

Saccharina latissima value chain, patents and economic analysis

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Outline

Presenting the work of Work Package 5

Value chain analysis: Sander van den Burg

Patent analysis: Ana Daniel

Economic analysis: Maggie Skirtun

Not presented now: LCA

Note the results of the economic analysis are left out of this publication. For more information contact Sander van den Burg (sander.vandenburg@wur.nl)





The GENIALG approach to value chain analysis

Analysis of the organization of seaweed value chains, combining qualitative and quantitative

methods.

Identified 6 characteristics of value chains, drawing upon with work of Gereffi et al,

- Upgrading strategy
- Innovation
- Input-output structure
- Stakeholders
- Governance
- Geographic scope

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Prospects for upgrading by the European kelp sector $\,$

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186 Accesses | 4 Altmetric | Metrics

Abstract

The interest in cultivating seaweed in European seas as source of food, feed and feedstock for the biobased economy is growing. Amongst the species investigated is kelp, also known as sugar kelp, Saccharina latissima or Laminaria saccharina. The European kelp sector is relatively small, compared to the global production and use, yet growth of the sector is aimed for. An inevitable question for European seaweed producers is how they can compete in the global seaweed value chain. This paper assesses to what extent the European strategy for growing (GVC) framework is applied to study how the global kelp sector is organized, including analysis of trends in science and patents. The upgrading strategy deployed by the European sector is critically evaluated against this framework. The analysis points towards various dividing lines between the established kelp cultivation and processing industry in Asia and the (far smaller) nascent cultivation and processing industry for high-value applications. These represent two unconnected worlds. Chain or intra-sectoral upgrading to spur the European kelp sector could

More details in van den Burg et al (forthcoming): https://doi.org/10.1007/s10811-020-02320-z





Applying this approach to Saccharina latissima

Upgrading strategy for *Saccharina latissima*: development of high value products from seaweed for the following markets: alginate, pharmaceuticals, cosmetics, bioplastics

How does this relate to the current organization of the value chain?

- Innovation: trends in number of scientific publications and developments in patents (to be discussed)
- Input-output structure: Geographic data on production
- Stakeholders: Key players in Europa
- Governance: Relation between actors in the value-chain
- Geographic scope: Locality of innovation

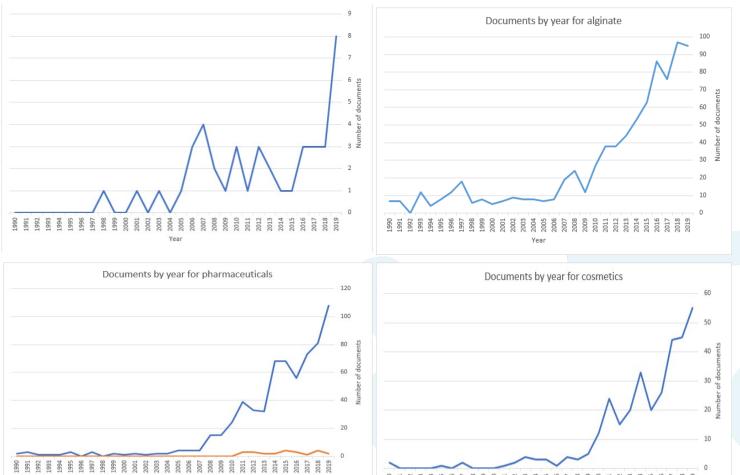




Value chain: innovation

Systematic literature review using Scopus

Qualitative analysis of 10 most cited



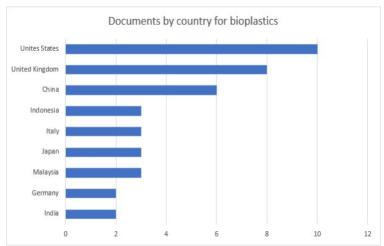
— Pharmaceuticals — Pharmaceuticals and Fucoxanthin

