CENTRE D'ÉTUDE
& DE VALORISATION
DES ALGUES

Edible seaweed and microalgae - Regulatory status in France and Europe

2024 update

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1. Status of edible algae in Europe

a. Food-grade algae

In France, food status of algae was already considered before the Novel Food regulation came into force. Significant history of consumption and several assessments by the Conseil Supérieur d'Hygiène Publique de France led to the establishment of a list of algae acceptable for human consumption (CSHPF 01/1990, 02/1992, 10/1997; DGCCRF 04/2009).

The marine microalga *Odontella aurita* also received a positive opinion from EFSA regarding its use as a food ingredient (condiment in finished products) and was authorized on the basis of its substantial equivalence with other authorized edible seaweed under regulation (CE) n° 258/97 (AFSSA 2002; DGCCRF 04/2009).

In total, 25 algae species of which 3 microalgae, were listed as food (vegetables or condiments). Among the macroalgae, 9 brown seaweed species, 11 red seaweed species and 2 green seaweed species are listed.

Table 1 : Algae listed for food consumption in France

Scientific name	Common name
• **Brown seaweed**	
- *Ascophyllum nodosum*	
- *Fucus vesiculosus*	
- *Fucus serratus*	
- *Himanthalia elongata*	Sea Spaghetti
- *Undaria pinnatifida*	Wakame
- *Laminaria digitata*	Kombu
- *Laminaria saccharina*	Royal Kombu
- *Laminaria japonica*	Kombu
- *Alaria esculenta*	Atlantic wakame
• **Red seaweed**	
- *Palmaria palmata*	Dulse
- *Porphyra umbilicalis*	Nori
- *Porphyra tenera*	"
- *Porphyra yezoensis*	"
- *Porphyra dioica*	"
- *Porphyra purpurea*	"
- *Porphyra laciniata*	"
- *Porphyra leucostica*	"
- *Chondrus crispus*	Pioca, lichen
- *Gracilaria verrucosa*	Ogonori
- *Lithothamnium calcareum*	Mäerl
• **Green seaweed**	
- *Ulva sp.*	Sea lettuce
- *Enteromorpha sp.*	Aonori
• **Microalgae**	
- *Spirulina sp.*	
- *Odontella aurita*	
- *Chlorella sp.*	

It shall be noted that several of the listed species have undergone taxonomic revisions since the publication of the opinions. An updated list, with valid taxons, is available in the synthetic tables at the end of this document.

b. Food supplements

For food supplements, the ministerial order of June 24th 2014, known as « Arrêté Plantes » establishes a list of plants and mushrooms which are allowed in food supplements, as well as their conditions of use. It includes a number of algae (JORF 06/2014):

- 8 of the listed algae species were not present in the food species list mentioned previously for food (circled in blue in the table below).
- Inversely, 9 seaweed species from the food species list are not included in the « Arrêté Plantes »

Table 2 : Algae species listed in the "Arrêté Plantes"

Macro/Micro	NOM SCIENTIFIQUE
Macro	Ascophyllum nodosum
Macro	Chondrus crispus
Macro	Fucus serratus
Macro	Fucus vesiculosus
Macro	Gelidium corneum
Macro	Gracilaria gracilis
Macro	Himanthalia elongata
Macro	Laminaria digitata
Macro	Laminaria hyperborea
Macro	Macrocystis pyrifera
Macro	Mastocarpus stellatus
Macro	Palmaria palmata
Macro	Phymatolithon calcareum
Macro	Porphyra umbilicalis
Macro	Saccharina japonica
Macro	Saccharina latissima
Macro	Sargassum fusiforme
Macro	Ulva lactuca
Macro	Undaria pinnatifida
Micro	Aphanizomenon flos aquae
Micro	Chlorella vulgaris
Micro	Dunaliella salina (Dunal) Teodoresco
Micro	Haematococcus pluvialis Flotow
Micro	Spirulina major
Micro	Spirulina maxima
Micro	Spirulina platensis

In January 2019, French DGCCRF (General Directorate for Competition Policy, Consumer Affairs and Fraud Control) published a list of over 50 algae species which can be used in food supplements, on the basis of their traditional consumption or their authorization under the Mutual Recognition Principle as outlined in Article 16 of the Food supplements Decree n°2006-352 (JORF 05/2006; DGCCRF 2019b).
The presence of an algae in this « Liste Algues » does not preclude the safety of use of the preparations including it, which remains the responsibility of the operator. Specific sanitary recommendations can also be included for some of them (DGCCRF 2019a).

