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Supercritical and High Pressure Subcritical Fluid Extraction from Lemon Balm (*Melissa officinalis* L., Lamiaceae)

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Abstract

Analysis of yield and composition profile of *Melissa officinalis (Lemon balm)* extract obtained by two step CO_2 extraction at high pressure was analyzed. The first or essential oil fraction, collected at 10 MPa and 40°C , contained mostly the high volatile and aromatic compounds. The second fraction was consenquently extracted at 30 MPa using different temperature: 25°C (higher pressure than critical pressure but at temperature below the critical; HPCP-CO_2), 40°C or 100°C (supercritical CO_2; SC-CO_2). Obtained yield of essential oil fraction was 0.45% at 10 MPa, while depending on applied extraction temperature (HPCP-CO_2 or SC-CO_2), the yields of the second fractions collected at 30 MPa varied from 0.44% to 0.94%. Within the study, the content of active substances in obtained extracts was analyzed, too. For comparison with CO_2 extracts (HPCP or SC) the yield and characterization of essential oil obtained by hydrodistillation was accomplished, as well. A significant difference was noted not only between the essential oil isolated by hydrodistillation and SC-CO2 extraction (40^oC, 10 MPa) but also between total extracts obtained by HPCP-CO_2 and SC-