

Distribution of Marine Algae in the Littoral zone of the Karnataka Coast

V. V Agadi *

National Institute of Oceanography
DONA PAULA, GOA-403 004.

ABSTRACT

The Study on the qualitative distribution of marine algal species was made along the Karnataka coast. In all, 43 marine algae were collected from 9 stations along this coast. Species of ENTEROMORPHA, ULVA, SARGASSUM, PADINA, GRACILARIA and GRATELAUPIA were found to be common.

Chlorophyta and Rhodophyta were represented by maximum number of species followed by Phaeophyta. Kumta coast harboured 26 algal species followed by Karwar (23) and Malpe (17). In general, the Karnataka coast showed a poor distribution of marine algae in the littoral zone.

INTRODUCTION

The west coast of India has been studied for the distribution of economically important marine algal resources (Srinivasan, 1960 ; Chauhan & Mirth, 1978 ; Untawale *et al.*, 1979 ; Dhargalkar, 1982). Recently, Subbaramaiah *et al.*, (1979) studied the marine algal resources of Lakshadweep islands. However, Karnataka coast, the southern part of central west coast of India remained unexplored for marine algal distribution. Present paper deals with the qualitative distribution and abundance of marine algae in the littoral zone of the Karnataka coast.

This coast is about 300 km long and has a remarkably straight shoreline with rivers like Kali, Sharavati, Gurupur and Kollur opening into the Arabian Sea. The coast is mostly sandy towards the southern part, while north of Bhatkal, it is rocky, interspersed with sandy beaches (Ahmed, 1972). The interesting feature of this coast is the presence of chain of rocky islands near Malpe and Karwar (Fig. 1).

In all, 9 stations were selected along the Karnataka coast to study the qualitative distribution and abundance of marine algal species. The diagrammatic representation of the shore profiles at various stations under investigation are shown in Fig. 2. These stations were visited every month during 1980-81.

For the climatological data, the average observations for the year 1930 to 1960, were taken (IMD,) According to this, the atmospheric temperature along the Karnataka coast shows seasonal variation from 21.5°C to 32.5°C. The average total rainfall was found to be around 3467 mm, most of which is received during June to September. The Admiralty Charts of the Karnataka coast were used for the average tidal levels according to *Chart Datum* and are indicated below.

Present Address : P. I. D. (CSIR) Hillside Road, New Delhi - 110 012.

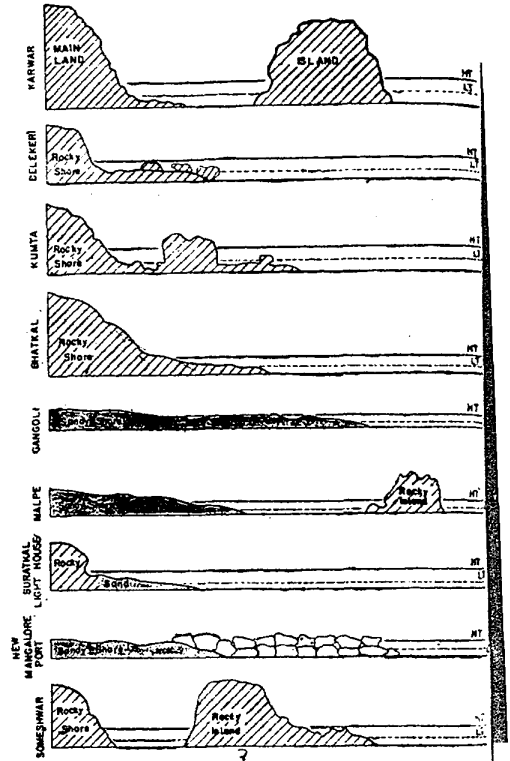
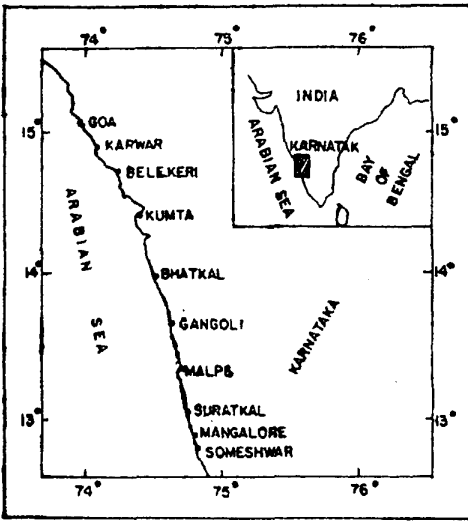


Table 1

Stations	Lat.	Long.	Hts. in metres above Datum				
			MHHW	MLHW	MHLW	MLLW	MSL
Karwar	14°49'	74°07'	1.83	1.55	0.85	0.27	1.13
Bhatkal	13°58'	74°32'	1.16	0.98	0.52	0.12	0.70
Malpe	13°21'	74°42'	1.55	1.42	0.86	0.30	1.04
Mangalore	12°51'	74°51'	1.58	1.37	0.85	0.43	1.01

Marine algal distribution :

In all 43 species belonging to 33 genera have been recorded. Chlorophyta and Rhodophyta had 16 species each, while Phaeophyta was represented by 10 species. Only one species of Cyanophyta

was observed. Maximum number of species were collected from Kumta (26) and Karwar (23), while Galgoli and Belekeri coasts were poor in marine algal growth. The systematic list of marine algae is given below.

