



## **Evaluation of Algal Biodiversity along Western Coasts of India; A Review**

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### **Abstract**

Assessment of regional diversity of marine algae is the preliminary step of phycological researches. Current paper reviews various works that have been undertaken for the examination of algal biodiversity at different states (Gujarat, Maharashtra and Goa) of southern coast of India. The commonness and variations among different states of the same coast has been studied and indexed.

**Keywords:** Biodiversity, Algae, Phycological.

### **Introduction**

Algae, the simplest groups of plant kingdom have recently become a main attraction of biological and medical research for their potential constituent phytochemicals are known to contain various nutritive and medicinal compounds. In medicine itself algae are being tested for its suitability in manufacturing various pharmaceuticals, while in biological researches, its nutritional assay, extraction and separation have

already been shown their miscellaneous content of beneficial minerals and nutrients. As all these properties of algae make them an interested field of botanical researches, it is important to primarily assess the biodiversity and richness of these groups. Current paper reviews the algal survey works undertaken by various authors along the western coasts of India, i.e., along the selected coastal areas of Gujarat, Maharashtra and Goa (Figure 1).

Figure 1: India Map showing Western coast



## Reviews

### 1. Sub-tidal Marine Algae of the Dwaraka Coast (Gujarat)

V K Dhargalkar and G V Deshmukhe, 1996

Numerous research works have already shown that Dwarka coast, Gujarat is a potential habitat for many Marine algae species such that the study of nutritive, medicinal and many other beneficial aspects of different groups of algae as well as the utilization of this natural resources in an appropriate manner for the sustainability of human life can be better undertaken based on these areas.

Dhargalkar and Deshmukhe have reported a total of 35 Marine algae of different classes during 1990. They collected the samples at various depths- 3 to 20 meters of the sea using transect method. The outcomes of their work have suggested that the growth of marine algae on Dwaraka sub tides were maximum at the optimum depth, which is 5 to 8 meters. Even if the water clarity was appreciable at deeper the sea, the growth of algae was quite lesser in such areas and no special algae which grows deeper into the sea could be reported.

From there finding it is clear that Dwaraka sub tides are the treasure trove for Red and Green algal species. Among the 35 species of algae they have reported 20, that is 57.14 % were the members of Rhodophyceae, followed by those green algae have dominated too at a rate of 22.86% that is 8 among the remaining 15 species collected. 7 species were Phaeophyceae members (Table 1).

The main highlight of the study was that they have found that the algal growth was minimized at deeper regions of the sea due to the deposition of silt, that reduced the algal growth at these regions and only one species was recorded from 15 to 20 meters deeper areas. They suggested that the lesser penetration of diffused light into the deeper regions might also be a barrier for the algal growth in these regions. On the basis of the range of depth from the sea shore, the pattern of distribution of algae has compared and it was found that the growth of majority of the recorded algae was maximum at regions of optimum depth that is 0 to 5 meters down from the sea shore (Table 2). Plate 1 represents some of the recorded species of current study.

**Table 1: Distribution of algal species at different depths**

Depth range(m)	Chlorophyta	Phaeophyta	Rhodophyta	Total	Percentage
0-5	2	7	18	27	54%
6-10	6	3	5	14	28%
11-15	3	0	5	8	16%
16-20	0	0	1	1	2%

**Table 2: Comparison between intertidal and sub tidal marine algal distribution**

Division	Intertidal (0-2m)	Subtidal (2-20 m)	Common sp.	Similarity index (%)
Chlorophyta	12	8	6	42.86
Phaeophyta	11	7	5	38.46
Rhodophyta	19	19	12	46.15

**Plate 1: Various algae reported from Dwaraka coast**



*Caulerpa taxifolia*



*Halimeda tuna*



*Caulerpa scalpelliformis*



*Padina tetrastromatica*



*Spatoglossum asperum*



*Sargassum tenerrimum*



*Laurencia obtuse*



*Calliblepharis jubata*



*Gracilaria corticata*

**2. Biodiversity of marine algae along the Raigad coast of Konkan, Maharashtra**

J. S. Ambhore and V. R. Whankatte, 2016

Marine algal biodiversity along different coasts of Raigad, Maharashtra was investigated by Ambhore and Whankatte during 2016. They have collected various algae of different groups separately and identified those by using various previous publications. The collected algae were grouped according to the class in which they have to be included and their occurrence, characters and economic benefits were also mentioned for each of the

recorded species. Various algae from class Chlorophyceae (green algae), Phaeophyceae (brown algae) and Rhodophyceae (red algae) were recorded from Raigad coast, among which red algae were the best distributed species in the selected area. 13 algae each were reported from both class Chlorophyceae and Phaeophyceae. Whereas 18 species of algae recorded were red algae. The recorded species (Plate 2) were beneficially used for various purposes like food, medicine, animal feed, fodder, alginic acid source, raw material for paper industries and as fertilizers (Table 3).

