

Effect of the environmental pollution on marine macro-algae of Visakhapatnam coast, India

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SUMMARY

To assess the impact of different industrial effluents and sewage on some important marine algal species was studied during 2007. Six species which are economically important for extraction chemicals and biogas were selected for this study. Apices of these species were cultured in different concentrations of industrial effluents and sewage. Spore liberation experiments and spore germination studies were conducted with above algal species. Growth of the apices of different plants was reduced from control to 20% concentration of industrial effluents. At 30% concentration of effluents growth was completely inhibited and malformation of the fragments was also noticed. Similarly spore liberation and spore germination results coincidence with the growth data of the above algal forms.

Key words : Marine macro algae, Industrial effluents, Sewage, Growth and spore germination, Pollution

Visakhapatnam is a well known coastal industrial city with a natural harbor located in the northern part of Andhra Pradesh. Industrial wastes from the nearby major factories such as Hindustan Polymers, HPCL and Coromandal fertilizers release their effluents at different places into a stream known as Meghadrigedda which in turn opens into the inner harbour. Besides, untreated sewage from the Visakhapatnam city enters into the inner harbour. All these pollutants enter into the coastal waters of Visakhapatnam and ultimately play a vital role on the life of the aquatic organisms in the offshore waters of the Visakhapatnam coast. Several authors emphasized the intensity of pollution at the inner harbour and coastal waters of Visakhapatnam (Ganapathi and Raman, 1973; Sarma *et al.*, 1982; Venkateswara Rao, 1990; Jagannadha Rao, 1991 and Narasimha Rao, 1994). Algae constitute a major part of the primary producers in an aquatic ecosystem and their survival is of much ecological and economical value (Rachlin *et al.*, 1982). Marine algae forms used as biological indicators for the assessment of aquatic pollution Bharati *et al.*, 1980; Trivedy, 1986). In the present study apical growth of some economically important seaweeds and sporulation, spore germination experiments were conducted in different concentrations of industrial effluents and city sewage.

MATERIALS AND METHODS

Visakhapatnam lies (Lat. 17° 40' 30" and 17° 45' N and Long. 83° 10' and 83° 21' E) on the east coast of India. Industrial effluents from HPCL, Coromandal fertilizer were collected at the discharge points and sewage was collected at old post office region near inner harbour. Different concentrations were prepared with these effluents. Treating the effluent as 100% of concentration and dilutions from 10 to 100 % was prepared adding sterile seawater. Growth of apical fragments, sporulation and spore germination experiments were conducted using the marine algae such as *Gracilaria corticata*, *Hypnea valentiae*, *Gigartina acicularis*, *Gelidiopsis variabilis*, *Bostrychia tenella* and *Pterocladia heteroplotos*. Apical fragments measuring 5 cms from the healthy plants were used for growth experiments. Growth of the apices was measured at 10 days intervals. The Petriplates with algal thalli were maintained at photon flux density of 9 μ E m² s⁻¹ provided by white fluorescent light in the culture chamber with continuous illumination with 8:16 light and dark cycle. Sporulation and spore germination experiments were conducted using the tetrasporophytic and cystocarpic populations of the different species with different concentration of industrial effluents and sewage. Methodology for these experiments was followed by Narasimha Rao (1989).

RESULTS AND DISCUSSION

Table 1 shows the growth of the apical fragments of different algal species cultured in different concentrations of HPCL effluent along with control. Maximum growth

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