

## Distribution and diversity of marine macro algae at valinokkam coast, southeast coast of Tamil Nadu, India

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### Abstract

The present study highlights, distribution and diversity of twenty two marine algae species from the intertidal rocks at nine sampling stations along Valinokkam coast during six month period from January to June 2019. Among the different species of seaweeds, the dominant species *Gracilaria corticata* in all the sampling stations indicated it's adaptability to the surf zone. *Acanthophora spicifera* and *Caulerpa scalpeiliformis* var. *denticulata* were the next two dominant species. The present study reveals that intertidal rocks occurring along the entire coast of Valinokkam offer suitable substratum for the luxuriant growth of seaweeds. The lack of anthropogenic activity along this coast favours for the good growth of different seaweeds.

**Keywords:** marine algae, diversity, valinokkam, intertidal rocks, substratum

### Introduction

Marine algae (Seaweeds) are considered as ecologically and biologically important component in the marine ecosystems. Marine algae make a substantial contribution to marine primary production and provide habitat for nearshore benthic communities (Mann, 1973<sup>[8]</sup>; Williams & Smith 2007<sup>[17]</sup>). Marine algae are primitive type of plants. They are key space occupiers of rocky shores and interact with other organisms and here play a key role in overall coastal biodiversity. They are found on rocks in the intertidal zone as a giant underwater forest. In India macro algal resources are found in many coastal areas, especially along the maritime states of Gujarat, Tamil Nadu, Andaman-Nicobar Islands and Lakshadweep. But our efforts to utilise the algal biomass for making products of commercial value are very limited when compared with countries of Indo Pacific region. The macro algal diversity is very high along the Indian shores. OZA and Zaidi (2001)<sup>[10]</sup> listed 844 species of marine algae and the number of species reported to date (up to 2010) is 896 (Umamaheswara Rao is press). The marine algae occurring between Mandapam, Kilakarai and Gulf of Mannar Islands including Kurusadai Island were recorded during the seaweed resources survey conducted along the Tamil Nadu coast by central marine fisheries Research Institute, central salt & marine chemical Research Institute and dept of Fisheries, Govt of Tamil Nadu during 1971, 1976 (Anon, 1978)<sup>[1]</sup>.

Marine algae from Indian coasts have been fairly well surveyed since several decades. Seaweeds generally grow in the intertidal and subtidal regions of the sea upto the depth where sufficient light intensity is available for photosynthetic activity. The seaweed ecosystem provides habitat for a variety of invertebrate and vertebrate animals. Hence, from ecological and economical points of view it is an important marine realm. Valinokkam coast (9.1847937°N, 78.6363274°E) is located near Keelakarai coast in the Gulf of Mannar. Their intertidal region of Valinokkam coast is dominated by beach rocks which were formed from lithification by calcium carbonate sediment in the intertidal and spray zone. The hard substratum of the

rocks favours for the growth of diverse marine macro algal species.

### Materials and Methods

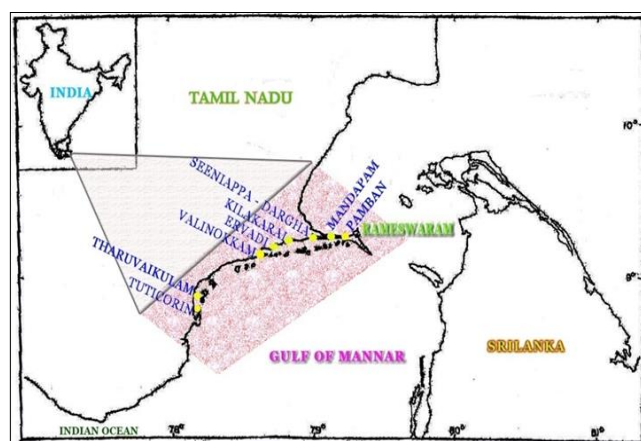


Fig 1: Map showing the study area

The location of the study area of Valinokkam is shown in Figure-1. The study was made for a period of six month from January to June 2019. The regular field survey was carried out during the lowest low tide periods. Seaweed samples were collected as per the standard survey methods of Leliaert and Coppejans (2004)<sup>[7]</sup> along one km stretch of intertidal coast covering nine sampling stations. The algal samples if collected were sorted out species wise, placed in polythene bags containing seawater and transported to the laboratory. Then they were fixed in 4% formaldehyde solution for taxonomic studies. The collected marine algae were identified by referring the literature published by, Umamaheswara Rao (1970<sup>[13]</sup>, 1972<sup>[14]</sup> and 1987)<sup>[16]</sup>, and Kalimuthu *et al.* (1992)<sup>[5]</sup>. The identification of marine algae was also confirmed by Dr. N. Kaliaperumal, Former Principal Scientist & Scientist-In-Charge, Regional Centre of Central Marine Fisheries Research Institute (CMFRI), Mandapam camp, Tamilnadu.

