

Title : Effect of Culture Media on Growth and Chemical Composition of *Spirulina* sp.

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ABSTRACT

Spirulina sp. is a raw material that has attracted considerable attention in the food industry due to its richness in bioactive compounds with functional properties, as well as its safety and non-toxic nature. In order to obtain desirable biomass and bioactive compounds from *Spirulina* sp., the cultivation medium plays a crucial role in algal growth and metabolite production, particularly nitrogen, which is an essential nutrient for algal metabolism. Therefore, this study aimed to investigate the effects of five modified Zarrouk media with different sodium nitrate concentrations (1.5–3.5 g/L) on the growth performance and chemical composition of *Spirulina* sp. *Spirulina* sp. was cultivated under laboratory conditions for 21 days, and algal growth was monitored every 6 days. At the end of the cultivation period, the algal biomass was harvested and analyzed for chemical composition, including total lipid, total carbohydrate, total fatty acids, total phenolic content, and C-phycoerythrin content. The results revealed that medium formulation 2 yielded the highest biomass production, with a value of 1.25 ± 0.05 g/L. In terms of chemical composition, medium formulation 1 resulted in the highest total lipid and total carbohydrate contents, at $17.80 \pm 0.44\%$ and $12.28 \pm 1.69\%$, respectively, whereas medium formulation 2 exhibited the highest total fatty acid content ($2.17 \pm 0.00\%$). Palmitic acid was identified as the predominant fatty acid in all media formulations. Regarding bioactive properties, medium formulation 1 showed the highest total phenolic content (7.05 ± 0.08 mg GAE/g), while medium formulation 2 produced the highest C-phycoerythrin content ($10.28 \pm 0.27\%$). The C-phycoerythrin obtained from all media formulations exhibited food-grade purity. These findings demonstrate that varying sodium nitrate concentrations in modified Zarrouk media significantly affect the growth and chemical composition of *Spirulina* sp., and the results may serve as a guideline for optimizing cultivation media to enhance biomass yield and bioactive compound production for food industry applications.

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