

Seaweeds And Its Health Benefits

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Abstract- Seaweeds are considered to be sea vegetables. Mostly weeds are unwanted plants which are not consumed by humans. In this article the author describes the uses and health benefits of seaweeds to be use in mere future. Seaweeds contain vitamins, minerals, fibre, Antioxidants, and various biochemical compounds. Several studies have shown that seaweeds consumption has lowered certain life threatening diseases.

Index Terms- Seaweeds, Antioxidants, Culinary uses, Health benefits

I. INTRODUCTION

Marine micro algae or seaweeds are plant like organism that generally live attached to the rock is other hard substrate in coastal areas (www.seaweeds.com). Seaweeds along rocky shore lines around the world, but it most commonly eaten in Asian countries such as Japan, Korea and China (Sharon 2018). In particular, sea weeds harvested in the autumn contains high levels of easily extractable Laminaria and Mannitol (Horn,2000).

Although extensive marine algal collections have been made since the eighteenth century from India and Indian ocean region, iyengar (1927) was the first phycologist to publish the marine algal flora of the Indian coast (Bhavanath et al, 2009)

Edible seaweed is a vegetable of the sea, a food source for ocean life and humans who consume it in its many forms. Nutritionally speaking, seaweed has the unique ability to absorb concentrated amounts of iodine from the ocean which a human body cannot produce by itself, but requires for healthy thyroid functions. Seaweed is also an excellent source of micronutrients including folate, calcium, magnesium, zinc, iron and selenium (www.guide.michelin.com)

Seaweed research has been carried out for more than seven decades by many research workers. Research has been done separately in different aspects accordingly to our need. The main objective of the present review is to gather information relating to nutritional, pharmacological, clinical, biochemical, industrial uses and its application to human welfare.

Seaweeds have a high concentration of essential vitamins, trace elements, proteins, lipids, polysaccharides, enzymes, and minerals as compared to terrestrial foodstuffs. These plants have been a source of food, fodder, medicine, cosmetics, energy, fertilizer and are used for industrial production of agar and alginate. Their recent utilization increases in poultry due to their nutritive value. In the present scenario, it is being used for

wastewater treatment such as treatment of wastewater to reduce nitrogen and phosphorus containing compounds (Mitali et al., 2016)

II. TYPES

Macro algae are classified in to three major groups.one brown algae (phaeophyceae). Second green algae chorophyta and red algae rhodophytae.as all of the groups contain chlorophyll granules, their characteristics colour are derived from other pigments. Many of the brown algae are referred to simply as kelp (www.americianscientist.org).

The red seaweeds are more diverse with more than thousand species, followed by brown and green sea weeds with 2030 and 600 marine species, respectively although the brown algal thalli are largest (Joel Flurence and Ira Levine, 2016)

III. HEALTH BENEFITS

Seaweeds contain minerals, vitamins soluble dietary fibres and flavonoids. Which are regarding as preventive agents against life style related diseases.Sea weeds are consumed commonly in East Asian countries including japan, thus intake of seaweeds might contribute to Japanese. Longevity via prevention of life style related diseases. (Utakomurai et al., 2020)

Plants avail themselves of a class of water soluble polysaccharides called pectin which are often used to help set jams and jellies ,seaweeds on the other hand contain polysaccharides that are unique to them mainly alginates carrageenan and agars which are all soluble dietary fibres (Ole G.Mouritesen,2013).

The inclusion of large amounts of seaweeds in a balanced diet has been connected to decreased the rates of many of the “western life style” diseases example (cancer and cardiac vascular diseases).Reduced rates of breast cancer in post-menopausal Japanese woman are thought to be connected to the ingestion of seaweeds in general and the kelp kombu and wakame in particular.

Seaweeds are the only source of phytochemicals namely agar agar carrageenan and align which are extensively used in various indurates such as food confectionary textiles pharmaceuticals diary and paper industries. Mostly as jelling stabilizing and thickening agents. (Joel Flurence and Ira Levine, 2016)

Against Asthma

Data reviewing the 2013–2016 Korea National Health and Nutrition Examination Survey (KNHANES) discovered that lower intakes of seaweed and seafood were associated with higher rates of asthma. Because asthma is an inflammatory disease, it's hypothesized that the polyunsaturated fats and vitamins found in these foods are protective. Although more research is needed to confirm a cause and effect benefit, introducing seaweed during pregnancy and early childhood appears to be beneficial.

Reduces Risk of Osteoporosis

Oxidation from free radicals is associated with a host of health issues, including the weakening of bones. Seaweed contains antioxidant compounds, called fucoidans, which are shown to prevent bone breakdown by free radicals. Specifically, fucoidans protect osteoblasts (the cells responsible for building bone) against apoptosis, or cell death, which may otherwise be induced by oxidative stress. Seaweed also provides vitamin K and calcium, two key nutrients for bone strength.

