

## PRODUCT FOCUS

# A unique seaweed as source of key ingredients for health?

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### INTRODUCTION

Seaweed, a generic name addressing macroalgae, are simple organisms having unique properties, as shown by scientific literature on their active ingredients and by epidemiological data taken from population that usually eats seaweed. In Asia seaweeds have been consumed as a vegetable since the beginning of time while in western countries they are attracting more and more interest as food and food supplement ingredient thanks to several positive scientific evidences supporting the claims associated with the regular use of seaweed. The beneficial effect of seaweed on human health appear to derive from the presence of fibres, proteins, minerals as well as substance with antioxidant properties, including carotenoids, polyphenols, vitamins, polyunsaturated fatty acids and fibre.

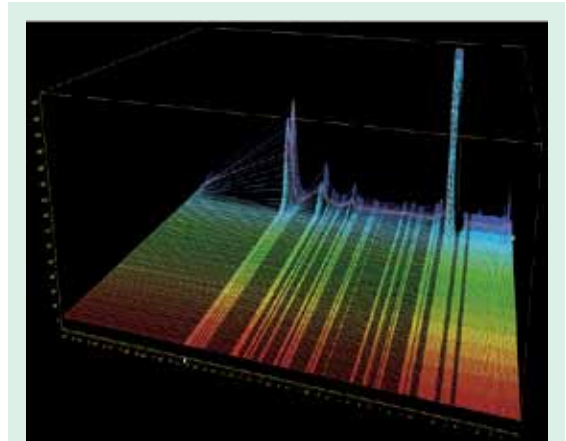
The term "fucoidans" is generally used to describe a family of polysaccharides, containing L-fucose as the main monosaccharide, which are generally highly sulphated and containing varying amounts of glucuronic acid, xylose, mannose, glucose and galactose. The terms sulphated fucans was applied to the one derived from marine invertebrates, whereas the term fucoidans has been used for fucans obtained from algae. These polysaccharides are easily extracted from the wall cell of brown algae, studies so far seem to demonstrate the absence in red and green algae and land plants. Fucoidans structure depends on species, climatic and environmental factors. Seaweeds grow in highly stressful environment and they stand both many hours of sunlight and strong marine salinity. By adapting to these challenging conditions, they produce in their structure a lot of powerful substance, among these; fucoidans are attracting an increasing interest in the health business environment for their several biological activities making them an excellent base ingredient for food supplements and medicine.

### ALGEAFOOD POWDER AND ALGEAFOOD POWDER MICRO

AlgeaFood Powder and AlgeaFood Powder Micro are natural phytocomplexes obtained from selected seaweed, *Ascophyllum nodosum*, a large brown algae of Fucaceae family. AlgeaFood products are produced by ALGEA AS, a Norwegian company that started to manufacture seaweed products in 1937. Thanks to continuous development of specialized methods and equipments, for harvesting and processing, Algea AS developed special processing life circle for seaweed, harvesting Arctic *Ascophyllum nodosum* and offering the highest quality of seaweed products. Special care is taken throughout all the processing stages, from harvesting to drying, milling and packaging, in order to maintain all the active naturally present ingredients untouched and bioavailable.

#### Harvesting

*Ascophyllum nodosum*, a large brown alga that grows only in the tidal zones of the North Atlantic coasts, has fronds that can reach 2 m in length and are attached by a holdfast to rocks and boulders. It reproduces in spring and it may take 4-5 years before becoming fertile. Northern Norway is called the Land of the Midnight Sun; with 24 hours of daylight during the summer certain chemical compounds are naturally produced in Arctic Norwegian seaweed.



HPLC-DAD profile of derivatised monosaccharides in fucoidan extracted from Algea's *A. nodosum*.



Fresh *Ascophyllum Nodosum*.



One of Algea's harvesting areas. Norwegian Arctic Sea.

