

SEAWEED RESOURCES OF THE TUTICORIN-TIRUCHENDUR COAST,
TAMIL NADU, INDIA*

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ABSTRACT

The southern coast of Tamil Nadu (Mandapam to Kanyakumari) supports luxuriant growth of economic seaweeds. The entire indigenous phycocolloid industry of the country gets the raw material from this region and during the last two decades, due to indiscriminate harvesting, there has been over-exploitation of the resource. The present paper deals with survey conducted in the first sector from Tuticorin to Tiruchendur during December 1986--March 1987. In this study 58 species of marine algae were recorded of which 7 belong to Chlorophyta, 12 to Phacophyta and 39 to Rhodophyta besides 3 species of seagrasses namely *Cymodocea serrulata*, *Halophila ovalis* and *H. ovata* within 650 sq. km area surveyed. The total standing crop of the seaweeds was estimated at 9,100 tonnes (wt.). The estimates for the dominant species are *Dictyota maxima* 530 t, *Sargassum tenerrium* 640 t, *D. bartayresiana* 860 t, *Seligeria rebusta* 2,090 t and *Hypnea valentiae* 2,430 t. The seaweed potential for commercial exploitation has been briefly discussed.

INTRODUCTION

SEAWEEDS are the only source for the production of phytochemicals such as agar and algin. Surveys of seaweed resources of the Indian coastal waters have been carried out by several workers from time to time in different regions along the coast of the mainland and also Lakshadweep and Andaman-Nicobar Islands to locate the seaweed growing areas and to assess the standing crop of seaweeds (Subbaramaiah, 1984; Kaliaperumal *et al.*, 1978). All these surveys are restricted to nearshore areas of the coast. The coast of Tamil Nadu from Mandapam to Kanyakumari supports luxuriant growth of seaweeds and a total standing crop of 22,000 tonnes (wet) seaweeds

was estimated from this region (Anon., 1978). Only few attempts were made on the qualitative survey of seaweeds occurring in deep waters (Varma, 1960; Mahadevan and Nagappan Nayar, 1967). From their inception, the entire raw material requirement for the Indian agar and algin industries have been met from the natural seaweed beds of Tamil Nadu Coast. As a result of intensive and indiscriminate harvesting of the agarophytes from the Mandapam region, severe depletion of *Gelidiella acerosa* and *Gracilaria edulis* resources was noticed. Hence, locating new areas of seaweed growth has become necessary. The deep water seaweeds of Tamil Nadu Coast are still unexplored. In order to locate the deep water seaweed beds and to assess the standing crop of seaweeds in the Gulf of Mannar region, Central Marine Fisheries Research Institute and Central Salt and

* Presented at the 'Symposium on Tropical Marine Living Resources' held by the Marine Biological Association of India at Cochin from January 12-16, 1988.

Marine Chemicals Research Institute have undertaken jointly the survey of deep water seaweed resources from Tuticorin to Kanyakumari. The present paper gives the results of the survey conducted from Tuticorin to Tiruchendur during December 1986 - March 1987.

The authors are grateful to Dr. P. S. B. R. James, Director, Central Marine Fisheries Research Institute, Prof. M. M. Taqui Khan, Director, Central Salt and Marine Chemicals Research Institute, Bhavanagar, Dr. P. Vedavyasa Rao, Mandapam Regional Centre of CMFRI and Shri S. Mahadevan, Tuticorin Research Centre of CMFRI, for their encouragements and facilities provided for carrying out this survey.

MATERIALS AND METHODS

The entire coast from Kattapadu, 25 km north of Tuticorin (09° N, 78° 17'E) to Tiruchendur (08° 28'N, 78° 7'E) was divided from north to south into 12 transects of 5 km intervals. In each transect sampling was done at stations fixed at 500 m intervals. Among the 12 transects surveyed, 5 to 30 stations were sampled and the depth ranged from 5.5 to 21.5 m. The seaweed and seagrass samples occurring in 1 sq.m area at the sampling stations were collected by SCUBA diving. The samples were sorted out and the biomass of each species noted. Herbarium and liquid specimens of all specimens were prepared.

The sampling biomass taken per 1 sq. m is computed for 2.5 sq. km area, taking into consideration the area covered on all sides from a sampling station. The estimates for all the sampling stations were added to get the total standing crop of the areas supporting seaweed growth. The specieswise resource estimates and the area covered were also calculated by the same method. Estimate of resource for a species was calculated only when

the biomass in a sampling station was 5 gm or more.

RESULTS

Among 260 stations sampled in all the 12 transects, only 50 stations had vegetation. The seaweed growth was always found to be associated with coral or rocky substrata. A total number of 34 genera and 58 species of algae were recorded from all the 12 transects of which 5 genera and 7 species belong to Chlorophyta, 5 genera and 12 species to Phaeophyta and 24 genera and 39 species to Rhodophyta. The resource potential for 32 species is given in Table 1. Of the total area of 650 sq. km surveyed only 125 km² supported vegetation with a total biomass of 9,100 t (wet). The seaweeds with biomass of above 500 t (wet) were *Dictyota maxima* (530 t), *Sargassum tenerrimum* (640 t), *D. bartayrestiana* (860 t), *Solieria robusta* (2,090 t) and *Hypnea valentiae* (2,430 t). Totally three species of seagrasses *Cymodocea serrulata*, *Halophila ovalis* and *H. ovata* were recorded.

