TO STUDY THE SEAWEED DIVERSITY OF THE INTERTIDAL ZONE AT CHORWAD COAST, GUJARAT, INDIA

PRAKASH BAMBHANIYA, PIYUSH VADHER, SHARAD CHHETA, JAGDISH MANGUKIYA

Abstract: Gujarat coastline consist 28 % sandy beach, 21 % rocky coast, 29 % muddy flats, 22 % marshy coast. The marine biodiversity of Gujarat coast of India is rich and much of the world's wealth of biodiversity is found in highly diverse coastal habitats. A present study was carried out on Seaweed accessibility among Chorwad coast of Gujarat coastline to identify the Seaweed resources potential for development of a small-scale fertilizer industry. A large collection of Seaweed was made among the coastal line of Chorwad found 58 species of Seaweed over a 9 months period from July - 2013 to March - 2014. Most of the species were common like *Caulerpa fastigiata, Caulerpa racemosa, Ulva fasciata, Ulva lactuca, Amphiroa anceps, Gelidiella acerosa, Gracilaria corticata, Gracilaria verrucosa, Sargassum cinctum, Sargassum johnstoni* and *Sargassum tenerrimum* were available in Chorwad coast.

Key words: Intertidal Seaweed Diversity, Chorwad coast, algae.

Introduction: India has a coastline of more than 7000 km and an Exclusive Economic Zone (EEZ) over 2 million km^2. A total of 770 species of seaweeds have been reported from different parts of the Indian coasts which includes 184 species of green, 166 species of brown and 420 species of red [1]. Seaweed is macroscopic, multicellular, marine algae that lives near the seabed (benthic). The term includes some members of the red, brown and green algae. Seaweeds can also be classified by use (as food, medicine, fertilizer, filtration, industrial, etc.). The study of seaweed is known as Phycology. Seaweed may belong to one of several groups of multicellular algae: the red algae, green algae, and brown algae. As these three groups are not thought to have a common multicellular ancestor, the seaweeds are a polyphyletic group. In addition, some tuft-forming blue-green algae (Cyanobacteria) are sometimes considered to be seaweeds — "seaweed" is a colloquial term and lacks a formal definition. Seaweeds are considered as ecologically and biologically important component in the marine ecosystems. Seaweeds make a substantial contribution to marine primary production and provide habitat for near shore benthic communities [2], [3].

Materials And Methods: The present investigation was carried out at Rocky and Sandy intertidal area at Chorwad. Total 2.38 km long stretch between 21°00′46.93″N & 70°12′37.87″E and 21°01′29.43″N & 70°11′45.99″E. from July 2013 to March 2014. The intertidal zone of each sampling sites was surveyed regularly on monthly basis and all the Seaweed encountered were recorded. All intertidal Seaweed observed were recorded properly and later classified systematically. Thus Seaweeds under various families were recorded and checklist was prepared. Extensive photography was employed for the identification of the Seaweed species with the identification keys, literature available in the form of books, journals, reports and with extensive use of internet. The complete study was conducted in a non-destructive manner in which the organisms were not at all disturbed. However, few Seaweeds samples were collected and stored immediately in 10 % formaldehyde. They were then brought to the laboratory and washed in running tap water, and then it was subjected for temporary herbarium preparation. They were then brought to the laboratory for further study.

Study Area: India has a vast coastline of approximately 8,100 km along the Arabian Sea in the west and the Bay of Bengal in the east. It is a great significance to our country, a nation with an enormous and unique coast line of two oceans, a couple of Gulfs and a bay. Gujarat shares the lion portion of coastline covering around 1,650 Km. long shore of this the Saurashtra region occupy a total stretch of 985 km. And the present investigation was carried out at Rocky & Sandy intertidal belt at Chorwad (21°01'00" N and 70°14'00"E) Saurashtra coast of Gujarat, India. The present investigation was carried out at Rocky & Sandy intertidal belt at Chorwad about 2.38 Km. between 21°00'46.93"N & 70°12'37.87"E and 21°01'29.43"N & 70°11'45.99"E. My study area Chorwad is coastal part of Junagadh District. Length of the coast of Junagadh District is 192 km, as part of the Saurashtra. The nearest sea port is Veraval and it is mainly used for commercial product exports and imports. Passenger ferries are very limited. Chorwad is one of the most beautiful beaches in India.

