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INFLUENCE OF BG-11 CULTURE MEDIA ON GROWTH OF CYANOBACTERIA, *OSCILLATORIA* SPECIES

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Abstract
Oscillatoria species is a Cyanobacteria that is important because it can conduct photosynthetic activities. it has a long un branching filamentous morphology and is green colour due to the chlorophyll content which is the unique features that set it apart from other. In this investigation it was cultured on BG-11 media and influences the growth after 1st week, parameters recorded i.e., fresh weight (2.04g) and dry weight (0.08 g) at room temperature. On 4th week fresh weight (at room temperature) recorded (1.18 g) and dry weight (0.1g). Culturing of Cyanobactria, Oscillatoria species is the part of biotechnolgy but they play a very important role in all the field of environmental science and biology.

Key words: *B.G-11 media, Cyanobacteria, Oscillatoria.*

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INTRODUCTION

Cyanobacteria is also known as Cyanophyta, belongs to the phylum of bacteria that obtain their energy through photosynthesis .The name "Cyanobacteria" comes from the colour of the bacteria (Greek: *Kyanos* = blue). They are often called blue-green algae, they are quite small and usually unicellular, though they often grow in colonies large enough to see. Cyanobacteria can be found in almost every terrestrial and aquatic habitat oceans, fresh water, damp soil, temporarily moistened rocks in deserts, bare rocks and soil. They are found in the almost every endolithic ecosystem. A few are endosymbionts in lichens, plants, various protists, or sponges and provide energy for the host. Some live in the fur of sloths, providing a form of camouflage. Cyanobacteria get their name from the bluish pigment phycocyanin, which they use to capture light for photosynthesis. They also contain chlorophyll a, the same photosynthetic pigment that plants use. In fact, the chloroplast in plants is a symbiotic cyanobacterium, taken up by a green algal ancestor of the plants sometime in the Precambrian. However, not all "blue-green" bacteria are blue; some common forms are red or pink from the pigment phycoerythrin (Beuernfeind, 1981). Cyanobacteria fulfill vital ecological functions in the world's oceans, being important contributors to global carbon and nitrogen budgets. Cyanobacteria been an important element for forming the earth's oxygen atmosphere, but it has also contributed to many other attributes important to human life. They are also important providers of nitrogen fertilizer in the cultivation of rice and beans. The other great contribution of the cyanobacteria is the origin of plants. Keeping in view the importance of Cyanobacteria the present investigation was carried out to Culture the *Oscillatoria* species through BG 11 medium and to observed the growth at different duration.

MATERIALS AND METHODS

The investigation was conducted at the Laboratory of CSFER, Allahabad, to study the growth performance of the cyanobacterium *Oscillatoria* sp. under controlled laboratory conditions. The mother culture of *Oscillatoria* sp. was procured from Indian Agricultural Research Institute and maintained under sterile conditions throughout the experiment.

Methodology

1. **Preparation of Culture Medium**

- The cyanobacterial culture was grown in BG-11 medium following the standard procedure described by Rippka *et al.* (1979).
- All required nutrients and chemicals were carefully mixed for the preparation of the medium.

2. **Inoculation of Culture**

- About 100 ml of actively growing *Oscillatoria* culture was transferred into a 1 L Erlenmeyer flask.
- The final volume was adjusted up to 1 litre using sterilized BG-11 medium.
- The flask was gently swirled to ensure uniform mixing of the culture suspension.

3. **Sterilization Procedure**

- All glassware and culture media were sterilized in an autoclave at 121°C and 15 psi pressure for 15–30 minutes to avoid contamination.
- Sterile conditions were maintained carefully during all experimental procedures.

4. **Reason for Selection of Species**

- *Oscillatoria* sp. was selected for the study because it propagates easily under laboratory conditions.
- The species is economically feasible, easy to maintain, and shows consistent growth performance.

5. **Sub-Culturing Process**

- Sub-culturing was carried out in 1000 ml conical flasks containing sterilized BG-11 medium.
- After sterilization, the medium was allowed to cool to room temperature before inoculation.
- The transfer of culture was performed inside a laminar airflow chamber under aseptic conditions.
- Prior to inoculation, UV light was switched on in the laminar chamber for 15 minutes to minimize microbial contamination.

