

DISTRIBUTION AND SEASONAL CHANGES OF MARINE ALGAL FLORA FROM SEVEN LOCALITIES AROUND MANDAPAM

S. Kalimuthu, N. Kaliperumal and J.R. Ramalingam
Regional Centre of Central Marine Fisheries Research Institute,
Marine Fisheries - 623 520, Tamil Nadu

Abstract

Studies on the distribution and seasonal changes in the marine algal flora was made for a period of one year from July '83 to June '84 by making fortnightly collection of algae from intertidal and subtidal regions upto 1.0 m depth at seven localities along Mandapam coast namely Rameswaram, Pamban, Krusai Island, Thonithurai, Seeniappa Darga, Pudumadam and Kilakarai. Totally 104 algal species belonging to the groups Chlorophyta, Phaeophyta, Rhodophyta and Cyanophyta were recorded from these places. A maximum number of 77 algal species at Krusadai Island and a minimum number of 35 species at Rameswaram were recorded.

Introduction

Floristic studies on the marine algae growing in Mandapam area were made by several workers. Chacko *et al* (1955) listed the algal flora of Krusadai Island. Varma (1959) studied the seasonal succession of algae on a fresh substratum at Palk Bay. Umamaheswara Rao (1969) listed 182 algal species from different localities around Mandapam. Studies were made on the ecology of intertidal algae of Mandapam coast (Umamaheswar Rao, 1972 a) and the algae occurring on the coral reefs at Gulf of Mannar and Palk Bay (Umamaheswara Rao, 1972 b) and also between Pamban and Theedai (Umamaheswara Rao, 1973). Subbaramaiah (1974) studied the algal vegetation at Mandapam Camp in the Gulf of Mannar during different seasons in a year. Subbaramaiah *et al* (1977) studied the distribution pattern of algae at Pamban. The marine algae occurring between Mandapam and Kilakarai and Gulf of Mannar Islands including Krusadai Island were recorded during the seaweed resources survey conducted along the Tamil Nadu coast by Central Marine Fisheries Research Institute, Central Salt & Marine Chemicals Research Institute and Dept. of Fisheries, Govt. of Tamil Nadu during 1971-1976 (Anon, 1978).

The present study was undertaken with a view to know the changes taken place in the algal composition and the seasonal changes in the distribution during one year period from seven important seaweed growing localities of Mandapam area. The information collected in the present investigation would be very much useful to the seaweed industries about the occurrence of economically important agar and algin yielding seaweeds for commercial exploitation and collection of seed materials from the available localities for cultivation. The data collected for a period of one year from July '83 to June '84 are presented in this communication.

Area investigated

Mandapam is situated (78° 08'E and 9° 17' N) on the southeast coast of Tamil Nadu in between Palk Bay and Gulf of Mannar in the north and south side (Fig.1). Seven stations namely Rameswaram, Pamban, Krusadai Island, Thonithurai, Seeniappa Darga, Pudumadam and Kilakarai were selected for

