

Status of Algal diversity at Panchotiya village of Mandvi coast Kachchh, Gujarat

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Abstract: Algae are considered as the main primary producer in marine ecosystem. The present paper deals with diversity and distribution of marine algae of the selected study area. An extensive ecological survey was carried out during September 2015 to Jan 2016 at Panchotiya Village of Mandvi tehsil of Kachchh district of Gujarat state. For the enumeration of algal species random sampling method was carried out. Total 27 algal species were recorded, which include species of Chlorophyceae, Phaeophyceae and Rhodophyceae. The present study provides the status of algal diversity of selected study site.

Keyword: Marine Algae, Gulf of Kachchh, Diversity.

1. INTRODUCTION:

Marine algae are primary producer in marine ecosystem. India is the seventh largest country in the world and Asia's second largest nation with an area of 3,287,263 sq/km. (Government of India, 1985). India is blessed with a 7500 km long coastline. Among the Indian maritime states, Gujarat state has the longest coastline extending up to 1600 km. Gulf of Kachchh, the fast developing area of Gujarat is the north-western boundary of the Indian coast, which extends to length of 170 km covering an area of around 7300 km² (Dr.G.V.M.Gupta,2002). Biodiversity of marine algae along the East and West coast regions of India was studied by several authors (Srinivasan, 1946; Gopalakrishnan, 1970; Kalimuthu, 1995; Dhargalkar et al. 2001; Sahoo et al 2003; James, 2004; Venkataraman, 2005). Marine algae are macroscopic, multicellular, and constitute one of the most important marine natural resources. They are broadly classified as Chlorophyceae (green algae), Rhodophyceae (red algae) and Phaeophyceae (brown algae). They are mainly found to attach to the bottom, in relatively shallow waters areas upto 180 meter depth, on solid substance such as rocks, dead corals, pebbles, shells, and plants. Throughout the World, Rhodophyceae is dominated by 6000 species followed by Phaeophyceae (1780) and Chlorophyceae (920 species) respectively. Though the world, production of seaweed is estimated at 21, 65,675 mt/year while India contributing only 3,003 mt/year. The marine algae of India are highly diversified and comprise mostly of tropical species but temperate and subtropical elements have been also reported. Many of the rocky beaches, mudflats estuaries, coral reefs and lagoons along the India coast provide ideal habitats for the growth of marine algae (Rao and Mantri, 2006). In India, total 770 species of marine algae have been reported from different coastal areas of India, Out of the total which include 184 species of Chlorophyceae, 166 species of Phaeophyceae and 420 species of Rhodophyceae (Sahoo et al. 2001). In India, over 45 species of marine algae are useful mainly as source of Agar-Agar (species of Gelidium, Gelidiella and Gracilaria) and Algin (species of Ulva, Tubinaria, Gracilaria and Porphyra); as fodder (species of Dictyota, Padina and Sargassum) and manure. In Gulf of Kachchh, totally 78 species of marine algae was recorded. Overall, the pre-monsoon diversity of marine algae was rich with totally 78 species belonging to Rhodophyceae (26), Chlorophyceae (25) and Phaeophyceae (21). The overall diversity during post-monsoon was less with 44 species again comprised almost equally with Rhodophyceae (13), Chlorophyceae (13) and Phaeophyceae (14), Cyanophyceae and Bacillariophyceae contributed least (Dr.G.V.M.Gupta, 2002). During the present study, investigation of occurrence and distribution of marine algae at selected study site were undertaken. Thus, the present study is an important step to re-evaluate the algal diversity of the selected sea coast.

2. STUDY AREA:

Mandvi is located in the Kachchh district which is located between at western part of the Gujarat state. It is located between 22.81 N & 69.36 E. Mandvi was developed by the Rao of Kachchh state, Khengarji in 1580. The population of Mandvi tehsil according to the census of 2011 was 51,376.

The maximum and minimum temperatures recorded in the area are 2 C in the winter and 4C to 45C in summer. June to September is monsoon period. The Average annual rainfall is approximately 14 inches.

Panchotiya is a village of Mandvi tehsil. It is approximately 26 km away from Mandvi. The location of the study area of Panchotiya sea coast is lies between 22.85055 N and 69.173488 E. The site is famous for the Mahabaleswar temple. The folklore goes that Pandava of Mahabharata were playing Garaba over here. The

population of Panchotiya village according to the census of 2011 was 711. The frequent study trips were arranged during September 2015 to January 2016 at Panchotiya sea coast to record the algal diversity of the area. During investigation, samples of marine algae were observed, identified, enumerated & collected. Total 27 species were recorded.

