

TECHNOLOGY OFFER

METHOD FOR OBTAINING PROTEINS OR A RICH-PROTEIN EXTRACT FROM ALGAE

This technology relates to novel methods for disrupting algae cell walls based on milling and enzymatic lysis obtaining a high nutrient digestibility protoplast to be used as a functional feed or food ingredient in human or animal diets.

KEYWORDS

Algae nutrient bioavailability

Aquafeeds

Novel ingredients

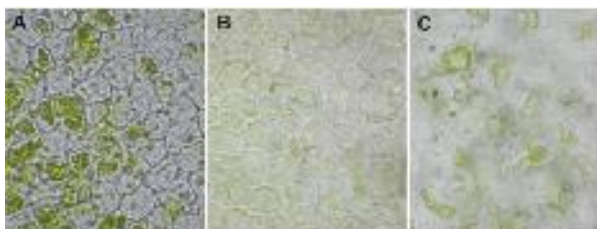
Cell wall disruption

Digestive enzymes

DESCRIPTION

Global population growth and increased living standards will push up the demand for fish-derived protein in the future. However, resource scarcity (feed, water and energy), environmental impacts, and changes in climate and growing conditions can seriously hamper aquaculture that supplies a significant proportion of human food. New sustainable protein and lipid sources and improved technologies to increase bioavailability of existing sources are needed, ensuring adequate supply of aquafeeds and sustained growth of aquaculture.

The cellulosic cell wall, which represents about 10% of the algal dry matter, poses a serious problem in the use of the algal biomass as feed/food ingredients, since it is not digestible by humans and other non-ruminants like fish. This technology provides therefore an effective solution to improve the algal nutrient bioavailability, being relevant for the algae biomass sector, especially for aquaculture, food/feed ingredients, nutraceuticals, cosmeceuticals and fertilizers industries.



Microscopy images (100x) of Hydrated *Ulva* sp. cell wall disruption: A - after 5 minutes of ultra-turrax action; B - after 10 minutes of gravitational ball mill action; C - after 5 minutes of vibratory rings mill action.

ADVANTAGES & INNOVATIONS

The novel disrupted algal suspension contains a high level of “free” protein, peptides and amino acids and other valuable soluble nutrients and bioactive compounds entrapped in cell membranes (minerals, vitamins, lipids, antioxidants, etc.) that can be dried and efficiently used as feed/food ingredient for animals or humans.

Improved algal biomass digestibility capacity and nutrient metabolism in aquaculture systems, leading to higher fish growth performance and better end product quality. The use disrupted micro- and macro-algal biomass as feed ingredients contributes to increased farming efficiency, sustainability and reduced environmental impact, providing a safe and healthy food item with wide consumer acceptance.

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INTELLECTUAL PROPERTY RIGHTS

Patent status

International Patent Application via PCT [WO2019171293](https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2019171293)

Priority date: 06.03.2018

Pending in EU, US, India



STAGE OF DEVELOPMENT

TRL4 - Technology validated in lab

Further development for validation in large scale setups required



COOPERATION OPPORTUNITY

Licensing agreement

Product development and marketability.

Collaboration for further validation in large scale setups, namely regarding the optimization of a large-scale capacity vibratory mill to process larger quantities of biomass.

RD&I partners to conduct in vivo experiments with farmed fish for the development of a novel commercial aquafeed.



RELEVANT PUBLICATIONS

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