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Production and nutritive value of *Spirulina platensis* in reduced cost media

Abd El-Wahab Kamil[1], **Fedekar Fadel Madkour**[2] and **Hoda Shafik Nassr**[1]
[1]National Institute of Oceanography and Fisheries, Egypt
[2]Port Said University, Egypt

This study aimed to provide a cost effective medium to large scale production of *Spirulina platensis*. This intention was implemented by substituting all the nutrients present in Zarrouk's medium (SM) with cheaper and locally available commercial fertilizers and chemicals. The reduced cost medium contained single super phosphate (SSP), commercial sodium bicarbonate, muriate of potash (MOP) and crude sea-salt, (Syahat salt). Four grades of nitrogen concentrations representing 10, 20, 30 and 40% of SM nitrogen concentration (29.42 mM-N) were taken from ammonium nitrate (Treatments 1-4) or urea (Treatments 5-8) respectively, for testing. The alga was grown for 33 days at 30±2 °C, pH 9, 30 µEm2s-1 irradiance. The growth characteristics (maximum biomass Xm, cell productivity Px, specific growth rate µm and chlorophyll concentration) and biochemical composition (proteins, carbohydrates and lipids) of the alga grown in these media were compared with that cultivated in SM. Significant differences in the growth parameters and biochemical composition were observed for the different nitrogen sources and concentrations. The results revealed that *S. platensis* could utilize ammonium nitrate most efficiently and that growth was enhanced with increasing the concentrations of ammonium nitrate giving maximum biomass at 0.353 g/L (Treatment 3). Further increasing the concentration limited growth. The growth parameters in urea showed a significant decrease associated with increasing urea concentrations. The maximum biomass, chlorophyll and protein yield (0.813±0.018 mg/L, 0.0685±0.0024 µg/L and 52.62%, respectively) were recorded using Treatment 3 which was comparable with that of SM (0.840±0.008 mg/L, 0.0701±0.0089 µg/L and 52.95%, respectively). The results indicated that the newly prepared medium can be used profitably for large-scale mass production of protein-rich Spirulina and yields similar performance with cost effective to Zarrouk's medium.

Biography

Abdel-Wahab Kamel is expert in microalgae mass production at the Marine Invertebrates Lab, Aquaculture Division of the National Institute of Oceanography and Fisheries (NIOF). He has thirty years in experience in economic culture media, low cost technique with reduced production cost of different microalgae species. He has earned his B.Sc. degree in 1974 in Agriculture Science, El-Mansoura University; M.Sc., 1985, in the field of Aquatic Plant, El-Zagazig University, and the Ph.D., 1991, on Phytoplankton, El-Zagazig University. He participated as PI, team leader, in national project under the title (The Development Methods of Mass Production of Natural Food, Phytoplankton), funded from NIOF 2015-2016.

abdelwahabkamil@gmail.com