

DISTRIBUTION OF SEaweEDS OFF ALANTALAI—MANAPAD AND VEMBAR—NALLATANNI TIVU IN TAMILNADU

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ABSTRACT

The deep water areas at Alantalai—Manapad (Southern Zone) and Vembar—Nallatanni Tivu (Northern Zone) region in Tamilnadu were surveyed during 1988 for seaweed resources employing 'SCUBA' diving technique. A total of 28 species of algae in the Southern Zone and 27 in the Northern Zone were encountered. Majority of the seaweeds belonged to Rhodophyceae.

Key Words : Distribution, marine algae, transect, Tamil Nadu.

INTRODUCTION

Some attempts were made earlier to study the distribution of seaweeds growing in deep waters at Tuticorin area (Varma, 1960; Mahadevan and Nagappan Nayar, 1967). With a view to collect information on the distribution of standing crop of seaweeds in deep waters from Dhanushkodi to Kanyakumari in the Gulf of Mannar region of Tamilnadu, the Central Salt & Marine Chemicals Research Institute and Central Marine Fisheries Research Institute jointly surveyed the deep water seaweed resources of this region during the years 1986 to 1991 (Anon, 1988, 1989).

The present paper deals with the distribution of seaweeds in the deep waters off Alantalai—Manapad and Vembar—Nallatanni Tivu areas conducted during 1988.

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MATERIAL AND METHODS

The area between Alantalai—Manapad (Southern Zone $8^{\circ} 23' - 8^{\circ} 27' N$ and $78^{\circ} 6' - 78^{\circ} 14' E$) and Vembar—Nallatanni Tivu (Northern Zone $8^{\circ} 57' - 9^{\circ} 4' N$ and $78^{\circ} 25' - 78^{\circ} 35' E$) was surveyed in March 1988. The total area covered was 175 and 268 km² in the Southern and Northern Zones respectively. The entire region from Alantalai to Manapad was divided into 5 transects and Vembar—Nallatanni Tivu region into 5 transects with 5 km interval (Fig. 1 & 2). In each transect, seaweeds and seagrass samples occurring in 1 m² area were collected by 'SCUBA' divers at every 500 m vertical intervals which were determined by employing an electronic device called patent-log. This instrument is attached to a battery system and for every 500 m distance travelled in the sea it indicates 270 pts or 0.27 nautical miles.

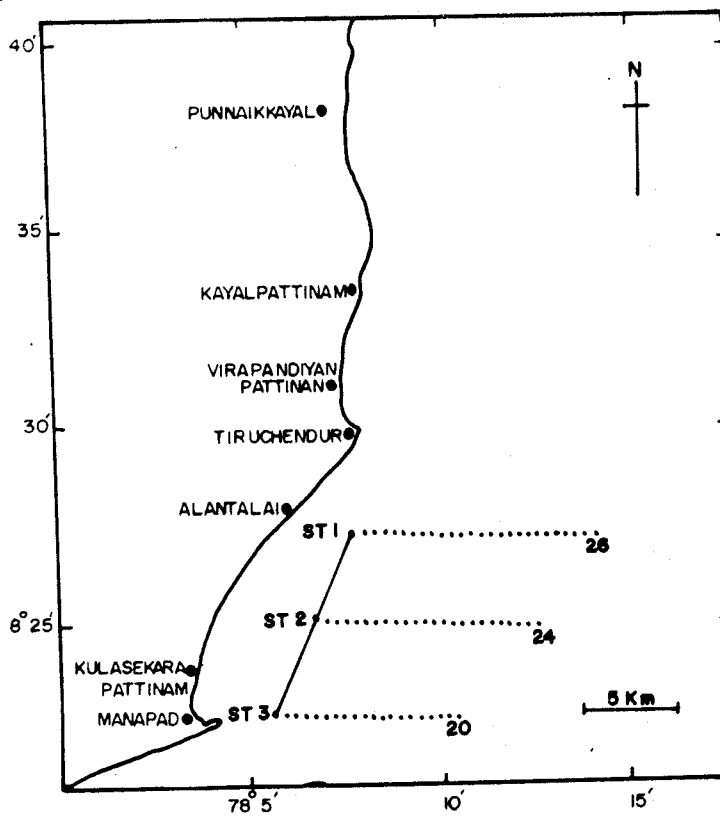


Fig. 1. Location of transects and stations surveyed in the southern zone from Alantalai to Manapad (S T - Southern Transect).

