



STUDY OF DIFFERENT CULTURE MEDIA FOR GROWTH OF CYANOPHYCEAN MEMBERS

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Abstract: Cyanobacteria are morphologically diverse group of photosynthetic prokaryotic organism and it occur in almost every habitat on earth. They are useful to mankind in various way such as food, feed, fuel, fertilizer, medicine, industry etc. The cultivation of blue green algae has been studied by many researchers because of its utility. Fifteen cyanophycean members were taken for study. Aim of this work is to evaluate the most suitable medium for the growth of cyanophycean members. Effect of five different defined inorganic medium such as BG 11 Medium, Chu-10 medium, Zarrouk's Medium, Myer's Medium, and Fogg's medium has been studied. BG 11 Medium and Chu-10 medium are most suitable for culturing of most of cyanophycean material, but *Spirulina platensis* shows growth in Zarrouk's Medium only

Keywords: algae culturing media, BG 11 Media, Cyanophycea, *Spirulina platensis*, Chu-10 Medium,

I. Introduction:

Cyanobacteria is also known as Cyanophyta, belongs to the phylum of bacteria that obtain their energy through photosynthesis. They are quite small and usually unicellular, though they often grow in colonies large enough to see [2]. Cyanobacteria are also called as blue green algae which occur in almost every habitat on earth and useful to mankind in various ways [9]. These organisms are the pioneer oxygenic phototrophs on the earth whose distribution around the world is surpassed only by bacteria [4]. Cyanobacteria has wide application such as food, feed, fuel, fertilizer, medicine and Industry also. BGA play a potential role in plant cells, metabolic system like bacteria and crop

protection as herbicides, algacides, occupy a unique position. Cyanobacteria are nematicides, fungicides, bactericides and extraordinarily diverse group of gram-negative insecticides and release growth promoting distributed in rice field [7].

The cultivation of photosynthetic microorganisms such as the cyanobacterium has been studied by many researchers in different countries. Microalgae have the ability to grow very fast, synthesize and accumulate high amounts of lipids which can be modulated by several biotic and abiotic factors; hence, attracted a lot of attention for biodiesel production and as a potential renewable resource for essential fatty acids in the last decade. The lipid content of some microalgal species, which is the most important aspect for biofuel production, is much higher (50-60 % of dry weight) than that of terrestrial plants, such as rice and soybean (2-20 % of dry weight) [8]. This research is aimed to study the effect of different media compositions on the growth of blue green algae to optimize the best culture condition.

II. Materials and Methods:

Fresh algal biomass was collected from Nagpur, Wardha, Chandrapur, Gadchiroli, Bhandara, Gondia, Amravati, Yawatmal, Akola from different locations for the study. Total of about 15 cyanophycean samples were taken for study. Mats of filamentous material were washed with tap water up to cleaning of impurities. Filamentous and unicellular materials were directly proceed for isolation, identification, culturing by using different media [12]. 240 ml of media were taken from prepared medium and all medium in the flask were sterilized in autoclave at 121°C for 20

min. before inoculation. Three loop of cyanophycean material (inoculum) were taken from a clonal culture (10 days old culture) to liquid medium and Cultures were shaken gently. 240 ml media divided into three flask, each containing 80 ml of media and inoculum. This process was repeated for all 16 cyanophycean material. The flasks were maintained at temperature $25^{\circ}\text{C} (\pm 2)$ in culture room. Light intensity was approximately 200 mol/sec/m². Cultures were shaken gently, three times a day to avoid clumping and accelerate the growth process. Experiment for each medium was carried out in three replicates. Optical density (using spectrophotometer), cell count (using haemocytometer) were done every 7 days for 5 weeks [1].

Approximately 5 ml sub-samples were taken after five day. After thorough mixing, 1ml was set aside and preserved with 0.1ml iodine for determination of cell counts using an improved haemocytometer [10]. 10 ml of the sample was used for measurement of OD by using UV spectrophotometer using 1 cm path-length cuvette at absorbance 750nm [8].

Identification:

The identification of the collected algae was made with referring the standard books on monographs of Forest (1954), Randhawa (1959), and Desikachary (1959)

III. Observation, Result and Discussion:

Table 1 shows cultivated algal samples in above mention five culture medium. *Microcystisaeuroginosa*, *Oscillatoria okeni*, *O. chlorina*, *O. subbrevis*, *O. ornata*, *O. anne*, *Scytonema*

sp., *Phormidium molle*, *P. tenue*, *Lyngbya* sp. Shows growth in BG11 and Chu -10 medium with exception of

Microcystisaeuroginosa and *Scytonema* sp. these species not grown in Chu-10 medium .

Microcystisaeuroginosa, *Oscillatoria okeni*, *O. chlorina*, *O. subbrevis*, *O. ornata*, *O. anne*, *Scytonema* sp., *Phormidium molle*, *P. tenue*, *Lyngbya* sp. Shows precipitation in other medium.

Fogg's medium used for *Nostoc elipsosporum*, *Scytonema* sp., *Aulosirax* and Zarrouk medium was used for *Spirulina platensis*. B.G.11 medium was most suitable for blue green algal members.

A. Yadav *et al* (2016) found similar result for *Oscillatoria* species, found prominent growth in BG 11 medium. Latha Madhavi (2014) observed the highest number of algal colonies in modified Bristol's medium followed by Beneck's and Tamiya's medium. J.N.Nurul reported (2014) BG-11 medium supported the growth of *Lyngbyabipunctata* properly and Allen and Arnon medium also supported the growth after 20 to 25 days while Fogg's and Zarrouk's medium supported the growth at very low rate similar results are found in our experiment. Out of fifteen Blue green algae only *Spirulina platensis* shows growth in Zarrouk's Medium remaining member shows precipitation.

V. Conclusion: BG 11 Medium and Chu-10 medium are most suitable for culturing of most of cyanophycean material and show fast growth comparison with Fogg's and Zarrouk's Medium

Acknowledgements

Authors are grateful to head of department P.G.T.D. Botany; RTM Nagpur University for permission to carry out this study. Grant was received for this study from University Grant Commission.

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Observation Table 1: Shows list of cultivated materials in media

Name of materials	B.G.11 media	Chu.10	Myer's C Medium	Fogg's	Zarrouk
<i>Microcystisaeuroginosa</i>	+	-	-	-	-
<i>Aulosiralaxa</i>	-	-	-	+	-
<i>Oscillatoria anne</i>	+	+	-	-	-
<i>O. Chlorina</i>	+	+	-	-	-
<i>O. Subbrevis</i>	+	+	-	-	-
<i>Oscillatoria ornate</i>	+	+	-	-	-
<i>Phormidium tenue</i>	+	+	-	-	-
<i>Oscillatoria okeni</i>	+	+	--	-	-
<i>Gloeocapsasp</i>	-	-	-	-	-
<i>Anabaena sp.</i>	-	-	-	-	-
<i>Lyngbya sp.</i>	+	+	-	-	-
<i>Scytonema sp</i>	+	-	-	+	-
<i>Spirullina platensis</i>	-	-	-	-	+
<i>Nostoc elipsosporum</i>	-	-	-	+	-
<i>Phormidium molle</i>	+	+	-	-	-