

Studies on Seasonality of Marine Algae at Appikonda, Visakhapatnam District, East Coast of India

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Abstract

Original Research Article

Seasonal studies on marine macro algae present along the coastal regions of Appikonda near Steel plant of Visakhapatnam was studied for a period one year during 2017 to 2018. Quadrant studies were conducted for three seasons such as winter, summer and monsoon, identified 24 macro algal forms in all three seasons of the year. Maximum number of species were recorded during winter season and minimum number of species were recorded in summer season during period of the investigation. Species of *Ulva*, *Caulerpa*, *Cladophora*, *Chaetomorpha*, *Spongomorpha*, *Gracilaria*, *Gratelophia*, *Amphiroa*, *Jania*, *Gelidiopsis* and *Gelidium* were present in all seasons along the intertidal habitats of the study area.

Keywords: Marine macro algae, seasonal distribution, Appikonda, Visakhapatnam district, East Coast of India.

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INTRODUCTION

Several investigators (Umamaheswara Rao and Sree Ramulu, 1964; 1972; Narasimha Rao and Umamaheswara Rao, 1986; Narasimha Rao 1989; 1991; 1992; Prasanna Lakshmi and Narasimha Rao 2009; Narasimha Rao and Subba Rangaiah 2010; Satya Rao *et al.*, 2011; Narasimha Rao *et al.*, 2012; Narasimha Rao, 2014; Narasimha Rao and Srinivasa Rao, 2016; Narasimha Rao, 2017 and 2022) studied the distribution and composition marine macro algae along the Coastal regions of Bhimili, Visakhapatnam, Mutyalampalem and Revupolavaram regions of Visakhapatnam district, East Coast of India. Studies were made on distribution of marine algae in other parts of East Coast of India by Kalimuthu *et al.*, (1995); Rath and Adhikary (2006) and Sulekha and Panikkar (2007). In this present investigation an attempt was made to study the composition and distribution of marine macro algae present along the coastal regions of Appikonda, Visakhapatnam district, East Coast of India.

MATERIALS AND METHODS

Appikonda is a coastal village located at distance of 19 KM from the Visakhapatnam city. It lies

between the 17.34 N longitudes and 83.10 E Latitudes on the east coast of India. Rocky boulders here and there along the beach of Appikonda supports the growth and development of marine algae. For biomass estimation, quadrates of 0.50 X 0.50 M were used. Different algal forms present in the quadrants were collected and brought them to the laboratory and were separated carefully and spread on the concrete platform under the sun dried and then dried to a constant weight in an oven at 60° C temperature. Each season 15 quadrant samples were collected randomly and average biomass values for each season were gathered during 2017 to 2018 and expressed as gram dry weight/m².

RESULTS AND DISCUSSION

Information collected on the composition and distribution of the marine algae at Appikonda coastal line was presented in the Table 1. During this study 24 marine algal species were identified and out of these 8 algal species belongs to Chlorophyceae, 5 algal forms belongs to Phaeophyceae and remaining 11 species belongs to the Rhodophyceae. Seasonal fluctuations in biomass of the marine algae during the three seasons from 2017 to 2018 was presented in the Table 2.

Table 1: List of the marine macro algae reported from the Coastal waters of Appikonda

S. No.	Name of the Species	Class
1	<i>Ulva fasciata</i> Delile	Chlorophyceae
2	<i>Chaetomorpha antennina</i> (Bory) Kutzing	Chlorophyceae
3	<i>Cladophora socialis</i> Kutzing	Chlorophyceae
4	<i>Spongomorpha indica</i> Thiviy at Visalakshmi	Chlorophyceae
5	<i>Bryopsis pennata</i> Lmouroux	Chlorophyceae
6	<i>Caulerpa fastigata</i> J.Ag.	Chlorophyceae
7	<i>Caulerpa racemosa</i> J.Agardh	Chlorophyceae
8	<i>C.taxifolia</i> (Vahl.) C.Agardh	Chlorophyceae
9	<i>Ectocarpus mitchellae</i> Hamel	Phaeophyceae
10	<i>Chnoospora minima</i> (papenfuss)	Phaeophyceae
11	<i>Padina tetrastrumatica</i> Hauck	Phaeophyceae
12	<i>Sargassum vulgare</i> C.Agardh	Phaeophyceae
13	<i>S.Ilicifolium</i>	Phaeophyceae
14	<i>Porphyra vietnamensis</i> , Tanaka et Ho	Rhodophyceae
15	<i>Bangiopsis subsimplex</i> Schmitz	Rhodophyceae
16	<i>Gelidiopsis variabilis</i> Schmitz	Rhodophyceae
17	<i>Gelidium pusillum</i> Le Jolis	Rhodophyceae
18	<i>Amphiroa fragilissima</i> Camouroux	Rhodophyceae
19	<i>Jania rubens</i> Lamouroux	Rhodophyceae
20	<i>Grateloupia lithophila</i> Borgesen	Rhodophyceae
21	<i>Grateloupia filicina</i> J.Agardh	Rhodophyceae
22	<i>G.textori</i>	Rhodophyceae
23	<i>Gracilaria corticata</i> J.Agardh	Rhodophyceae
24	<i>Wrangelia argus</i>	Rhodophyceae