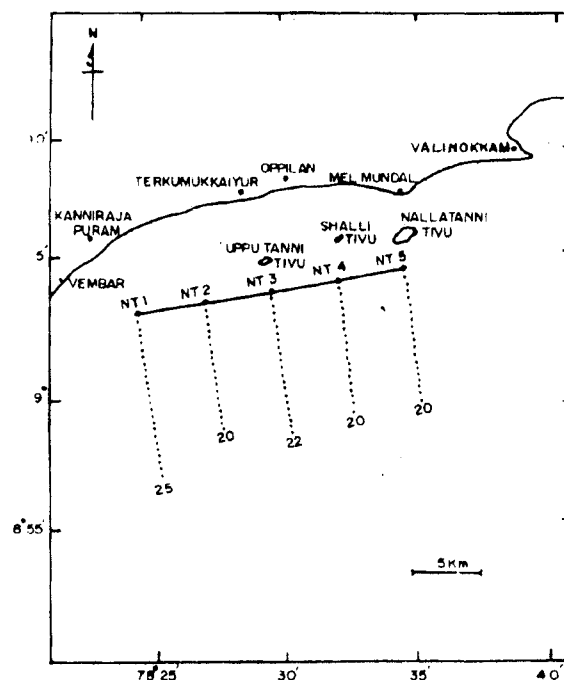


Fig. 2. Location of transects and stations surveyed in the northern zone from Vembar to Nallatanni Tivu (N T - Northern Transect).

The number of stations sampled along the transects in the southern zone varied from 20 to 26 and from 20 to 25 in the northern zone. The depth varied from 10 to 19.5 m and 6 to 20 m in the southern and northern zones respectively. Seaweeds and seagrass samples were sorted out and identified upto species level (Dawson, 1954; Jaasund, 1976; Taylor, 1960 and Umamaheswara Rao, 1987).

The water samples were collected between 08.00 and 12.20 hr from the bottom in the first, middle and last stations of each transect. Air temperature and bottom seawater temperature at the collection spots was also recorded. The water samples were analysed for pH, salinity, dissolved oxygen and nutrients such as phosphate, silicate, nitrate and nitrite following the methods described by Strickland and Parsons (1968).

RESULTS

The substratum consisted of either sand, silt, rocks and rocks covered with mud or in some cases coral beds. The seaweeds generally occurred

on the rocky and coral substratum. In the Alantalai—Manapad region, out of 70 stations sampled in 3 transects, vegetation occurred only in 22 stations at depths ranging from 11.5 to 18 m. The vertical distribution of the species along the transects varied with 11 sampling stations in transect 1, 10 sampling stations in transect 2 and 1 sampling station in transect 3. The vegetation comprised 28 species of marine algae and one seagrass (Table 1). Of these, 4 species belonged to Chlorophyceae, 5 to Phaeophyceae and 19 to Rhodophyceae. The dominant and widely distributed species were *Spatoglossum asperum*, *Scinaia bengalica*, *Halymenia venusta*, *Solieria robusta* and *Hypnea valentiae*. *Halophila stipulacea* was the only seagrass found at 14.0 m depth.

Table 1. Distribution of seaweeds and seagrass at different depths, stations and transects from Alantalai to Manapad

| Alga | Depth (m) | Transect (T) and Station (S) Number |
|--------------------------------|-----------|---|
| Chlorophyceae | | |
| <i>Enteromorpha compressa</i> | 13-14 | ST 1 S 4, ST 2 S 6 |
| <i>E. intestinalis</i> | 14 | ST 2, S 6 |
| <i>Chaetomorpha aerea</i> | 13.5-14 | ST 2 S 6, S14 |
| <i>Codium tomentosum</i> | 13 | ST 1 S 3, S 13 |
| Phaeophyceae | | |
| <i>Ectocarpus irregularis</i> | 11.5-14 | ST1 S4, S7, S13, ST2 S2, S4, S6, S16, S19 |
| <i>Dictyota maxima</i> | 14-17 | ST1 S6, S7, S8, S25 |
| <i>Padina pavonica</i> | 17 | ST1 S25 |
| <i>Spatoglossum asperum</i> | 12-18 | ST1 S4, S5, S6, S8, S9, S25, ST2 S6, S9, S16, S18, S19, ST3 S8, |
| <i>Sargassum tenerrimum</i> | | ST1 S25 |
| Rhodophyceae | | |
| <i>Scinaia bengalica</i> | 11.5-14.5 | ST1 S5, S7, S8, S9, S13, ST2 S2 |
| <i>Chondrococcus homemarii</i> | 14 | ST1 S8 |
| <i>Halymenia floresia</i> | 18 | ST3 S8 |
| <i>H. porphyroides</i> | 18 | ST3 S8 |
| <i>H. venusta</i> | 10-15 | ST1 S2, S16, ST2 S4, S10, S18, S21 |
| <i>Gracilaria millardetii</i> | 14.5-18 | ST1 S7, ST3 S8 |
| <i>G. textorii</i> | 14-14.5 | ST1 S6, S7 |
| <i>Agardhiella robusta</i> | 13 | ST2 S18 |
| <i>Sarconema furcellatum</i> | 14 | ST2 S6 |

