 - 20 % *Chlorella* FS + 50% CM. Plant height, leaf number, flowers per plant, and the yield of brinjal were recorded and statistically analyzed. The *Chlorella* had 25% of nitrogen, 7.5% phosphorus, and 0.74% potassium. Significant variations were observed in height, leaf number and flower numbers among different treatments. All the treatments gave either a statistically similar or higher yield than T2 (100% IF), except the control. T6 (*Chlorella* 15 g + 50% CM) gave a significantly higher yield than all other treatments except T4 (30 g *Chlorella* + 100% IFEN). Considering the yield, T6 (15 g *Chlorella* + 50% CM) is the best option in organic combinations while T4 (30 g *Chlorella* + 100 % IFEN) is the best option in inorganic combinations. This study, therefore, highlights the potential of using *Chlorella* sp. grown in parboiled effluent as a nitrogen source for crop production. Further studies are required to optimize the nutrient supply including phosphorus.

Keywords: Algae, Brinjal, Foliar spray, Organic nutrient source

***Corresponding Author:** khglithma@gmail.com