

Article for Soap, Perfumery and Cosmetics

The Fascinating Seaweed

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## INTRODUCTION

Seaweed has a tremendous potential that in the most part has been ignored by the Marketeers and product developers. This may in part be due to the poor image of seaweed. It is smelly, slimy, not particularly pretty and spoils a day by the coast by attracting the most persistent of flies. Even finding a common name that would appeal to the consumer is difficult.

Throughout history one finds references to seaweed. As long ago as 3000 B.C. one reads that the Chinese used seaweed in one form or another for curing various ills, which included the use of the powdered material on burns and rashes. The Hawaiians used seaweed for stomach complaints. The Romans used the natural colours in seaweed as dyes and pigments. The Japanese and Chinese included it as part of their diet, and so avoided many of the ills caused through a diet lacking in iodine. In ancient Polynesia, the people knew of the curative properties of seaweed and used it to treat various wounds, bruises and swellings. Mariners recognised the healing properties of one brown seaweed and it became known as the "Sailor's Cure".

In reality, seaweed is a simple and fascinating plant that is a treasure chest of natural chemicals and beneficial ingredients. They are the oldest plants on Earth and do not produce roots, flowers or fruits. They absorb their nourishment from the sea and in the most part reproduce asexually through their spores. They can be microscopic in size or very large, and they can grow on the surface of the sea or at considerable depths. There are over 17,000 species recorded to date, which for simplicity can be divided into four classes by their colour, namely green, blue, red and brown varieties. The red and brown types are the most commonly used in the cosmetics and toiletries industry.

## SPECIES

It is known by a number of different names. When it is dried or burnt, it is more commonly referred to as Kelp or Sea Kelp. It is also known as algae, spirulina (a filament type alga, which is of the blue-green variety), diatoms (which are microscopic algae from phytoplankton), and plankton which are made up of algal cells. There is also Irish Moss, which is a small procumbent seaweed with fan-shaped fronds and falls into the red algae category.

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## OPTION 1

The most commonly found species are *Ascophyllum nodosum* which is also known as Tangle or Knotted Wrack. *Fucus serratus* or Blackwrack, Kelpware, Cutweed, *Fucus nodosus* or Knobbed Wrack, *Fucus vesiculosus* or Fucus, Bladderwrack, Sea Wave, Kelp, Sea-Wrack, Black Tang, *Quercus marina* or Cutweed, Bladder Fucus, Blasentang, Seetang, Meeriche *Fucus (varech) vesiculosus* or Blasentang, Seetang, Meeriche, *Laminaria digitata* or Kelp, Oarweed, Sea-Tangle. *Chondrus crispus* or Irish Moss, Carrageen, Carrageen, Caragahen, Pearl Moss, Carrageenan, Carrageenin. The other major genera are the *Gelidium*, *Gracilaria*, *Pterocladia*, *Ahnfeltia*, *Acanthopeltis*, *Suhria*, *Macrocystis*, *Sargassum*, *Cladophora*, *Caulerpa*, *Hypnea*, *Valonia*, etc.

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\*\* OPTION2

There are so many different species of seaweed that it is impossible here to list all of their latin and common names. For the sake of brevity we will make the assumption that most seaweeds have some or most of the properties described.

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Millions of tons of these plants are produced annually by the sea and depending on the species can have very different compositions. Some suppliers extract a blend from a mixture of plants, others from a single variety. It is for this reason that the overall composition can only be considered in general terms. The salinity, sunlight and water temperature has an effect on the distribution of the different species.

## CONSTITUENTS

### Vitamins

Seaweed contains a wide variety of vitamins which include A (beta-carotene), vitamin B1 (thiamine), vitamin B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), B12 (cobalamine), C, D, E, K, folic acid, choline.

### Minerals

It also contains a rich collection of minerals: iodine, calcium, phosphorus, iron, sodium, potassium, nitrogen, magnesium, sulphur, chlorine, copper, zinc and manganese. In trace amounts one finds barium, boron, chromium, lithium, nickel, silver, titanium, vanadium, aluminium, silicon, strontium, molybdenum, cobalt, bromine, lead and arsenic.

### Amino acids

Compared to most plants, seaweed contains an extraordinary number of amino acids. These include serine, alanine, arginine, glycine, lysine, asparagine, valine, leucine, isoleucine and tryptophan.

### Sugars (polysaccharides)

These include fucose, mannose, xylose, galactose and glucose.

### Other components

In addition, the plant contains a wealth of other material, alginic acid, alginates, carrageenan, agar-agar, proteins, cellulose, mucilage, mannite, fucitol, algin, mannitol, alginates, fucosterol, iodine-protein complexes, uronic acid derivatives, fucose polymers, sulphated polygalactosides.

