Novel Food Candidate List 2023

EABA
EUROPEAN ALGAE
BIOMASS ASSOCIATION

IF YOU WISH TO <u>GIVE PRIORITY TO CERTAIN SPECIES</u> OR HAVE ANY COMMENTS ON THESE CANDIDATE LISTS (Microalgae and Seaweed) PLEASE <u>CONNECT TO THE SURVEY</u> AND SEND YOUR INPUTS:
<u>https://forms.gle/BEJVA6ihQwD88tB36</u>

Methodology

0. The algae biomass sector has a relevant need for new Novel Food approvals to stimulate the growth of the sector, requiring a list of promising candidate species.
1. This list of macroalgae (seaweed) and microalgae candidates was proposed along the last two years by EABA members and experts in the algae biomass sector.
2. The **two criteria** for the algae for the next Novel Food **candidates** was (1) the available scientific information and the (2) economic potential
3. Without a relevant scientific 'body of knowledge' is extremely complex the process and chances of presenting a proper file request for Novel Food approval
4. The subjectivity of the two criteria requires a quantitative metrics that can be based in Google Scholar and Google Patents with number of references in documents
5. The proposed metrics aims to bring to the curation, quantitative data to support the decision making, for the potential ranking of promising "species" for "food"

GS is the number of documents with the reference to "species" using **Google Scholar**; this is a good tool for large numbers
GP is the number of documents with the reference to "species" using **Google Patents**; this is a good tool for large numbers
GS+food is about the references in GS that include GS + the word "food"; this will provide a direction where the reference food is along the "species" in scientific documents
The ratio GS+food / GS shows the relevance of food in the number of references in Google Scholar; when x100 = % of food related references (not the number of documents)

the higher S the higher food relevance for the "species"
the higher P the higher business relevance considering that some food related patents exist if there are commercial applications
S x P is an index that combines the relevance of food related publications with reference to "species" with the relevance of references of "species" and food in Patents documents.

MICROALGAE Candidates for Novel Food (not ranked)							
Arthrospira maxima	13 700	9 860	0,72	3 755	2 680,00	0,71	0,51
Graesiella emersonii (formerly Chlorella emersonii)	2 040	1 170	0,57	1 677	1 469	0,88	0,50
Mychonastes homosphaera (formerly Chlorella minutissima)	4 140	2 860	0,69	2 271	2 012	0,89	0,61
Auxenochlorella protothecoides (formerly Chlorella protothecoides)	8 330	6 000	0,72	3 534	3 114	0,88	0,63
Chromochloris zofingiensis (formerly Chlorella zofingiensis)	3 490	2 720	0,78	1 274	1 150	0,90	0,70
Chlorella sorokiniana	12 500	7 440	0,60	3 339	2 680,00	0,80	0,48
Parachlorella kessleri	1 550	942	0,61	1 313	0,00	0,00	0,00
Dunaliella salina (formerly Dunaliella bardawil	29 830	17 730	0,58	9 535	7 164	0,74	0,43
Microchloropsis gaditana (formerly Nannochloropsis gaditana)	5 670	3 720	0,66	1 589	722	0,45	0,30
Nannochloropsis oceanica	3 320	2 300	0,69	845	0	0	0
Nannochloropsis oculata	12 200	8 820	0,72	2 241	2	0	0
Nostoc commune	8 920	4 190	0,47	2 484	1 302	0,52	0,25
Nostoc sphaeroides	850	525	0,62	237	186	0,78	0,48
Haematococcus lacustris (formerly Haematococcus pluvialis)	17 800	12 800	0,72	9 000	7 272	0,81	0,58
Isochrysis galbana	20 900	15 200	0,73	5 176	3 905	0,75	0,55
Tisochrysis lutea (T-iso) (formerly Isochrysis affinis galbana T-iso)	4 480	3 620	0,80	322	210	0,65	0,52
Tetradesmus obliquus (Scenedesmus obliquus)	29 500	15 800	0,54	2 792	1 691	0,61	0,32
Skeletonema costatum	26 200	14 900	0,57	1 750	865	0,49	0,28
Porphyridium purpureum (formerly Porphyridium cruentum)	10 300	5 710	0,55	2 967	2 172	0,73	0,41
Crypthecodinium cohnii	6 020	4 130	0,69	5 916	5 428	0,92	0,63
Ettlia oleoabundans (formerly Neochloris oleoabundans)	4 740	3 420	0,72	1 897	1 296	0,68	0,49
Diacronema lutheri (formerly Pavlova lutheri)	5 300	3 790	0,72	1 390	1 241	0,89	0,64
Lobosphaera incisa (formerly Parietochloris incisa)	1 607	1 130	0,70	157	133	0,85	0,60
Cylindrotheca fusiformis	3 360	1 760	0,52	599	403	0,67	0,35
Chlamydomonas reinhartii	99 800	28 000	0,28	15 943	9 681,00	0,61	0,17

