

SPC

Soap, Perfumery & Cosmetics



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Added colour



treasure chest of the deep

Anthony Dweck, research director at Peter Black Cosmetics looks at the fascinating but undervalued seaweed as a cosmetic raw material.

Seaweed has a tremendous potential that has been largely ignored by marketers and product developers. This may be partly due to the poor image of seaweed. It is smelly, slimy and not particularly pretty. 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 BC, the Chinese used seaweed for curing various ills, including the use of the powdered material for 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 diets and so avoided many of the ills caused through a lack of 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 which became known as the "Sailor's Cure".

Simple and fascinating plants

Seaweeds are simple and fascinating plants that are a treasure chest of natural chemicals and beneficial ingredients. They are the oldest plants on Earth but do not produce roots, flowers or fruits. They

absorb their nourishment from the sea and mainly reproduce asexually through their spores. They can be microscopic or very large, and they can grow either 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 — green, blue, red and brown. The red and brown types are the most commonly used in the cosmetics and toiletries industry.

This versatile plant 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 algae, which is of the blue-green variety), diatami (which are microscopic algae from phytoplankton), and plancton 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.

The most commonly found species are *Ascophylum 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) vesiculatus* or Blasentang, Seetang, Meeriche, *Laminaria digitata* or Kelp, Oarweed, Sea-Tangle. *Chondrus crispus* or Irish Moss, Carrageen, Carrageen, Caragahan, Pearl Moss, Carrageeninan, Carrageenin. The other major genera are the *Gelidium*, *Gracilaria*, *Pterocladia*, *Ahnfeltia*, *Acanthopeltic*, *Suhria*, *Macrocystis*, *Sargassum*, *Cladophora*, *Caulerpa*, *Hypnea*, *Valonia*, etc.

Millions of tons of these plants are produced by the sea annually 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, therefore the overall



Fucus vesiculosus, a brown seaweed, is valued for its stimulating, revitalising and nourishing properties for both skin and hair. Its high iodine and sulphur amino acids actives content makes it a useful addition to cellulite treatments (courtesy: Gattefosse).

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 of seaweed

Vitamins — Seaweed contains a wide variety of vitamins which include A (beta-



Marks & Spencer added three seaweed based products to its Extracts from Nature range in March — Sea Kelp and Dewberry Body Conditioning Milk (200ml £1.99), Sea Kelp and Sea Lavender Concentrated Foam Bath Essence (200ml £1.99) and Sea Kelp and Xanthium Conditioning Hand Cream (100ml £1.25).

NIGHT CREAM		
Ingredients		%
A Paraffin oil, beaded		5.0
Hard paraffin		7.0
Alugel DF 30		2.0
Emulsifier 780		5.0
Miglyol 182 Neutral Oil		30.0
Beeswax, white		7.0
Algae extract concentrate, oil soluble		2.0
B Borax		0.7
Glycerine		3.0
Water		q.s
C Perfume		q.s
Preservative		q.s
Manufacture		
Melt part A at 80°C; heat part B separately, also to 80°C and add to fatty phase. Homogenise and after cooling to 35°C, add perfume and preservative.		
Supplier: Croxton & Garry		

carotene), vitamin B1 (thiamine), vitamin B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), B12 (cobalamine), C, D, E, K, folic acid and choline.

Minerals — There is a rich collection of minerals contained in seaweed: iodine, calcium, phosphorus, iron, sodium, potassium, nitrogen, magnesium, sulphur, chlorine, copper, zinc and manganese.

There are trace amounts of 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 materials: alginic acid, alginates, carrageenan, agar-agar, proteins, cellulose, mucilage, mannite, fucitol, algin, mannitol, alginates, fucosterol, iodine-protein complexes, uronic acid derivatives, fucose polymers and sulphated polygalactosides.

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

Hair care preparations — The use of seaweed 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 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.

FACIAL MILK

Ingredients	%
A Arlacel 989	5.8
Arlacel 481	2.2
Miglyol 812	8.0
Cetiol V	5.0
Eutanol G	3.0
Squalane (Perhydrosqualene)	6.0
Algae extract concentrate, oil soluble	1.0
B Glycerine	2.0
Propylene glycol	1.8
MgSO ₄ × 7H ₂ O	0.7
Water	q.s
C Perfume	q.s
Preservative	q.s

Manufacture

Heat part A to 75°C; separately emulsify part B; Cool to 40°C and add perfume, preservative and homogenise all ingredients together.

