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PROXIMATE ANALYSIS OF SOME GREEN AND RED SEAWEEDS REPORTED FROM SINDHUDURG DISTRICT OF MAHARASHTRA

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Abstract:
Primary cell constituents of a few green and red seaweeds collected from Sindhudurg district of Maharashtra are reported. Moisture content was ranged from 25.75-95.99% in all the species of seaweeds. Highest being in *Acanthophra spicifera*. Ash content was more than 11% in different seaweeds. Maximum ash content, carbohydrate and lipid content was recorded in red seaweed *Porphyra vietnamensis*. (20.2 % 21.5% & 15% respectively). Maximum crude fiber content was recorded in green seaweed *Chaetomorpha linum*. Protein content < 10% in all reported species. Maximum being in *Chaetomorpha antennina*.Analysis revealed that Moisture content, ash content, carbohydrate was recorded maximum in red seaweeds while, crude fiber and protein content was more in green seaweeds.

Keywords: Red and Green seaweeds, Proximate analysis

Introduction

Seaweeds are macroscopic algae found in relatively shallow coastal waters. They grow in the intertidal, shallow and deep sea areas. Depending upon pigmentation they are classified as *Chlorophyceae,*(green algae), *Phaeophyceae,* (brown algae) and *Rhodophyceae* (red algae). Seaweeds has been considered for its nutritional value regarding vitamin, protein and mineral contents (5).In asian countries like China, Japan and Korea seaweeds are used as food. In particular, certain seaweeds are known to contain significant quantities of proteins, lipids, vitamin and minerals that are useful for human nutrition.(13).The nutrient composition of seaweeds varies and affected by species, geographic area, season and temperature of the water.(6).Consumption of seaweeds are also useful as source of dietary fiber hence minimize occurrence of some chronic diseases (diabetes, obesity, heart diseases, cancers, etc.) (Southgate, 1990). Present study was mainly focused to evaluate the Proximate composition of some selected green and red seaweeds reported from Sindhudurg district of Maharashtra.

Materials and Mehods

Fresh and mature thalli of green seaweeds (*Chaetomorpha antennina*, *Chaetomorpha linum*, *Enteromorpha intestinalis*, *Ulva fasiata*, *Ulva lactuca*,) and red seaweeds (*Acanthophora spicifera*, *Gelidiella acerosa*, *Gracilaria corticata*, *Jania rubens* and *Porphyra vietnamensis*,) were collected during low tide from rocky seashores of Kunakeshwar in Sindhudurg district along the west coast of Maharashtra (16^0 40'.120'N Latitude and 73^0 28'.120' E Longitude) and brought to laboratory. Collected samples were washed thoroughly with tap water to remove epiphytes and then dried in shade for seven days. Fine powder of this material was used to estimate the proximate composition of the selected species.

Proximate Analysis

Moisture percentage

Moisture content and ash content of seaweeds was determined according to AOAC (1995).

Total Proteins

Total proteins were determined according to the method of Lowry *et al.* (1951).

Crude fiber

Crude fiber content was determined using the method described by Sadasivam and Manickam (1996).

Total Carbohydrates:

Total carbohydrates were estimated according to the Anthrone method described by Sadasivam and Manickam, (1996).

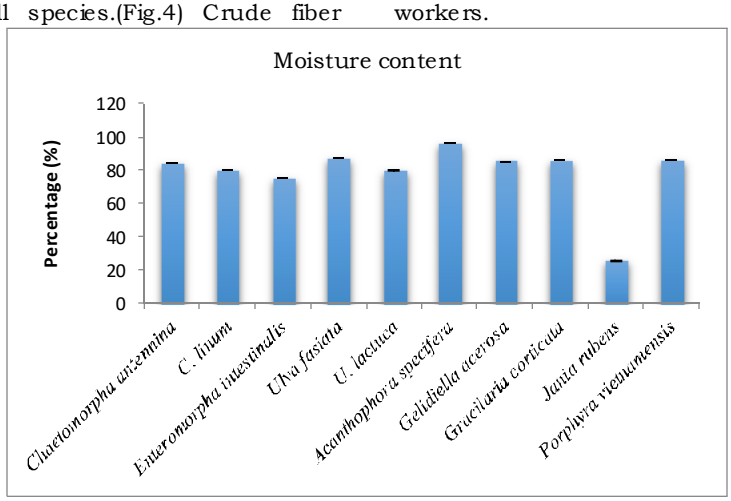
Total lipids:

Lipid content was estimated as per the method described by Folch *et al.* (1957).