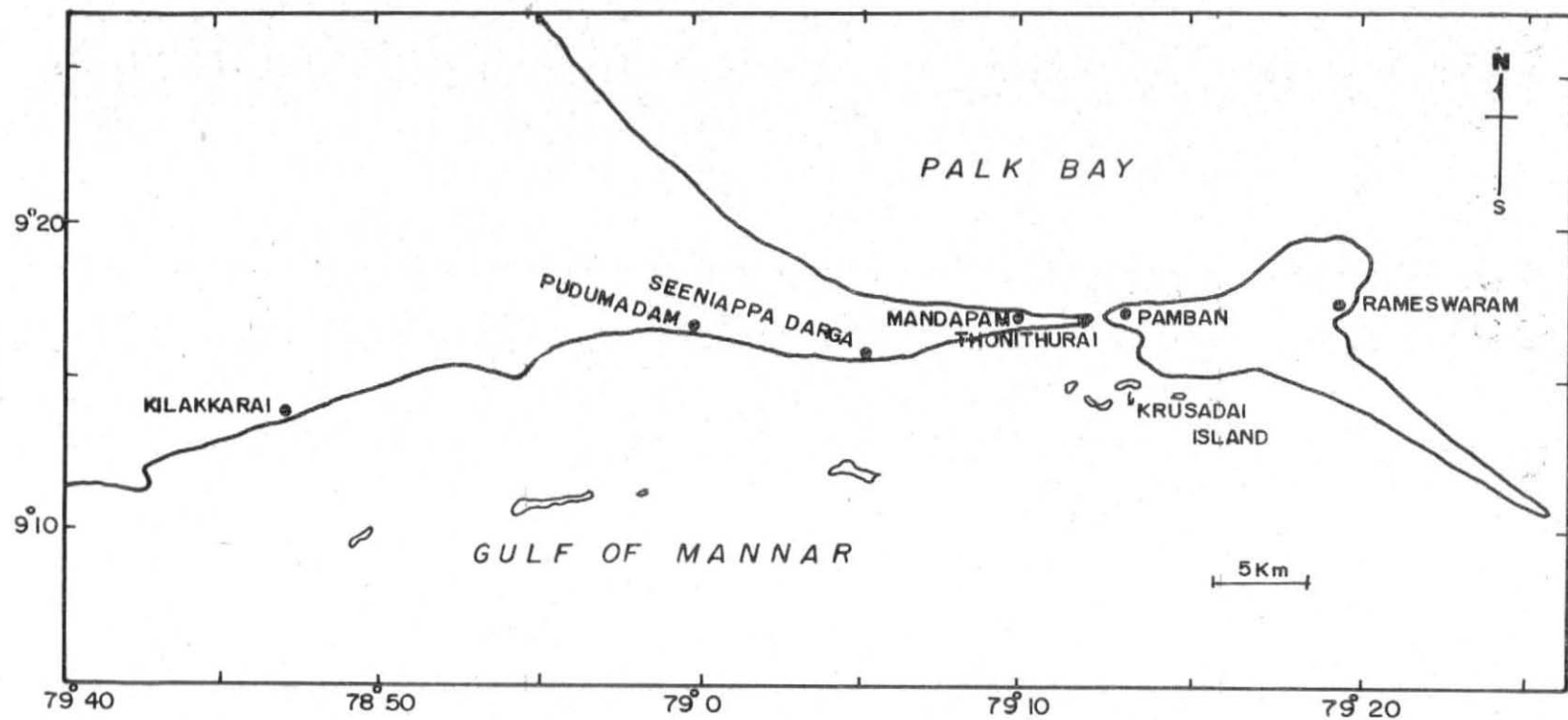


Fig.1. Map showing the collection localities around Mandapam.

Table 1. List of marine algae recorded at seven localities of Mandapam coast during July '83 to June '84

Sl No.	Name of the algae	1	2	3	4	5	6	7
<i>CHLOROPHYTA</i>								
	1. <i>Enteromorpha compressa</i> (Linn.) Grev.	+	+	+	+	+	+	+
*	2. <i>E. intestinalis</i> (Linn) Link	+	-	+	+	-	+	-
	3. <i>Ulva lactuca</i> Linnaeus	+	+	+	+	+	+	+
*	4. <i>U. reticulata</i> Forsskal	-	+	+	+	+	+	+
*	5. <i>Chaetomorpha aerea</i> (Dillw.) Kuetz.	+	+	+	+	+	+	+
	6. <i>C. antennina</i> (Bory) Kuetz.	-	-	-	+	+	+	-
*	7. <i>C. linoides</i> (Ag.) Kuetz.	+	+	+	+	+	+	+
*	8. <i>Cladophora fascicularis</i> (Mertens) Kuetz.	+	+	+	+	+	+	+
	9. <i>Rhizoclonium kochianum</i> Kuetz.	+	-	+	+	-	+	-
	10. <i>Bryopsis bypnoides</i> Lamouroux	+	+	-	-	-	-	+
	11. <i>B. plumosa</i> (Huds.) Ag.	-	-	-	+	+	+	-
	12. <i>Caulepra chemnitzia</i> (Esper) Lamour.	-	-	+	-	-	-	-
	13. <i>C. corynephora</i> Montagne	-	-	+	-	-	-	-
	14. <i>C. cupressoides</i> (Vahl) C. Ag.	-	+	+	+	-	-	-
	15. <i>C. fergusonii</i> Murray	-	+	-	+	+	-	-
	16. <i>C. peltata</i> Lamouroux	+	-	+	+	+	+	+
	17. <i>C. laetevirens</i> Montagne	-	-	+	-	-	+	+
	18. <i>C. racemosa</i> (Forssk.) J. Ag.	+	+	+	+	+	+	+
	19. <i>C. scalpelliformis</i> (R.Br.) C. Ag.	-	-	+	+	+	+	+
	20. <i>C. sedoides</i> (R.Br.) C. Ag. f. <i>crassicaulis</i> J. Ag.	-	-	+	-	+	+	+
	21. <i>C. serrulata</i> (Forssk.) J. Ag.	-	+	-	-	-	-	-
	22. <i>C. sertularioides</i> (Gmelin) Howe f. <i>longiseta</i> J. Ag.	+	+	+	+	+	+	+
	23. <i>C. taxifolia</i> (Vahl) C. Ag.	+	+	+	+	+	+	+
*	24. <i>Acetabularia calyculus</i> Quiot et Guimard	-	-	+	-	-	-	-
*	25. <i>Neomeris annulata</i> Dickie	-	+	+	-	-	-	-