May Aid Cancer Prevention

The fucoidans in seaweed have also been studied for cancer prevention. While human clinical trials are limited, fucoidan's ability to influence programmed cell death shows promise as a potential supplement to traditional cancer treatments. Like other vegetables, seaweed is also a source of antioxidants (like vitamin C and beta carotene). These compounds are known for cancer prevention qualities, especially when consumed as part of a nutrient-dense eating plan (rather than just supplementation).

Promotes Heart Health

Seaweed is a good source of soluble fiber, especially dulse seaweed and kombu which provide 5 to 6 grams per serving. [Soluble fiber](#) binds to cholesterol, pulling it out of the body through waste. In addition to reducing cholesterol, seaweed can also help lower blood pressure levels due to its potassium content (just watch out for added sodium). (<https://www.verywellfit.com/seaweeds-claims-2223487>)

IV. CULINARY USES

Edible algae are those that can be eaten directly or used in the preparation of other foods as jellying or emulsifying agents (Lenonel Perara, 2016). common seaweeds products

1. Agar Agar
2. Agariods
3. Algin

1. Agar Agar

As a gel forming substance. Soluble in hot water and requiring one percent solution to set as gel on cooling

1. Agariods

The gels like extracts produced from certain types of red seaweeds are commonly known as agariods.

2. Algin

Align is a main polysaccharides occurring in the cell walls of brown algae

(Chennubhotla et al., 1987)

Various red and brown seaweeds are used to produce three hydrocolloids: agar, alginate and carrageenan. A hydrocolloid is a non-crystalline substance with very large molecules and which dissolves in water to give a thickened (viscous) solution. Alginate, agar and carrageenan are water-soluble carbohydrates that are used to thicken (increase the viscosity of) aqueous solutions, to form gels (jellies) of varying degrees of firmness, to form water-soluble films, and to stabilize some products, such as ice cream (they inhibit the formation of large ice crystals so that the ice cream can retain a smooth texture). (www.fao.org)

Food additives made from seaweeds are mainly polysaccharides, long- chained molecules that are extracted from brown and red algae. These falls into three families: [agars](#) and [carrageenan](#) from red algae, and [alginates](#) from brown algae. Their usefulness lies mainly in their ability to emulsify, stabilise and thicken, but that they come from a natural source is, these days, a major advantage. Humans do not seem to have the ability to break them down, so they can be very useful in low-fat foods. Some coralline algae are now used as natural sources of calcium and magnesium sulphate. Alginate beads, dyed with natural colours (below) and with added fish oils, have been used as fish-egg substitutes (<https://seaweed.ie/additives/index.php>)

Seaweeds are used in many maritime countries as a source of food. The present uses of seaweeds are as human foods, cosmetics, fertilisers, and for the extraction of industrial gums and chemicals. They have the potential to be used as a source of long- and short-chain chemicals with medicinal and industrial uses. Marine algae may also be used as energy collectors and substances may be extracted by fermentation and pyrolysis (www.niobioinformatics.com)

V. SEAWEED ANTIOXIDANT

A study published in the Journal of Food Science shows that seaweed may be a good source of macromolecular antioxidants. Seaweeds are rich in different bioactive compounds with potential uses in drugs, cosmetics, and the food industry. In this study, researchers wanted to analyze macromolecular antioxidants or non-extractable polyphenols in several edible seaweed species collected in Chile.

Macromolecular antioxidants, commonly ignored in studies of bioactive compounds, are associated with insoluble dietary fiber and exhibit significant biological activity, with specific features that are different from those of both dietary fiber and extractable polyphenols.

The researchers also evaluated extractable polyphenols and dietary fiber, given their relationship with macromolecular antioxidants. They found that that macromolecular antioxidants are a major polyphenol fraction (averaging 42% of total polyphenol content), with hydroxycinnamic acids, hydroxybenzoic acids, and flavonols being the main constituents. This fraction also showed remarkable antioxidant capacity, as determined by two complementary assays. The dietary fiber content was more than 50% of dry weight, with some samples exhibiting the target

proportionality between soluble and insoluble dietary fiber for adequate nutrition. The researchers concluded that "Given the nutritional interest of these compounds, the consumption of these seaweeds might be promoted within the frame of a healthy diet and they can also be used as sources of macromolecular antioxidants and dietary fiber for the production of new ingredients." (www.ift.org)

Algotherapy is a science in which, seaweed extracts are used in health or beauty treatments. Seaweed baths were a widespread feature of seaside resorts at the end of the 19th and beginning of 20th century in several southern and western locations. Seaweed baths as a treatment for arthritis, rheumatism and other aches and pains. Many companies producing a seaweed powder (made mainly from Medicinal and pharmacological properties *Ascophyllum nodosum*) for beauty and body care products containing seaweed extracts. A number of compounds extracted from seaweeds are thought to be of value in various cosmetic applications and some are now becoming commercially important. (Sharma et al., 2000)

VI. CONCLUSION

Seaweeds which are considered to be the most needed powerful plants of the ocean not only serve as a vegetable but at the same time it is believed to be highly beneficially in curing certain life style diseases and disorder of humans. The author of the article brings the need of using seaweeds in various culinary and pharmaceutical preparations to lead a healthy life

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