## PROPERTIES

The benefits of seaweed and its extracts are numerous and can be attributed to the great wealth of material that it contains.

## Internally

The dietary importance of seaweed has been attributed to the iodine which it contains, which plays a key role in the production of thyroxine (a hormone) by the thyroid gland, which determines the metabolic rate. Deficiency of this hormone can lead to an increase in body weight, lethargy and feeling the cold. It is sometimes indicated for cases of obesity.

It can also be used for treating constipation without catharsis, and is a deobstruent. It also is reported to act on the kidney and act as an alterative.

It has also been cited for use in respiratory problems such as colds, bronchitis, influenza, asthma and emphysema.

Seaweed has been proved to reduce the cholesterol level in rats.

## Externally

### Hair care preparations

Its use in hair care is said to improve split ends and enhance the condition of hair that has been damaged by frequent bleaching or dyeing. Seaweed is also of value in products designed to stimulate the hair and scalp. It is reported that it combines with the protein in the hair by means of ionic interaction and so acts as a protective moisturising agent. Algae extracts have a pronounced moisturising effect on the hair, increasing hair lustre and softness and decreasing its electrostatic charge. Treated hair has more body and is less fly away.

### Slimming and slenderising products

There is a wide body of opinion that says seaweed is beneficial in anti-cellulite preparations, and it has been used in a number of slenderising products for the hips, thigh and neck areas. These have been in the form of creams and massage lotions.

### Moisturising and emollient

Its ability to react with protein to form a gel has a pronounced moisturising effect on the skin, softens the hands and body, and produces soothing face packs or masks. It has been known for a long time that seaweed is an emollient with smoothing and anti-inflammatory properties. It acts as a moisturiser by its hydrating and protective action of forming a layer on the skin that reduces loss of skin moisture through evaporation.

### Anti-wrinkle

Cosmetic scientists must always be wary of making strong claims, however, there does seem to be a great deal of evidence that credits seaweed with tissue renewal action, and that it can have a positive effect on problems such as facial wrinkles. In another reference the anti-wrinkle effect is attributed to the silicon that seaweed contains.

### Skin protecting and correcting

It has also been used in cases of psoriasis (where it can be used as a wash) and for the treatment of seborrhoeic skin conditions. Indeed, the inclusion of 2-5% of seaweed extract in shaving creams will offer protection against the irritation of sensitive skins. It is said to be of benefit in older and drier skins, where it can exert a smoothing and softening effect. This smoothing effect even extends to the coarseness of highly keratinised regions, such as the elbows, knees and feet.

The versatility of seaweed has also been shown to be effective in the treatment of acne. This is confirmed in another reference which says that algae is assumed to have antibiotic properties, which offers the skin good protection against infection. It is also reported to improve the blood circulation in the skin. The iodine in seaweed exerts a positive action on inflammations and secretions of the skin whilst having a disinfectant property.

#### Wound healing

There is a lot of evidence to suggest that seaweed speeds up the healing process, and the presence of calcium alginate has been thought instrumental in the improved healing of burns and other wounds when incorporated into dressings.

#### Rheumatic and sciatic preparations

The ability of the material to ease rheumatism and rheumatic arthritis has also been reported. In addition it is said to be beneficial for sprains and bruises.

#### Thickener

Finally, seaweed is a rich source of alginates, which can be used as gellants and emulsion thickeners. At high concentrations they can be used for face packs and rinse off masks.

#### DOSAGE LEVELS

The dosage level depends on the activity of the extract, and it would not be easy to be specific. However, it is likely that a level of 1 - 10% would be used in a general range of products, with higher levels for the intensive treatments.

#### CONCLUSION

Seaweed is a natural choice for virtually any application, it has a wide spectrum of activity and seems well supported in the literature. There are no indications that seaweed is anything but innocuous, and it may be safely used in cosmetic and toiletry preparations.

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## SUPPLIERS OF RAW MATERIALS

The following suppliers of seaweed extracts may be contacted for further information and samples.

Alban Muller International  
 Alembic Products Ltd.  
 Aston Chemicals Ltd.  
 S.Black (Import and Export) Ltd  
 A & E Connock Ltd.  
 Biocosmetics Ltd.  
 Cosmetochem  
 Croxton & Garry Ltd.  
 Honeywill & Stein Ltd.  
 Jan Dekker International

Morham Ltd.  
Paroxite Ltd.  
Sanofi Bio-Industries Ltd.  
Wilfred Smith Ltd.

#### SUPPLIERS OF SEAWEED RANGES

The following suppliers were kind enough to show us their literature.

Aquatonale Ltd.  
Laboratoires Algotharm  
Laboratoire Phykidis  
Phytomer Corporation