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P50 Influence of the maturation stages on the chemical composition and biological activity of cardoon seeds

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Cynara cardunculus L., usually known as cardoon, is a Mediterranean herbaceous plant with diversified industrial applications. It is used in traditional medicine due to its several health-promoting effects, mainly associated with its chemical composition. Cardoon is also considered a functional food due to its richness in compounds with high added value and health benefits (e.g., phenolic acids, flavonoids, fiber, inulin)¹. In the present study, the influence of the harvest stage of cardoon seeds was analyzed. Seeds samples of cultivated cardoon (*C. cardunculus* L. var. *altilis*) were collected in Greece at different maturation stages (samples S1 - S4). The individual profiles in tocopherols, free sugars, organic acids, and fatty acids were determined using chromatographic methodologies. Its hydroethanolic extracts were characterized in terms of phenolic composition and cytotoxic, anti-inflammatory, antioxidant, and antimicrobial activities. The polyphenolic profile was analyzed by HPLC-DAD-ESI/MS. Antioxidant capacity was measured through two cell-based assays, namely TBARS and OxHLIA. The cytotoxic potential was determined against four tumor cell lines and a non-tumor cell line (PLP2). For the anti-inflammatory activity, it was determined the extracts' capacity to inhibit the formation of NO production. Finally, the antimicrobial activity was assessed by the microdilution method. Six phenolic compounds were tentatively identified, with their content increasing with the increasing maturation state. Mature seeds also demonstrated high content in lipids (23 g/100 g) and tocopherols (29.62 mg/100 g), as well as relevant cytotoxic (GI₅₀ of 97 – 216 µg/mL), antioxidant (TBARS; IC₅₀ = 5 µg/mL), and anti-inflammatory potential (IC₅₀ = 148 µg/mL). Significant antibacterial and antifungal activities were also demonstrated, particularly for samples S3 and S1, respectively. Further studies are needed to better understand which compounds are responsible for the observed bioactivities and the mechanisms responsible for the corresponding effects.

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