Comments

1. The changes of names in recent years must be considered as they introduce a higher complexity in this process, but the quantitative changes are minor.
2. The list of candidates proposed below addresses biomass of microalgae species that cannot be placed in the market because they are not in the NF Catalog, Union List or under an application process (e.g. *Phaeodactylum t.* is under approval application for extract and oil but not as whole biomass)

SEAWEED Candidates for Novel Food (not ranked)						
Saccharina japonica (formerly *Laminaria japonica*)	19 200	13 900	*0,72*	5 000	**3 628**	*0,73*	**0,53**
Laminaria hyperborea	7 720	4 770	*0,62*	1 984	**1 252**	*0,63*	0,39
Laminaria palmata	1 690	917	*0,54*	8	8	*1,00*	**0,54**
Macrocystis pyrifera	17 800	1 110	*0,06*	4 986	**2 853**	*0,57*	0,04
Ulva rigida	10 400	5 740	*0,55*	378	1	*0,00*	0,00
Neopyropia yezoensis (formerly *Porphyra yezoensis*)	9 770	5 570	*0,57*	1 715	**1 127**	*0,66*	0,37
Sargassum muticum	9 650	5 850	*0,61*	409	235	*0,57*	0,35
Sargassum fusiforme	4 080	3 060	*0,75*	1 712	**1 323**	*0,77*	**0,58**
Sargassum vulgare	**3 100**	1 890	*0,61*	157	101	*0,64*	0,39
Sargassum fulvellum	1 980	1 520	*0,77*	682	494	*0,72*	**0,56**
Porphyra umbilicalis	5 180	2 420	*0,47*	846	495	*0,59*	0,27
Codium fragile	9 000	5 330	*0,59*	1 036	620	*0,60*	0,35
Codium tomentosum	1 600	781	*0,49*	689	306	*0,44*	0,22
Caulerpa taxifolia	7 470	3 800	*0,51*	245	135	*0,55*	0,28
Ectocarpus siliculosus	6 320	2 380	*0,38*	375	239	*0,64*	0,24
Hypnea musciformis	5 910	3 460	*0,59*	374	199	*0,53*	0,31
Porphyra umbilicalis	5 180	2 420	*0,47*	846	495	*0,59*	0,27
Eisenia bicyclis	4 860	3 630	*0,75*	1 213	834	*0,69*	**0,51**
Neopyropia tenera (formerly *Porphyra tenera*) [nori]	4 670	3 020	*0,65*	843	600	*0,71*	**0,46**
Ulva compressa (formerly *Enteromorpha compressa*)	3 940	1 900	*0,48*	1 039	590	*0,57*	0,27
Gelidium corneum (formerly *Gelidium sesquipedale*)	2 050	1 711	*0,57*	319	215	*0,57*	**0,47**
Gelidium amansii	3 720	2 480	*0,67*	1 164	889	*0,76*	**0,51**
Gelidium corneum	1 200	681	*0,57*	158	90	*0,57*	0,32
Porphyra purpurea	2 940	1 090	*0,37*	1 117	778	*0,70*	0,26
Gracilaria gracilis	2 740	1 630	*0,59*	168	120	*0,71*	**0,42**
Asparagopsis taxiformis	2 520	1 330	*0,53*	144	97	*0,67*	0,36
Eucheuma denticulatum (formerly *Eucheuma spinosum*)	2 470	1 500	*0,61*	928	734	*0,79*	**0,48**
Mastocarpus stellatus	2 420	1 610	*0,67*	436	289	*0,66*	**0,44**
Osmundea pinnatifida (formerly *Laurencia pinnatifida*)	1 832	778	*0,42*	8	6	*0,75*	0,32

Comments
0. The changes of names in recent years must be considered as they introduce a higher complexity in this process, but the quantitative changes are minor.
1. A first priority group should include a set of *Laminaria, Macrocystis, Ecklonia, Porphyra* (*Porphyra dioica, Porphyra purpurea, Porphyra leucosticta, Porphyra linearia*), a set of *Sargassum* a set of *Codium* and *Caulerpa*.
2. A second priority group should include a set of *Gelidium* (approved in France), a set of *Gracilaria* (approved in France , including Gracilaria vermiculophylla), a set of Porphyra (approved in France), Eucheuma (approved in France).

Under EU regulations, any food that was not consumed "significantly" prior to May 1997 is considered to be a novel food. The category covers new foods, food from new sources, new substances used in food as well as new ways and technologies for producing food. Examples include oil rich in omega-3 fatty acids from krill as a new source of food, phytosterols or plant sterols as a new substance or nanotechnology as a new way of producing food. Traditional food is a subset of novel food and refers to food that is traditionally consumed anywhere outside Europe. Since the new EU regulation on novel food came into effect in January 2018, the process for scientific risk assessment of a novel food application has been centralised. EFSA performs risk assessments on the safety of a novel food upon request by the European Commission. **www.efsa.europa.eu/en/topics/topic/novel-food**