

From grams to tonnes: a decade of history of ALGAplus



OLIVEIRA I^{1,1}, MENDES M. C.^{1,2}, AZEVEDO A.¹, CORREIA H.¹, COSTA B.¹, MELO R.¹, MARTINS M.¹

1 ALGAplus, Produção e Comercialização de Algas e Seus Derivados SA. PCI-Via do Conhecimento, 3830-352 Ílhavo, Portugal;
2 GreenCoLab, Associação Oceano Verde, Universidade do Algarve, Campus de Gambelas, 8005-139 Faro, Portugal

Correspondence: Inês Oliveira ines.oliveira@algaplus.pt

Introduction

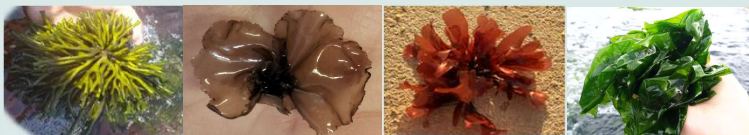
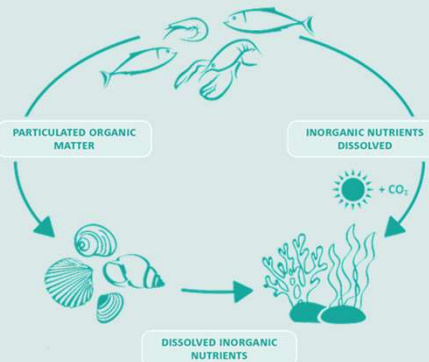
ALGAplus is a Portuguese company located in Ria de Aveiro that produces customised organic certified seaweed and seaweed-based products mainly for the food and well-being markets, assuring warranties of sustainability, quality standards through time and traceability to the customers.



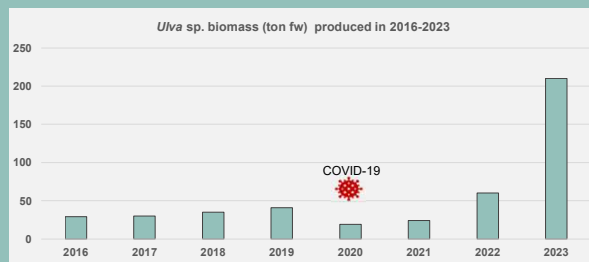
The production settles in an Integrated Multi-Trophic Aquaculture (IMTA) concept, with a strong focus in R&D and continuous support to the customers. All seaweed production phases are carried out in-house: from biomass production to processing (washing, drying, salting, cutting, milling), and packaging.

The main species in production at this Portuguese company is *Ulva* sp., however, other species native from the Atlantic ocean are also farmed and commercialized year-round, such as *Porphyra dioica*, *Porphyra umbilicalis*, *Gracilaria gracilis*, *Codium*

tomentosum, among others. *Palmaria palmata* is the only species of seasonal cultivation at ALGAplus.



After their installation and months of trials, the 15 raceway units propelled the company production of *Ulva* sp. from 50 to 210 tonnes (wet weight) in 2023: not much for Asian production levels, but a crucial milestone for an EU young seaweed farmer.



R&D

Worldwide there has been a significant interest of the academic institutions and companies not only on the upstream processes associated to the cultivation/harvesting of seaweed (and algae in general) but also related to downstream and application of these resources. Nowadays, these keystone milestones are being carried out in the framework of projects like SeaMark (Horizon Europe Grant Agreement N° 101060379) and Pacto da Bioeconomia Azul (02/C05-i01/2022).

The Algae Vertical (part of the project Pacto da Bioeconomia Azul) was created intending to develop:

- Cultivation protocols and methodologies to increase the availability of sustainable algal biomass
- Innovative algae-based applications for the nutraceutical and cosmeceutical markets
- Innovative algae-based ready-made meals and novel foods for human consumption
- New functional foods for aquaculture
- New agricultural solutions



Regarding the pilot scale of seaweed farming, interesting results have been achieved, such as the development of an optimized cultivation protocol in the raceway system. Adjustments to the water movement allowed for the improvement of the electric power efficiency of the system. The first results indicate that biomass yield is not compromised using the new protocol (differences in yield below +/- 10%), nor the quality of the biomass, with an expected saving of 61000 kW/year.

Final remarks

Follow this project in <https://www.algaevertical.com/> and on ALGAplus social media.



Key milestones

Since 2011, ALGAplus has been actively working on the production, optimization and upscaling of Atlantic seaweed, from lab scale to outdoor units. With an R&D backbone, many of the achievements of the company have been reached in the frame of internal and collaborative innovation projects.

2016 | Land-based modular seaweed cultivation system: The company reached 600 m² of surface of production, an important milestone for ALGAplus but small in comparison with the market demand and the upscaling production/processing.

2017 | Atlantic Nori (*P. umbilicalis* and *P. dioica*) hatchery/nursery developed.

2020 | Implementation of two raceway pilot units for seaweed production, in the frame of the European project GENIALG (Horizon 2020, Grant agreement N° 727892).

2022 | Implementation of 13 more raceway units for seaweed production in a total of 15 units.

2023 | Considerable increase in *Ulva* sp. production: from 50 ton to 210 ton (fw) in the frame of the project SeaMark (Horizon Europe Grant Agreement N° 101060379).

References & Acknowledgements

Acknowledgments

This work was financially supported by "Pacto da Bioeconomia Azul" (Project No. C644915664-0000026) within the WP5 Algae Vertical, funded by Next Generation EU European Fund and the Portuguese Recovery and Resilience Plan (PRR), under the scope of the incentive line "Agendas for Business Innovation" through the funding scheme C5 - Capitalization and Business Innovation.

