

Microalgae are sustainable bio-factories of healthy lipids

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The transition to more sustainable and healthier diets, capable of preventing non-communicable and age-related diseases, involves the development of new food sources and ingredients with high nutritional value, with sustainable production and reduced environmental impact. Microalgae are a sustainable and an alternative to traditional protein and lipid sources that can contribute to the transition to more environmentally friendly and healthier nutritional components, such as vitamins, proteins, and lipids. [1]

The mass spectrometry group of the Department of Chemistry of the University of Aveiro and its collaborators carried out an extensive lipidomic study of microalgae to describe the lipidomic profile and bioactivity [2-3], the best food grade lipid extraction methods [4] and how culture conditions influence the lipid profile of microalgae [5]. These findings contribute to the development of new lipid-rich microalgae-based nutraceuticals with great potential as human health supplements.



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FIGURE 1

Dry algae powder.



FIGURE 2

Liquid chromatography–mass spectrometer at the Chemistry Department of the University of Aveiro.

[1] Conde, T.A., et al. Microalgal lipid extracts have potential to modulate the inflammatory response: A critical review (2021) *International Journal of Molecular Sciences*, 22 (18), 9825.

[2] Conde, T.A., et al. Polar lipidomic profile shows *Chlorococcum amblyostomatis* as a promising source of value-added lipids (2021) *Scientific Reports*, 11 (1), 4355.

[3] Conde, T.A., et al. Microalgae as sustainable bio-factories of healthy lipids: Evaluating fatty acid content and antioxidant activity (2021) *Marine Drugs*, 19 (7), 357.

[4] Couto, D., et al. Chemoplasticity of the polar lipid profile of the microalgae *Chlorella vulgaris* grown under heterotrophic and autotrophic conditions (2021), *Algal Research*, 53, 102128.

[5] Melo, T., et al. Ethanol extraction of polar lipids from *nannochloropsis oceanica* for food, feed, and biotechnology applications evaluated using lipidomic approaches (2021) *Marine Drugs*, 19 (11), art. no. 593 DOI: 10.3390/md19110593 (2021) *Marine Drugs*, 19 (8), 414.