

# Special Issue on Antioxidants in Natural Products

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The importance of consuming antioxidants in food and beverages has increased enormously in recent years. Natural antioxidants, such as polyphenols, carotenoids and vitamin C, exhibit a plethora of biological effects, including anti-inflammatory, anti-aging, anti-atherosclerosis and anticancer effects. Extended original scientific research has been devoted to the evaluation of the antioxidant activity of natural products, such as olive oil, fruits and vegetables, as well as to the extraction, isolation and characterization of antioxidant compounds from medicinal plants, spices and marine sources. Extensive research has also been devoted to the recovery of antioxidants from olive mill waste, winery waste and other wastes.

The scope of this Special Issue, entitled “Antioxidants in Natural Products”, is to collect some of the available scientific research on the discovery of new antioxidants from all kinds of natural products, including their uses for human benefit, and to critically present available and emerging analytical methods for the measurement of antioxidant activity/capacity and other quality parameters of natural products.

A total of fifteen papers (fourteen research papers and one review paper) in various fields of antioxidants are included in this Special Issue. Tan et al. [1] investigated the effects of glazing with sodium polyacrylate (SP) and D-sodium erythorbate (DSE) on changes in squid quality during frozen storage and reported that SG-3DSE (0.1% SP with 0.3% DSE-glazed) has significant potential for this purpose. Messina et al. [2] investigated the extraction of antioxidants and bioactive components using a supercritical fluid technique from four taxa of the genus *Calendula* collected in the Mediterranean region (Sicily). The extraction process with the reported SFE technique did not require the use of toxic solvents and provided high selectivity. In the study by Sarikurku et al. [3], extracts of *Ziziphora taurica* subsp. *cleonioides* were obtained with ethyl acetate, methanol and water solvents, and the chemical profile of the aerial part of the plant was clarified. Mitrevska et al. [4] comparatively evaluated the polyphenolic content and antioxidant activity of selected regional red and white wine varieties produced in the Republic of North Macedonia. Sun et al. [5] investigated the anticancer activity and inhibition mechanism of catechin against non-small cell lung cancer A549 cells and reported that catechin can effectively inhibit the proliferation of A549 cells by regulating cell cycle arrest or indirectly via the p21 signaling pathway. Sotiropoulou et al. [6] evaluated the total phenolic content, antioxidant activity and potential toxicity of chamomile and sage aqueous extracts prepared at different temperatures and reported that the optimal phenolic profile level was reached at 80 °C. Oh et al. [7] investigated the protective effects of (2′S)-columbianetin against changes in matrix metalloproteinase-1 and collagen production caused by ultraviolet A radiation in human dermal fibroblasts. As a result of this study, the potential of (2′S)-columbianetin to be a cosmeceutical precursor compound with antiphotaging properties against ultraviolet A-induced collagen degradation was reported. Chang et al. [8] investigated the antioxidant activity changes in terms of 1,1-diphenyl-2-picrylhydrazyl (DPPH) scavenging ability and total phenolic content of black tea under different infusion and storage conditions. It was reported that antioxidant activity increased with increasing infusion temperature for black

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tea, and DPPH scavenging activity and total phenolic content did not change during 15-day short-term storage. Tzachristas et al. [9] investigated the antioxidant capacity, total phenolic content and sensory profile of some Greek wines made in two consecutive vintages from *Vitis vinifera* L. c.v. Moschofilero treated with powdered leaves of *Hippophae rhamnoides* L. In the study, it was reported that the addition of *Hippophae rhamnoides* leaves to white wines contributes positively to antioxidant capacity and has the potential to be used as an antioxidant agent in wines without the use of sulfur dioxide. Grigorakis et al. [10] investigated the effects of three common cyclodextrins (methyl  $\beta$ -cyclodextrin, hydroxypropyl  $\beta$ -cyclodextrin and  $\beta$ -cyclodextrin) as enhancers in aqueous extraction of polyphenols from aerial parts of *Salvia fruticosa*. In this study, it was reported that methyl  $\beta$ -cyclodextrin was the most effective extraction enhancer utilizing the least energy-intensive process. Kim et al. [11] investigated the interaction profiles of phytochemicals with human serum albumin in some kiwifruits and persimmon cultivars and tried to predict their biological roles under in vivo conditions. In light of the fluorescence quenching and molecular docking results, it was reported that these fruits have great potential for functional food formulations and medicinal applications. Gomaa et al. [12] studied the neuroprotective effect of Ginkgo biloba (Ginkgo) against the neurotoxicity induced by cisplatin (Cis) in rats, where concomitant treatment with Ginkgo could reduce Cis-mediated neurotoxicity in experimental animals. Zieniewska et al. [13] compared the antioxidant and antiglycation properties of seventeen fruit teas obtained from the producer. In their study, they examined different brewing times and temperatures and reported that infusions with the longest brewing time exhibited the highest antiradical activity and that increasing brewing temperature did not significantly affect the evaluated parameters. They also reported that extracts from fruit tea reduced the oxidation and glycation of albumin in vitro. Mlinarić et al. [14] investigated the effect of 24 and 48 h lighting on dark chia microgreens. As a result of the study, it was reported that lighting has a positive effect on the antioxidant potential of chia microgreens, which can make a valuable contribution to the human diet. Tzachristas et al. [15] investigated the potential of polyphenols to be used as a quality tool in the diagnosis of wine authenticity. Analytical approaches using ultra-sensitive instrumentation combined with advanced chemometric techniques were reported to reveal the polyphenolic composition of wine. In addition, it was emphasized that synergistic approaches between the emerging analytical platforms with advanced multivariate data analysis play important roles in fraud detection and identification of authentic wines.

Although submissions for this Special Issue have been closed, more in-depth research continues into the extraction, characterization, determination and waste evaluation of natural antioxidants.

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