

CLARIFICATION ON phytaFIBER® STATUS

Seaweed has been historically recorded as a traditional part of the human diet around the world. People living in coastal areas have used seaweed as food since the prehistory. Nowadays, seaweed is used for many purposes, such as direct food, as a source of phycocolloids, for extraction of precious pharmaceutical compounds and as bio-stimulants⁴.

In many countries, especially in Asia, seaweed products are an important dietary source, constituting a substantial part of the total food intake. Seaweed can be eaten directly – either raw, dried or cooked. While it has relatively few calories, seaweed contains a vast abundance of important minerals, trace elements, proteins and vitamins, as well as healthy dietary fiber and vital oils and fats³.

In most countries, there are no special regulations enforced for the usage of seaweed as food for human consumption; the population treats seaweeds as a common vegetable.

The European Community has recently included some species of macro algae in the catalog of traditional foods widely used and consumed before the application of the regulation of Novel Food in 1997 now authorized as a safe ingredient/food for human consumption as listed in Table 1.

Scientific Name	Common Name
Brown seaweed <ul style="list-style-type: none"> - <i>Ascophyllum nodosum</i> - <i>Fucus vesiculosus</i> + <i>serratus</i> - <i>Himantalia elongata</i> - <i>Undaria pinnatifida</i> - <i>Laminaria digitata</i> - <i>Laminaria saccharina</i> - <i>Laminaria japonica</i> - <i>Alaria esculenta</i> 	Sea spaghetti Wakame Kombu Royal Kombu Kombu Atlantic wakame
Red seaweed <ul style="list-style-type: none"> - <i>Palmaria palmata</i> - <i>Porphyra umbilicalis</i> - <i>Porphyra tenera</i> - <i>Porphyra yezoensis</i> - <i>Porphyra dioica</i> - <i>Porphyra purpurea</i> - <i>Porphyra laciniata</i> - <i>Porphyra leucostica</i> - <i>Chondrus crispus</i> - <i>Gracilaria verrucosa</i> - <i>Lithotamnium calcareum</i> 	Dulse Nori Nori Nori Nori Nori Nori Nori Pioca, lichen Ogonori Mäerl
Green seaweed <ul style="list-style-type: none"> - <i>Ulva sp.</i> - <i>Enteromorpha sp.</i> 	Sea lettuce Aonori

Table 1. Seaweeds Authorized for Human Consumption in Europe¹

The intakes have to conform to the general safety regulation for food and its contents⁵. Europe also specifies upper limits of the contents of inorganic arsenic, lead, cadmium, tin, mercury, and iodine in edible seaweeds, as seen as Table 2 below.

Heavy metals	Maximum level (mg/kg dry weight)
Inorganic Arsenic (As)	3.0
Cadmium (Cd)	0.5
Mercury (Hg)	0.1
Lead (Pb)	5.0
Tin (Sn)	5.0

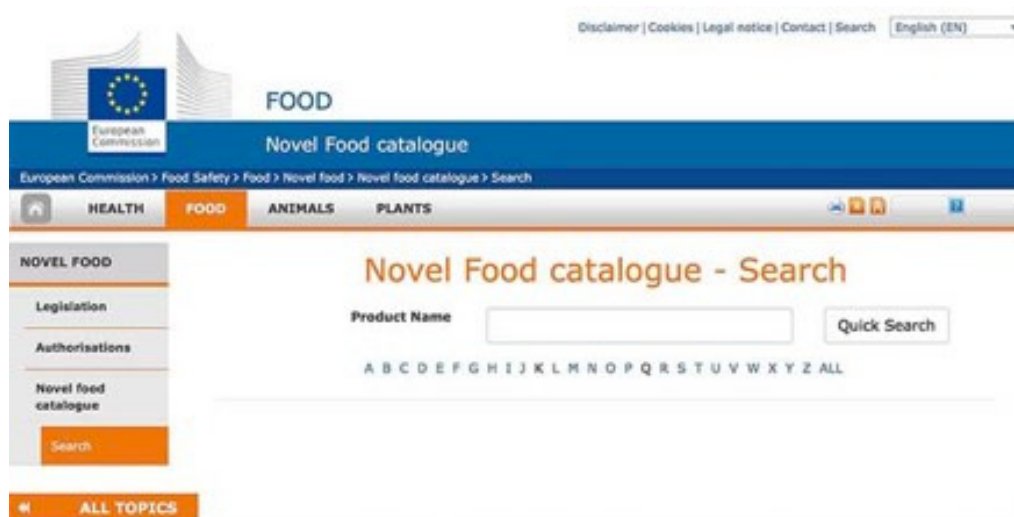
Component	Maximum level (mg/kg dry weight)
Iodine (I)	2000

Table 2. Maximum Level of Heavy Metals and Iodine Allowed in Edible Seaweeds²

Gracilaria verrucosa (as well as all species of *Gracilaria* genus), also often called “ogonori”, is common edible red seaweeds that have been consumed as food or ingredient in Asia, Europe, Africa etc.⁴ *Gracilaria verrucosa* is considered a traditional food, not categorized as a Novel food. Based on the European Commission, Novel Food is defined a food or ingredient that has not been consumed to a significant degree by humans in the EU before 15 May 1997.