6. **Maintenance of Culture Conditions**

- All inoculated cultures were maintained in the culture room under controlled environmental conditions.
- The temperature was maintained at 28 ± 2°C.
- A photoperiod of 8 hours light and 16 hours dark was provided throughout the experimental period for proper growth of the cyanobacteria.

7. **Observation and Biomass Estimation**

- The growth of *Oscillatoria* sp. was monitored regularly during the experimental period.
- Fresh biomass and dry biomass were recorded at weekly intervals, namely during the 1st, 2nd, 3rd, and 4th weeks after inoculation.
- The collected data were used to evaluate the growth pattern and biomass production of the cyanobacterial culture under laboratory conditions.

Fig.1 Culture growth of *O*scillatoria sp.

RESULTS AND DISCUSSION

After 1st week the dark green colour appears in the conical flask, Fresh weight of *Oscillatoria sp*. after filter (wet) = 2.040 g and Dry weight of *Oscillotoria sp*. (dry at room temp.) = 0.08 g recorded. On 2nd weak growth, Fresh weight of *Oscillatoria* sp. After filter (wet) = 2.190 g, and Dry weight of *Oscillatoria sp*.(dry at room temp)=0.5 g. The third weak result shows, Fresh weight of *Oscillatoria* sp. After filter(wet)=1.11 g and Dry weight of *Oscillatoria* sp.(dry at room tem)=0.2g. The fourth weak result shows, Fresh weight of *Oscillatoria* sp. After filter (wet) =1.18 and Dry weight of *Oscillatoria* sp.(dry at room temp)=0.1 g. There was significant increases in growth on 2nd week. The yield of the biomass is one of the direct measures of the quantity of biomass produced per unit area with in specific time. Higher yield indicates higher biomass produced per unit area, the results are in accordance with Nehul, 2014. The growth was may be due to as BG-11 medium composition and pH is moderate which resulted in higher accumulation of biomass (Cifuentes *et. al.,* 1996).

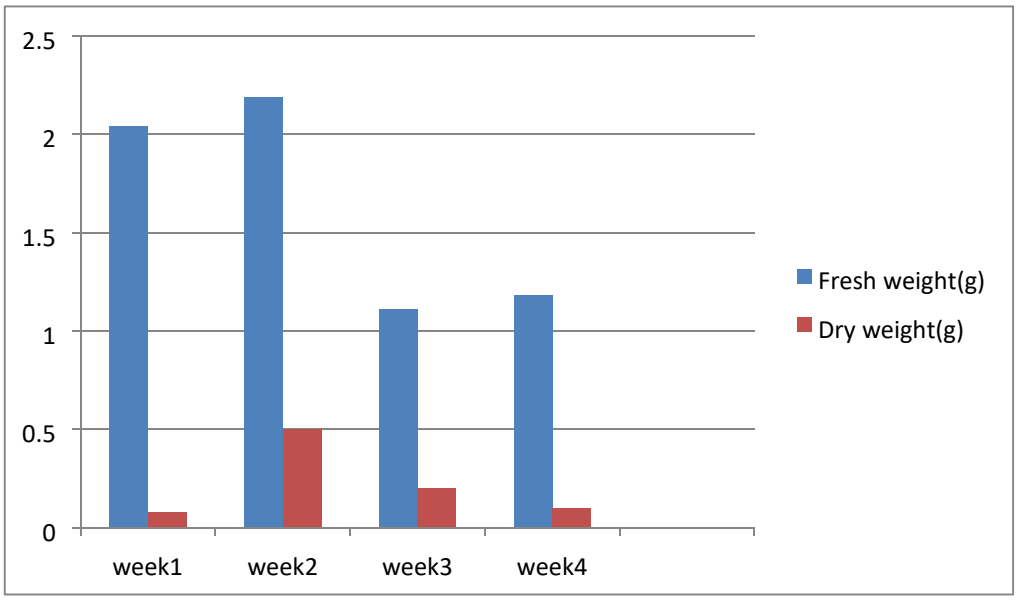

Fig 2. Culture Growth analysis of *Oscillatoria* species

CONCLUSION

Based on the results it was concluded that BG-11 media pH has the significant effect on the growth of Cyanobacteria *Oscillatoria* species.

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