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OPTIMUM PHOTOPERIOD FOR THE GROWTH OF *SPIRULINA PLATENSIS*

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To determine the optimum photoperiod for the high yield of Jaipur isolate strain of *Spirulina platensis* (SPJ), algal strain was subjected to three photoperiodic conditions i.e. (i) continous illumination (ii) 16 h/d light period and (iii) 12 h/d light period. The growth was followed optical density and chlorophyll$_a$ contents. Both the parameters proved 16 h/d light condition as optimum photoperiod for this strain.

Keywords : CHl$_a$; Growth; Optical density; Photoperiod; *Spirulina platensis*.

Duraion of light and dark periods have been suggested to play a significant role in modifying algal biomass production. The growth of plants is directly proportionate to the duration of light period[1]. *Anabaena* showed just half the growth rate with 10 h/d light period against constant illumination[2]. It was also observed that the better growth of *Ankistrodesmus fusiformis* was in natural day and dark conditions[3]. Giri and Choudhary observed 16 h/d photoperiod to be optimum for the growth of *Cyclotella striata* and *Nitzschia palea*[4]. Gajraj observed that 18 h/d light period was most suitable for high biomass production of *Spirulina platensis*[5]. Present experiment was designed to determine the duration of light period in contrast to continuous illumination for the high yield in the present strain of *Spirulina platensis*.

3 days old freshly growing cultures of *Spirulina platensis* were grown in closed culture cabinets at 30°C under 600 lux light intensity, under three sets of photoperiods i.e. (i) continuous light (ii) 16 h/d and (iii) 12 h/d. Three culture flasks of 250 ml capacity and three culture tubes of 15 x 150 mm capacity were employed. Growth was followed through optical density and chlorophyll$_a$ percentage at an interval of 5 days, over a period of 20 days. The optical density of each flask was adjusted to 0.6 and chlorophyll$_a$ was 0.82%.

Optical density was continuously increasing under all photoperiodic conditions upto 10th day. It was maximum under 16 h/d light. After 10 days, the optical density of the cultures declined under continuous light condition. These results supported the findings of Subramanian and Shanmugsundaram[2] who observed less growth of *Anabaena* under continuous light, compared to 10 h/d photoperiod. Highest growth of *Spirulina platensis* was recorded under the photoperiod of 16 h/d which drew its support from the work of Singh & Srivastava[3] and Giri & Choudhary[4]. However, Gajraj found 18 h/d photoperiod for the optimum yield of the biomass of this strain of *Spirulina platensis*[5].

Continuous illumination suppressed synthesis of chlorophyll$_a$. Shutter[6] also observed harmful impact of continuous light on chloroplast complex. These findings are closely related to the contributions of Healey[7] and Millie *et al.*[8]. Chlorophyll$_a$ content was maximum in culture placed under the light period of 16 h/d. These results proved that alternate light of 16 h/d was best for optimum growth of *Spirulina platensis* (SPJ).

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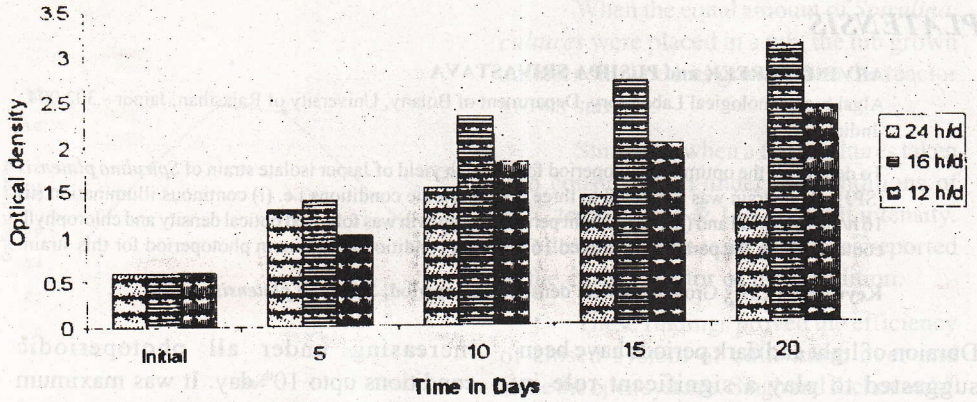

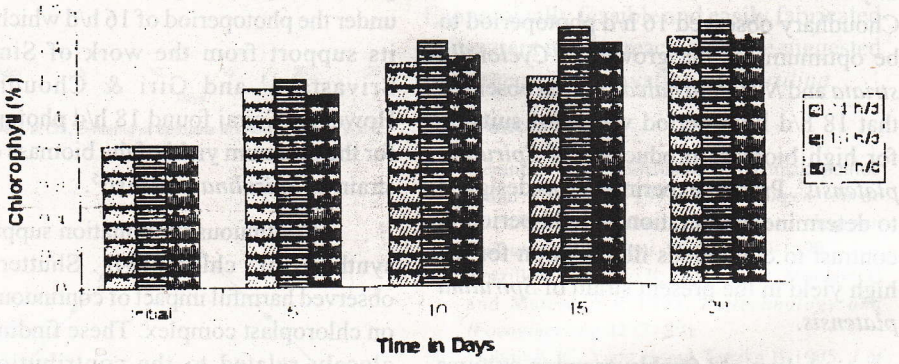

Fig. 1. Growth of *Spirulina platensis* through optical density and chlorophyll$_a$ content under different photoperiods.

Fig. 2. Growth of *Spirulina platensis* through chlorophyll$_a$ content under different photoperiods.

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