Plate 2: Various algae reported from Raigad coast



*Caulerpa racemosa*



*Acetabularia caliculus*



*Caulerpa peltata*



*Cystoseira indica*



*Dictyota woodwardia*



*Sargassum cinerum*



*Corallina berteroi*



*Gelidium pusillum*



*Gracilaria edulis*

Table 3: Benefits of Algal Species of Raigad Coast

Food	Fodder	Alginate	Medicine	Fertilizer	Industry
<i>Caulerpa microphysa</i>	<i>Acetabularia caliculus</i>	<i>Chaetomorpha antennina</i>	<i>Ulva fasciata</i>	<i>Cystoseira indica</i>	<i>Cladophora glomerata</i>
<i>Caulerpa racemosa</i>	<i>Caulerpa racemosa</i>	<i>Codium dwarkense</i>	<i>Padina tetrastrumatica</i>	<i>Stoechospermum marginatum</i>	<i>Gelidium pusillum</i>
<i>Caulerpa peltata</i>	<i>Caulerpa sertularioides</i>	<i>Monostroma oxyspermum</i>	<i>Sargassum cinerum</i>	<i>Sargassum cinerum</i>	
<i>Chaetomorpha antennina</i>	<i>Caulerpa scealpelliformis</i>	<i>Sargassum tenerrimum</i>	<i>Jania rubens</i>	<i>Sargassum tenerrimum</i>	
<i>Enteromorpha intestinalis</i>	<i>Caulerpa peltata</i>	<i>Dictyota bartayresiana</i>		<i>Acanthophora specifera</i>	
	<i>Chaetomorpha antennina</i>	<i>Sargassum cinerum</i>			
	<i>Ulva fasciata</i>				
	<i>Ulva lactuca</i>				

### 3. A Preliminary Checklist of Marine Algae from the Coast of Goa

N Pereira and M R Almeida, 2012

The thorough knowledge on Marine algae from the Goa region was not much established for recent past years. The main reason for this limitation according to many phycologists was the lack of appropriate literatures. During 2014, Pereira and Almeida conducted a preliminary survey on the algal diversity along the Goa coast. They have chosen 16 different stations along Goa for the study. The work was such an elaborated and intense such that they collected a total of 145 specimens from the northern end to the southern end of Goa comprised the 16 study sites which include Terokol, Chapora, Vagator, Anjuna, Baga, Reis Magos, Dona Paula, Sindao, Mormugoa, Bogmalo, Holant, Betul, Cabo de Rama, Palolem, Talpona and Polem. As the seasonal variations are the main causative factor of establishment or vanishing off of different species of algae, the work was conducted during different seasons.

Plate 3: *Erythrogllossum lusitanicum*



#### Comparative Analysis of Selected Research Works

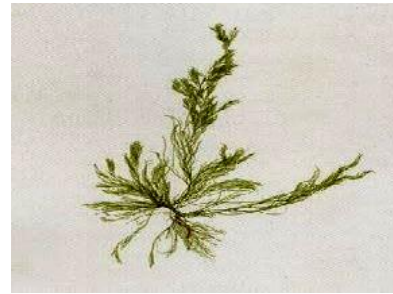
The current review article is based on the algal biodiversity of 3 different coastal areas of 3 different states along western coast of India. Study of algal biodiversity at these sites and the comparative analysis of different areas along the western coast are the primary objective of current study.