ALGEA *Ascophyllum nodosum* is harvested in the coldest and cleanest water of open Northern Norway Arctic Sea, where it withstands both the winter frost and the unique light conditions of summer months.

ALGEA *Ascophyllum nodosum* is harvested, cut and gathered in a very sustainable manner thus allowing it to fully re-grow after 4-5 years and ensuring this wonderful being available to man, animals and plants. The professional harvesters wait patiently until the cut seaweed float to the surface of the water, to be collected. This unique method is easy on the environment and ensures that only fresh seaweed free from contamination (like shells, sand and small stones) is used as raw material for our products.

### The unique phytocomplex of Algea seaweed and its application

AlgeaFood Powder and AlgeaFood Powder Micro are natural phytocomplexes of fucoidans, in association with alginates, as naturally occurring in *Ascophyllum nodosum*. The combination of fucoidans and alginates make AlgeaFood Products unique. Moreover AlgeaFood Products are naturally rich in iodine, vitamins (A, B1, B2, B6, B12, C, E, folic acid) and trace elements (Na, K, Ca, Mg, Zn, Fe). These active ingredients are present in easily bioavailable form suitable for the physiological wellness of the human organism.

### Fucoidans, Joint disease and functionality

From the past decade fucoidans isolated from seaweed have been extensively studied due to their several biological activities including anticomplementary (Blondin et al., 1194), anti-inflammatory (Cumashi et al., 2007) antioxidant (Bo et al, 2008), antiviral (Bo et al., 2008; Hoshino et al., 1998; Hayashi et al., 2008), anticoagulant (Chandia et al., 2008; Boisson-Vidal et al., 1995) activity. The complement system is the major component of the immunity system and it is mainly involved in the innate and humoral response. It also allows the link between the innate immunity and the adaptive defence. An uncontrolled activation of this system can be harmful for the host organism. Algal fucoidan from *Ascophyllum nodosum* has been first described as an anticomplementary molecule. This activity finds application in case of autoimmune pathologies. Fucoidans of *Ascophyllum nodosum* shows also anti-inflammatory action. In ex vivo experiments, fucoidans have been demonstrated to be able to protect body elastic fibres by the action of Proteolytic enzymes; these results suggest a possible use of these polysaccharides in the treatment of inflammatory pathologies, such as those affecting the joints

### Digestion and intestinal health

Alginates are polyuronic saccharide isolated from the cell walls of brown algae. As soluble seaweed fibres pass through gastrointestinal tract largely without digestion. The chemical nature of monomers present in alginates makes them particular fibres. In fact they are partially degraded after a period of latency. Oligo-alginates produced in this stage have demonstrated some biphidogenous effects, thus opening the field of prebiotic application (Michel C et al., 1999). In addition as soluble fibres can increase feelings of satiety and aid digestive transit through their bulking capacity (Brownlee et al., 2005). Alginates show GI protective action, binding a wide range of damaging agents (toxins) present in the GI lumen to form insoluble salts which are then naturally eliminates (Nishyama et al., 1991).

### CONCLUSION

Nordic *Ascophyllum nodosum* reveals extremely superior source of phytonutrients. AlgeaFood Powder and AlgeaFood Powder Micro are active marine ingredients having beneficial effect on human health, obtained from a superior quality of Norwegian *Ascophyllum nodosum*, produced closed to the Arctic Circle, where nature gives wonders to men.

AlgeaFood Products are totally natural products, safe, free of contamination and produced respecting the environment. The phyto-complex, as naturally occurring in Norwegian *Ascophyllum nodosum*, finds several applications: joint disease, inflammation processes, gastrointestinal health, weight control and skin care. AlgeaFood Powder and AlgeaFood Powder Micro can be used for functional food and food supplements in tablets, capsules and pills. AlgeaFood Powder and AlgeaFood Powder Micro is product of ALGEA® AS- distributed in Italy by Sochim International Spa.

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Examples of functional food and food supplements application.