These two lists (« Arrêté Plantes » and « Liste Algues ») are compiled in the synthetic tables at the end of the document.

2. Status of edible algae in Europe

There is no harmonized seaweed/algae regulation in Europe.

The suitability of an algae for human food consumption is governed by the so-called "Novel Food" Regulation (Regulation (UE) 2015/2283), which applies to food and ingredients which were not consumed consumption to a significant degree in Europe before May 15th 1997 (European Commission 11/2015)

a. Not « novel food » algae

The European Novel Food Catalogue lists products of animal and plant origin and other substances, whose history of consumption and status with regards to the Novel Food Regulation, were evaluated by EU Member States. The status of ingredients listed in this catalogue may be "not novel", with details of their use in foods or food supplements. Some ingredients are marked "Novel Food", indicating that their use requires the submission of a full Novel Food dossier. The ingredients "Authorized Novel Food" have been the subject of a validated dossier. However, EU countries may still restrict the marketing of a product through specific legislation. For information, businesses should contact their national authorities.

Algae with "not novel" status are listed in the tables at the end of this document. This information is published by the European Union in the Novel Food status Catalogue, which was updated in February 2024 (European Commission 2024a).

When a food business operator is unsure whether a food is novel, they shall consult the competent authorities of the EU country where they first intend to place the food on the market in accordance with the procedure set out in Article 4 of Regulation (EC) 2015/2283. Applications have been made for algae and algae-based ingredients since 2019. The full list of these consultations can be viewed online. https://food.ec.europa.eu/safety/novel-food/consultation-process-novel-food-status_en

"Novel Food" status was thus notified for the microalgae *Chlamydomonas reinhardtii* or for the hydroalcoholic extract of *Porphyra yezoensis* (European Commission 2024a)

On the other hand, the "not Novel" status was notified for the various species of *Chlorella* or microalgae considered as *Chlorella* when they were placed on the market: *Chlorella sp. (Auxenochlorella pyrenoidosa, Chlorella sorokiniana, Chlorella vulgaris, Jaagichlorella luteoviridis, Parachlorella kessleri, Auxenochlorella protothecoides*)

An application for authorisation is currently being examined for the microalgae *Galdieria sulphuraria* (EFSA 2020).

b. Algae that underwent a Novel Food assessment procedure

Algae are authorised for use either in food or in food supplements, and must meet the specifications set out in the dossiers submitted. Inclusion on the EU list includes the conditions of use and labelling requirements set out in the annexes to the regulations.

As mentioned previously, the use of the microalga *Odontella aurita* as condiment in finished products was authorized on the basis of its substantial equivalence with edible seaweed according to Regulation (CE) n° 258/97.

Another microalga, *Tetraselmis chuii*, was the object of a Novel Food dossier submitted to the Spanish authorities under the framework of Regulation (CE) n° 258/97. An authorization to commercialize it in sauces, special salts and condiments was notified to the company Fitoplancton Marino S.L. in March 2014 (AECOSAN 2014). This authorization was then subject to an extension of use in the field of food supplements in 2017 (AECOSAN 2017). The company Green Sea Bio System One S.L. also recently submitted a request to the EC to extend the product specifications (NF 2019/1062 (EFSA 2019).

The microalgae *Euglena gracilis* was the subject of an application by Kemin Foods L.C. based on proprietary data. In December 2020, Kemin Foods L.C. was granted an authorisation to commercialize this microalgae as food with an exclusivity period of 5 years (European Commission 12/2020)

Another microalgae, *Chlamydomonas reinhardtii,* is currently being assessed under the Novel Food procedure: a dossier was submitted in April 2023 by Triton Algae Innovations Ltd with a request for data protection (EFSA 2023b).

Lastly, the seaweed Cochayuyo (*Durvillaea antarctica/ Durvillaea Incurvata*) has been the subject of a notification (currently being assessed) as a traditional food from a country outside the European Union (EFSA 2023c).

c. Novel Food ingredients extracted from algae

Microalgae extracts

In 2003, DHA-rich (>32%) oil from *Schizochytrium sp*. received an authorization to be placed on the market under Regulation (CE) n° 258/97 (European Commission 2003). Several dossiers for extension of use as well as new authorizations were subsequently submitted and accepted (European Commission 10/2009b, 07/2014, 07/2018, 03/2019b), as well as several dossiers for substantial equivalence.