| Alga | Depth (m) | Transect (T) and Station (S) Number |
|-----------------------------------|-----------|-------------------------------------|
| <i>Solieria robusta</i> | 10-18 | ST1 S4, S6, ST2 S14, S21, ST3 S8 |
| <i>Hypnea musciformis</i> | 13 | ST1 S4 |
| <i>H. valentiae</i> | 11.5-14.5 | ST1 S7, S8, S13, ST2 S2, S6 |
| <i>Champia compressa</i> | 12 | ST2 S19 |
| <i>C. parvula</i> | 13 | ST1 S4 |
| <i>Spyridia filamentosa</i> | 13.5 | ST2 S14 |
| <i>Wrangelia argus</i> | 13-14.5 | ST1 S7, S13, ST2 S6 |
| <i>Acanthophora spicifera</i> | 13 | ST2 S16 |
| <i>Chondria hypnoides</i> | 11.5-13 | ST2 S2, S16 |
| <i>Polysiphonia tuticoriensis</i> | 12-14 | ST2 S6, S14, S16, S19 |
| Seagrass | | |
| <i>Halophila stipulacea</i> | 14 | ST2 S6, S7 |

Out of 107 stations sampled in 5 transects in the Vembar—Nallatanni Tivu region, vegetation was present only at 24 stations at the depth ranging from 6.5 to 19.0 m. The vertical distribution of the species along the transects varied. The transects 1 and 4 showed good vegetation in 8 and 6 stations respectively. The vegetation occurred at 4 stations in transects 2 and 3 and only at 2 stations in transect 5. The vegetation consisted of 27 species of algae and 3 species of seagrasses (Table 2). Of these, 3 species belonged to Chlorophyceae, 5 to Phaeophyceae and 19 to Rhodophyceae. The dominant and widely distributed species were *Halimeda macroloba*, *Spatoglossum asperum*, *Amphiroa anastomosans*, *Halymenia dialata*, *H. floresia*, *Solieria robusta*, *Hypnea musciformis* and *Haloplegma duperreyii*. Three species of seagrasses *Cymodocea rotundata*, *Halophila ovalis* and *H. stipulacea* were recorded at depth ranging from 10.5 to 18.0 m.

Table 2. Distribution of seaweeds and seagrasses at different depths, stations and transects from Vembar to Nallatanni Tivu.

| Alga | Depth (m) | Transect (T) and Station (S) Number |
|--------------------------------|-----------|--|
| Chlorophyceae | | |
| <i>Caulerpa sertularioides</i> | 9.0 | NT3 S5 |
| <i>Codium tomentosum</i> | 6.5-19 | NT1 S8, S14, S17, S19, NT2 S12, S14, NT3 S12, NT4, S20 |
| <i>Halimeda macroloba</i> | 6-19 | NT1 S8, S14, S19, NT2 S12, S13, NT3 S4, S5, S19, NT4 S1, S2, S3, S5, S6, S20, NT5 S5 |

