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**THE EFFECT OF CONSTANT LIGHT ON *VAUCHERIA*
SESSILIS (VAUCH) DC**

FARRUKH HUSSAIN AND M. A. F. FARIDI

Botany Department, Peshawar University, Peshawar.

Introduction

The taxonomy of *Vaucheria* is disputed. Smith (1951) Prescott (1969), Chapman & Chapman (1973) placed it in Xanthophyceae instead of Chlorophyceae following Strain (1948) because it lacked starch siphonoxanthin Siphonin and chlorophyll "b", the so characteristic of Codiales (Siphonales). It was also reported that the male gametes of the plant have tinsel type of flagellum along with whiplash. The pigments included typical xanthophycean carotenoides and oil being the food reserve. Tiffany (1958) was however successful in inducing starch formation by exposing the plant to constant electric light.

The induction of sexual reproduction in algae has been a neglected topic. The work on this aspect is chiefly confined to members of Volvocales (Starr & Jeanicke 1974; Starr, 1969, 1970, 1971; Karn et al, 1974; Meredith & Starr, 1975).

The present study was confined to two aspects viz; (i) to test the validity of Tiffany's view for induction of starch in *Vaucheria* by constant light and to see the effect of constant light on sexual reproduction.

Material and Methods

Vaucheria sessilis (Vauch) DC was collected from Mallmandi Peshawar from slow running water. Plants were washed in tap water and cultured in glass dishes with soil-extract (Faridi, 1971) as nutrient solution. Some plants were kept in natural condition to be used as control and the others were exposed to constant light by using 100 W. electric Hysesons bulbs at a distance of one foot separated by a glass sheet to avoid heating of the test plants. The plants were watched daily under microscope for change if any. The starch was tested by iodine.

I. *Effect on starch formation:*

After daily observation over a period of 40 days no starch was seen either in the control or in treated organisms. The study thus contradicts the findings of Tiffany (1958).

II. *The effect on sex-organs:*

The control as well as the treated plants were watched daily for initiation of sex-organs. After 15 days of the treatment, the male and female sex-organs were

observed in the treated organisms while the control plants were completely sterile. The position of the sex-organs remained unchanged. The control specimens produced sex-organs after 32 days. The position of the sex-organs was the same in the control as well as in the treated plants.

There was however one change in the treated plants and that was the size of oogonia. The oogonia of the control plants were $61-69.3 \times 84-100 \mu\text{m}$ but in the treated plants they were $61-69.3 \times 61.9-77 \mu\text{m}$ thus the length in the treated plant was reduced by about $22-27 \mu\text{m}$. The opening of the oogonia was the same in both the cases and it was terminal.

Conclusion

The following conclusions were made from this study.

1. The starch is not formed as a result of the constant light and the plant therefore belongs to Xanthophyceae.
2. The initiation of sex-organs was earlier by 17 days in treated organism.
3. The oogonia of the treated plants were smaller by about $22-27 \mu\text{m}$ in length, thus proving the oogonium length to be a variable character and it should not be used for identification.
4. The position of the sex-organs is not changed under constant light and this is a constant character
5. The opening of oogonia is also a constant character and can be safely used in taxonomy along with the position of sex-organs.

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