Follow the steps and links below to see the status of *Gracilaria verrucosa* based on European Commission.

1. Definition of Novel Food:
https://ec.europa.eu/food/safety/novel_food_en
2. Novel Food Catalogue:
http://ec.europa.eu/food/safety/novel_food/catalogue/search/public/index.cfm

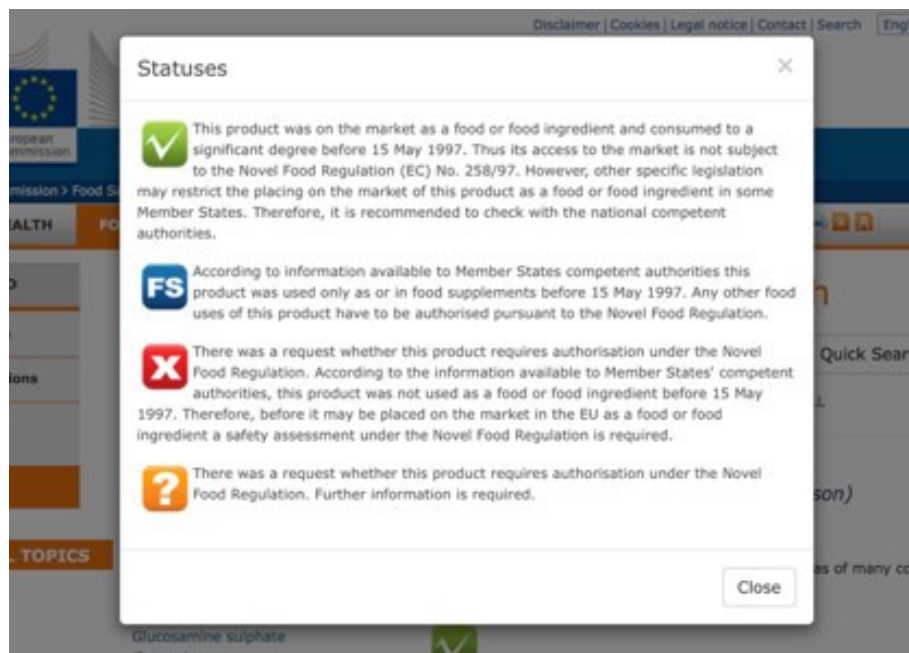


3. Click the letter “G” to find *Gracilaria verrucosa* (Hudson) on the list or enter “*Gracilaria verrucosa*” in the search bar.



The screenshot shows the 'Novel Food catalogue - Search' page. On the left, there is a sidebar with 'NOVEL FOOD' categories: Legislation, Authorisations, and Novel food catalogue. Below these is a 'Search' button and an 'ALL TOPICS' button. The main content area has a search bar for 'Product Name' and a 'Quick Search' button. Below the search bar is an alphabetical index from A to Z and ALL. The letter 'G' is selected, and a list of products is shown. *Gracilaria verrucosa* (Hudson) is highlighted in orange. To the right of the product list, the details for *Gracilaria verrucosa* (Hudson) are displayed, including 'Common Names' (It is a red alga that is widely distributed in seaside areas of many countries), 'Status' (indicated by a green checkmark icon), and a link 'What does it mean?'.

4. Click the link “What does it mean?” under the green tick icon for the status explanation.



The screenshot shows a 'Statuses' modal window with four status categories:

- Green checkmark:** This product was on the market as a food or food ingredient and consumed to a significant degree before 15 May 1997. Thus its access to the market is not subject to the Novel Food Regulation (EC) No. 258/97. However, other specific legislation may restrict the placing on the market of this product as a food or food ingredient in some Member States. Therefore, it is recommended to check with the national competent authorities.
- FS (Food Supplement):** According to information available to Member States competent authorities this product was used only as or in food supplements before 15 May 1997. Any other food uses of this product have to be authorised pursuant to the Novel Food Regulation.
- Red X:** There was a request whether this product requires authorisation under the Novel Food Regulation. According to the information available to Member States' competent authorities, this product was not used as a food or food ingredient before 15 May 1997. Therefore, before it may be placed on the market in the EU as a food or food ingredient a safety assessment under the Novel Food Regulation is required.
- Question mark:** There was a request whether this product requires authorisation under the Novel Food Regulation. Further information is required.

