

Mineral profile of the selected edible marine algae in Thikkoti, Calicut, Kerala Coast

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Abstract

Seaweeds are traditionally consumed in many parts of the world as daily diet. Fresh and dried seaweeds are extensively consumed especially by people living in the coastal areas. Seaweeds are high in minerals due to their marine habitat and the diversity of the minerals they absorb is wide. In the present study the mineral profile of the selected edible marine algae *Padina gymnospora (Kutzing) Sonder* and *Stoechospermum marginatum (C. Agardh) Kutzing* was analysed. The results conclude that among the two selected edible algae, minerals such as potassium, phosphorous, calcium, magnesium and iron was found to be higher in *Padina gymnospora (Kutzing) Sonder* than in *Stoechospermum marginatum (C. Agardh) Kutzing*. Based on the results, the seaweeds contain essential mineral nutrients in higher levels than in terrestrial sources and their supplementations proved with a larger evidence and based on scientific validation studies has been accepted by global accreditation as a safe nutritional and dietary supplement. Hence the dietary reference intake recommends that approximately 25g of seaweed in a day can fulfill the mineral requirements in an adult.

Keywords: *Padina gymnospora*, *Stoechospermum marginatum*, Mineral profile, Dietary supplement

Introduction:

The marine environment comprises approximately half of the global biodiversity, to discover enormous resource for new compounds. Seaweeds which are also known as marine macroalgae are a habitat of both marine and brackish water environment. Seaweeds are found in the intertidal and subtidal region up to where photosynthetic light of 0.01% prevails and also in the coastal region between high tide and low tide. As the first organism in marine food chain, seaweeds provide nutrients and energy for all other living organisms.

Seaweeds which grow in the oceans, absorb wide range of minerals and other nutrients. They are also helpful in making easy for human body to break down and release the healthful substances providing variety of vitamins and minerals.

Almost all the seaweeds appear to be nutritious, but each type differs in nutrient contents. Seaweeds consists of materials such as dietary fiber, vitamins A, B, C, D and E, essential amino acids, riboflavin, ω -3 fatty acids, niacin, folic acid and pantothenic acid as well as minerals such as Ca, P, Na, K are present in seaweeds.

The chemical composition of seaweeds is so closely related to human plasma that they are excellent at regulating and purifying our blood. They help to neutralize the alkaline content of our blood over acidic effects of our modern diet. The chlorophyll rich seaweeds are powerful natural detoxifiers that help to draw our waste products. Seaweeds can be an important source of dietary iodine. Naturally seaweeds have high concentrations of iodine which helps to stimulate thyroid gland, that is responsible for maintaining a healthy metabolism. They have a salted flavor, mildly spicy and they can be eaten and used in the preparation of food. They contain high amounts of fiber trace metals contrary to land-based plant foods and they also contain complete proteins.

Seaweed phycocolloids like alginates has great therapeutic value as a heavy metal detoxifying agent. In brown edible seaweed, the component of alginate powder or sodium alginate have the capacity to bind with heavy metals present in food stream and carry them out with the stool, since this metal is generally not digestible, so it can be added to human diet. In the present study the mineral profile of the selected edible marine algae *Padina gymnospora* (Kutzing) Sonder and *Stoechospermum marginatum* (C. Agardh) Kutzing was analysed.

Botanical description of the selected edible marine algae:

Padina gymnospora (Kutzing) Sonder

Taxonomic Position

Division : Phaeophyta

Order : Dictyotales
Family : Dictyotaceae
Genus : *Padina*
Species : *P.gymnospora* (Kutzing) Sonder



Padina gymnospora is a green alga. It is wide spread in warmer seas. It consists of thick thallus and they are distributed on the superior surface of the thallus. The thalli are olive-brown in colour. They are found attached by a small stupose rhizoidal base and is 6.5 cm high, Hair rows are present on both sides of the thallus, but it is more conspicuous on the inferior side of the thallus. The superior surface is moderately calcified.

