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**The impact of chemical composition on the antioxidant,
antifungal and antibacterial activity of commercial Macedonian
cold-pressed oils**

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Abstract

The chemical composition and quality of four commercial cold-pressed oils (poppy seed oil, almond oil, walnut oil and wheat germ oil) from Macedonia were examined in this work. Regarding the fatty acid composition, the highest level of oleic acid was determined in almond oil ($67.57 \pm 0.02\%$) and wheat germ oil ($38.14 \pm 0.04\%$), whereas the poppy seed oil and walnut oil were the richest sources of linoleic acid with abundance of $72.28 \pm 0.06\%$ and $60.73 \pm 0.01\%$ respectively. The significant quantity of α -linoleic acid (ALA) was detected only in walnut oil ($11.74 \pm 0.01\%$). The highest level of α -tocopherol (23.77 ± 0.01 mg/100 g of oil) was quantified in almond oil while γ -tocopherol was the most abundant in walnut and wheat germ oils.

The results from antioxidant assays showed that Vitamin-E-active compounds were the most important minor compounds responsible for antioxidant activity against DPPH radical, whereas total phenolic compounds were the most active against ABTS radical. Phytosterols, as minor compounds present in the oils, did not contribute significantly to the total antioxidant potential of the oils but, their levels in particular oils, together with fatty acids, can be useful and reliable markers for the purity of the oils and determination of the composition of blends.

Regarding antimicrobial activity, the cold-pressed poppy seed oil had antibacterial activity against *Listeria monocytogenes* whereas, significant antifungal activity against *Candida albicans* indicated almond, walnut and poppy seed oils.

Key words: commercial cold-pressed oils, fatty acid composition, vitamin-E-active compounds, phytosterols, antioxidant activity, antimicrobial activity