Results and Discussions: The present study was conducted to know the status of floral diversity of Chorwad coast. I have visited these site nine times during July'13 to March'14. During study all the three

seasons' i.e. monsoon, winter, and summer were observed. The result of the present investigation shows that the rocky intertidal zone is rich in seaweed. In my study 58 species of floral diversity were recorded. During July'13, Total 30 species of seaweed were recorded, out of them 10 species of Chlorophyta, 6 species of Phaeophyta, and 14 species of Rhodophyta were recorded. During August'13, Total 37 species of seaweed were recorded, out of them 12 species of Chlorophyta, 9 species of Phaeophyta, and 16 species of Rhodophyta were recorded.During September'13, Total 48 species of seaweed were recorded, out of them 17 species of Chlorophyta, 12 species of Phaeophyta, and 19 species of Rhodophyta were recorded.During October'13, Total 46 species of seaweed were recorded, out of them 17 species of Chlorophyta, 12 species of Phaeophyta, and 17 species of Rhodophyta were recorded.During November'13, Total 48 species of seaweed were recorded, out of them 15 species of Chlorophyta, 13 species of Phaeophyta, and 20 species of Rhodophyta were recorded.During December'13, Total 43 species of seaweed were recorded, out of them 11 species of Chlorophyta, 11 species of Phaeophyta, and 21 species of Rhodophyta were recorded.During January'14, Total 40 species of seaweed were recorded, out of them 10 species of Chlorophyta, 19 species of Phaeophyta, and 11 species of Rhodophyta were recorded.During February'14 Total 31 species of seaweed were recorded, out of them 8 species of Chlorophyta, 9 species of Phaeophyta, and 14 species of Rhodophyta were recorded. During March'14, Total 18 species of seaweed were recorded, out of them 7 species of Chlorophyta, 5 species of Phaeophyta, and 7 species of Rhodophyta were recorded.

Conclusion: During present study from July'13 to March'14 total of 58 floral species were recorded. During July'13 to September'13 a number of species was less because this time is not favourable for some intertidal animal due to high temperature and heavy wave splash on starting of winter [4]. During Oct'13 to Jan'14 the total number of invertebrate species was higher due to low temperature.[4]. This is an indication of the ability of the organisms to survive, adapt, migrate or die under favourable and unfavourable environmental conditions. The presence of such a good diverse life forms indicates the higher productivity and healthy ecosystem of Chorwad coast.

ANNEXURE: 01 CHECKLIST OF FLORAL DIVERSITY AT CHORWAD COAST:

NO.	CHLOROPHYTA	JULY 2013	AUG 2013	SEP 2013	OCT 2013	NOV 2013	DEC 2013	JAN 2014	FEB 2014	MAR 2014
1	*Boergesenia forbesii*	-	+	+	+	+	+	-	-	-
2	*Caulerpa fastigiata*	+	+	+	+	+	+	+	+	+
3	*Caulerpa racemosa*	+	+	+	+	+	+	+	+	+
4	*Caulerpa Scalpelliformis*	+	+	+	+	+	+	+	-	-
5	*Caulerpa sertularoides*	+	+	+	+	+	+	+	-	-
6	*Caulerpa taxifolia*	-	-	-	+	+	+	+	+	+
7	*Caulerpa veravalensis*	-	-	+	+	+	+	+	-	-
8	*Chaetomorpha antennina*	+	+	+	+	+	-	-	-	-
9	*Chaetomorpha crassa*	-	-	+	+	+	+	+	-	-
10	*Chamaedoris auriculata*	-	-	+	+	+	-	-	-	-
11	*Codium decorticatum*	-	+	+	+	+	+	+	+	-
12	*Codium dwarkense*	+	+	+	+	-	-	-	-	-
13	*Enteromorpha flexuosa*	+	+	+	+	-	-	-	+	+
14	*Enteromorpha prolifera*	+	+	+	-	-	-	-	+	+
15	*Halimeda tuna*	-	-	+	+	+	-	-	-	-
16	*Ulva fasciata*	+	+	+	+	+	+	+	+	+
17	*Ulva lactuca*	+	+	+	+	+	+	+	+	+
18	*Valoniopsis pachynema*	-	-	+	+	+	-	-	-	-
	RHODOPHYTA									
1	*Acanthophora dendroides*	-	-	-	-	+	+	+	+	-
3	*Amphiroa anceps*	+	+	+	+	+	+	+	+	+
4	*Centroceras clavalatum*	+	+	+	-	-	-	-	-	-
2	*Agardhiella subulata*	+	+	+	+	-	-	-	-	-

