Optimisation and characterisation of marihuana extracts obtained by supercritical fluid extraction and focused ultrasound extraction and retention time locking GC-MS.

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Source

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Abstract

The optimisation of focused ultrasound extraction and supercritical fluid extraction of volatile oils and cannabinoids from marihuana has been accomplished by experimental design approach. On the one hand, the focused ultrasound extraction method of volatile compounds and cannabinoids was studied based on the optimisation of cyclohexane and isopropanol solvent mixtures, and the instrumental variables. The optimal working conditions were finally fixed at isopropanol/cyclohexane 1:1 mixture, cycles (3 s(-1)), amplitude (80%) and sonication time (5 min). On the other hand, the supercritical fluid extraction method was optimised in order to obtain a deterpenation of the plant and a subsequent cannabinoid extraction. For this purpose, pressure, temperature, flow and co-solvent percentage were optimised and the optimal working conditions were set at 100 bar, 35°C, 1 mL/min, no co-solvent for the terpenes and 20% of ethanol for the cannabinoids. Based on the retention time locking GC-MS analysis of the supercritical fluid extracts the classification of the samples according to the type of plant, the growing area and season was attained. Finally, three monoterpenes and three cannabinoids were quantified in the ranges of 0.006-6.2 μg/g and 0.96-324 mg/g, respectively.