Statistical mixture design extraction of total polyphenols and compounds with antioxidant activity and from Cannabis Sativa L. residues.

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Abstract

Cannabis sativa L. is an important herbaceous species with high interest for the pharmaceutical and construction sectors. It is considered as treasure trove of phytochemicals potent bioactivities on human health. Extraction presents one of the crucial steps in the individual separation and identification of phytochemicals for which selectivity is very affected by numerous conditions such as solvent polarity. The present study was aimed to optimize the extraction process through the biomonitoring of total phenolic compounds (TPC), from cannabis residues using
a statistical mixture simplex-centroid design to study the effects of different solvents (hexane, ethanol, methanol and water) and their mixtures. Solvent selection was done based on the preliminary experiments in which ten solvents with different polarities were screened for their ability to extract TPC. TPC varied from 7,25 to 20,67 mg GAE/g dry plant. The experimental results and their response-surface models that binary mixtures with rich in methanol and ethanol extracted higher TPC amounts. Whereas, binary and ternary mixture showed high antioxidant activity. Pareto chart analysis showed that phenolic compound extraction was mostly ethanol followed by methanol. While antioxidant activity was highly affected by ethanol, methanol and hexane.

Keywords: cannabis sativa, mixture simplex, centroid design, DPPH, total phenolic compounds

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