## Results and Discussion

On the impact of Tsunami on 26th December, 2004 on the eastern and southeast coast of India (Mantri, 2005) [9] resulted in the damage and major change in the intertidal region of India (Jain *et al.* 2006) [3]. These changes resulted in the vast change in the seaweed biota and the recent update on the seaweed diversity in these coast is not enough (Mantri, 2005) [9]. Eventhough few work were carried out soon after the impact of Tsunami and later in the some parts of the southeast coast like Kudankulam coast (Satheesh and Wesley, 2012) [11], Muttom coast (Domettilla *et al.* 2013) [2]. There is scanty of work reported in the marine algal diversity of Gulf of Mannar region after the impact of Tsunami after December 2004. During the present study twenty two seaweed species were collected from valinokkam coast, of which 10 species belonged to Chlorophyceae, 5 species to Phaeophyceae and 7 species to Rhodophyceae (Table-1). *Gracilaria corticata* was the dominant species occurred from all the 9 sampling stations. *Acanthophora spicifera*

And *Caulerpa scalpelliformis var. denticulata* were the next two dominant species in the entire seaweed distribution from all the 9 sampling stations. The species of *Caulerpa* were found more on the western side of the Valinokkam coast and *Gelidiella acerosa* was found only in few stations. *Sargassum myriocystum* and *Champia compressa* were the least dominant species along this coast. The dominance of *Gracilaria corticata* in all the sampling stations showed that the surf zone is best suited for this species. The genus *Gracilaria* is cosmopolitan in distribution. In India, the genus *Gracilaria* includes 32 species, of which 31 are reported from different parts of Tamil Nadu coast (Umamaheswara Rao, 1972 [14]; Kaliaperumal and Pandian, 1984 [4]; Krishnamurthy, 1991 [6]).

The present study reveals that the rocky formation occurring along the entire intertidal region of Valinokkam offers good substratum for the rich growth of different seaweeds. The lack of anthropogenic activity along this coast allows the luxuriant growth of many marine algal species belonging to four groups of algae.

**Table 1:** Distribution of seaweeds in nine stations at Valinokkam Coast

S. No.	Name of the seaweeds	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9
Chlorophyceae										
1	<i>Caulerpa scalpelliformis</i> (R. Brown ex. Turner) C. Agardh Var. <i>denticulata</i> (Decalsne)	+	-	+	+	+	-	+	+	-
2	<i>Caulerpa racemosa</i> V. <i>laetevirens</i> (Sonder) Weber van Bosse	-	-	-	+	-	-	-	-	-
3	<i>Caulerpa racemosa</i> V. <i>Clavifera</i> (Turner) C. Agardh	-	-	-	-	-	-	-	-	+
4	<i>Caulerpa taxifolia</i> (Vahl) C. Agardh	+	+	+	+	-	-	-	-	-
5	<i>Caulerpa verticillata</i> J. Agardh. F. <i>typica</i>	-	-	-	+	-	-	-	-	-
6	<i>Caulerpa serrulata</i> (Forsskal) J. Agardh	-	-	-	+	-	-	-	-	-
7	<i>Chaetomorpha antennina</i> (Bory De Saint - Vincent) Kuetzing	+	-	-	-	-	-	+	-	+
8	<i>Valoniopsis pachynema</i> (G. Martens) Boergesen	+	-	-	-	+	-	-	-	-
9	<i>Boergesenia forbesii</i> (Harvey) J. Feldmann	-	-	-	-	-	-	-	-	+
10	<i>Codium gepplorum</i> O. Scmiot	-	-	-	-	-	-	-	-	+
Phaeophyceae										
1.	<i>Stoechospermum marginatum</i> (C. Gardh) Kuetzing	+	-	+	+	-	-	-	-	-
2.	<i>Padina tetrastrumatic</i> Hauck	-	+	+	+	+	-	+	-	-
3.	<i>Sargassum myriocystum</i> J. Agardh	-	-	-	-	-	-	-	-	+
4.	<i>Sargassum wightii</i> greville	-	-	-	-	-	-	-	+	-
5.	<i>Dictyota dichotoma</i> (Hudson) Lamouroux	-	-	-	-	-	+	-	-	-
Rhodophyceae										
1.	<i>Gelidiella acerosa</i> (Forsskal) Feldmann & Hamel	-	-	+	+	-	+	-	+	-
2.	<i>Jania rubens</i> (Linnaeus) Lamouroux	-	-	+	+	+	-	-	+	+
3.	<i>Grateloupia lithophila</i> Boergesen	-	-	-	-	+	-	-	-	+
4.	<i>Gracilaria corticata</i> (J. Agardh) J. Agardh	+	+	+	+	+	+	+	+	+
5.	<i>Champia compressa</i> Harvey	-	-	-	-	+	+	+	-	-
6.	<i>Acanthophora spicifera</i> (Vahl) Boergesen	+	+	+	-	+	+	+	+	+
7.	<i>Hypnea pannosa</i> J. Agardh	-	+	+	+	-	+	-	+	+

+ Available - Not available

## Conclusion

The composition and seasonal abundance of marine algae depend mainly on factors like temperature, salinity, water current, substrate, tide range and nutritional availability. The ability of marine algae to adapt to different light regime determine the vertical distribution in the intertidal and subtidal region.

Although an understanding of the biology of Gulf of Mannar region, macro algae has increased considerably a lot more remain to be studied with regards to the structures and biodiversity of the algae communities. Life histories of the

individual species, adaptation to the seasonal variation and their physiological mechanism to grow and survive in Gulf of Mannar coastal waters particularly in Valinokkam coastal region.

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