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## Original Article

Solvent optimization on Taxol extraction from *Taxus baccata* L., using HPLC and LC-MS

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## Abstract:

**Background and the purpose of the study:** Taxol, a natural antitumor agent, was first isolated from the extract of the bark of *Taxus brevifolia* Nutt., which is potentially a limited source for Taxol. In the search of an alternative source, optimum and cost benefit extracting solvents, various solvents with different percentage were utilized to extract Taxol from needles of *Taxus baccata*.

**Methods:** One g of the dried needles of *Taxus baccata*, collected from Torkaman and Noor cities of Iran, was extracted with pure ethanol or acetone and 50% and 20% of ethanol or acetone in water. Solvents were evaporated to dryness and the residues were dissolved in 5 ml of methanol and filtered. To one ml of the filtrate was added 50 µl of cinamyl acetate as the internal standard and 20 µl of the resulting solution was subjected to the HPLC to determine the extraction efficiencies of tested solvents. Five µl of filtrate was also subjected to the LC-MS using water/acetonitrile (10/90) as mobile phase and applying positive electrospray ionization (ESI) to identify the authenticity of Taxol.

**Results:** Results of this study indicated that Taxol extraction efficiency was enhanced as the percentage of ethanol or acetone was increased. HPLC analysis showed that Taxol could be quantified by UV detection using standard curve. The standard curve covering the concentration ranges of 7.8 - 500 µg/ml was linear ( $r^2 = 0.9992$ ) and CV% ranged from 0.52 to 15.36. LC-MS analysis using ESI in positive-ion mode confirmed the authenticity of Taxol (m/z 854; M+H), as well as some adduct ions such as M+Na (m/z 876), M+K (m/z 892) and M+CH<sub>3</sub>CN+H<sub>2</sub>O (m/z 913).

**Conclusions:** The results suggest that 100% acetone is the best solvent for the extraction of Taxol from *Taxus baccata* needles.

## Keywords:

Taxol , *Taxus baccata* , Solvent Extraction , HPLC , LC-MS

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