SCREENING OF PHAEODACTYLUM TRICORNUTUM EXTRACTS REGARDING THEIR BIOACTIVE AND FUNCTIONAL PROPERTIES.

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The expanding interest in addressing a more sustainable and eco-friendlier product development regarding the problem of ecological preservation results in a growing community search for bioactive natural-based formulations. Microalgae extracts potential for their interesting bioactive properties has been widely recognized, with antioxidant activity accounting for a major application in cosmetics, pharmaceutics and nutrition fields, due to its health-promoting effects. Moreover, microalgae generally contain large amounts of structural biopolymers, which might possibly display interesting rheological properties. This work was designed to enhance microalgae potential biotechnology exploration by attaining at least two different main fractions, namely with bioactive and texturizing functions. *Phaeodactylum tricornutum* was used under a biorefinery concept, by performing extractions with several solvent systems with a wide polarity spectrum. Previous work enhanced this microalgae species potential as an antioxidant agent, regardless of the antioxidant quantification method used, when compared to *Nannochloropsis oceanica* and *Chlorella vulgaris* extracts. *P. tricornutum* powdered biomass was extracted (4% dry weight) using water or hydroethanolic mixtures (25-96%) under same conditions of extraction, namely, over one hour at three different temperatures: 40ºC, 60ºC and 80ºC. All extracts were screened for their bioactive potential by three different antioxidant activity measurement assays: FRAP, ABTS and DPPH, as well as chemical characterized regarding their phenolic and pigment content. Lipidic fraction was evaluated for ethanol 25%, 50% and 96% extracts. Rheological properties and emulsifying capacity and stability were determined for water and ethanol 25% extracts, while protein and carbohydrate content were also assessed. Overall, findings from this study suggest that *P. tricornutum* extracts have a great potential for biotechnology purposes: aqueous extracts were particularly interesting for their functional properties while bioactive properties were more relevant for the ethanolic extracts. These may due to a higher protein and carbohydrate fraction present in more aqueous extracts. On the other hand, extracts with higher concentration of ethanol evidenced a greater amount of pigments, phenolics and lipids. In this manner, further studies should be fulfilled in order to explore their application in natural-based product formulation.**Acknowledgements**
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Palavras-chave : Phaeodactylum tricornutum, Solvent extraction, Microalgae biorefinery, Bioactive properties, Functional properties