

**FIELD CULTIVATION OF *GRACILARIA EDULIS* (GMELIN) SILVA
IN CHINNAPALAM ESTUARY, PAMBAN**

ABSTRACT

Requirement of agarophytes for agar producing industries is more than the crop available in natural habitat. To augment the supply of such seaweeds, culture experiments were undertaken with *Gracilaria edulis* (Gmelin) Silva in Chinnapalam Estuary area, Pamban. About 40 gm fragments of *G. edulis* measuring 3 cm in length, cut from the apical parts of healthy growing plants, were inserted in the twists of long coir ropes. The ropes were then tied to the poles already erected in the estuary and were kept submerged 0.5 m depth even at the lowest low tide. After 47 days, the harvest indicated the rate of growth of the plant as 1.5 mm/day. The rate of production was 2.3 gm/day/m. There was 2.8 fold increase in weight within the experimental period.

SEAWEEDS form the raw materials for agar and algin industries. In India distribution of such economically important seaweeds is restricted only to certain parts of the east and west coasts (Umamaheswara Rao, 1970). Various estimates have also been made of the available

seaweed resources in Pamban and neighbouring areas (Chacko and Malu Pillai, 1958; Varma and Rao, 1962; Subbaramiah *et al.*, 1977). Recently people have resorted to extensive and unrestricted collection of seaweeds for industries and this has led to the depletion of seaweed stock from natural beds. To avoid this denudation and to provide a continuous supply of raw materials to the seaweed based industries, cultivation of these economically important marine algae becomes an absolute necessity. Efforts were also made to cultivate agarophytes, *G. edulis* and *G. corticata* in the lagoon and near shore area of the Gulf of Mannar, Mandapam (Raju and Thomas, 1971; Umamaheswara Rao, 1973, 1974; Krishnamurthy *et al.*, 1978; Paramasivam and Devadoss, 1985). In the present study attempt was made to culture *G. edulis* in Chinnapalam Estuary, Pamban and the results obtained are presented here.

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Materials and methods

Experimental site was selected on the eastern side of Chinnapalam Estuary near Pamban, just behind its bar mouth. Rapidly growing healthy plants of *G. edulis* were collected from Krusadai Island. Seeding was done as described by Raju and Thomas (1971). Five ropes each with a length of 10 m were used in this experiment and 2080 gm of plant material was used for seeding 50 m of the rope. The ropes were tied to the poles already fixed in the estuary. The ropes were kept submerged

at 0.5 m depth even during the lowest low tide. During the period of culture *Lyngbya* sp. and *Chaetomorpha* sp. were found growing on the ropes which were weeded out periodically. Harvest of cultured plants was made after 47 days by using scissors leaving the basal portions on the ropes for regeneration.

Atmospheric temperature and surface water temperature were recorded from the culture site at weekly intervals and water samples were analysed for salinity and dissolved oxygen using standard methods described by Strickland and Parsons (1968).

Data obtained on the fresh weight, density, rate of production and growth of harvested plants of *G. edulis* over a period of 47 days are presented in Table 1.

The growth rate of *G. edulis* in the present culture experiment is less than that obtained by Raju and Thomas (1971) and Krishnamurthy *et al.* (1977) and more than that reported by Paramasivam and Devadoss (1985) for the same *G. edulis* cultured in the lagoon of Krusadai Island. It is comparable to the values obtained by Chennubhotla *et al.* (1978) for *G. edulis* in the inshore waters of the Gulf of Mannar near Mandapam. In the natural environment the mean growth rate of *G. edulis* was found to be 1.34 mm/day (Umamaheswara Rao, 1973) whereas in the present experiment the growth rate observed was 1.5 mm/day.

During the period of this study in the culture site, the atmospheric temperature ranged from

TABLE 1. Rate of production of *G. edulis* on coir ropes

Date of Planting	Date of harvest	Growth period days	Fresh weight planted (gm)	Fresh weight harvested (gm)	Density (gm/m)	Rate of production (gm/m/day)	Rate of growth (mm/day)
29-9-1984	13-11-84	47	2,080	7,920	160	2.3	1.5

27 to 34°C while the surface water temperature ranged from 28 to 32°C. The range of salinity, dissolved oxygen and pH during the experimental period was 33.76 to 34.16‰, 3.0 to 6.0 ml/l and 8.5 to 9.0 respectively. These preliminary observations indicate that estuarine conditions existing in Chinnapalam are suitable for the cultivation of *G. edulis* using coir ropes.

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