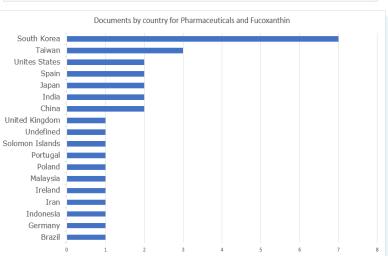


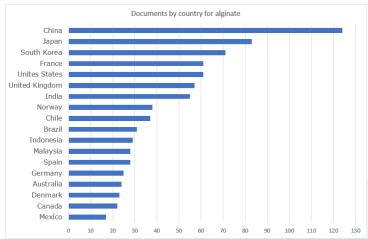


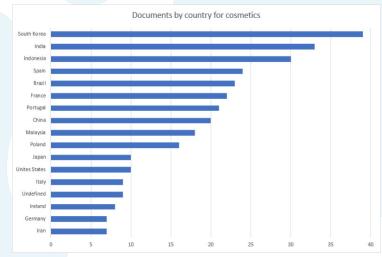
Value chain: geographic scope

Based on Scopus search













Value chain: input-output structure

Length of input-output structure varies

The seaweed is processed by 1 to 4 companies before it reaches the end-user

In all markets: seaweed is supplied by a raw material supplier

End-users are served by the lead firm – not the seaweed producer







Value chain: stakeholders

Four different value chain in terms of regulation and dominant actors:

Pharma and cosmetics: strong role of regulators

Bioplastic: little governmental regulation

Cosmetics, alginate, pharma: relatively few companies control the market

Alginate: role of quality standard, set by clients







Value chain: observations

Increasingly strong position of Europe in seaweed research

But Europe is not unique in its focus high value products

Niche food products are the most important market for European many seaweed producers as of now

These new markets are organized differently, more regulated (government and private regulation) & stronger influence of lead firms

Strengthen capacities in the supply chain is win-win

- Develop new products and markets with the lead firm
- Avoid competition based on price of raw materials only

Quality and sustainability as Unique Selling Point for European other raw material suppliers



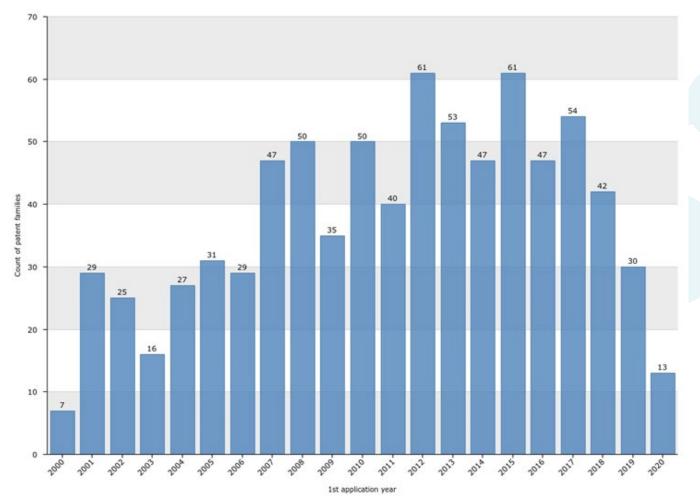


Investment trend

Patents

Orbit Intelligence Software

Saccharina latíssima OR Sugar Kelp OR Laminaria saccharina patents: Investment trend

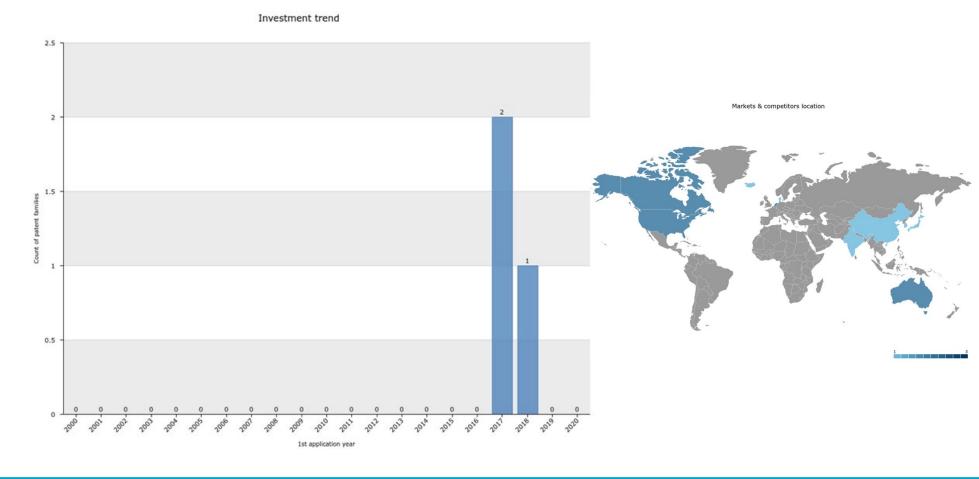






Patents: Bioplastics

(Saccharina latíssima OR Sugar Kelp OR Laminaria saccharina patents) AND Bioplastics





