

# Assessment of Conventional Solvent Extraction vs. Supercritical Fluid Extraction of Khella (*Ammi visnaga* L.) Furanochromones and Their Cytotoxicity

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## Abstract

Background: Khella (*Ammi visnaga* Lam.) fruits (Apiaceae) are rich in furanochromones, mainly khellin and visnagin, and are thus incorporated in several pharmaceutical products used mainly for treatment of renal stones. Methods: The objective of this study was to compare the yield of khellin and visnagin obtained using different conventional solvents and supercritical fluid extraction (SCFE) with carbon dioxide (containing 5% methanol as co-solvent). Water, acetone and ethanol (30% and 95%) were selected as conventional solvents. Results: Highest extract yield was obtained from 30% ethanol (15.44%), while SCFE gave the lowest yield (4.50%). However, the percentage of furanochromones were highest in SCFE (30.1%), and lowest in boiling water extract (5.95%). HPLC analysis of conventional solvent extracts showed other coumarins that did not appear in supercritical fluid extraction chromatogram due to non-selectivity of solvent extraction. *Ammi visnaga* extracts as well as standard khellin and visnagin were tested for their cytotoxic activity using sulforhodamine B assay on breast cancer (MCF-7) and hepatocellular carcinoma (Hep G2) cell lines. Results revealed a strong cytotoxic activity ( $IC_{50} < 20 \mu g/ml$ ) compounds (khellin and visnagin) ( $IC_{50}$  ranging between 12.54 and 17.53  $\mu g/ml$ ) (IC<sub>50</sub> 20690  $\mu g/ml$ ) activity ( $IC_{50} > 90 \mu g/ml$ ) efficient, relatively safe, and cheap technique that yielded a more selective purified extract with better cytotoxic activity.

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