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FIELD CULTIVATION OF *GRACILARIA EDULIS* (GMELIN) SILVA IN THE LAGOON OF MINICOY (LAKSHADWEEP)

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Abstract

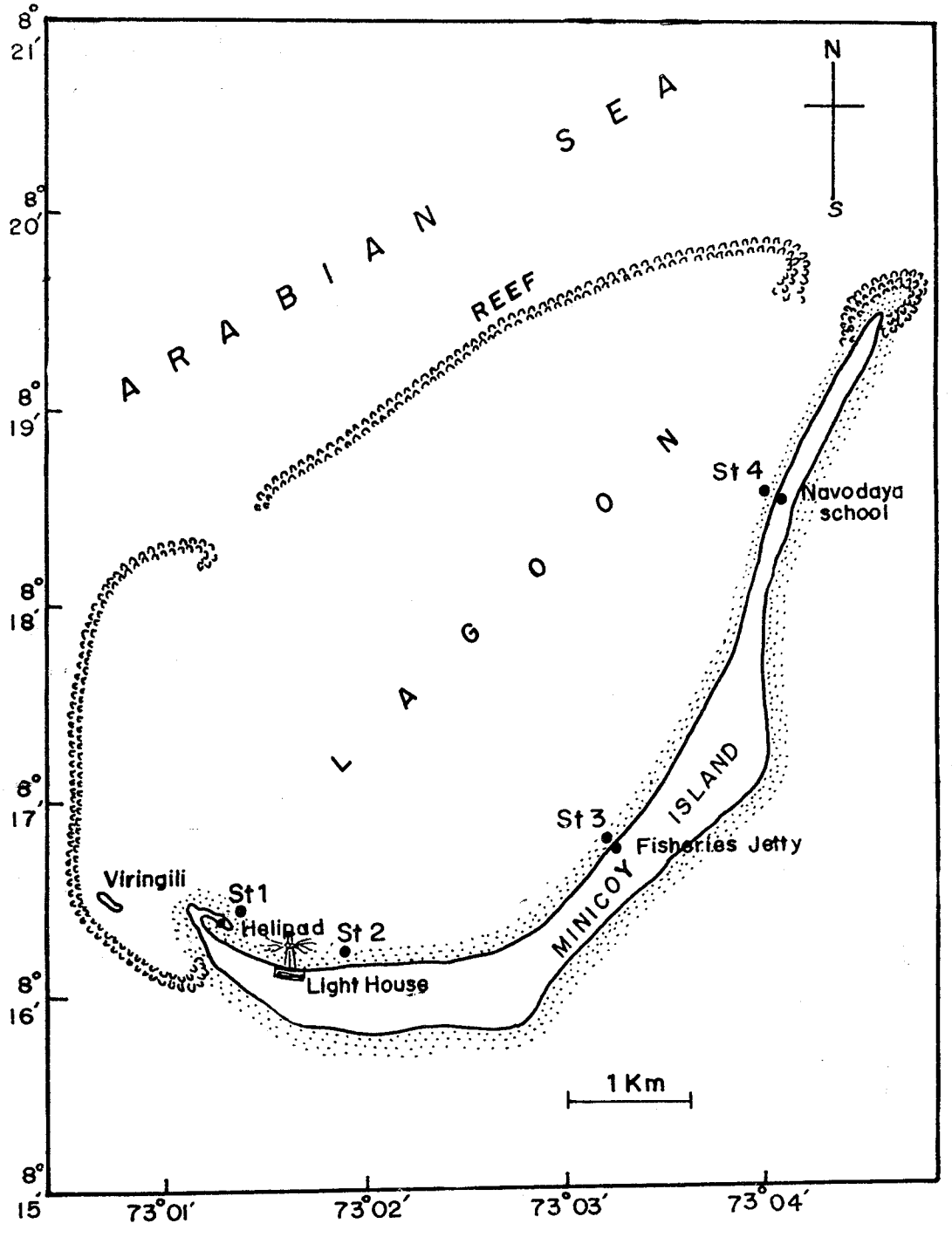
Experimental field cultivation of the agar yielding seaweed *Gracilaria edulis* was carried out on long line coir ropes and nets at four locations in the lagoon of Minicoy Island during the period March-June '90. The plants of *G. edulis* collected from Krusadai Island (Mandapam) and Kavaratti Island (Lakshadweep) were transported to Minicoy by rail and ship and used as seed material. The seedlings grew very well at two places and yield obtained after 60 days growth was a seven fold increase over the quantity of seed material. This may be attributed to the clarity of water, low sedimentation and less epiphytic growth in these two locations. The growth of *G. edulis* introduced in other two palces was affected by heavy sedimentation and attachment of several other algae on seedlings, coir ropes and nets. The present experiment shows the high potential for the successful cultivation of this agarophyte in the lagoon of Minicoy.

Introduction

Studies were made by several workers (Raju and Thomas, 1971; Umamaheswara Rao, 1973, 1974; Krishnamurthy *et al*, 1975; Chennubhotla *et al*, 1978 and Paramasivam & Devadoss, 1985) on the cultivation of *G. edulis* at different field environments near Mandapam adopting various culture techniques. To explore the possibility of *G. edulis* cultivation at Minicoy Island, field experiments were conducted at four sites in the lagoon from March to June '90 and the results obtained are presented in this communication.