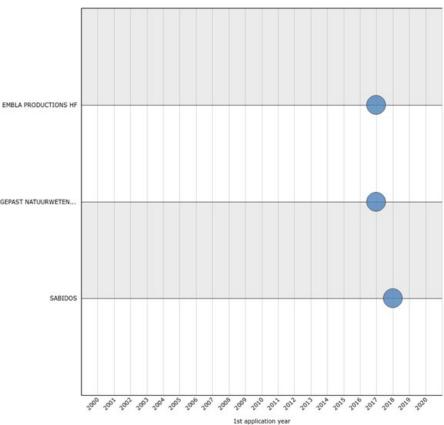


Patents: Bioplastics

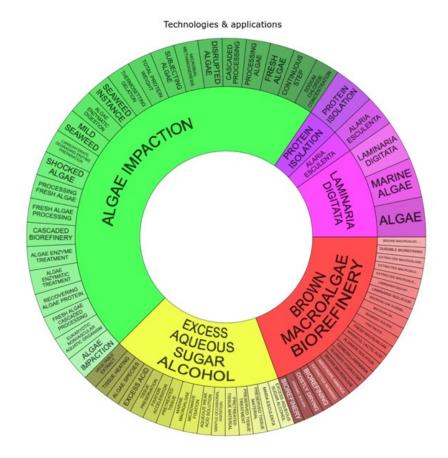
(Saccharina latíssima OR Sugar Kelp OR Laminaria saccharina patents) AND Bioplastics

3 patent families

NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETEN.



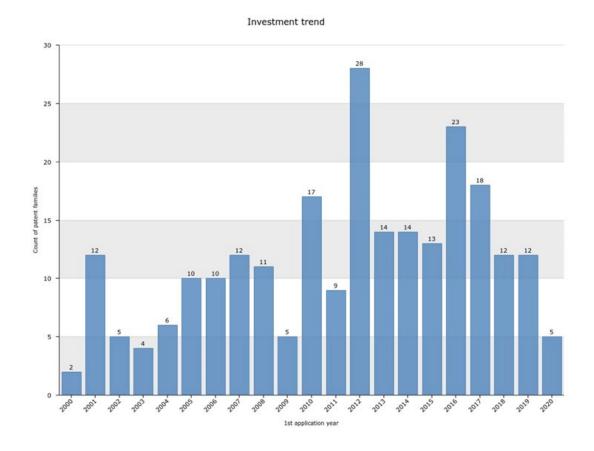
Investment trend for key players





Patents: Alginate

(Saccharina latíssima OR Sugar Kelp OR Laminaria saccharina patents) AND alginate