26.	<i>Anrainvillae erecta</i> (Berk.) Gepp	-	-	+	-	-	-	-
27.	<i>Chlorodesmis hildebrandtii</i> A. & E.S. Gepp	-	-	-	+	-	+	-
*	28. <i>Codium adhaerens</i> Anderson	-	-	+	+	-	-	-
	29. <i>Halimeda gracilis</i> Harv. ex. J. Ag.	-	+	+	+	+	+	+
	30. <i>H. macroloba</i> Decaisne	-	+	-	+	+	+	+
*	31. <i>Andyomene stellata</i> (Wulf.) C. Ag.	-	-	+	-	-	-	-
	32. <i>Boergesenia forbesii</i> (Harv.) Feldmann	+	-	+	+	+	+	+
*	33. <i>Cladophoropsis zoolingeri</i> (Kuetz.) Boergs.	-	-	+	+	+	+	+
	34. <i>Dictyosphaeria cavernosa</i> (Forssk.) Boergs.	-	-	+	+	-	+	-
*	35. <i>Microdictyon tenuis</i> (Ag) Decsne	-	-	+	-	-	-	-
*	36. <i>Valonia aegagrophila</i> C. Ag.	+	-	-	+	-	-	-
	37. <i>Valoniopsis pachynema</i> (Martens) Boergs.	+	-	+	+	+	+	

PHAEOPHYTA

*	38. <i>Ectocarpus breviarticulatus</i> J. Ag.	-	-	+	+	-	+	-
*	39. <i>Sphacelaria furcigera</i> Kuetzing	-	-	-	-	-	+	-
*	40. <i>S. tribuloides</i> Meneghini	-	-	-	-	-	+	-
*	41. <i>Dictyopteris delicatula</i> Lamouroux	-	+	-	-	-	-	-
*	42. <i>Dictyota bartaryresiana</i> Lamouroux	-	+	+	+	+	+	-
*	43. <i>D. dichotoma</i> (Huds.) Lamouroux	+	+	+	+	+	+	+
	44. <i>Padina boergeseni</i> Allender and Kraft	+	+	+	+	+	+	+
	45. <i>Pocockiella variegata</i> (Lamour.) Papenfuss	-	-	+	+	-	-	-
	46. <i>Stoechospermum marginatum</i> (C. Ag.) Kuetz.	-	-	+	+	+	+	-
*	47. <i>Colpomenia sinuosa</i> Derbes et Sol.	-	+	+	+	-	+	+
*	48. <i>Ydroclathrus clathratus</i> C.Ag.	-	+	+	+	-	-	+
*	49. <i>Rosenvingeia intricata</i> (J. Ag.) Boergs.	-	-	+	+	-	-	-
	50. <i>Cystoserira trinodis</i> (Forsskal) C. Ag.	-	-	+	-	-	+	-
	51. <i>Hormophysa triquetra</i> (Linnaeus) Kuetz.	-	-	+	-	-	-	-
	52. <i>Sargassum ilicifolium</i> (Turner) J. Ag.	-	-	+	+	+	+	-
	53. <i>S. myriocystum</i> J. Ag.	+	+	+	+	-	+	+
	54. <i>S. plagiophyllum</i> (Mert.) Agardh	-	-	-	+	-	-	-
	55. <i>S. wightii</i> Greville	+	+	+	+	+	+	+
	56. <i>Turbinaria conoides</i> Kuetzing	-	+	+	+	-	-	+
	57. <i>T. decurrens</i> Bory	-	+	+	-	-	-	-

