



Microalgae for a biomass applied to the extraction of high-value compounds

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Microalgae are considered as a new promising feedstock since they are rich in several valuable and bioactive compounds, including carbohydrates, polyunsaturated lipids, proteins or terpenoids, and are easily cultivated. These bioactives are currently used in industries such as cosmetic, pharmaceutical or biodiesel. Moreover, microalgae are a natural source of highly appreciated pigments that are used for commercial production of carotenoids (e.g., astaxanthin from *Haematococcus pluvialis* or β -carotene from *Dunaliella salina*). Besides, certain carotenoids from natural sources have shown potential health benefits including cardioprotective, neuroprotective, antioxidant, anti-cancer and anti-diabetes effects, among others.

In order to obtain these high-value compounds, different microalgal species (*Haematococcus pluvialis*, *Porphyridium cruentum*, *Nannochloropsis oceanica*, *Dunaliella salina* and *Tisochrysis lutea*) have been studied. Advanced environmentally friendly extraction techniques based on the use of compressed fluids, such as pressurized liquid extraction or supercritical fluid extraction, have been applied after optimization. Furthermore, for a better recovery of these compounds, different supercritical fluids-based purification and fractionation techniques, including supercritical antisolvent fractionation, have also been studied.

Depending on the chemical composition of each strain, different extraction strategies are proposed looking not only for the extraction of the main target components but also to produce a valorization of the residual biomass, maintaining a biorefinery perspective. Extracts and fractions produced have been chemically characterized using liquid chromatography coupled to mass spectrometry.

Keywords: green extraction, microalgae, high-value compounds, biorefinery.