I. CHLOROPHYTA

1. *Enteromorpha flexuosa* (Wulfen) J. Agardh Karwar and nearby islands, Belekeri, Kumta, Gangoli, Malpe and nearby islands, Suratkal Light House, New Mangalore port and Someshwar.
 2. *E. intestinalis* (Linn.) Link Karwar and nearby islands
 3. *Ulva fasciata* Delile Karwar and Anjdiv island, Befekeri, Kumta, Bhatkal, Malpe and nearby islands, Suratkal light house and Someshwar.
 4. *U. lactuca* Linn. Karwar
 5. *U. reticulata* Forssk Karwar
 6. *Monostroma* Sp. Mavinhole creek, Karwar
 7. *Chaetomorpha linum* (Muller) Kuetzing Suratkal lighthouse
 8. *C. Media* (C. Agardh) Kuetzing Karwar, nearby islands, Kumta, Bhatkal, Malpe and nearby islands, Suratkal light house, New Mangalore port, Someshwar.
 9. *Cladophora* Sp. Suratkal light house, Someshwar
 10. *Ernodesmis verticillata* (Kuetzing) Boergesen Karwar and nearby islands
 11. *Microdictyon* Sp. Kumta, Suratkal light house and Someshwar
 12. *Bryopsis plumosa* (Hudson) C. Agardh Malpe and nearby islands, Suratkal lighthouse
 13. *Caulerpa peltata*, Lamour. Karwar and nearby islands, Bhatkal, Malpe and nearby islands
 14. *C. racemosa* (Forsskal) J. Agardh Kumta, Malpe and nearby islands, Suratkal light house
 15. *C. scalpelliformis* Weber-van Bosse Karwar, Malpe and nearby islands
 16. *C. sertularioides* (Gmelin) Howe Bhatkal, Malpe and nearby islands, Suratkal light house
- ## II. PHAEOPHYTA
17. *Sphacelaria furcigera* Kuetzing Karwar and nearby islands, Kumta, Bhatkal, New Mangalore Port.

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| 18. <i>Dictyota bartayresiana</i> Lamour. | Kumta, Malpe and nearby islands |
| 19. <i>D. dichotoma</i> (Hudson) Lamour. | Kumta, Bhatkal |
| 20. <i>D. dumosa</i> Boergesen | Kumta |
| 21. <i>Dictyopteris australis</i> Sonder | Karwar and islands |
| 22. <i>Padina tetrastromatica</i> Hauck | Karwar and islands, Kumta, Bhatkal, Malpe and nearby islands |
| 23. <i>Stoechospermum marginatum</i> (J. Agardh) Kuetzing | Karwar and islands, Malpe and islands |
| 24. <i>Colpomenia sinuosa</i> (Roth) Derbes et Solier | Malpe and islands |
| 25. <i>Sargassum ilicifolium</i> (Turner) J. Agardh | Karwar and islands, Belekeri, Kumta, Bhatkal, Suratkal lighthouse. |
| 26. <i>Sargassum tenerrimum</i> J. Agardh | Karwar and islands, Kumta, Malpe and islands |
| III. RHODOPHYTA | |
| 27. <i>Porphyra vietnamensis</i> Tanaka et Ho | Karwar and islands |
| 28. <i>Gelidiopsis variabilis</i> (Greville) Schmitz | Kumta, Bhatkal |
| 29. <i>Gelidium pusillum</i> (Stackhouse) Le Jolis | Kumta, Suratkal light house |
| 30. <i>Amphiroa fragilissima</i> (Linn) Lamour. | Karwar, Kumta, Bhatkal, Malpe and islands |
| 31. <i>Cheilosporum spectabile</i> Harvey | Karwar and islands, Bhatkal, Malpe and islands |
| 32. <i>Grateloupia lithophila</i> Boergesen | Kumta, New Mangalore port, Someshwar |
| 33. <i>Gracilaria corticata</i> J. Agardh | Karwar and islands, Kumta, Bhatkal, Suratkal light house, New Mangalore port, Someshwar. |
| 34. <i>Hypnea musciformis</i> (Wulfen) Lamour | Karwar and islands, Kumta, Bhatkal, Suratkal light house, New Mangalore port, Someshwar. |
| 35. <i>Champia</i> Sp. | Kumta |
| 36. <i>Ceramium</i> Sp. | Kumta, Suratkal lighthouse |
| 37. <i>Centroceras clavulatum</i> (C.Agardh) Montagne | Kumta, Bhatkal, Suratka light house, New Mangalore port, Someshwar |