58. *T. ornata* J. Ag. - + + + - - -

RHODOPHYTA

- * 59. *Liagora erecta* Zeh - + + + - + -
- * 60. *Galaxaura oblongata* Lamouroux - - + - - - -
61. *Gelidium pusillum* (Stackhouse) Le Jolis - - - - - + +
62. *Pterocladia heteroplotos* (Boergs.)
Umamaheswara Rao et Kaliaperumal + + - + + + +
63. *Gelidiella acerosa* (Forsskal) et Hamel - - + + + + +
- * 64. *Chondrococcus hornemanii* (Mert.) Schmitz - - + - - - -
65. *Amphiroa anceps* (Lamk.) Decsne - - + - - - -
66. *A. fragilissima* (Linnaeus) Lamouroux - + + + + + +
67. *Cheilosporium spectabile* Harvey - - + + + + -
68. *Jania rubens* (Linnaeus) Lamour. + + + + + + +
69. *Grateloupia filicina* (Wulf.) J. Ag. - + - - + + +
70. *G. lithophila* Boergesen - - - - + + -
71. *Gelidiopsis variabilis* (Greville) Schmitz - - - + + + +
72. *Gracilaria arcuata* Zan. var.
arcuata Umamaheswara Rao - - + + - - +
73. *G. corticata* var. *corticata* J. Ag. - - - + + + +
74. *G. corticata* J. Ag. var.
cylindrica Umamaheswara Rao - - + + + + +
75. *G. crassa* (Harvey) J. Ag. + + + + - - -
76. *G. edulis* (Gmelin) Silva + - + + + - -
77. *G. folifera* (Forsskal) Boergs. + - + + - - -
- * 78. *G. lemaneiformis* (Bory) Weber van Bosse - + + + - - +
- * 79. *G. textoril* (Suringar) J. Ag. - - + - - - -
- * 80. *Sarconema furcellatum* San. - + - + - + +
- * 81. *Solieria robusta* (Greville) Kylin - - + - - - -
82. *Hynpea musciformis* (Wulf.) Lamour. - + + - + - +
83. *H. pannosa* J. Ag. + - - - - - -
84. *H. valentiae* (Turner) Montagne + + + + + + +
- * 85. *Gymnogongrus pygmaeus* (Greville) J. Ag. - - - - - + -
- * 86. *Gigartina acicularis* (Wulf.) Lamouroux + - - + + + +
87. *Champia globulifera* Boergesen - - - + + + +

88.	<i>C. parvula</i> (C. Ag.) Harvey	+	+	+	+	+	+	+
89.	<i>Centroceras clavulatum</i> (C. Ag.) Mont.	+	+	+	+	+	+	+
* 90.	<i>Ceramium cruciatum</i> Collins et Harvey	+	+	+	+	+	+	+
* 91.	<i>Spyridia filamentosa</i> (Wulf.) Harvey	-	-	-	+	-	-	-
* 92.	<i>Nitophyllum marginale</i> Harvey	-	-	+	-	-	-	-
93.	<i>Acanthophora muscoides</i> (Linnaeus) Boergs,	+	+	+	+	+	+	-
94.	<i>A. spicifera</i> (Vahl) Boergs.	+	+	+	+	+	+	+
* 95.	<i>Falkenbergia hillebrandii</i> (Bornet) Falkenberg	-	-	+	-	-	+	-
* 96.	<i>Herposiphonia insidiosa</i> (Greville) Falkenb.	-	-	-	+	+	+	+
97.	<i>Laurencia obtusa</i> (Huds.) Lamouroux	-	+	+	+	-	+	+
98.	<i>L. papillosa</i> (Forsskal) Greville	+	+	+	+	+	+	+
99.	<i>L. poitei</i> (Lamouroux) Howe	-	-	+	+	+	+	+
* 100.	<i>Leveillea jungermannoides</i> (Mert. et Hering) Harvey	-	-	+	+	-	+	-
* 101.	<i>Polysiphonia unguiformis</i> Boergs.	+	-	+	+	+	+	-
* 102.	<i>Roschera glomerulata</i> (C. Ag.) Webber van Bosse	-	-	-	+	-	-	-

CYANOPHYTA

* 103.	<i>Lyngbya majuscula</i> Harvey ex Gomont	+	+	+	+	+	+	+
* 104.	<i>Phormidium tenue</i> (Meneghini) Gomont	-	-	-	-	-	+	-

+ Available - Not available * Seasonal occurrence

Table 2. Number of genera and species of marine algae collected from seven localities at Mandapam coast

