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OP1. Essential oils from 11 *Cannabis sativa* cultivars isolated by different methods and toxicological evaluation of their components

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Industrial hemp is grown for numerous applications, traditionally for the production of textile fiber, pressing oil from the seeds and in foods. More recently, non-psychotropic phytocannabinoids have attracted an increasing interest of researchers and medics due to their health benefits. Industrial hemp accumulates comparatively low amounts of essential oil (EO); however, it is considered as an important ingredient for some hemp oil based products. The aim of this study was to expand the existing knowledge on the composition of EO compounds isolated from eleven *Cannabis sativa* cultivars using *Clevenger* hydrodistillation and supercritical CO_2 extraction (SFE-CO_2) for their isolation. In addition, microwave (MAD) and ultrasound (UAD) assisted distillation has been tested in order to evaluate their advantages. The dried plant material was ground using a 0.5-mm hole size sieve before EO isolation, while the fresh material was used undried. MAD was applied to the fresh material without its dilution with water, while SFE-CO_2 was performed in *Helix* extractor using 2 separators operating at different pressure and temperature. EO collecting vessel was cooled from –40 to +20 in order to evaluate possible losses of volatile constituents during system depressurization. The yield of EOs varied from 0.07 to 0.35% depending on the cultivar, extraction method, plant harvesting time, drying and SFE-CO_2 parameters. The main volatile components identified and quantified in *C. sativa* cultivars by GC×GC-TOF/MS and GC-FID, respectively, were β-caryophyllene (16.6-34%), humulene (13.1-30.0%), α-pinene (0.1-31.2%), caryophyllene oxide (4.3-10.2%), β-pinene (0.1-8.3%), myrcene (0.2-9.5%), limonene (0.1-2.7%), eucalyptol (0.1-3.1%), humulene epoxide II (1.4-3.6%) and *trans*-β-farnesene (1.3-4.6%). The toxicology of the main EO components was reviewed based on the previously reported data. In the second part of this study acetone extracts of the solid residue and water extracts consisting of the liquid phase after hydrodistillation were used for evaluating their antioxidant activities and total phenolic content in order to assess the possibility of using plant distillation residues as a source of various functional non-volatile ingredients. It was recently reported that the biorefining approach may give several valuable fractions from hemp threshing residues [1].

References:
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