Marine macro algae occurring along the coastal zone of the Appikonda region was varied seasonally. Presence of Chlorophyceae members were reported throughout the year but members of the Phaeophyceae were reported in winter season only. Species of the Rhodophyceae except *Gracilaria textorii* occurs throughout the year (Table 2). Biomass values of these algal species was varied seasonally with higher biomass values for the species of *Ulva fasciata*, *Spongomorpha indica*, *Gracilaria corticata*, *Grateloupia lithophila* and *Amphiroa fragilissima*. Minimum biomass values were reported for the species of *Ectocarpus mitchellae*, *Bangiopsis subsimplex* and *Wrangelia argus*. Present study investigations are agrees with the earlier studies on marine algae at Visakhapatnam (Umamaheswara Rao and Sreeramulu, 1964; Narasimha Rao and Umamaheswara Rao, 1986; Narasimha Rao, 1989; 1991; 1992; Prasanna Lakshmi and Narasimha Rao, 2009; Narasimha Rao, 2017) and marine algae of nearby

coastal regions such as Bhimili region (Satyarao *et al.*, 2011), Mutyalammalem beach of Visakhapatnam district (Narasimha Rao and Srinivasa Rao, 2016). Narasimha Rao (1991) studied the seasonal growth of *Ectocarpus mitchellae* and observed its presence from November to May months at Visakhapatnam coast and Narasimha Rao and Srinivasa Rao (2016) observed the growth of *Ectocarpus mitchellae* at Mutyalamma palem coast for the period of four months only. Narasimha Rao (2022) studied the seasonal growth of *Ectocarpus mitchellae* at Revupolavaram coast and observed its growth from November to February months only supporting the earlier studies of Narasimha Rao (1991); Narasimha Rao and Srinivasa Rao (2016). Due to climatic change and anthropogenic activities biomass as well as number of species were reducing without notice of the public. It is right time to initiate the conservation measures to protect the algal flora along the coastal regions.

Table 2: Seasonal fluctuations in the biomass of Marine algae at Appikonda Coast during the three seasons of 2017 to 2018 (gram dry wt. /m²)

S. No	Name of the species	Monsoon	Winter	Summer
1	<i>Ulva fasciata</i>	6.1—7.2	7.3—8.9	7.2—9.1
2	<i>Chaetomorpha anteninna</i>	2.5—2.8	1.8—2.1	1.4—2.3
3	<i>Cladophora socialis</i>	5.1—7.9	4.9—6.3	4.6—5.2
4	<i>Spongomorpha indica</i>	6.1—8.2	5.8—7.3	5.4—6.9
5	<i>Bryopsis pennata</i>	1.1-1.8	1.7—2.4	1.4—2.1
6	<i>Caulerpa fastigiata</i>	2.1--2.5	2.4—3.6	2.6—3.5
7	<i>Caulerpa racemosa</i>	2.3—3.1	3.4—3.9	3.3—3.7
8	<i>C.taxifolia</i>	2.0—2.7	2.6—4.1	3.0—3.6
9	<i>Ectocarpus mitchellae</i>	--	0.3 --0.5	--

S. No	Name of the species	Monsoon	Winter	Summer
10	<i>Chnoospora minima</i>	--	0.6--1.1	
11	<i>Padina tetrastrumatica</i>	--	2.5--3.7	1.2--2.0
12	<i>Sargassum vulgare</i>	--	3.8--7.1	2.3--5.7
13	<i>S.Ilicifolium</i>	--	3.2--7.5	1.8--4.9
14	<i>Porphyra vietnamensis</i> ,	--	05--0.9	--
15	<i>Bangiopsis subsimplex</i>	--	03--04	--
16	<i>Gelidiopsis variabilis</i>	2.4--3.6	2.2--3.5	1.7--2.8
17	<i>Gelidium pusillum</i>	2.0--2.6	2.3--2.9	1.9--2.3
18	<i>Amphiroa fragillissima</i>	10.5--11.8	12.6--14.4	10.5--11.8
19	<i>Jania rubens</i>	3.0--3.3	3.1--3.6	2.7--2.9
20	<i>Grateloupia lithophila</i>	11.7--12.2	12.3--14.8	11.2--12.8
21	<i>G. filicina</i>	2.8--3.1	3.1--3.9	2.9--3.7
22	<i>Gracilaria corticata</i>	10.2--12.1	11.5--14.3	11.8--13.5
23	<i>G.textorii</i>	--	7.2--8.9	--
24	<i>Wrangelia argus</i>	0.3--07	0.3--0.5	0.5--0.8

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