5	*Champia compressa*	-	-	+	+	+	+	+	+	-
6	*Champia Indica*	-	-	-	+	+	+	+	-	-
7	*Champia somalensis*	-	-	-	-	+	+	+	+	-
8	*Corallina berteroi*	+	+	+	+	+	+	+	-	-
9	*Cryptonemia Undulate*	-	-	+	+	+	+	+	-	-
10	*Gelidiella acerosa*	+	+	+	+	+	+	+	+	+
11	*Gracilaria corticata*	+	+	+	+	+	+	+	+	+
12	*Gracilaria corticata Var. cylindrica*	+	+	+	+	+	+	+	+	+
13	*Gracilaria Dura*	-	-	-	-	-	+	+	-	-
14	*Gracilaria verrucosa*	+	+	+	+	+	+	+	+	+
15	*Grateloupia Indica*	+	+	+	+	+	+	+	+	-
16	*Halymenia venusta*	+	+	+	+	+	+	+	+	-
17	*Hypnea Pannosa*	+	+	+	+	+	+	+	-	-
18	*Hypnea spinella*	-	+	+	+	+	-	-	-	-
19	*Jenia rubens*	-	-	+	+	+	+	-	-	-
20	*Laurencia cruciata*	+	+	+	-	-	-	-	-	-
21	*Laurencia papillosa*	-	-	-	-	-	+	+	+	-
22	*Sarconema filiforme*	+	+	+	-	+	+	+	+	-
23	*Sarconema scinaioides*	+	+	+	-	-	-	-	-	+
24	*Scinaia Carnosa*	-	+	+	+	+	+	-	-	-
25	*Sebdenia polydactyla*	-	-	-	+	+	+	+	+	-
26	*Solieria Robusta*	-	-	-	-	+	+	+	+	-
	PHEOPHYTA									
1	*Colpomenia sinuosa*	-	+	+	+	+	-	-	-	-
2	*Cystoseira indica*	-	-	+	+	+	-	-	-	-
3	*Dictyota bartayresiana*	-	+	+	+	+	+	+	+	-
4	*Dictyota Dichotoma*	-	+	+	+	+	+	+	-	-
5	*Iyengaria stellata*	-	-	+	+	+	+	+	+	+
6	*Padina gymnospora*	+	+	+	+	+	+	+	+	-
7	*Padina tetrastromatica*	+	+	+	+	+	+	+	+	-
8	*Sargassum cinctum*	+	+	+	+	+	+	+	+	+
9	*Sargassum johnstoni*	+	+	+	+	+	+	+	+	+
10	*Sargassum plagiophyllum*	+	+	+	+	-	-	-	-	-
11	*Sargassum tenerrimum*	+	+	+	+	+	+	+	+	+
12	*Sargassum vulgare*	-	-	-	-	+	+	+	+	-
13	*Spatoglossum asperum*	-	-	+	+	+	+	+	+	+
14	***Stoechospermum marginatum***	-	-	-	-	+	+	+	-	-

References:

1. Sahoo D., 2001. Seaweeds of Indian coast. A.P.H. Publishing
2. Mann, 1973; Williams & Smith, 2007.
3. Williams S.L. & Smith, J.E., 2007.
4. Bhadja, Poonam. (2010). "Marine wealth of Saurashtra Coast: Spatial and Temporal variations in the seawater Quality and its role in intertidal assemblage and macro faunal diversity around anthropogenically influenced shores", thesis PhD, Saurashtra University, Rajkot.

Prakash Bambhaniya/ Piyush Vadher/ Sharad Chheta/ Jagdish Mangukiya/
Department of Marine Sciences/ Maharaja Krishnakumarsinhji Bhavnagar University/ Bhavnagar/ India
Prakashbambhaniya72@gmail.com/vadher.piyush4@gmail.com/
chhetasharad@gmail.com/mangukiya_jagdish@yahoo.in