A 'Close' button is located at the bottom right of the modal window.

These days, consumers are getting more and more critical and conscious of the ingredients in their products. Many ingredients are used in industrial commercial products that are generally categorized under foods additives with E numbers. Java Biocolloid is proud to present a new concept of a clean label product with no E number, named phytaFIBER®.



phytaFIBER® is an ingredient/food made from 100% cultivated - EU-organic and Fair Trade certified - *Gracilaria verrucosa*. With innovative technologies from Java Biocolloid, phytaFIBER® is obtained through purification with high grade of Reverse Osmosis potable water without any chemical treatment, in order to preserve the natural functionality of the fresh *Gracilaria verrucosa*.

phytaFIBER® is not just a simple food ingredient, it acts as 2-in-1 texturizer and dietary fiber. It contains soluble and insoluble fiber components. Thanks to these properties, phytaFIBER® contributes to adding thickness and richness in mouth-feel and texture, as well as increasing the content of fiber in the product.

phytaFIBER® has a very high content of essential minerals like Potassium and Magnesium, fundamental to a healthy diet, while maintaining a very low content of Sodium. The combination of a low level of Sodium and a high content of Iodine (within the limits allowed by European Legislation) makes phytaFIBER® a perfect Iodine supplement without increasing the level of Sodium (like iodized table salt would) for elderly people that suffer from thyroid problems and blood hypertension.

More studies show that phytaFIBER® is a potential ingredient in ready-to-consume products such as nut and grain milks (soy, almond, oat), coffee drinks and desserts (puddings, yogurt, etc). These can be promoted specifically to health-conscious consumers as clean-label products with an excellent source of soluble and insoluble dietary fiber. The nutritional value and heavy metal analysis of phytaFIBER® can be seen in table 3.

phytaFIBER® is a perfect ingredient for texturize the food for elderly people suffering dysphagia avoiding the production of filaments (wiring); typical of some texturizers of fermentative origin; in the ready to eat food.

Nutrition value analysis

<i>PARAMETER</i>	<i>Unit</i>	<i>RESULT</i>
Dry matter	g/100g	92.6
Moisture content	g/100g	7.4
Minerals	g/100g	13.5
Protein (N x 6.25)	g/100g	1.6
Fat content	g/100g	0.1
Total dietary fibres	g/100g	52.4
Total sugars	g/100g	<0.10
Carbohydrate, calculated	g/100g	25.0
Energy value	KJ/100g	875
Energy value	kcal/100g	212
Saturated fatty acids	g/100g	<0.03
Monounsaturated fatty acids	g/100g	<0.03
Polyunsaturated fatty acids	g/100g	<0.03
trans C 18:1	%	<0.03
trans C 18:2	g/100g Fat	<0.03
trans C 18:3	g/100g Fat	<0.03
Sodium	g/100g	0.669
Sodium chloride (calc. from sodium)	g/100g	1.67

Examination of heavy metals

<i>PARAMETER</i>	<i>Unit</i>	<i>RESULT</i>
Potassium	mg/kg	20047
Iron	mg/100g	21.8
Magnesium	mg/kg	4127
Calcium	mg/100g	1069
Iodine	µg/100g	680

Chemical - physical examination

<i>PARAMETER</i>	<i>Unit</i>	<i>RESULT</i>
Phytosterol	mg/100g	26.49

Vitamins

<i>PARAMETER</i>	<i>Unit</i>	<i>RESULT</i>
Vitamin A	IE/kg	<1000
Vitamin D	IE/kg	<1000
Vitamin E	mg/kg	<1.0
Vitamin B5	mg/100g	<0.05
Vitamin B6	mg/100g	<0.05
Vitamin C	mg/100g	23.7

Table 3. Nutritional Value and Heavy Metal Analysis of phytaFIBER®



References

- ¹Burtin, P. 2003. Nutritional Value of Seaweeds. *Electron J. Environ. Agric. Food Chem.* 2:498-503.
- ²Mouritsen, O. G. 2013. *Seaweeds: Edible, Available & Sustainable*. Hong Kong: The University of Chicago Press.
- ³Pereira, L. 2016. *Edible Seaweeds of the World*. New York: CRC Press.
- ⁴Tiwari, B. K and D. J. Troy. 2015. *Seaweed Sustainability: Food and Non-Food Applications*. USA: Elsevier