Another oil from *Schizochytrium sp*., with high contents in DHA (>22%) and EPA (>10%) also received an authorization to be placed on the market under Regulation (CE) n° 258/97 (European Commission 2003) and a subsequent extension of use (European Commission 03/2015, 2022).

A number of other applications have been submitted over years by various suppliers, specifying the strain, uses or extensions of use, sometimes with data protection for 5 years.

The commercialization of oil extracted from the microalgae *Schizochytrium sp.* (ATCC PTA-9695) was authorized in 2015, with extension of use in 2019 (European Commission 03/2015, 03/2019a).

The oil extracted from *Schizochytrium sp.* (WZU477) is authorized with an exclusivity period of five years (since 23 April 2021) for the original applicant, Progress Biotech bv (European Commission 04/2021)

Oil extracted from *Schizochytrium sp.* (FCC-3204) is also authorized for use in infant formulations and food supplements, up to 1 g/day (European Commission 2021a). Finally, oils extracted from two additional strains of *Schizochytrium sp*. (CABIO-A-2 and TKD-1) were authorized in July 2024 for use in infant formula and follow-on formula (European Commission 2024c, 2024b).

In total, therefore, there are currently 8 oils extracted from *Schizochytrium* authorized for commercialization as Novel Food, each with different specifications and uses. They can be found on the union list, which was last updated in July 2024 (European Commission 12/2017).

DHA-rich (>32%) oil from *Ulkenia sp.* was also the object of a substantial equivalence dossier in 2003 (equivalent to DHA-rich oil from *Schizochytrium sp*). It was approved by the German authorities and subsequently received an extension of use for bakery, cereal bars and juices (European Commission 10/2009a).

Astaxanthin-rich oleoresin extracted from the algae *Haematococcus pluvialis* was authorized back in 2004 via an application to the UK authorities. In an opinion published in 2004, UK Advisory Committee on Novel Foods and Processes (ACNFP) acknowledges the substantial equivalence of an oleoresin extracted from *Haematoccocus pluvialis* with the whole algae meal (UK Food Standards Agency - Advisory Committee on Novel Foods and Processes 2004). It is worth noting that, although ACNFP opinion establishes that *Haematococcus pluvialis* was commercialized as food supplement in Europe since at least 1995, it is not currently listed as such in the Novel Food catalogue, unlike *Haematococcus lacustris* (but *H. pluvialis* Flotow is mentioned as a synonym of *H. lacustris*).

Several other applications for substantial equivalence for extracts of this microalga have also been submitted and accepted (same use limited to food supplements). They concern oleoresins obtained by various extraction processes (supercritical CO2, solvents, etc.). These oleoresins appear under the name 'Astaxanthin-rich oleoresin extracted from the algae *Haematococcus pluvialis*' in the Union list of novel foods (European Commission 12/2017) and may be labelled 'astaxanthin'.

However, applications to extend the use of astaxanthin in foods (dairy products, beverages) were rejected.

A modification of the conditions of use of astaxanthin-rich oleoresin extracted from the microalgae *Haematococcus pluvialis* was specified in 2021 with a specification of maximum doses (40-80 mg oleoresin per day, equivalent to ≤ 8 mg astaxanthin per day) in food supplements excluding infants, young children, children and adolescents under 14 years of age (European Commission 2021b). In 2023, an extension of the target population was authorized, with maximum levels of astaxanthin in food supplements not to be exceeded. They range from 2.3 mg/day of astaxanthin for children aged 3 to 10 to 5.6 mg/day of astaxanthin in food supplements intended for adolescents aged 10 to under 14 (European Commission 2023a).

AstaReal recently submitted a request to modify the specifications: modifications to astaxanthin monoesters, astaxanthin diesters, astaxanthin 9-cis stereoisomers and a range of protein content. EFSA concluded that the extract was non-toxic even with these specification changes, and the opinion was published on 8 November 2023 (EFSA 2023a). The European Commission recently voted for its authorization and the regulation was published in April 2024 (European Commission 2024d).

Finally, the beta-1,3-β-glucan polymer extracted from the microalga *Euglena gracilis,* known as paramylon, has been recognized as non-toxic at the proposed doses and for the proposed uses (cereal bars, food supplements, meal replacements). Its authorization was voted and the text published in April 2024 (European Commission 2024e).

However, several applications for extracts of the microalgae *Phaeodactylum tricornutum* were not successful, and some applications were also withdrawn.

Seaweed extracts

Commission Implementing Regulation (UE) 2018/460 authorizes the placing on the market of *Ecklonia cava* phlorotannins as novel food for use in food supplements (European Commission 03/2018).