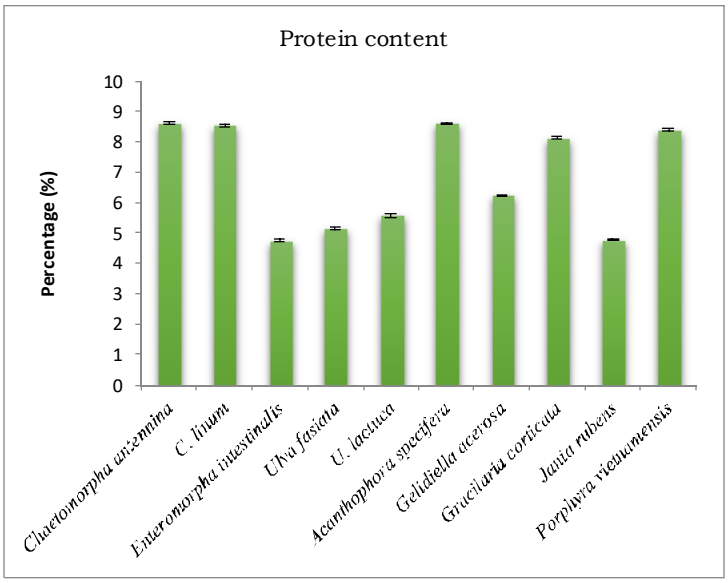
Results and Discussion

Moisture content of green and red seaweeds in present study varied from 25.75 to 95.99%. (Fig.1). Highest being in *Acanthophora spicifera*. In all the red seaweeds it was more than 85%. In all the red seaweeds it was more than 80%, but slightly less in *Chaetomorpha* and *Enteromorpha* species. In green seaweeds it was more than 80% but slightly less in *Chaetomorpha* and *Enteromorpha* species. In *Jania rubens* it was the least (25.75%).Protein is an important constituents as supplemental food for human and performs crucial function in all the biological processes.(7). Protein content ranged from 4.7 to 8.6% in different green and red seaweeds. In both the *Chaetomorpha* species *Acanthophora spicifera* and *Porphyra vietnamensis*.(Fig.2). It was more than 8%. In both the species of *Ulva* which is

popularly consumed as food had about about 5% Protein. Content of carbohydrates ranged from 13.5 to 21.3% in different seaweeds.(fig. 3). being the highest in *Porphyra vietnamensis* (21.3%).The content of carbohydrate was more than 15% in most of species. Ash content ranged from 9.9-20.2% in different seaweeds. Maximum amount was recorded in red species *Porphyra vietnamensis* (20.2%). In green seaweeds ash content was less than red seaweeds but more than 10% in all species.(Fig.4) Crude fiber content ranged from 1.6-16.3% in different green and red seaweeds and maximum was recorded in *Chaetomorpha linum* (18.6%). In all green seaweeds crude fiber content was more than 10% while in red seaweeds it was less than 10% except in *Porphyra* ,*Acanthophora* and *Jania.* (Fig. 5). In present study lipid content ranged from 5-17.5%. Maximum being in red seaweed *Porphyra vietnamensis* (17.5%) (Fig. 6). Proximate analysis of seaweeds has been reported by several workers.



(Figure-1)



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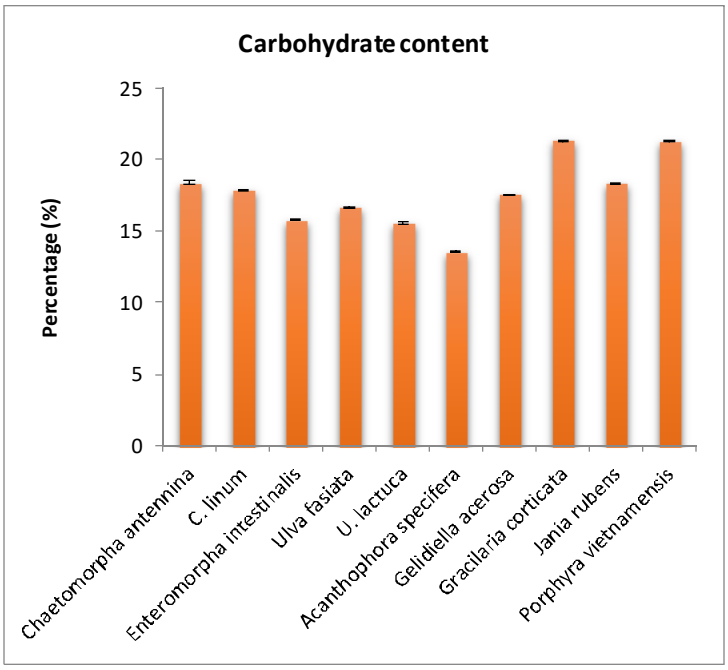

