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STUDY OF BIOMASS PRODUCTION OF *SPIRULINA MAXIMA* IN DIFFERENT TEMPERATURE

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ABSTRACT

Spirulina maxima are known to be useful to man in virtually all aspects of life including health, food and cosmetics. In the present study, we set out to investigate how a parameter namely temperature, affect maximum production of biomass. Through manipulating environmental condition of the algal growth, one can modify the biomass production. They were monitored for 25 days on daily basis. The dry weight of Spirulina maxima was 0.73g/500ml at temperature 35 ^{o}C.

INTRODUCTION

Spirulina is a microscopic blue-green aquatic plant and it is the nature's richest and most complete source of organic nutrition. *Spirulina* is cultivated in tropical and subtropical bodies of water and filamentous form of cyanobacteria. *Spirulina* is type of filamentous blue green alga due to the capacity to produce bioactive components such as vitamins, minerals, polyunsaturated fatty acid, carotenes, and other pigments that have an antioxidant activity to receiving attention *spirulina* have antioxidant capacities to attribute biliproteins called as phycocyanin [1]. Proteins (60%-70%), vitamins, essential amino acid, minerals and essential fatty acid such as palmitic acid, linolenic acid and linoleic acid are produced by *sprulina*. *Spirulina*, a blue-green alga, is now becoming a health food worldwide. It is a multicellular, filamentous cyanobacterium belonging to algae of the class Cyanophyta. [2]

The objective of the work presented in this paper was to evaluate the physical factor temperature for growth of *Spirulina maxima*.

MATERIALS AND METHODS

Organism: - The strain of *Spirulina maxima* was obtained from B 3 Pvt. Ltd. Gwalior M.P., which is previously maintained in Zarrouk's agar media slants in 4oC 9. All the reagents used were of analytical grade, obtained from the Rankam Chemical Co.

Cultivation: - *Spirulina maxima* were axenically grown in Zarrouk's medium. Cultures were incubated in a culture room at temperature of 30 ± 2^{o}C and illuminated with day- light fluorescent tubes saving 4 Klux at the surface of the vessels. During the process of growth the flask was shaken 3 to 4 times per day. The experiments were run in duplicates. All manipulation involving the transfer of cultures in the liquid media or on agar plates were carried out under aseptic conditions in a laminar flow.

Filtration: - Cells were collected by filtration using filter paper 8 mm pore size (Screen printing paper). **Washing:** - Cells were washed with buffer solution (pH 7), diluted to known volume and processed for further inoculation. **Shaking in cyaclomixture**: - Diluted inoculum shaked in cyaclomixture for making homogenized mixture.

Analysis of variance (ANOVA) was used to compare the data during experiments.

RESULTS AND DISCUSSION

Physico-chemical profiles of *Spirulina maxima* describe the relationship between growths and environmental factors especially irradiance flux, density and temperature, which are important in the evolution of micro algae and cyanobacteria for biomass production, as well as their

general characterization. High alkalinity is mandatory for the growth of Spirulina maxima and bicarbonate is used to maintain high pH. [3]

When the mass production of *S. maxima* is tested under different physical condition following result is obtained-

Effect on growth of *S. maxima* at different temperature condition-

Maximum bulk density of *S. maxima* obtained at room temperature (35^0 C) 4 Klux. Culture was grown at different temperature in flask and result expressed in term of dry weight. Maximum growth of *S. maxima* was noticed a flask which has maintained at room temperature (35^0 C) 4 Klux with medium volume 500ml in a 1000ml flask. About 0.73 gm of *S. maxima* biomass was measured at this phase in 25 days harvesting period. Result suggests room temperature for the growth of *S. maxima* in subtropical region of Madhya Pradesh [Table 1]. The similar studies were done by Dwivedi, *et* al., 2013. [4]

Table 1: Different temperature condition

S. No.	pH	Vol. (in ml.)	Light Intensity in Klux	Temp. in ^{0} C	Duration	Biomass (in gm)
1	9	500	4	25	25	0.41
2	9	500	4	30	25	0.65
3	9	500	4	35	25	0.73

CONCLUSION

This paper has demonstrated that temperature has an important influence on the production of biomass of *Spirulina maxima*. In the present study, we set out to investigate how a combination of a set of parameters namely temperature, light intensity, pH affect maximum production of biomass.

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