

Abundance of iodine in marine algae of Cape Comorin

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Concentration of iodine in 18 species of marine algae (green, brown and red) from Cape Comorin were analysed by the alcoholic potash method. The values ranged from 2.54 to 70.85 mg/100 g dry weight. High iodine content was observed in red algae (av. 38.07) as compared to green (av. 29.07) and brown (av. 27.18 mg/100 g dry weight) algae.

Iodine is an essential element for many organisms. Its deficiency causes serious disorders such as goitre and cretinism in many parts of the world. Considerable quantity of iodine is required for the preparation of iodine chemicals used in pharmaceuticals, chemical industry and photographic purposes. Although the main source of iodine is Chile Salt Petre, it is also being produced at present in smaller quantities from marine algae in France, Norway, Java and Japan from brown seaweeds and in Russia from red seaweeds¹. Certain seaweeds have the capacity to accumulate iodine in their tissues and therefore some of them can become natural source of iodine. *Ascophyllum*² can concentrate iodine up to 220 times that of seawater (0.01-0.007 ppm) while *Asparagopsis taxiformis*³ (Delile) Collins *et* Harvey can accumulate up to 0.3%. In India the concentrations of iodine in different groups of marine algae was reported³⁻⁶. Information on the iodine content in marine algae of south west coast of India is rather meagre. Hence the present investigation of iodine content in the 18 species collected during February 1993 from Cape Comorin (Kanyakumari) has been undertaken.

The freshly collected specimens from Cape Comorin, (the southern most tip of India at 8°4'45'' N latitude and 77°34' E longitude) during February 1993 were washed with fresh water and freed from extraneous matter. They were dried at room temperature, powdered (100 mesh) and the iodine content was estimated by the alcoholic potash method⁷. The algal powder (5 to 10 g) was refluxed for 24 hours with 30 ml absolute alcohol and 10 g potassium hydroxide. The dried mass was ashed at 450-500°C for about 4 hours. The hot water extract of the ash was made up to 100 ml. About 25 ml of the

solution obtained was acidified to the acid point of methylred, oxidised with bromine water and the excess bromine was boiled off. Potassium iodide (1 g) was then added and the liberated iodine was titrated with 0.001 N sodium thiosulphate using starch as indicator. The results (carried out in duplicate) are presented in Table 1.

Of the 18 species of algae studied, eight belonged to Chlorophyta, two to Phaeophyta and eight to Rhodophyta. *Sarconema filiforme* showed the highest value of iodine content (70.85 mg/100 g dry weight) in the present study. The value obtained herein is within the range of earlier reports⁶. Two species of *Caulerpa* (*C. racemosa* and *C. scalpelliformis*) collected from the same locality and time varied widely in their iodine content. This finding clearly indicated that the iodine showed variation between the different species of the same genus. Similar observations were reported earlier^{2,8,9}. The variation may be associated with the different stages of development. In the present study no iodine was found in *Ulva fasciata* while varying concentrations were reported by earlier studies^{2,4,9} in the same genus. Kappanna & Sitakara Rao⁸ reported that *Ulva lactuca* collected from Hawaii, Massachusetts and Kristineburg contained no iodine. The concentration of iodine in *Chaetomorpha antennina*, *Halimeda tuna* and *Cladophora fascicularis* were lower than the values obtained in the earlier studies^{2,8,9}. In the present analysis *Sargassum tenerrimum*, *Stoechospermum marginatum* and *Hypnea nigrescens* showed higher values than the values of Dave *et al*⁹. Iodine content in *Cladophora fascicularis* and *Polysiphonia tuticurinensis* was higher than the earlier values^{2,9,10}.

Table 1—Iodine content of marine algae

Species	Iodine content (mg/100 g dry wt)
CHLOROPHYCEAE	
<i>Caulerpa scalpelliformis</i>	2.54
<i>Caulerpa racemosa</i>	43.36
<i>Enteromorpha linza</i>	39.13
<i>Chaetomorpha antennina</i>	23.27
<i>Halimeda tuna</i>	19.04
<i>Valoniopsis pachynema</i>	47.59
<i>Cladophora fascicularis</i>	28.55
<i>Ulva fasciata</i>	Nil
PHAEOPHYCEAE	
<i>Sargassum tenerrimum</i>	47.59
<i>Stoechospermum marginatum</i>	6.77
RHODOPHYCEAE	
<i>Gracilaria corticata</i>	9.52
<i>Hypnea nigrescens</i>	46.53
<i>Gymnogongrus pygmaeus</i>	17.98
<i>Chondrococcus hornemanii</i>	48.65
<i>Spyridia insignis</i>	41.24
<i>Sarconema filiforme</i>	70.85
<i>Grateloupia filicina</i>	60.28
<i>Polysiphonia tuticorinensis</i>	9.52

The earlier reports^{8,10} revealed that the element varied in the order Phaeophyceae>Rhodophyceae>Chlorophyceae and Chlorophyceae>Rhodophyceae>Phaeophyceae. While the level of iodine varied in this study in the order Rhodophy-

ceae>Chlorophyceae>Phaeophyceae. This result is in unison with the earlier values². Studies on iodine content indicated that the environmental parameters, the stages of life cycles of algae and the concentration of iodine in seawater have an influence on the absorption and accumulation of iodine by marine algae². In *Asparagopsis taxiformis* Thomas *et al.*³ found a correlation between the variation in iodine content and the growth of algae. Hence it will be worthwhile to perform a seasonwise and stationwise analysis of iodine in marine algae of this coast.

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