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| 38. <i>Caloglossa lepreurii</i> (Montagne) J. Agardh | Karwar and islands, Kumta, New Mangalore port |
| 39. <i>Taenioma perpusillum</i> (J. Agardh) J. Ag. | Bhatkal |
| 40. <i>Polysiphonia</i> sp. | Karwar and islands, Malpe and islands, New Mangalore port |
| 41. <i>Acanthophora spicifera</i> (Vahl.) Boergesen | Kumta, Malpe and islands, New Mangalore port. |
| 42. <i>Laurencia papillosa</i> (Forsskal) Greville | Kumta, Malpe and islands, New Mangalore port |
| IV. CYANOPHYTA | |
| 43. <i>Schizothrix creswelli</i> Harvey | Belekeri, Malpe and Islands |

Among the species collected, species of *Enteromorpha*, *Ulva*, *Sargassum* and *Gracilaria*, were found to be more dominant along the coast. Majority of the species were growing on rocky substratum, while sandy areas were devoid of any algal vegetation. The backwater regions fringed with mangroves also harboured some species like *Ulva reticulata*, *Monostroma* sp. (Bopaiah, 1980) *Caloglossa lepreurii* and *Chaetomorpha linum*. Most of the species collected from Karnataka coast have also been recorded earlier from Saurashtra, Maharashtra & Goa (Chauhan & Krishnamurthy, 1968; Misra, 1960; Boergesen, 1935, Dixit, 1933, 40; Untawale et al., 1979; Dhargalkar, 1982).

During the studies on the marine algae of the littoral region, different zones were studied as reported by Misra (1960), Stephenson & Stephenson (1979), Doty (1946). The algal species were found to prefer certain positions as per the tidal levels, light requirements and other relevant parameters. Although some of the species were found to encroach on other zone, but their original level is maintained.

The uppermost littoral zone also

called the supralittoral fringe was occupied by *Porphyra vietnamensis*, which grows only during monsoon (June to September) along the central west coast of India. Only monsoonal waves or their spray can reach this top portion of this zone which otherwise remains dry during October to May. No other algal species were found at any time of the year in this region. *P. vietnamensis* has recently been reported from the Goa coast (Dhargalkar et al., 1981) and subsequently observed all along the Maharashtra and Goa coast. This species was earlier reported from the east coast during premonsoon months by Sreeramulu (1952), Umamaheswar Rao and Sreeramulu (1963).

Other algal species recorded from the upper littoral zone, but below the *Porphyra* belt, were *Ulva fasciata*, *Enteromorpha flexuosa* and *Chaetomorpha media*. However, at Karwar, Kumta, Bhatkal and nearby islands, a few rock pools of varying depth were observed in the upper littoral and midlittoral regions, where *U. fasciata*, *E. flexuosa*, *C. media*, *Gracilaria corticata*, *Hypnea musciformis* and *Caulerpa* spp. were recorded. Similar rock pools have been noticed at Ratnagiri (Untawale et al.,

1979) with varieties of species. Misra (1960) has also observed a similar pattern of zonation along the north western coast of India (from Okha to Bombay), however, he has not reported the occurrence of *C. media* which is otherwise common along the Maharashtra, Goa and also Karnataka coasts.

Backwater areas (Mavinhole creek, Karwar) fringing with mangroves were the sites for algal species like *U. reticulata*, *U. lactuca*, *E. intestinalis* and *Monostroma* sp. Untawale *et al.*, (1979, 80) have reported the occurrence of *Monostroma* sp. from the Ratnagiri coast and Bopaiah (1980) from Karwar. Another species which was noticed on mangrove roots was *Caloglossa leprieurii*.

The midlittoral zone of this coast varies according to the profile gradient of the rocky cliffs. According to Misra (1960) this zone usually gets inundated more frequently than the upper littoral zone. The algal species found in this zone were *Colpomenia sinuosa*, *Ceramium* sp. *Monostroma* sp. and *Caloglossa leprieurii*.

In the lower littoral zone, which is mostly submerged, the species which can not tolerate long exposures or dessication were observed. These are species of

Sargassum, *Dictyota*, *Dictyopteris*, *Spathoglossum*, *Laurencia* growing particularly on rocky substratum. The sandy substratum usually showed the presence of *Caulerpa peltata*, *C. racemosa*, *C. sertularioides* and *C. scalpelliformis*. However, species like *Gracilaria corticata* and *Grateloupia lithophila* having strong holdfasts were found growing in the regions where strong wave action or current is present. According to Setchell (1926), such species are known as 'Pheophilic' algae. Among the species recorded from this coast, *Padina tetrastromatica* generally occupies the region from midlittoral to lower littoral zone.

The northern Karnataka coast is rocky, however, as in Goa, the shore profile is quite steep resulting into the limited intertidal expanse. On the contrary the south Karnataka coast is mostly sandy and hence the marine algal biomass is significantly less compared to the northern part. In spite of such unfavourable geomorphological characters of the Karnataka coast, some pockets exist where a good representation of marine algal distribution is seen. However, as compared with Goa and Maharashtra coast, the marine algae along the Karnataka coast is poor both qualitatively and quantitatively.

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V. V. Agadi and
V. K. Dhargalkar

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