

PHOTOSYNTHETIC PIGMENT OF MARINE ALGAE FROM MANDAPAM COAST

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Abstract

Thirty species of marine algae collected from different localities of Mandapam coast (Gulf of Mannar) were analysed for their photosynthetic pigments such as chlorophyll and carotenoids. The lowest value of chlorophyll as well as carotenoids content were found in Rhodophyceae.

The grouping and separation of algae based on coloration has been practiced for over 100 years (Harvey, 1841). Pigments such as chlorophyll and carotenoids play important roles in photosynthesis. Several studies have been conducted in the algal pigment by Ramus *et al.* (1976); Brody *et al.* (1959); Jones *et al.* (1965) and Waaland *et al.* (1974). As there is no detailed work in this line on Indian seaweeds, the present study of thirty species of marine algae belonging to Chlorophyta, Phaeophyta and Rhodophyta from Mandapam coast has been carried out.

Materials and Methods

The plants were collected from different localities of Mandapam coast (Gulf of Mannar) and transported to laboratory in plastic bags containing seawater. The plants were washed thoroughly, blotted, weighed, pulverised in 90% acetone and kept in dark for complete extraction. Pigments analysis were carried out by the method of Jaffery and Humphery (1975).

Result and Discussion

Results of the pigment analysis in different species of Chlorophycean, Phaeophycean and Rhodophycean algae are given in Table 1.

Table - 1.

Chlorophyll and carotenoid contents of different species of algae from Mandapam coast. The value expressed in mg/gm dry weight.

Name of the plant	Dry wt	Chl a	Chl b	Chl c	TC	Carotenoid	Chl/ carotenoid
<i>Enteromorpha compressa</i>	12.41	.0160	.0068	X	.0228	.0073	3.12
<i>Ulva lactuca</i>	14.37	.0412	.0135	X	.0547	.0167	3.28
<i>Ulva reticulata</i>	10.46	.0558	.0082	X	.0640	.0131	4.89
<i>Caulerpa racemosa</i>							
<i>Var. racemosa</i>	07.06	.0384	.0135	X	.0519	.0102	5.09
<i>C.cupressoides</i>	13.51	.0364	.0154	X	.0518	.0106	4.89
<i>C.peltata</i>	10.48	.0265	.0117	X	.0382	.0051	7.49
<i>C.taxifolia</i>	09.13	.0516	.0185	X	.0700	.0289	2.42
<i>C.scalpelliformis</i>	10.41	.0781	.0402	X	.1183	.0292	4.05
<i>Chaetomorpha antennina</i>	09.41	.0219	.0008	X	.0227	.0082	2.77
<i>Bryopsis plumosa</i>	20.18	.0348	.0161	X	.0509	.0156	3.26
<i>Halimeda maculosa</i>	09.58	.0375	.0181	X	.0556	.0127	4.38
<i>H.gracilis</i>	43.55	.0110	.0054	X	.0164	.0037	4.43
<i>Padina boergesinii</i>	17.97	.0276	X	.0045	.0321	.0078	4.12
<i>Colpomenia sinuosa</i>	07.55	.0124	X	.0055	.0179	.0052	3.44
<i>Stoechospermum marginatum</i>	25.30	.0227	X	.0047	.0274	.0060	4.57
<i>Hydroclathrus clathratus</i>	08.85	.0144	X	.0057	.0201	.0028	7.18
<i>Hormophysa triquetra</i>	21.33	.0049	X	.0016	.0065	.0012	5.42
<i>Sargassum myriocystum</i>	17.13	.0259	X	.0092	.0341	.0052	6.56
<i>S.longifolium</i>	20.26	.0141	X	.0111	.0252	.0075	3.36
<i>S.wightii</i>	19.30	.0127	X	.0041	.0168	.0038	4.42
<i>Turbinaria conoides</i>	15.56	.0163	X	.0038	.0201	.0063	3.19
<i>Gelidiella acerosa</i>	42.21	.0071	X	X	.0071	.0031	2.29
<i>Gracilaria corticata</i> var. <i>cylindrica</i>	19.01	.0061	X	X	.0061	.0019	3.21
<i>G.edulis</i>	15.02	.0138	X	X	.0138	.0039	3.54
<i>G.foliifera</i>	17.26	.0127	X	X	.0127	.0024	5.29
<i>G.crassa</i>	08.40	.0119	X	X	.0119	.0041	2.70
<i>Hypnea valentiae</i>	11.94	.0159	X	X	.0159	.0085	1.87
<i>Acanthophora muscoides</i>	10.14	.0054	X	X	.0054	.0009	5.89
<i>A.spicifera</i>	14.38	.0134	X	X	.0134	.0051	2.63

The total chlorophyll content which include chl a and chl b in Chlorophyceae algae was more compared to other group of algae. It varied from 0.0164 in *Halimeda gracilis* to 0.1183 in *Caulerpa scalpelliformis*. The carotenoid content varied from 0.0037 in *H. gracilis* to 0.0292 in *C. scalpelliformis*. The lower value of pigment content in *H. gracilis* was due to higher calcification of the plant. Further the dry weight percentage of *H. gracilis* was found to be more. It was observed that there was a wide variation in pigment content in different species of *Caulerpa*. The chlorophyll to carotenoid ratio varied from 2.42 in *Caulerpa peltata* to 7.49 in *C. cupressoides*.

In Phaeophyta the total chlorophyll content varied from 0.0065 in *Hormophysa triquetra* to 0.0341 in *Sargassum myriocystum* whereas in Rhodophyta it varied from 0.0053 in *Acanthophora muscoides* to 0.0159 in *Hypnea valentiae*. The carotenoid content in Phaeophyta varied from 0.0012 in *H. triquetra* to 0.0078 in *Padina boergesinii* whereas in Rhodophyta it varied from 0.0009 in *A. muscoides* to 0.0085 in *H. valentiae*. The chlorophyll content and the carotenoid content in Rhodophyta was found to be least among all other group of algae.

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LIPID CONTENT OF SOME ALGAE FROM TUTICORIN COAST

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Abstract

Twenty-three genera comprising 25 species of green, brown and red algae of Tuticorin coast were analysed for total lipid content which varied from 17 to 140 mg.g⁻¹. Chlorophyceae and Rhodophyceae members were rich in lipid content compared to Phaeophyceae.

Introduction

Marine algae produce a variety of glycerides or lipids. Many authors have attributed biocidal and antimicrobial properties to these compounds (Padmini Sreenivasa Rao, 1991; Venkataraman Kumar, 1992). Lipid contents of some marine algae of different coasts of India have been reported (Sumitra Vijayaraghavan *et al.*, 1980; Parekh *et al.*, 1983; Parekh and Chauhan, 1987; Sobha *et al.*, 1988; Reeta Jayasankar *et al.*, 1990). However, there is no information on total lipid content of marine algae from Tuticorin coast. Therefore, the present investigation was undertaken to estimate the total lipid content in the commonly available algae of Tuticorin coast.

Materials and Methods

Twenty five species belonging to green, brown and red algae were collected from Red gate to light house stretch of Tuticorin coast. The samples were thoroughly rinsed with fresh water and spread for shade drying. Then these were dried in hot air oven at 60°C. The dried samples were used for lipid estimation. Total lipid content was determined by solvent extraction method using chloroform and methanol (2:1 v/v) (Bligh and Dyer, 1959).