Sl No.	Locality	Chlorophyta		Phaeophyta		Rhodophyta		Cyanophyta		Total	
		Genera	Species	Genera	Species	Genera	Species	Genera	Species	Genera	Species
1.	Rameswaram	10	15	3	4	11	15	1	1	25	25
2.	Pamban	8	16	7	11	14	17	1	1	30	45
3.	Krusadai Island	17	29	12	17	20	30	1	1	50	77
4.	Thonithurai	15	26	10	15	22	31	1	1	48	73
5.	Seeniappa Darga	10	20	4	6	17	24	1	1	32	51
6.	Pudumadam	13	24	8	12	23	29	2	2	46	67
7.	Kilakarai	10	18	6	7	17	23	1	1	34	49

this study (Fig.1) since they bear luxuriant growth of seaweeds throughout the year. At Rameswaram, Thonithurai, Seeniappa Darga, Pudumadam and Kilakarai, the shore is sandy with boulders and platforms of compressed sandstones with rough end uneven surfaces situated at different level from high water to low water. At Pamban and Krusadai Island, the shore is mainly sandy with patches of dead coral pieces and coral heads in low water level which get completely submerged during high tide and exposed during low tide.

Material and Methods

Fortnightly collection of algae during spring tide periods from the intertidal and subtidal region upto 1.0 m depth were made from seven stations. The available macroalgae were collected in polythene bags and microalgae separately in specimen tubes and transported in wet condition with seawater. They were sorted out and identified in the laboratory.

Results and Discussion

The list of marine algae recorded from July '83 to June '84 from the seven localities are given in Table 1. The total number of genera and species of marine algae occurring in each station are given in Table 2. Totally 104 species of algae were recorded from all stations, of which 37 species belong to Chlorophyta, 21 species of Phaeophyta, 44 species of Rhodophyta and 2 species to Cyanophyta (Table 1). Out of 104 species, 44 species were seasonal and occurred during some part of the year (Table 1), while 60 species occurred during the whole year. Among these seven stations, maximum number of 77 species at Krusadai Island and minimum number of 35 species at Rameswaram were recorded. A total number of 73 species from Thonithurai, 67 species from Pudumadam, 51 species from Seeniappa Durga and 49 species from Kilakarai and 45 species from Pamban were recorded (Table 2). In all stations, the distribution of green and red algae were almost equal in number and more than brown and blue-green algae.

In the present study the total number of algal species observed at Rameswaram, Pamban, Krusadai Island, Pudumadam and Kilakarai is more than that recorded by Umamaheswara Rao (1969) from these places. Chacko *et al* (1955) have reported 134 algae and Krishnamurthy and Joshi (1970) have listed 103 species from Krusadai Island. But in the present study only 77 species are found at Krusadai Island. This may be due to the changes in the ecological and environmental conditions within the intermittant period.

Literature cited

- Anon 1978 Report on survey of marine algal resources of Tamil Nadu 1971-1976, CSMCRI, Bhavanagar pp 1-25
- Chacko, P.I., S. Mahadevan & R. Ganesan 1955 A guide to the field study of the fauna and flora of Krusadai Island. Gulf of Mannar Contr. mar. bio. St. Krusadai Island, 3: 1-16
- Krishnamurthy, V. & H.V. Joshi 1970 A check-list of Indian Marine Algae CSMCRI, Bhavanagar, pp. 1-36
- Subbaramaiah, K. 1974 Intertidal ecology of a rocky shore at Mandapam Camp, India Indian J. mar. Sci., 3 (1): 58-60

- Subbaramaiah, K., M.R.P. Nair & V. Krishnamurthy 1977 Distribution pattern of marine algae on the shore of Pamban Seaweed Res. Utiln., 2 (2):74-77
- Umamaheswara Rao, M. 1969 Catalogue of marine algae in the reference collection of the Central Marine Fisheries Research Institute Bull. cent. mar. Fish. Res. Inst., 9: 37-48
- Umamaheswara Rao, M. 1972 a Ecological observation on some intertidal algae of Mandapam coast Proc Indian natl. Sci. Acad., 38 (3&4): 298-307
- Umamaheswara Rao, M. 1972 b Coral reef flora of Gulf of Mannar and Palk Bay Proc. Symp. Corals and Coral Reefs, Mar. biol. Assn. India, Mandapam Camp, pp.217-230
- Umamaheswara Rao, M. 1973 The seaweed potential of the seas around India Proc. Symp. on Living Resources of the Seas Around India, pp.687-692
- Varma, R.P. 1959 Studies on the succession of marine algae on a fresh substratum in Palk Bay Proc. Indian Acad. Sci, B.49: 245-263