Fucoidan extracts from *Fucus vesiculosus* and *Undaria pinnatifida* are also authorized in food and food supplements (European Commission 12/2017).

Lastly, a dossier filed by par Islenska Saltbrennslan in Iceland is currently under evaluation for ash produced from the brown algae *Laminaria digitata* as a novel food (NF 2018/0728 (EFSA 2018)).

3. Requirements for algae commercialization

a. Contaminants

The European reference regulation for chemical contaminants is Regulation (EU) 2023/915 on the maximum levels for certain contaminants (heavy metals, mycotoxins, etc.) in foodstuffs (European Commission 2023b)
To date, algae are not specifically covered by this European regulation, with the exception of food supplements containing seaweed and spirulina. Maximum levels for heavy metals have been set for supplements in general, as well as for cadmium in food supplements containing at least 80% dried seaweed or products derived from seaweed, and for Polycyclic Aromatic Hydrocarbons (PAHs) in botanical preparations (including algae) and spirulina-based food supplements.
A threshold for pyrrolizidine alkaloids (PAs) is also established for botanical preparations including algae. Pyrrolizidine alkaloids are naturally occurring toxins found in a wide variety of plant species, produced as a defense mechanism. However, to our knowledge, these substances are not naturally produced by algae.
The regulation does not set maximum levels for seaweed not used in food supplements.

Specific criteria also exist in France. They were defined in recommendations of the French High Council for Public Hygiene (CSPHF) and the former AFSSA agency, now the French Agency for Food, Environmental and Occupational Health & Safety (ANSES). These opinions set maximum limits in mg/kg dry weight for certain contaminants such as heavy metals (inorganic arsenic, lead, cadmium, mercury and tin), and for iodine (CSHPF 01/1990; AFSSA 04/2009).

Table 3 : Maximum levels of iodine and contaminants authorized in algae

	Algae (vegetables or condiments) (CSHPF01/1990, AFSSA 04/2009) mg per kg (dry weight)	**Food supplements** (UE) 2023/915 mg per kg (product sold)
Inorganic Arsenic (As)	3	
Cadmium (Cd)	0,5	3
Mercury (Hg)	0,1	0.1
Lead (Pb)	5	3
Tin (Sn)	5	
Iodine (I)	2 000	
		µg/kg product sold
Benzo(a) Pyrene Sum of PAHs		10 50
Pyrrolizidine alkaloids		400

In the case of cadmium, a recent opinion from French ANSES on the maximum cadmium content for seaweed intended for human consumption recommends "a maximum cadmium concentration in seaweed that is as low as possible" due to the high exposure of the general population to this ubiquitous element (ANSES 2020).

The assessment of dietary exposure to cadmium in seaweed consumers based on different types of consumption scenarios enabled them to identify a maximum cadmium concentration in seaweed of 0.35 mg/kg dry matter to ensure that the population consuming seaweed does not exceed the Tolerable Daily Intake (TDI) for cadmium in 95% of cases. Thus "a *cadmium concentration of 0.35 mg.kg^{-1} dry matter of seaweed as an unprocessed food would, in terms of dietary exposure of consumers of seaweed in all its forms (food, ingredient, food supplement), contribute on average 11.5% of the TDI for cadmium (compared to 15.4% for a maximum concentration of 0.5 mg Cd.kg^{-1} dry matter of seaweed). However, as the confidence interval includes the maximum concentration of 0.5 mg Cd.kg^{-1} dry matter of seaweed, it is possible that this concentration prevents 95% of the population from exceeding the TDI for cadmium".*

When this opinion on cadmium was published, we, at CEVA, reacted to this proposal of a low limit. This limit of 0.35 mg/kg would in fact introduce a ban on the consumption of certain species (both domestic and imported), despite their traditional consumption in Asia for centuries and their widely recognized nutritional value. For CEVA, it is important to stress that seaweed is just one of many contributors of heavy metals to our diet, and should be subject to the same restrictions as other foods. On the contrary, this opinion, based on the precautionary principle, considers them to be an additional source of cadmium, which should be specifically minimized, rather than a part of the diet. Furthermore, this opinion is based on insufficient data (according to the ANSES opinion itself), and should be modulated according to the type of seaweed and the way it is actually consumed as part of a diversified diet.