Stoechospermum marginatum (C. Agardh) Kutzing

Taxonomic Position

Division : Phaeophyta
Order : Dictyotales
Family : Dictyotaceae
Genus : *Stoechospermum*
Species : *S.marginatum* (C. Agardh) Kutzing



Stoechospermum marginatum (C. Agardh)

Kutzing is a regurously forking seaweed that may reach a length of 40 cm and usually they are 20 - 30 cm long and 8 - 11 mm broad. The thallus is flat, erect, spatulate, dichotomously branched, apex bifid or flatly truncate, without a midrib, margin entire, in the section of thallus a greater part has a large parenchymatous cells in the middle and on either side covered by two layers of small cells; fertile plants are easily identified on the marginal dark lines of crowded sporangia.

Materials and methods

Collection of the sample

The selected samples were collected from the sea coast of Thikkoti, Calicut, Kerala.

Mineral analysis

The mineral analysis was studied by using Atomic Absorption Spectrophotometer (AAS) by (AOAC,1995); (Gupta, 1999).

Results and Discussion

The mineral profile of the selected edible algae *Padina gymnospora* (Kutzing) Sonder, *Stoechospermum marginatum* (C. showed the

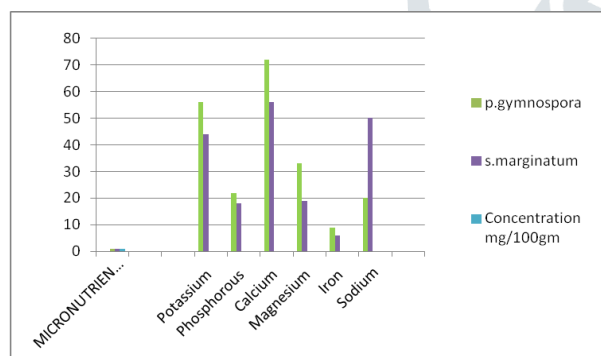
presence of several nutrients. *Padina gymnospora* (Kutzing) Sonder, contains 9mg/100mg of iron, 20mg/100mg sodium, 22mg/100mg of phosphorous, 33mg/100mg of magnesium, 56mg/100mg of potassium and 72mg/100mg of calcium. *Stoechospermum marginatum* (C. Agardh) Kutzing, contains 6mg/100mg of iron 18mg/100mg phosphorous 19mg/100mg magnesium, 44mg/100mg potassium, 50mg/100mg sodium and 56mg/100mg calcium (TABLE 1). The results conclude that among the two selected edible algae, minerals such as potassium, phosphorous, calcium, magnesium and iron was found to be higher in *Padina gymnospora* (Kutzing) Sonder than in *Stoechospermum marginatum* (C. Agardh) Kutzing. Phosphorus plays a major role in the growth of new tissue and division of cells. It is a vital component of DNA which contains the genetic data of all living things. Phosphorus is an essential mineral primarily used for growth and repair of body cells and tissues. Potassium is a very significant body mineral, important to both cellular and electrical function. Sodium plays a major role in the maintenance of normal fluid levels and also body's blood volume and blood pressure. Magnesium helps in muscle function which supports healthy immune system and keeps the heart beat steady.

Hence the present study reveals that seaweeds are a good source of mineral nutrients. Essential mineral content in seaweeds are at higher levels than many terrestrial mineral sources such as spinach.

MINERAL PROFILE OF THE SELECTED EDIBLE ALGAE

SL.No	MICRONUTRIENTS	CONCENTRATIONS (mg/100g)	
		<i>P.gymnospora</i>	<i>S.marginatum</i>
1.	Potassium	56	44
2.	Phosphorous	22	18
3.	Calcium	72	56
4.	Magnesium	33	19
5.	Iron	9	6
6.	Sodium	20	50

MINERAL PROFILE OF THE SELECTED EDIBLE ALGAE



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