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STUDY OF THE PHENOLIC PROFILE AND BIOACTIVE POTENTIAL OF CARDOON BRACTS AS A PROMISING FUNCTIONAL INGREDIENT

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The world population has been growing and, consequently, so have the nutritional and food needs. The balance between adequate supply and the planet's resources is a subject with increasing attention in the world. The development of new strategies to combat this problem and ensure the population's nutritional needs are urgent and extremely necessary. The most complete characterization of crop species and their potential is extremely important for the adequate use of resources and the valorization of bio-waste generated annually through the development of new functional products [1]. *Cynara cardunculus* L. is a species widely cultivated in the Mediterranean region, and its production has an economic impact on this region. It is widely consumed in the Mediterranean cuisine as a result of its high nutritional value and the medicinal properties it has been demonstrating [1,2]. Cardoon bracts (variable *altilis*) were collected at the principal growth stage (PGS) 5. The phenolic composition was evaluated by HPLC-DAD-ESI/MS. Two *in vitro* assays were used to evaluate the antioxidant potential: TBARS (thiobarbituric acid reactive substances formation inhibition) and OxHLIA (oxidative hemolysis inhibition). The antiproliferative capacity was evaluated by the colorimetric method of sulforhodamine B, using several tumor cells lines and in a primary culture of non-tumor cells (PLP2). The anti-inflammatory activity was evaluated using a murine macrophage cell line (RAW 264.7). Eleven phenolic compounds were tentatively identified, with the compounds 5-*O*-caffeoylquinic and 3,5-*O*-dicaffeoylquinic acids present in higher abundance (6.362 and 21.83 mg/g extract, respectively). The cardoon bracts demonstrated cytotoxic (GI₅₀ of 30 – 79 µg/mL) and anti-inflammatory (IC₅₀ of 72 µg/mL) potential. The capacity to inhibit the formation of TBARS (IC₅₀ = 26.8 µg/mL) and the oxidative hemolysis (IC₅₀ of 82 and 159 µg/mL at Δt=60 min and 120 min, respectively) were also demonstrated. The results obtained allow us to confirm the high bioactive potential associated with cardoon bracts, as well as the great variety in phenolic compounds. These results also showed the promising potential of this species for its exploitation in the fortification of food products, such as bakery products and others. Therefore, the newly acquired knowledge allows the application of less used and less studied species as functional ingredients, and at the same time, obtain food products with richer nutritional value and higher interest for the food industry. Nevertheless, further studies are needed to better understand the compounds responsible for the observed activities, to reveal the mechanisms involved in these activities, as well as to evaluate the incorporation of this material in new functional food products.

References

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