3. METHODOLOGY:

Frequent field trips were arranged in the selected study area i.e. Panchotiya coast during September 2015 to February 2016. During field investigation, algal species were collected from the intertidal zone of the coast. The investigation was made throughout the coastal area of Panchotiya coast. All the specimens of algal species were stored in 10% of alcohol solution. All the algal specimens were identified at Gujarat Institute of Desert Ecology (GUIDE), Bhuj- Kachchh. All the algal specimens were recorded and well documented in field note.



[Map showing the selected study site- Panchotiya village at Mandvi sea coast, Kachchh district- Gujarat]

4. RESULT AND DISCUSSION:

Total 27 species of 16 genera of 13 families were recorded from the study site. Out of 27 species, *Phaeophyceae* was represented by 10 species belonging to 6 genera of 5 families, which is quite higher than that of *Rhodophyceae* and *Chlorophyceae*. *Rhodophyceae* was represented by 9 species of 6 genera belonging to 6 families while *Chlorophyceae* was represented by 8 species belonging to 4 genera of 3 families. Out of total 14 families, family *ulvaceae* is dominated by 6 species, which is followed by family *dictyotaceae* and *gracillariaceae* (4 species) and family *surassaceae* (3 species) respectively. Out of total 18 genera, Genus *Gracilaria* was represented by 4 species while *Ulva*, *Sargassum*, *Enteromorpha* and *Dictyota* were represented by 2 species of each. Remaining all species were represented by single species i.e. monospecific. Out of total 14 families 10 families were represented by only 1 genus i.e. monogeneric.

Table-1 Showing Algal diversity- checklist of algal species:

DIVISION	CLASS	ORDER	FAMILY	SR No.	GENUS AND SPECIES			
Chlorophyta	Ulvophyceae	Ulvales	Ulvaceae	1	<i>Enteromorpha compressa</i> (L) Nees			
				2	<i>Enteromorpha Limza</i> (L.) J. Agardh			
				3	<i>Enteromorpha flexuosa</i> (Wulfen) J. Agardh)			
				4	<i>Ulva intestinalis</i> Linnaeus			
				5	<i>Ulva lactula</i> Linnaeus			
				6	<i>Ulva Reticulata</i> – Forsk.			
		Cladophoraceae	Cladophoraceae	7	<i>Cladophora glomerata</i> Linnaeus (Kützting)			
		Bryopsidophyceae	Bryopsidales	Caulerpaceae	8	<i>Caulerpa taxifolia</i> (M.Vahl) C. Agardh		
Pheophyta	Pheophyceae	Dictyotales	Dictyotaceae		Ectocarpales	Scytosiphonaceae	9	<i>Iyengaria stellata</i> (Boergesen)
				10	<i>Dictyota ciliolata</i> Sonder (nützling syn) D. Ciliate			
				11	<i>Dictyota Cervicornis</i> (Kützting)			
				12	<i>Dictyota dichotoma</i> (Hudson) J.V.Lamouroux			
				13	<i>Pedina tetrastratica</i> Hauck			

		Fucales	Surgassaceae	14	<i>Sargassum echinocarpum</i> J.Agardh
				15	<i>Sargassum swartzii</i> Agardh
				16	<i>sargassum tenerrimum</i> J. Agardh
		Laminaria	Laminariaceae	17	<i>Laminaria hyperborea</i> (Gunnerus)
		Scytosiphonales	Scytosiphonaceae	18	<i>Colpomenia sinuosa</i> (Mertens ex Roth) Derbes & Solier
Rhodophyta	Rhodophyceae	Gracilariales	Gracillariaceae	19	<i>Gracilaria Corticata</i> (J. Agardh)
				20	<i>Gracilaria folifera</i> (Forsskal) Borgensen
				21	<i>Gracilaria mammillaris</i> (Montagne) M Howe
				22	<i>Gracilaria saricornia</i> (C. agardh) Dawson
	Florideophyceae	Nemaliales	Scinaiceae	23	<i>Scinaia carnosa</i> (Nutzung) J. Agardh
		Gigartinales	Cystocloniaceae	24	<i>Hypnea Valentiae</i> (Turner) Montagne
		Ceramiales	Ceramiaceae	25	<i>centroceraus clavalatum</i> (C. agardh)
			Rhodomelaceae	26	<i>Acanthophora spicifera</i> (M.Vahl) Borgesen
Bonnemaisoniales	Bonnemaisoniaceae	27	<i>Asparagopsis taxiformis</i> (Delile)		

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