

**Evaluation of Anti-inflammatory and Cytotoxic Activities of Extracts of Waste Petals, Leaves, and Stems of Turkish Artichoke (*Cynara scolymus*) by Phenolic Content****Authors:** [Bihter Şahin](#)<sup>1,2</sup>, [İsa Çelik](#)<sup>3</sup>, [Özge Tokul-Ölmez](#)<sup>2</sup>, [Yusuf Sıcak](#)<sup>4</sup>, [Mehmet Öztürk](#)<sup>2</sup> and [Muhammad Iqbal Choudhary](#)<sup>5,6</sup>**Affiliation:** <sup>1</sup>*Bandırma Onyedi Eylül University, Susurluk Agriculture and Forest Vocational School, Department of Chemistry and Chemical Processing Technologies, Türkiye;* <sup>2</sup>*Muğla Sıtkı Koçman University, Faculty of Science, Department of Chemistry, Mugla, Türkiye;* <sup>3</sup>*Muğla Sıtkı Koçman University, Ortaca Vocational School, Ortaca-Mugla, Türkiye;* <sup>4</sup>*Muğla Sıtkı Koçman University, Köyceğiz Vocational School, Köyceğiz-Mugla, Türkiye;* <sup>5</sup>*H. E. J. Research Institute of Chemistry, International Center for Chemical and Biological Sciences, University of Karachi, Karachi-75270, Pakistan;* <sup>6</sup>*Panjwani Center for Molecular Medicine and Drug Research, International Center for Chemical and Biological Sciences, University of Karachi, Karachi-75270, Pakistan*  
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*Cynara scolymus* L. (artichoke) is a member of the Asteraceae family and is widely cultivated in Mediterranean countries. In Türkiye, the average annual production is around 40.000 tons in the Aegean, Marmara, and Mediterranean regions. Since it has been used for therapeutic aspects alongside its usage in the Mediterranean diet, it is recorded in various pharmacopeia and monographs [1]. Some of the biological properties reported for artichokes are anticarcinogenic [2], antigenotoxic, hypocholesterolemic [3], antidiabetic [4], hypoglycemic, and hepatoprotective [5]. In addition, it is known to have significant medicinal properties such as antifungal, anti-HIV virus, and antibacterial properties [6]. Except for the edible part, *C. scolymus* L. generates much agricultural waste. Meanwhile, the packaging of harvested artichoke produces over 60% of waste. Cancer is considered one of the most fatal diseases all around the world. It is known that extracts obtained from the edible part of artichoke positively affect cancer cell lines. Therefore, to use the waste part of the artichoke, we aimed to study the antioxidant, anti-inflammatory, and cytotoxic activity of cooked and uncooked extracts together with their phenolic ingredients. The artichoke was collected from Dalaman-Muğla. The heat-treated and untreated portions of the artichoke's stem, petals, and leaves were dried in the shade. Different pH differentiation extractions were applied to cooked and raw parts of *C. scolymus*. The obtained extracts containing various amounts of phenolic compounds were studied for their antioxidant, anti-inflammatory, and cytotoxic properties. Cytotoxic activity was performed against human cervical and colon carcinoma cell lines. According to the results, the cooked artichoke extracts, containing a higher amount of cynarin, cynaroside, chlorogenic acid, 1,3-, and 1,4-di-caffeic acid quinic acids, possessed better results on human cervical cancer cell (HeLa) and colon carcinoma cancer (Caco-2) cells than the extracts obtained from uncooked parts.

**Keywords:** Artichoke (*Cynara scolymus* L.); anti-inflammatory activity; cytotoxic activity.**Acknowledgment:** This study is supported by Mugla Sıtkı Kocman University Research Projects Foundation with Project number 17/216.**References**

- [1] M.P. Curadi, N.Ceccarelli, L. Picciarelli, C. Martelloni and M.G. Sbrana (2007). Globe artichoke as functional food, *Mediterr. J. Nutr. Metab.* **31**, 97–201.
- [2] A. Zuorro, G. Maffei and R. Lavecchia (2014). Effect of solvent type and extraction conditions on the recovery of phenolic compounds from artichoke waste, *Chem. Eng. Trans.* **39**, 463–468.
- [3] A. Garbetta, I. Capotorto, A. Cardinali, I. D'Antuono, V. Linsalata, F. Pizzi and F. Minervini (2014). Antioxidant activity induced by main polyphenols present in edible artichoke heads: influence of in vitro gastro-intestinal digestion, *J. Funct. Foods* **10**, 456–464.
- [4] Y. Atıcı (2015). “Dişbudak ağacı (*Fraxinus excelsior*) ve enginar (*Cynara scolymus*) yapraklarından klorojenik asit ekstraksiyonun optimizasyonu”, Yüksek Lisans Tezi, Uşak Üniversitesi.
- [5] Y. Zhou, Z. Ruan, L. Zhou, X. Shu, X. Sun, S. Mi, Y. Yang and Y. Yin (2016). Chlorogenic acid ameliorates endotoxin-induced liver injury by promoting mitochondrial oxidative phosphorylation, *Biochem. Biophys. Res. Commun.* **469**, 1083-1089.
- [6] E. Miadokova, S. Nadova, V. Vlckova, V. Duhova, M. Kopaskova, L. Cipak, P. Rauko, P. Mucaji and D. Grancai (2008). Antigenotoxic effect of extract from *Cynara cardunculus* L., *Phytother. Res.* **22** (1), 77–81.

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