Supplier: Croxton & Garry

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.

SLIMMING CREAM

Ingredients	%
A Tefose 1500	12.0
Cetyl alcohol	2.0
Mineral oil	6.0
Isostearyl isostearate	3.0
Silicone 200 (100CS) (Dow Corning)	3.0
B Demineralised water	60.1
Kathon CG (Rohm & Haas)	0.1
Carbopol 934 (Goodrich)	0.2
Triethanolamine 99% (50% aqu sol)	0.4
Vegetol seaweed CB 4136 hydro	2.0
Vegetol ivy MCF 775 hydro	2.0
Vegetol horse chestnut MCF 1972 hydro	2.0
Demineralised water	5.0
Pancogene S	2.0
Perfume 'Symphonie' MA 1401	0.2

Manufacture

Disperse the Carbopol. Let stand. Pour B at 75°C in I at 75°C. Add the Triethanolamine solution. Cool while stirring. Between 30 and 35°C, add the other components. Cool.

Supplier: Gattefossé

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.



Launched last year, Creightons' Ocean Harvest range contains a number of marine ingredients including seaweed, sea lavender and moss. The active ingredients in the seaweed extract — vitamins A, B, B2, C and E — help to keep skin in a healthy condition. In hair care products, seaweed helps prevent dandruff.

Anti-wrinkle — Although cosmetic scientists must always be wary of making strong claims, there does seem to be a great deal of evidence that credits seaweed with tissue renewal action, as well as having a positive effect on problems such as facial wrinkles. In one reference, the anti-wrinkle effect is attributed to the silicon that is contained in seaweed.

Skin protecting and correcting — Seaweed has been used in treating 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 to 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 and knees.

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 offer the skin good protection against infection. It is also reported to improve blood circulation in the skin. The iodine in seaweed exerts a positive action on inflammations and secretions

SKIN TONER

Ingredients	%
Rose Water	10.00
Ethyl alcohol (95°C)	20.00
Hamamelis distilled water	5.00
Glycerin codex (or Sorbitol at 70%)	5.00
Distilled water	59.10
Satiagum standard (as thickener)	0.60
Preservative	0.30
Perfume	As required

Manufacture

Disperse Satiagum standard into half of water at 70–80°C until the stabilizer is completely dissolved. Allow to cool to 40°C.

Pour the thickened solution into mix containing the remaining ingredients (including the remaining water with preservative) whilst stirring. Add perfume and fill.

Supplier: Sanofi Bio-industries

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, it can be used for face packs and rinse off masks.

SEAWEED MASK

Ingredients	%
A Demineralised water	41.9
Kathon CG (Rohm & Haas)	0.1
Kaolin	8.0
Calcium carbonate	25.0
Tefose 1500	10.0
Mineral oil	3.0
Fondix G bis	1.0
Glycerine	5.0
Vegetol seaweed CB 4136 hydro	5.0
Perfume 'Nautilus' MA 1429	0.5
Green dye (0.1% sol)	0.5

Manufacture

Heat part A to 75/80°C. Cool while stirring. When cold (35°C), add the other components. Homogenise.

Supplier: Gattefossé

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.

EMOLLIENT CREAM

Ingredients	%
Self-emulsified ethylene glycol monostearate	8.50
Spermaceti (Cetaceum)	2.00
Cosbiol (Perhydrosqualene)	2.00
Isopropyl myristate	4.50
Stearin, triple pressed	5.00
Propylene glycol	3.00
Distilled water	74.45
Aubygum x2 or Aubygel x52 or Satiagum standard	0.25
Preservative	0.30
Perfume	As required

Manufacture

Heat the ethylene glycol monostearate, spermaceti and stearin in the mix prepared with the cosbiol, isopropyl myristate and the propylene glycol to 85°C until the solution is completely melted. Allow the solution to cool to 60°C.

In the meantime, heat $\frac{1}{4}$ of the amount of water to 80°C and disperse the stabilizer into this portion of water whilst stirring. Allow solution to cool to 60°C. Add the remaining water and the preservative.

Pour the second solution onto the first one and allow the cream to cool with constant agitation until the room temperature is reached. Add the perfume to about 45°C and fill.

Supplier: Sanofi Bio-industries

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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