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# PHENOLIC COMPOSITION, ANTIOXIDANT, ANTI-HEPATOCELLULAR CARCINOMA AND HEPATOTOXIC PROPERTIES OF *CYNARA SCOLYMUS* L. (ARTICHOKE)

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*Cynara scolymus* L. (artichoke) is a medicinal plant native to the Mediterranean Basin that belongs to the Asteraceae family; it can be eaten (raw, fried, boiled, etc.) or consumed as infusion or dietary supplement (pill, capsule, syrup, etc.). This plant is widely cultivated all over the world being perceived as a nutritious and healthy vegetable due to its antioxidant and hepatoprotective effects [1]. The beneficial properties of medicinal plants can be related to their large diversity of phytochemicals, among which phenolic compounds are outstanding. Thereby, the aim of the present work was to obtain and compare the phenolic profiles of artichoke infusion and hydromethanolic extracts, using HPLC-DAD-ESI/MS. Furthermore, the infusion was studied for antioxidant properties (radical scavenging activity, reducing power, and lipid peroxidation inhibition), anti-hepatocellular carcinoma activity (HepG2 tumor cell line) and hepatotoxicity (non-tumor liver cells primary culture).

The infusion of artichoke presented higher phenolic compounds concentration (15.29 mg/g) than the hydroalcoholic extract (4.37 mg/g) with slight differences between the respective profiles; luteolin-7-O-glucuronide was the major flavonoid found in infusion and hydroalcoholic extract (5.74 and 0.70 mg/g, respectively), followed by luteolin-7-O-glucoside (2.88 and 0.49 mg/g, respectively). Monocaffeoylquinic derivatives were only present in the hydroalcoholic extract, being 5-O-caffeoylquinic acid (0.49 mg/g) the most abundant one, while dicaffeoylquinic acid derivatives were mostly identified in the infusion; 1,3-O-dicaffeoylquinic acid was the most abundant one in both extracts (0.90 and 0.37 mg/g in the infusion and hydroalcoholic extract, respectively). Regarding the antioxidant activity, the infusion revealed EC<sub>50</sub> values ranging from 0.14 to 2.13 mg/mL in lipid peroxidation inhibition and radical scavenging activity, respectively. It also revealed anti-hepatocellular carcinoma activity at 52.06 µg/mL, while presented toxicity in normal cells in concentrations higher than 71.73 µg/mL [2]. All in all, the infusion of artichoke proved to be more effective than the hydroalcoholic extract, revealing interesting effects against oxidative stress and liver damages.

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#### References:

- [1] Wang M, Simon JE, Aviles IF, He K, Zheng Q, Tadmor Y. (2003). *J. Agric. Food Chem.* 51, 601-608.  
[2] Pereira C, Calhelha RC, Barros L, Ferreira ICFR. (2013). *Ind. Crop. Prod.* 49:61-65.