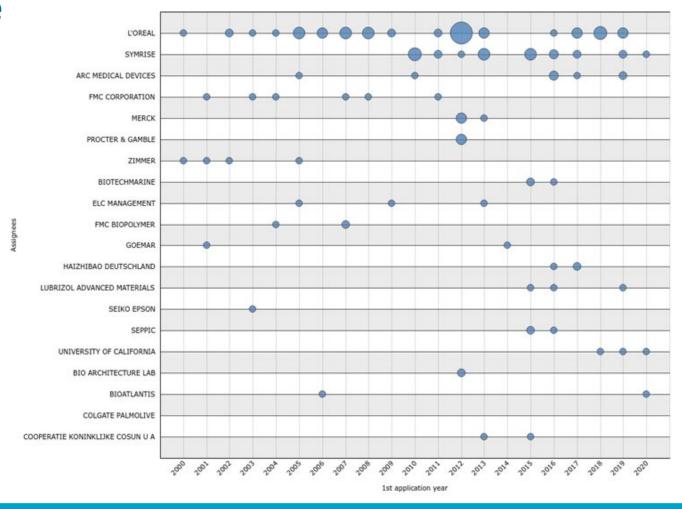




Investment trend for key players

Patents: Alginate

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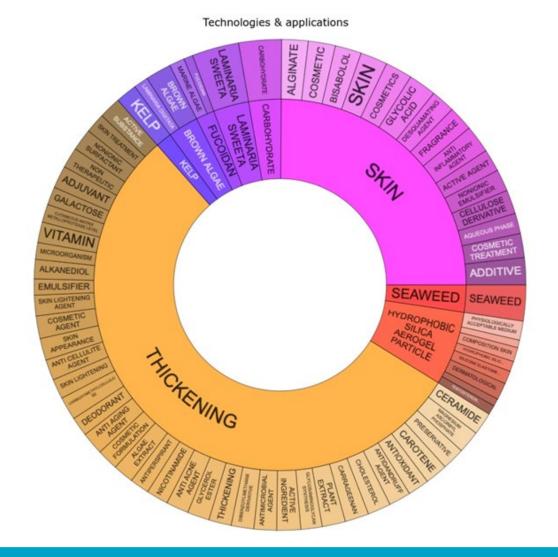






Patents: Alginate

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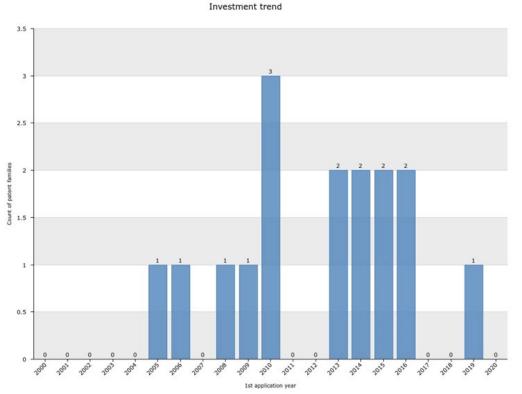


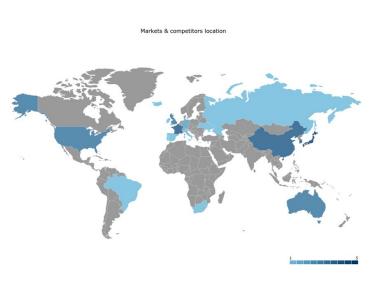




Patents: Fucoxanthin

(Saccharina latíssima OR Sugar Kelp OR Laminaria saccharina patents) AND fucoxanthin





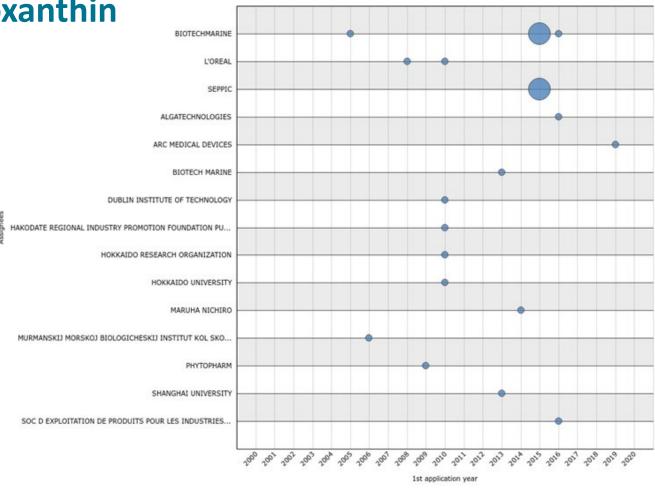




Investment trend for key players

Patents: Fucoxanthin

(Saccharina latíssima OR Sugar Kelp OR Laminaria saccharina patents) AND fucoxanthin





Technologies & applications



Patents: Fucoxanthin

(Saccharina latíssima OR Sugar Kelp OR Laminaria saccharina patents) AND fucoxanthin







Patent analysis: observations

Decreasing trend in the number of saccharina patent families, in the last years

Main patents' technology fiels: Organic fine chemistry (cosmetic and pharmaceutical) and food

Bioplastics portfolio:

- small number of patent families;
- focused on markets located in US, CanadaChina and Australia;
- technology concepts: protein isolation, biorefinery and methods of bioplastics production.

Alginate portfolio:

- large number of patent families;
- focused on markets located in US, Brazil, China and France;
- technology concepts: skin, thickening and cosmetics;

Fucoxanthin portfolio:

- small number of patent families;
- focused on markets located in China, France, Australia and US;
- technology concepts: skin, food and cosmetics;



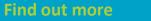


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