The review of algal diversity assessment along Dwaraka coast, Gujarat done by Dhargalkar and Deshmukhe suggested that 35 species of algae inhabited at those areas and among which red algae was the most dominant (20 species). The study of algal richness along Raigad coast of Maharashtra, reported by Ambhore and Whankatte also suggested that among the total 44 species recorded, red algae were the most dominant (18 species). The survey done by Ambhore and Whankatte along the entire coast of Goa has been indexed a total of 145 species and they also found the red algae to be dominant over the other

Among the total 145 species of algae collected 64 species were Rhodophycean algae, 41 were Chlorophycean algae and the remaining 40 were the members of Phaeophyceae. The potentiality of the study was highlighted by the fact that among the total 145 species collected, 70 species have been reported very new records for the Goa coast indicating how essential it is to study the algal wealth along this coast to make use of these species in an appropriate manner for various purposes.

In the current survey endemic algae of Mediterranean Sea- *Erythrogllossum lusitanicum* (Plate 3) was found and it was a new record to Goa coast and even to the Indian coast. Similarly, another endemic species *Cladophoraprehendens* (Plate 4) restricted to Australian coast was also reported from India. From this observation a reasonable conclusion was proposed by the authors that the floral migration along Asia, Europe and Australia resulted due to the shipping activities might be the possible cause for this invasion of new species in Goa coast and also for the well noted disappearance of certain previously recorded species from Goa coast.

Plate 4: *Cladophoraprehendens*



groups. Therefore a class wise comparison of three surveys suggests that the Rhodophycean species are potential inhabitants of western coast of India.

A species wise analysis of the selected articles was carried out for finding the commonness or the variations in the occurrence of species seen among various regions of the western coast of India (Table 4). It has been found that 2 species of green algae- *Caulerpa scalpelliformis* and *C. sertuloides*, 3 brown algae- *Spatoglossum asperum*, *Sargassum tennerium* and *S. cinerum* and 3 species of red algae- *Gracilaria corticata*, *Champia robusta* and *Acanthophora specifera* were common in all the three western coasts selected. This implies a less invasion of common species along the western coast. Seasonal variations and climatic conditions may be given consideration when comparing the affinity of coasts in their species diversity.

Table 4: Some Common Species along Western State Coasts of India

	Species	Gujarat	Maharashtra	Goa
<b>Chlorophyceae</b>	<i>Ulva fasciata</i>		+	+
	<i>Bryopsis plumosa</i>	+		+
	<i>Caulerpa scalpelliformis</i>	+	+	+
	<i>Caulerpa sertuloides</i>	+	+	+
	<i>Codium dwarkenese</i>	+	+	
<b>Phaeophyceae</b>	<i>Stoecospermum marginatum</i>		+	+
	<i>Padina tetrastomatica</i>	+	+	
	<i>Spatoglossum asperum</i>	+	+	+
	<i>Sargassum tennerium</i>	+	+	+
	<i>Sargassum. cinerum</i>	+	+	+
<b>Rhodophyceae</b>	<i>Amphiroa fragilissima</i>	+		+
	<i>Gracilaria corticana</i>	+	+	+
	<i>Hypnea musciformis</i>	+	+	
	<i>Champia compressa</i>	+	+	+
	<i>Acanthophora specifera</i>	+	+	+
	<i>Laurencia obtuse</i>	+		+

## Conclusion

The comparative analysis of the algal inhabitation of three regions suggests that western coast of India harbors rich vegetation of red algae which dominated all other groups. A species wise analysis conducted and assumed that a total of 8 species found common in all the three state coasts suggests that the research works should be undertaken to analyze the driving causes of variation of species along western coast of India.

The current review reveals that western coast of India acts as a house for various species of algae. The seasonal variations associated with the establishment of these species have proven to be adequate information that has to be gathered before starting algal researches. The current study very well highlights the need of continuous assessment of

marine flora along Indian coast to use these natural resources as excellent source as food, fodder, medicine, and other economic purposes.

## References

1. N Pereira and M R Almeida, 2012: A Preliminary Checklist of Marine Algae from the Coast of Goa, *Indian Jou. Of Geo-Marine Sci.* Vol: 43(4). Pp: 655-665
2. V K Dhargalkar and G V Deshmukhe, 1996: Subtidal Marine Algae of the Dwaraka Coast (Gujarat), *Researchgate*, 27668934
3. J. S. Ambhore and V. R. Whankatte, 2016: Biodiversity of marine algae along the Raigad coast of Konkan, Maharashtra, Pelagia research library, *European Journal of Exp. Bio.* 6(4): 69-76, ISSN: 2248 9215

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