We note also the particular case of Germany, where the maximum iodine content differs from the French recommendations. In 2004, the German Federal Institute for Risk Assessment (BfR) assessed the health risks of iodine contained in dried seaweed placed on the market and recommended a very strict maximum iodine content, set at 20 mg/kg of seaweed dry matter (Bundesinstitut für Risikobewertung 2007).

Concerning pesticide residues, EC regulation 396/2005 sets maximum limits that must not be exceeded. The maximum limits applicable to algae and prokaryotic organisms are available in the appendix to the regulation or in the European Commission database https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/start/screen/products and are set between 0.01 mg/kg and 0.1 mg/kg for a large number of pesticides.

b. Microbiological criteria

The reform of Community regulations on food hygiene, which came into force on 1st of January 2006, has simplified and harmonised the texts applicable in the European Union. Its objectives is to make a single, transparent hygiene policy applicable to all food and all food operators in the food chain ("from farm to fork"), together with effective instruments to manage food safety and any future food crises throughout the food chain.

- Only criteria for which the representatives of the Member States considered that there was a need for harmonisation, or for particularly sensitive ready-to-eat foods, or for raw foods which may cause cross-contamination, have been established by regulation;
- Other criteria are the responsibility of operators.

Regulation (EC) No 2073/2005 implements the "Hygiene Package". It distinguishes between safety criteria, which indicate "the acceptability of a product or batch of foodstuffs, applicable to products placed on the market", and process hygiene criteria, which indicate "the acceptability of the operation of a manufacturing process". Failure to comply with a process hygiene criteria leads to corrective action designed to maintain the hygiene of the process.

Fresh, processed seaweed or microalgae are not listed in the categories of foodstuffs covered by Regulation (EU) 2073/2005. There are therefore no specific microbiological criteria for algae in the regulation. However, they must comply with the general safety requirement and therefore must not be harmful to health. In this respect, the limits applicable to all foodstuffs concerning *Listeria monocytogenes* apply (European Commission 11/2005).

Historically, recommendations were also published in France for microbiological quality of packaged dried algae, which had to fulfill the following criteria presented in the table below (CSHPF 01/1990; BID 1987). These recommendations relate in particular to mesophilic aerobic germs, faecal coliforms, sulphite-reducing anaerobes, *Staphylococcus aureus, Clostridium perfringens and Salmonella.*

However, the hazard analysis carried out as part of the HACCP study could reveal the need to monitor the presence of other micro-organisms that are potentially harmful to health. It will then be necessary to take them into account. Conversely, the recommendation relating to *Clostridium perfringens* seems particularly strict. Higher levels are tolerated in many food matrices (up to 10^5/g for certain products), and ANSES now recommends this as a process hygiene criteria, rather than as a finished product safety criteria.

Table 4 : Historical microbiological criteria for dried algae (CSHPF 01/1990)

Mesophilic aerobic germs	≤ 10^5 / gram
Faecal coliforms	≤ 10 / gram
Anaerobic sulfito-reducing bacteria	≤ 10^2 / gram
Staphylococcus aureus	≤ 10^2 / gram
Clostridium perfringens	≤ 1 / gram
Salmonella	absence in 25 grams

Conclusion - Summary tables

As illustrated in this review, the use of edible seaweed and microalgae is still governed by several European and national regulations and guidances (Novel Food, food supplements, …).

It is necessary to combine these sources to provide a list of algae and algae-derived ingredients authorized for food applications in Europe. This is what we propose to do in the following tables.

This list is not exhaustive, and will keep evolving over time when Member States share national lists, or following the introduction of new Novel Food requests.

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Brown seaweed

Scientific name	France	France	Europe	Europe	Europe	Europe
	CSHPF opinions, DGCCRF	"arrêté plantes", DGCCRF "Liste algues"	Novel Food Catalogue "not novel"	Novel Food Catalogue "not novel"	Novel Food dossier	Novel Food dossier
	Food	Food supplements	Food	Food supplement	Food/Food supplement	Extracts
Ascophyllum nodosum	x	x	x			
Alaria esculenta	x	x	x			
Durvillaea antartica		x		x		
Ecklonia cava				x		x Phlorotannins
Eisenia bicyclis		x	x			
Fucus vesiculosus	x	x	x			x Fucoïdan
Fucus serratus	x	x	x			
Fucus spiralis			x			
Himanthalia elongata	x	x	x			
Laminaria digitata	x	x	x			
Laminaria hyperborea		x	x			
Macrocystis pyrifera		x		x		
Padina pavonica		x				
Saccharina japonica *(Laminaria japonica)*	x	x	x			
Saccharina latissima *(Laminaria saccharina)*	x	x	x			
Saccharina longicruris *(Laminaria longicruris)*		x	x			
Sargassum fusiforme *(Hizikia fusiformis)*		x	x			
Undaria pinnatifida	x	x	x			x Fucoïdan

