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MEETHA SODA : SUBSTITUTION FOR ANALYTICAL GRADE $NaHCO_3$ FOR OUTDOOR CULTIVATION OF *SPIRULINA PLATENSIS*

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In order to minimise the input cost of outdoor production of *Spirulina platensis,* analytical grade sodium bicarbonate was replaced with commercially available "Meetha soda". Different concentrations of Meetha Soda were employed and on the basis of growth and Chl *a* contents 6 gm of Meetha soda was found best for the growth of alga.

Keywords : Meetha Soda; Outdoor cultivation; *Spirulina platensis.*

High alkalanity of culture medium was mandatory for the growth of *Spirulina.* It has further been confirmed during optimisation of pH, which ranged between 8.3-11[1]. $NaHCO_3$ provided good buffering capacity. Shelef *et al.*[2] did not find considerable effect on growth of *Spirulina* by increased concentration of $NaHCO_3$. But Venkataraman and Becker[3] suggested 4.5 g/l $NaHCO_3$ for optimum yield of the alga. The analytical grade $NaHCO_3$ is comparatively costly from rural and commercial application point of view. To minimise the cost inuput of the culture medium for *Spirulina,* Gupta and Changwal[4] and Gajraj[5] have used commercial grade "meetha soda" as an alternate source of inorganic carbon in place of $NaHCO_3$. Chandgothia[6] also substituted "meetha soda" as an alternate source of analytical grade $NaHCO_3$ for *Arthrospira indica.* Present study has been carried out to find out the permissible limit of "meetha soda" for optimum growth of *Spirulina* in outdoor conditions of semi arid environment of Rajasthan.

Cultures of *Spirulina platensis* (SPJ) were grown in CFTRI (I) medium with graded concentraton of "meetha soda" in place of $NaHCO_3$ ranging from 4.5 g/l to 10 g/l in CFTRI (I) medium, while 4.5 g/l $NaHCO_3$ was maintained as control. Plastic tubes of one 1 capacity were employed for each concentration. 0.33 optical density (OD) was adjusted in each set of concentration. At this OD percentage of chlorophyll *a* was 0.35%. These sets of cultures were grown under outdoor premises for a period of 20 days. OD and chlorophyll *a* contents were recorded periodically at an interval of 5 days.

6 g/l meetha soda added in CFTRI (I) medium yielded maximum growth and chlorophyll *a* contents (Fig. 1 & 2) rather than 4.5 g/l analytical grade $NaHCO_3$. Though 5-10 g/l meetha soda substitution showed more growth than controlled set, yet it was maximum in 6 g/l substitution and growth continued linearly. Gupta and Changwal[4] working with *Spirulina subsalsa* (Sambher lake isolate) recorded similar results. According to them algal production in meetha soda was 2.7 times cheaper than analytical $NaHCO_3$. Gajraj[5] and Chandgothia[6] also found similar results, with *Spirulina platensis* and *Arthrospina*

