Short communication

iMedPub Journals
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Global Environment, Health and Safety

2022
Vol.6 No.3

An optimized process for supercritical CO2 extraction of high-value components from Artemisia annua L for cosmetic applications

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Abstract

Artemisia annua L. is a plant used as traditional Chinese herb medicines. The plant shows a strong antimalarial activity due to the presence in its aerial parts of artemisinin and its derivative compounds. A typical plant content of artemisinin is between 0.7â 1.5% w/w depending on the growth conditions and species. Besides being the only commercial source of artemisinin, the plant contains a pleasantly aromatic essential oil valued in perfumery and cosmetics. Recent published literatures reported that artemisinin and its derivatives present a wide range of biological activities, exhibiting therapeutic potential as anti-inflammatory and antimicrobial. These high-value components could be used to generate new sustainable multifunctional cosmetic products. However, the main process for obtaining artemisinin has been carried out by traditional organic solvent extraction that has residual solvent and low purity problems. Therefore, it is desirable to develop a greener extraction technique. Supercritical carbon dioxide extraction (SFE) can be very selective, presents high extraction yields and high purity advantages. The aims of this study were to evaluate the multi-use of leaf biomass for production of essential oil, artemisinin and residual extract using supercritical CO2 fractional extraction. Thin layer chromatography (TLC) and liquid chromatography coupled with mass spectrometry (LC-MS/MS) were used for qualifying and quantifying artemisinin and its derivative compounds in the extracts while the essential oil was characterized by gas chromatography coupled with mass spectrometry (GC-MS). The influence of the extraction pressure and temperature on the extract composition was systematically measured, analyzing the recovered fractions at different extraction times during the extraction process. Under optimized experimental conditions it was possible to obtain the fractionation of the desired products.

Received: May 05, 2022; **Accepted**: May 14, 2022; **Published**: May 25, 2022

Biography

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