DISCUSSION

In the earlier studies by Varma (1960) and Mahadevan and Nagappan Nayar (1967) in Tuticorin-Tiruchendur region, only qualitative estimation of seaweeds was made. From a comparison of the seaweed flora of the present study with that of the earlier studies, it is evident that only few genera are widely distributed. They are *Halimeda*, *Padina*, *Stoechospermum*, *Sargassum*, *Gracilaria* and *Hypnea*. Many of the algal species found in deep waters in the present investigation were also recorded earlier in the nearshore area from the same region (Anon., 1978). However, certain differences in the species composition have been observed. Species of *Sargassum* (790 t wet weight) occurring near Tuticorin and species of *Hypnea* (2,700 t wet weight) occurring near Tiruchendur can be exploited commercially for manufacture of phycocolloid.

TABLE 1. Estimated standing crop wt. (wet in tonnes) of seaweeds collected in 12 transects from Kattapadu to Tiruchendur

| Species | Transect | | | | | | | | | | | | Total |
|--------------------------------|----------|---|-------|-------|-------|--------|---|-------|---|----|--------|--------|--------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| <i>Gracilaria edulis</i> | — | — | — | — | — | — | — | 62.5 | — | — | 12.5 | — | 75.5 |
| <i>Sargassum ilicifolium</i> | — | — | 25.0 | — | — | 12.5 | — | — | — | — | — | — | 37.5 |
| <i>S. tenerrimum</i> | — | — | — | 625.0 | — | 12.5 | — | — | — | — | — | — | 637.5 |
| <i>S. wightii</i> | — | — | — | — | — | 100.0 | — | — | — | — | — | — | 100.0 |
| <i>Sargassum</i> sp. | — | — | — | — | — | 12.5 | — | — | — | — | — | — | 12.5 |
| <i>Padina pavonica</i> | — | — | — | 50.0 | — | — | — | — | — | — | 25.5 | — | 75.5 |
| <i>P. tetrastromatica</i> | — | — | — | — | 175.0 | — | — | — | — | — | — | — | 175.0 |
| <i>Dictyota burtayresiana</i> | — | — | — | 50.0 | 625.0 | — | — | — | — | — | 187.5 | — | 862.5 |
| <i>D. dichotoma</i> | — | — | — | — | — | 25.0 | — | — | — | — | — | — | 25.0 |
| <i>D. maxima</i> | — | — | — | — | — | — | — | — | — | — | 112.5 | 412.5 | 525.0 |
| <i>Chaetomorpha littorea</i> | 12.5 | — | — | 12.5 | — | — | — | — | — | — | — | — | 25.0 |
| <i>Cladophora fascicularis</i> | — | — | — | — | 25.0 | 12.5 | — | — | — | — | — | — | 37.5 |
| <i>C. tranqubarensis</i> | — | — | — | — | — | 12.5 | — | — | — | — | — | — | 12.5 |
| <i>C. dwarkense</i> | — | — | — | 12.5 | — | — | — | — | — | — | — | — | 12.5 |
| <i>C. tomentosum</i> | — | — | — | 12.5 | — | — | — | — | — | — | — | 337.5 | 350.0 |
| <i>Halimeda macroloba</i> | — | — | — | 125.0 | — | 150.0 | — | — | — | — | — | — | 275.0 |
| <i>Cryptonemja coriacea</i> | — | — | — | — | — | — | — | — | — | — | — | 25.0 | 25.0 |
| <i>Grateloupia filicina</i> | — | — | — | — | — | — | — | — | — | — | 25.0 | — | 25.0 |
| <i>Halymenia floresia</i> | — | — | — | — | — | — | — | — | — | — | 100.00 | 275.0 | 375.0 |
| <i>Sarconema filiforme</i> | — | — | — | — | — | 37.5 | — | — | — | — | — | — | 37.5 |
| <i>S. furcellatum</i> | — | — | — | — | — | — | — | — | — | — | — | 25.0 | 25.0 |
| <i>Solieria robusta</i> | — | — | 12.5 | 37.5 | — | 787.5 | — | 50.0 | — | — | 12.5 | 1187.5 | 2087.5 |
| <i>Hypnea esperi</i> | 12.5 | — | — | — | — | — | — | — | — | — | — | 75.0 | 87.5 |
| <i>H. musciformis</i> | — | — | — | — | — | 187.5 | — | — | — | — | — | — | 187.5 |
| <i>H. valentiae</i> | — | — | — | — | — | 12.5 | — | — | — | — | 2100.0 | 312.5 | 2425.0 |
| <i>Acanthophora muscoides</i> | — | — | 12.5 | — | — | — | — | — | — | — | — | — | 12.5 |
| <i>Chondria armata</i> | — | — | — | 12.5 | — | — | — | — | — | — | — | — | 12.5 |
| <i>Herposiphonia stiposa</i> | — | — | — | — | — | — | — | — | — | — | 350.0 | — | 350.0 |
| <i>Laurencia pinnatifida</i> | — | — | — | — | — | 12.5 | — | — | — | — | — | — | 12.5 |
| <i>Spyridia insignis</i> | 25.0 | — | — | — | — | — | — | — | — | — | — | — | 25.0 |
| <i>Scianaia bengalensis</i> | — | — | 50.0 | — | — | — | — | — | — | — | — | — | 5.0 |
| <i>Wrauzelis argus</i> | — | — | 125.0 | — | — | — | — | — | — | — | — | — | 125.0 |
| Total | 50.0 | — | 225.0 | 937.5 | 825.0 | 1375.0 | — | 112.5 | — | — | 2925.5 | 2650.0 | 9100.5 |

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