| Alga | Depth (m) | Transect (T) and Station (S) Number |
|---------------------------------|-----------|--|
| Phaeophyceae | | |
| <i>Dictyota dichotoma</i> | 6.5 | NT1 S8 |
| <i>Spactoglossum asperum</i> | 6.5-10.5 | NT1 S8, S12, S19, NT2 S12 S13, NT3 S5, NT4 S1, S5 |
| <i>Zonaria variegata</i> | 7 | NT1 S9, NT4 S3 |
| <i>Sargassum plagiophyllum</i> | 8 | NT3 S4 |
| <i>Sargassum</i> sp. | 10 | NT1 S17 |
| Rhodophyceae | | |
| <i>Scinaia bengalica</i> | 6.5 | NT1 S8 |
| <i>Amphiroa anastromosans</i> | 7-10 | NT2 S13, NT3 S4, S5, NT4 S1 S5, S6, NT5 S5 |
| <i>Jania adhaerens</i> | 7 | NT4 S3 |
| <i>Lithothamnion fruticosum</i> | 7 | NT4 S3 |
| <i>Cryptonemia ceriacea</i> | 9 | NT3 S5 |
| <i>Halymenia dilatata</i> | 8.5-19 | NT1 S21, S25, NT2 S6, S12, NT3 S5, S12, S19, NT4 S20, NT5 S6 |
| <i>H. floresia</i> | 8-19 | NT1 S19, S25, NT2 S12, S13, NT3 S4, S5, S12, NT4 S20 |
| <i>H. porphyroides</i> | 7 | NT1 S9 |
| <i>H. venusta</i> | 10 | NT2 S12 |
| <i>Halymenia</i> sp. | 8.5 | NT1 S14, S17, S19 |
| <i>Gracilaria dura</i> | 9.5-10.5 | NT1 S17, NT3 S19 |
| <i>G. textorii</i> | 10-18 | NT1 S17, NT3 S19 |
| <i>Sarcodia indica</i> | 18 | NT3 S19 |
| <i>Agardhiella robusta</i> | 8-8.5 | NT2 S12, S13 |
| <i>Solieria robusta</i> | 8-10.5 | NT1 S12, S14, S17, S19 |
| <i>Hypnea esperi</i> | 7-18 | NT3 S19, NT4 S3 |
| <i>H. musciformis</i> | 6.5-10.5 | NT1 S8, S19, NT3 S4, S5 |
| <i>Champia compressa</i> | 7 | NT4 S3 |
| <i>Holoplegma duperreyii</i> | 6.5-19 | NT1 S8, NT2 S13, NT3 S5, NT4 S20 |
| Seagrasses | | |
| <i>Cymodocea rotundata</i> | 12 | NT1 S22 |
| <i>Halophila ovalis</i> | 10.5 | NT1 S19 |
| <i>H. stipulacea</i> | 18 | NT3 S19 |

DISCUSSION

The survey conducted during 1988 from Alantalai to Manapad

and Vembar to Nallatanni Tivu was quite extensive as well as intensive. Better seaweed growth was observed on the coral and rocky substrata. A total number of 44 algal species were encountered in both the regions. Out of these 11 species were common. Discrete distribution of 17 species in Alantalai-Manapad and 16 species in Vembar—Nallatanni Tivu area was also seen. The presence of green and brown algae was outnumbered by the red algae, in both the areas. Out of the total of 44 algae, the distribution of 10 species was restricted upto 10 m depth, 20 species beyond 10 m depth while the remaining 14 species were distributed at various depths, ranging from 6.5 to 19.0 m.

Greater abundance of deep water algal vegetation was revealed in the present survey as compared to the intertidal survey (upto 4m depth). In the intertidal survey, the number of species recorded in Alantalai—Manapad and Vembar—Nallatanni Tivu was 17 and 10 respectively (Anon, 1978), whereas, it was 28 and 27 in deep water of these two areas. The composition of seaweed flora was found to be entirely different except for the common occurrence of *Spatoglossum asperum* in Alantalai—Manapad and *Sargassum plagiophyllum* and *Hypnea musciformis* in Vembar—Nallatanni Tivu. The quantity of economic seaweeds assessed during this survey revealed the feasibility of commercial exploitation of *Spatoglossum asperum*, *Halymenia* spp., and *Gracilaria textorii* for phycocolloid industry.

ACKNOWLEDGEMENTS

The authors are grateful to Prof. P. Natarajan, Director, Central Salt & Marine Chemicals Research Institute, Bhavnagar, Dr. P.S.B.R. James, Director, Central Marine Fisheries Research Institute, Cochin, Dr. P. Vedavyasa Rao, Officer-in-charge, Regional Centre of CMFRI, Mandapam Camp and Shri. S. Mahadevan, Officer-in-charge, Research Centre of CMFRI, Tuticorin for encouragement and facilities extended during the investigation.

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