Material and Methods

The culture experiments were carried out at four culture sites in the lagoon of Minicoy Island (Fig. 1) near Helipad (Station 1), Light House (Station 2), Fisheries Jetty (Station 3) and Navodaya school (Station 4) where the bottom was sandy with algae and seagrasses vegetation and the water level ranged from 30 to 180 cm during spring tides. As *G. edulis* (Gmelin) Silva does not occur naturally at Minicoy, the seed material was collected from Krusadai Island (Mandapam) and Kavaratti Island (Lakshadweep) and transported to Minicoy in live condition by rail and ship in aerated plastic containers and plastic bins with frequent change of seawater. Rope nets of 2 x 2 m size fabricated with 1" thick ropes and long line coir ropes (1" thick) were used for this experiment. Fragments of *G. edulis* (about 5 cm long) were inserted in the twists of the ropes and the seeded ropes and nets were tied to casuarina poles at the level of 20 cm above the bottom. The harvest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S
ARABIAN SEA
REEF
LAGOON
St 4
Navodaya school
St 3
Fisheries Jetty
ISLAND
MINICOY
Viringili
St 1
Helipad
St 2
Light House
1 Km

Table 1. Growth and production of *G. edulis* cultured in the lagoon at Minicoy

Location of culture site	Place of seed material collected (kg wet wt)	Method of culture growth	Date of intro-duction	Quantity of seed material introduced (kg wet wt)	Date of harvest and period	Quantity of crop harvested (kg wet wt)	Increase in yield	Growth rate (mm/day)	Rate of produc-tion
Light House	Kavaratti	Net	16-3-90	1.600	10-5-90 (60 days)	5.980	2.7	1.1	13 g/day/m^2
Light House	Krusadai	Net	29-3-90	2.000	10-5-90 (45 days)	3.470	0.7	0.8	8 g/day/m^2
Fisheries jetty	Kavaratti	Long line	12-3-90	0.250	13-4-90 (30 days)	0.800	2.2	0.5	3 g/day/m
Fisheries jetty	Kavaratti	Long line	13-4-90	0.250	28-5-90 (45 days)	1.475	4.9	0.3	4 g/day/m
Fisheries	Kavaratti	Long line	13-4-90	0.800	11-6-90 60 days)	6.450	7.0	0.8	5 g/day/m
Fisheries	Kavaratti	Net	3.750	9-5-90	11.850 (60 days)	2.2	0.8	0.8	34 g/day/m^2
Fisheries	Krusadai	Net	2.000	9-5-90	3.150 (45 days)	0.6	0.9	0.9	7 g/day/m^2

was made after 30, 45 and 60 days by hand picking.

Results

Among the four culture sites, good growth of *G. edulis* was observed at two places namely Light House and Fisheries jetty. The plants reached harvestable size after 30 to 60 days. The data obtained on the culture experiments at these two culture sites are given in Table 1. The yield of crop was 2.2 fold increase over the quantity of seed material after 30 days and it varied from 0.6 to 4.9 fold after 45 days and 2.2. to 7.0 fold after 60 days growth. This may be attributed to the clarity of water, low sedimentation and less epiphytic growth in these two locations. The growth of cultured *G. edulis* at other two places namely Helipad and Navodaya school was affected by heavy sedimentation and attachment of several algae such as *Cladophora fascicularis, Chaetomorpha aerea, Acanthophora spicifera, Hypnea valentiae, Ceramium* sp, *Polysiphonia* sp, *Leveillea jungermannioides, Jania capillacea, Lyngbya confervoides* and *Phormidium sp* on the nets and ropes.

Discussion

The rate of growth and production obtained from the cultivation of *G. edulis* at Minicoy Island can be compared with the results of the experiments conducted with *G. edulis* in the lagoon of Krusadai Island using long line coir ropes (Raju and Thomas, 1971 and Krishnamurthy *et al.*, 1977) and in the open shore environment near Mandapam using coir rope frames (Umamaheswara Rao, 1973, 1974; Chennubhotla *et al. 1978).* These preliminary observations indicate that Minicoy lagoon is also suitable for cultivation of *G. edulis* using coir ropes and nets. Attempts must be made to cultivate *G. edulis* throughout the year in Minicoy lagoon in order to find out the best period for maximum yield of the crop.

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Literature cited

Chennubhotla, V.S.K., N. Kaliaperumal & S. Kalimuthu 1978 Culture of *Gracilaria edulis* in the inshore waters of Gulf of Mannar (Mandapam) Indian J. Fish., 25 (1 & 2): 228-229

Krishnamurthy, V., P.V. Raju & P.C. Thomas 1975 On augmenting seaweed resources of India J. mar. biol. Ass. India, 17 (2): 181-185

Paramasivam,, M & G.G.M. Devadoss 1985 Effect of growth regulators in the field cultivation of *Gracilaria edulis* (Gmelin) Silva Indian J. mar. sci., 14 (4): 230-231

Raju, P.V. & P.C. Thomas 1971 Experimental field cultivation of *Gracilaria edulis* (Gmelin) Silva Bot. mar., 14 (2): 71-75