FORMULATION OF A LOW-COST MEDIUM FOR THE CULTIVATION OF *Spirulina*

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Abstract

Spirulina is a spiral shaped, multicellular and filamentous blue-green microalgae. Although it has high nutritional potential, mass production of *Spirulina* is expensive due to the high cost of culture medium. Therefore, the present study was conducted to formulate a low-cost medium for the cultivation of *Spirulina.* Eight different growing media were formulated with ash of cow dung, rice husk and paddy straw in combination with Zarrouk's medium (Control- 100% Zarrouk's medium, T1- 50% Zarrouk's medium, T2- 100% cow dung, T3- 100% husk, T4-50% husk + 50% cow dung, T5- 50% cow dung + 50% Zarrouk's medium, T6- 50% husk + 50% Zarrouk's medium, T7- 100% cow dung + 50% $NaHCO_3$ and T8-100% husk + 50% $NaHCO_3$). Fresh culture of Spirulina was inoculated in to each medium and kept in a polyhouse. Optical density (OD), pH, weight of dry biomass, total nitrogen, potassium, phosphorus and chlorophyll content of *Spirulina* biomass were measured using standard methods. Data were statistically analyzed using SAS University edition. The pH of culture media was increased in all treatments throughout the growing period. The higher dry biomass was obtained from control (0.367 g/l), T1 (0.366 g/l) and T6 (0.363 g/l) after 28 days of inoculation. The highest total nitrogen, phosphorus and potassium of *Spirulina* biomass were recorded in T6 (50% husk+50% Zarrouk's, medium) as 6.10%, 0.24% and 4.54 % respectively. The highest total chlorophyll content was obtained from control (15.74%) followed by T6 (13.48%). Among all treatments, T6 (50% husk+50% Zarrouk's medium) had better responses to growth parameters, dry biomass, nutrient availability and chlorophyll content. Therefore, this study has verified the husk ash medium to partially substitute Zarrouk's medium to culture *Spirulina* could help to decrease the cost of medium.

Keywords: Biomass, cultivation, formulation, low-cost, *Spirulina*