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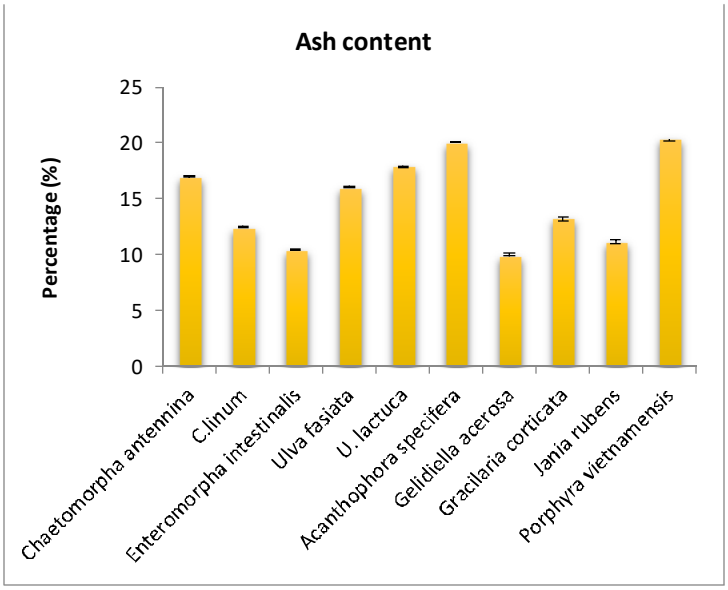

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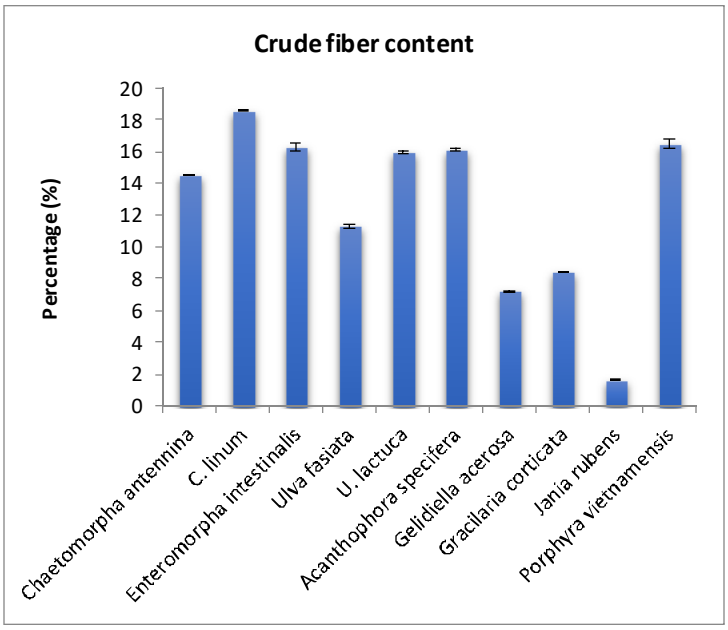

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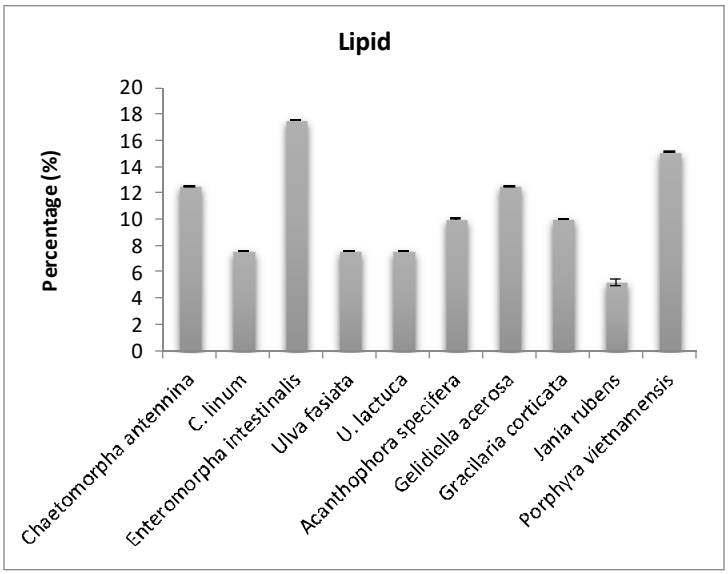

(Figure -6)

Benjama and Masniyom (2012) reported that protien Content in *Grailaria fisheri* was 11.6%. In *Gracilaria* moisture content, crude fiber and ash content was estimated by Ahmed *et al.,* (2012) in 15 seaweeds from Malaysia. Moisture content in their analysis ranged between 75.95-96.03%. Crude fiber content reported in their studies in *Gracilaria verrucosa* were comparable to our results. While protein content was higher than our reported value in *Gracilaria verrucosa* . Lipid content is very low than our reported value. In contrast, Mc Dermid and Stuercke (2003) reported higher lipid values for *Caulerpa* species collected from the Hawaian coast. Arunkumar *et al.*, (2014) investigated proximate composition, nutraceutical constituents of seaweeds collected from Balk Bay (Thondi) India . They found lipid content in *Ulva lactuca* and *Chaetomorpha linum* (7.4 and 7.8%), while in red seaweeds lipid content is low as compared to our reported value.

In general, Seaweeds are considered as a good source of carbohydrate, lipid, Ash and crude fiber content. The present study revealed that these seaweeds can be used as dietary supplement due to its variant nutrient content.

Conclusion

Seaweeds are a good source of Carbohydrate, protein, lipid in human nutrition and used in diet.

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