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## ANTIOXIDANT CAPACITY OF WILD THYME EXTRACT-LOADED LIPOSOMES

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Wild thyme (*Thymus serpyllum* L., Lamiaceae) contains bioactive compounds that show antimicrobial, anti-inflammatory, antioxidant, immunomodulatory, analgesic, and spasmolytic effects. However, the application of its bioactive components is limited due to their low stability, solubility, and consequently bioavailability. The encapsulation, as a process of entrapping bioactive compounds into particles, represents an appropriate way to overcome the mentioned disadvantages. Furthermore, the addition of sterols in a phospholipid mixture during liposomal preparation can result in liposomal particles with satisfied physicochemical characteristics. Hence, wild thyme extract-loaded liposomes were developed in the present study, and their antioxidant capacity was investigated. Liposomes were prepared using proliposome method and pure phospholipids (Ph) or the mixture of phospholipids and two different sterols (20 mol % of cholesterol or  $\beta$ -sitosterol). According to the results of ABTS and DPPH assays, pure wild thyme extract neutralized  $74.0 \pm 1.3\%$  of ABTS radicals and  $57.7 \pm 0.1\%$  of DPPH radicals. Additionally, the antioxidant activity of plain liposomes (without extract), which probably originates from an antioxidant compound added to the raw phospholipid mixture was 11.3-15.9% of ABTS neutralization and 9.89-12.7% of DPPH neutralization. All liposomal populations with extract have shown similar antioxidant potential towards free ABTS radicals. Namely, Ph, Ph+cholesterol, and Ph+ $\beta$ -sitosterol liposomes with extract neutralized  $64.8 \pm 1.2$ ,  $64.7 \pm 1.0$ , and  $65.9 \pm 0.6\%$  of ABTS radicals, respectively. However, DPPH radical scavenging potential was statistically significantly lower ( $56.5 \pm 2.3$ ,  $48.1 \pm 2.8$ , and  $47.8 \pm 2.2\%$ ). The addition of sterols significantly decreased the DPPH antioxidant capacity of the extract-loaded liposomes. Considering that the two used antioxidant tests are based on different principles and reactions, the obtained results may be different and provide good insight into the overall antioxidant activity of wild thyme extract-loaded liposomes. Due to shown antioxidant capacity of the liposomes with encapsulated bioactive compounds from wild thyme extract, they can be used in various cosmetic and pharmaceutical products for skin application.

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