

Determination of polyphenols and antioxidant activity of monoclonal cultures of marine microalgae and cyanobacteria.

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Abstract

Nowhere on Earth exists a biological diversity as large as in the oceans, providing abundant resources for research and development. The special geoclimatic conditions in the Canary Islands, with high solar radiation, represent a challenge for marine photosynthetic metabolism, favoring the development of strategies for the prevention of cellular damage. It has been found that the presence of phenolic derivatives, especially polyphenols, effectively prevents the development of oxidative processes (1). Polyphenols neutralize free radicals that are naturally formed, and which are initiators of cellular oxidative processes. In this regard, single-celled organisms such as marine microalgae and cyanobacteria, offer a high potentiality in terms of obtaining new compounds due to their relative ease of controlled cultivation in laboratory. Although marine macroalgae have received considerable attention in recent years, microorganisms remain enough absent in these studies.

In this work, we propose a study on the potentiality of cultivating microalgae and cyanobacteria for the production of natural antioxidants. For this, we have analyzed five monoclonal samples of microalgae and cyanobacteria from marine waters of the Canary Islands and cultivated in the laboratory under different conditions. These samples were isolated, grown and harvested by the Centro de Biotecnología Marina (Center for Marine Biotechnology) and form part of the collection of the Banco Español de Algas (Spanish Bank of Algae).

The polyphenol content analysis was performed using the Folin-Ciocalteu reagent (2) widely used in such trials. In order to determine the antioxidant activity of the polyphenols produced by these microorganisms, the extracts were subjected to trials of neutralization of radical DPPH (REF).

The results presented show the potentiality of the culture of marine organisms for obtaining new antioxidant systems.

References

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