Accepted Manuscript

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

Author: Aleksandra Bogdanovic Vanja Tadic Ivana Arsic Stoja Milovanovic Slobodan Petrovic Dejan Skala

PII: S0896-8446(15)30122-4

DOI: http://dx.doi.org/doi:10.1016/j.supflu.2015.09.008

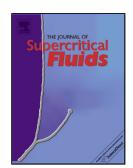
Reference: SUPFLU 3445

To appear in: J. of Supercritical Fluids

Received date: 5-8-2015 Revised date: 10-9-2015 Accepted date: 10-9-2015

Please cite this article as: A. Bogdanovic, V. Tadic, I. Arsic, S. Milovanovic, S. Petrovic, D. Skala, Supercritical and High Pressure Subcritical Fluid Extraction from Lemon Balm (*Melissa officinalis* L., Lamiaceae), *The Journal of Supercritical Fluids* (2015), http://dx.doi.org/10.1016/j.supflu.2015.09.008

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ACCEPTED MANUSCRIPT

Supercritical and High Pressure Subcritical Fluid Extraction

from Lemon Balm (Melissa officinalis L., Lamiaceae)

Aleksandra Bogdanovic^a, Vanja Tadic^b, Ivana Arsic^c, Stoja Milovanovic^a, Slobodan Petrovic^a,

Dejan Skala^a,

^aUniversity of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11120 Belgrade, Serbia

^bInstitute for Medical Plant Research "Dr Josif Pancic", Tadeusa Koscuska 1, 11000 Belgrade, Serbia

^c Faculty of Medicine, University of Nis, Bulevar dr Zorana Djindjica 81, 18000 Nis, Serbia

Abstract

Analysis of yield and composition profile of *Melissa officinalis* (*Lemon balm*) extract obtained by two step CO₂ 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-CO₂), 40°C or 100°C (supercritical CO₂; SC-CO₂). Obtained yield of essential oil fraction was 0.45% at 10 MPa, while depending on applied extraction temperature (HPCP-CO₂ or SC-CO₂), 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 CO₂ 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°C, 10 MPa) but also between total extracts obtained by HPCP-CO₂ and SC-

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