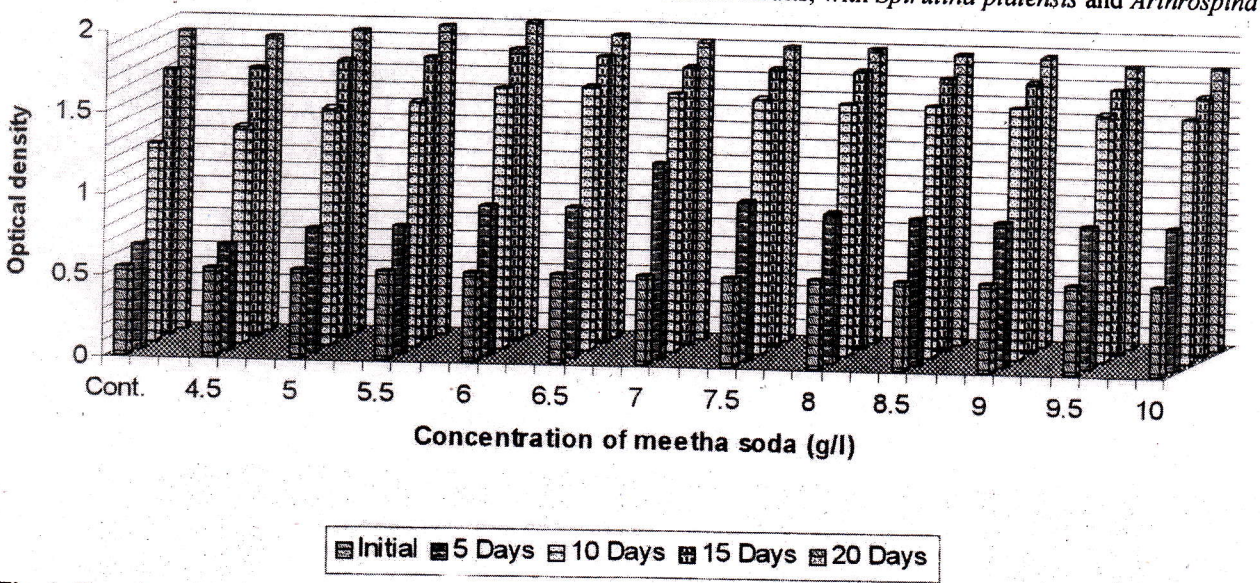

Fig. 1. Growth pattern of *Spirulina platensis* under different concentrations of meetha soda- a substitute to $NaHCO_3$

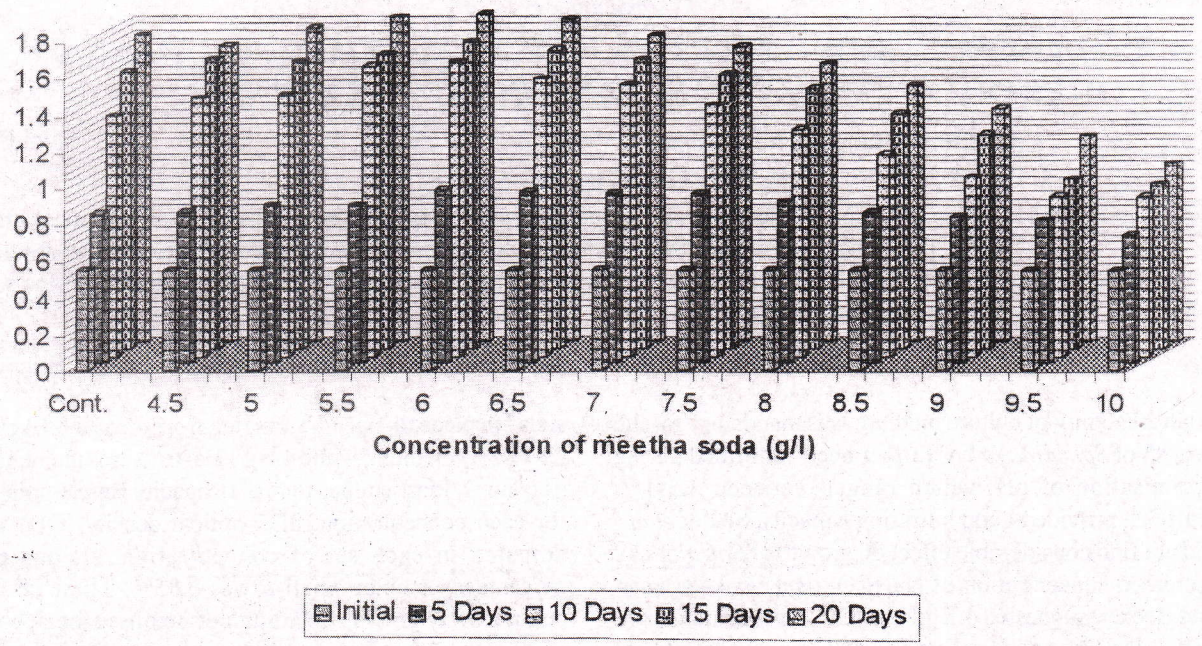

Fig. 2. Chlorophyll *a* content of *Spirulina platensis* under different concentrations of meetha soda - a substitute to $NaHCO_3$.

indica respectively.

According to present findings the cost input of medium was 40% cheaper as the cost of $NaHCO_3$ is Rs. 170/kg, while the cost of meetha soda is only Rs. 15/kg.

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