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Green seaweed

Scientific name	France	France	Europe	Europe	Europe	Europe
	CSHPF opinions, DGCCRF	"arrêté plantes", DGCCRF "Liste algues"	Novel Food Catalogue "not novel"	Novel Food Catalogue "not novel"	Novel Food dossier	Novel Food dossier
	Food	Food supplements	Food	Food supplement	Food/Food supplement	Extracts
Monostroma nitidum			x			
Ulva sp.	x					
Ulva lactuca		x	x			
Ulva sp *(Enteromorpha sp .)*	x					
Ulva intestinalis *(Enteromorpha intestinalis)*		x	x			

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Red seaweed

Scientific name	France	France	Europe	Europe	Europe	Europe
	CSHPF opinions, DGCCRF	"arrêté plantes", DGCCRF "Liste algues"	Novel Food Catalogue "not novel"	Novel Food Catalogue "not novel"	Novel Food dossier	Novel Food dossier
	Food	Food supplements	Food	Food supplement	Food/Food supplement	Extracts
Alsidium helminthochorton		x		x		
Chondrus crispus	x	x	x			
Corallina officinalis		x		x		
Eucheuma horridum		x		x		
Eucheuma denticulatum *(Eucheuma spinosum)*		x		x		
Gelidium corneum		x	x			
Gelidium amansii		x	x			
Gelidium sesquipedale		x				
Gracilaria gracilis		x		x		
(Gracilaria verrucosa)	x		x			
Gracilariopsis longissima		x	x			
Mastocarpus stellatus		x		x		
Palmaria palmata	x	x	x			
Porphyra umbilicalis	x	x	x			
Pyropia tenera *(Porphyra tenera)*	x	x	x			
Pyropia yezoensis *(Porphyra yezoensis)*	x	x	x			
Porphyra dioica	x	x	x			
Porphyra purpurea	x	x	x			
Porphyra laciniata **(= *Eryrhroglossum laciniatum*)**	x	x	x			
Neopyropia leucosticta *(Pyropia leucosticta, Porphyra leucosticta)*	x	x	x			
Phymatolithon calcareum *(Lithothamnion calcareum)*	x	x	x			

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Microalgae

Scientific name	France	France	Europe	Europe	Europe	Europe
	CSHPF opinions, DGCCRF	"arrêté plantes", DGCCRF "Liste algues"	Novel Food Catalogue "not novel"	Novel Food Catalogue "not novel"	Novel Food dossier	Novel Food dossier
	Food	Food supplements	Food	Food supplement	Food/Food supplement	Extracts
Aphanizomenon flos aquae		x		x		
Aphanizomenon flos-aquae* var. *flos-aquae			x			
Arthrospira sp. *("Spirulina sp")*	x					
Limnospira fusiformis *(Arthrospira fusiformis)*		x	x			
Limnospira indica *(Arthrospira indica)*		x		x		
Arthrospira major *(Spirulina major)*		x	x			
Limnospira maxima *(Arthrospira maxima)*		x	x			
Limnospira platensis *(Arthrospira platensis)*		x	x			
Chlorella sp.	x					
Chlorella vulgaris		x	x			
Heterochlorella luteoviridis *(Chlorella luteoviridis)*		x	x			
Jaagichlorella luteoviridis			x			
Auxenochlorella pyrenoidosa *(Chlorella pyrenoidosa)*		x	x			
Chlorella sorokiniana		x	x			
Parachlorella kessleri		x	x			
Auxenochlorella prothocecoides		x	x			
Euglena gracilis					x (specified categories)	x Beta-glucan
Graesiella emersonii		x	x			
Dunaliella salina		x		x		
Haematococcus lacustris				x		
Haematococcus pluvialis		x				x Oleoresin
Nannochloropsis oculata		x				
Odontella aurita		x			x (specified categories)	
Scenedesmus vacuolatus		x	x			
Ulkenia sp.		x				x Oil extracts
Tetraselmis chuii					x (specified categories)	
Schizochytrium sp.		x				x Oils extracts

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Société d'Economie Mixte Locale au capital de 1 056 000 € . RCS Saint-Brieuc 86 B 38 335 037 107 . APE 7219Z . SIREN FR 49/335 037 107 000 18

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