EFFECT OF ENVIRONMENTAL FACTORS ON SPORE
SHEDDING FROM
ROSENVENGEA NHIATRANGENSIS DAWSON

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ABSTRACT

Rosenvenga nhatrangensis Dawson is a winter annual growing alga from
November to March. Effect of environmental factors such as salinity, desiccation
and light intensity on plurisporal shedding of this alga was studied. 30 ppt
salinity, submerged condition of fronds and light intensity of 1500 lux are found
to be favourable for maximum liberation of plurisporas.

Key-words: Rosenvenga nhatrangensis, plurisporas, salinity.

Information on growth, reproduction and ecology of Rosenvenga is very
fragmentary. Seasonal growth and occurrence of Rosenvenga nhatrangensis
Dawson at Visakhapatnam was studied by Umamaheswara Rao and Sreearamulu
(1964). However, no reports are available on sporulation of this alga from
Indian shores. This alga grows during November to March on intertidal rocky
surfaces of Visakhapatnam coast. The present study deals with the study on
liberation of plurisporas in relation to different environmental conditions.

Rosenvenega nhatrangensis was collected from intertidal regions of
Visakhapatnam coast and fertile plants collected every fortnight during spring
tides and brought to the laboratory in polythene bags filled with seawater.
They were washed with sterile seawater and 2 to 3 fronds were placed
in petridishes filled with this sterile seawater. The experiments were conduc-
ted for 24 hours at room temperature (30 ± 2°C) and the petridishes were
illuminated by cool fluorescent tubes at illumination of 1500 lux for 8 hours
during the day time. The seawater containing spores was transferred to a
measuring cylinder after 24 hours and diluted to a known volume. The
spores in 1 ml subsample were counted under a microscope in plankton
counting chamber. Average values of three counts were used for computing
the spore output in each experiment. Wet weight of the plants was noted at
the end of the experiment and the spores liberated were calculated per gram
fresh weight per day.

Effect of salinity, desiccation and light intensity on spore shedding
were studied. For salinity experiments, lower grades were prepared from the
stock solution (100 ppt) by the addition of requisite quantities of distilled
water. Spore output was estimated as already described by conducting experi-
ments at 0, 10, 20, 30, 40, 50 and 60 ppt salinities. To find out the effect of
desiccation, the fertile fronds were blotted with blotting paper to remove
the water present on the surface of the plants and then exposed to air at
different exposure periods (0, 15, 30, 45, 60, 75 and 90 minutes). Effect of
light intensity on spore output was studied using 7 different light intensities ranging from dark to 3,000 lux.

Results obtained on effects of salinity, desiccation and light intensity are shown in Fig.1. Maximum plurisporic output was observed at 30 ppt salinity and nil at '0'-10 ppt. Spore output decreased from 30 ppt salinity onwards and was minimum at 50 ppt salinity. There was no spore output at 60 ppt salinity (Fig.1A). Maximum spore output was obtained at submerged condition or at 'zero' exposure (Fig.1B) which decreased from 10 minutes onwards upto 75 minutes of exposure. There was no spore output at 90 minutes of exposure. Maximum spore output was also noticed at 1,500 lux (Fig.1C) but there was no plurisporic production at 3,000 lux.

*Rosenvenega nhatrangensis* is a winter annual, growing at Visakhapatnam coast from November to March, with maximum growth during December and January. The study indicates that 30 ppt salinity, submerged condition of fronds and light intensity of 1,500 lux are optimum conditions for maximum liberation of spores. These observations also agree with those of Umanaheswara Rao and Reddy (1982); Umamaheswara Rao and Kaliperumal (1983) and Subbarangalai (1986). In *Porphyra vietnamensis*, Subbarangalai (1986) reported monospore output from fronds exposed upto 4 hours; carpospore and monospore output from *P. vietnamensis* and monospore output from *Bangioptis subsimplex*, when fronds were exposed upto 6 hours (Narasingha Rao, 1989). In *Dictyota dichotoma*, Umanaheswara Rao and Reddy (1982) reported the tetrasporic output upto 105 minutes only. In the present study, *Rosenvenega nhatrangensis* also could not tolerate higher desiccation periods (Fig.1B). This difference in tolerance limits in plants was mainly due to their position on the intertidal rocky surfaces. *P. vietnamensis* and *B. subsimplex*, which tolerated higher desiccation periods, grow in the midlittoral zone, whereas, *D. dichotoma* and *R. nhatrangensis* inhabiting the infra littoral fringe, are exposed during extreme low tide periods only. Hence *R. nhatrangensis* tolerated intensity of light upto 2,500 lux only while *P. vietnamensis* and *B. subsimplex* tolerated the intensities upto 4,500 lux.
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REFERENCES


