# Selective Fractionation And Isolation Of Allelopathic Compounds From Helianthus Annuus L. Leaves By Means Of High-Pressure Techniques

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## Abstract

The allelopathic potential of Helianthus annuus L. leaves was study based on bio-directed chemical fractionation approach. Aerial parts of H. annuus were extracted by means of SFE using supercritical carbon dioxide ($scCO_2$) and ESE using $CO_2$+50% EtOH/$H_2O$ (varying ethanol in water from 0 to 100%). Extractions were carried out at 400 bar, 55 °C, 20 g/min and for 4 h. Then, extracts were fractionated in three separators at the following conditions: S1: 200 bar/45 °C; S2: 90 bar/40 °C; and S3: 1 atm/30 °C. ESE obtained higher overall yields than $scCO_2$ and the use of water as cosolvent ($CO_2$+50% $H_2O$) resulted in a S3 fraction free from chlorophylls and rich in bioactive compounds. 14 compounds, including fatty acids, terpenes, flavonoids and heliannuols, were isolated from this fraction. After performing the bioassay on pure compounds, heliannuol D, tambulin, pinoresinol and sesquiterpene 10-oxo-isodauc-3-en-15-al showed the most effective inhibitor profiles.

### Keywords

Allelopathy; Enhanced Solvent Extraction; Fractionation; Helianthus Annus; Supercritical Fluids.