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Overview: Supercritical carbon dioxide versus subcritical water extraction of bioactive compounds from herbal material

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In order to meet the requirements of the constantly growing market for high quality medicinal plant products, the extraction and separation techniques that provide these products are in a state of constant development and improvement. Traditionally, the products of aromatic medicinal plants have been obtained by classical extraction methods such as hydrodistillation and Soxhlet, which are used to separate the fat and volatile fractions of these plants. These traditional methods, although well-known and documented, have a number of negative characteristics that can affect product quality such as toxic solvents residue, non-selective extraction and high energy consumption due to long extraction time as well as thermal degradation of high-value products. In order to neutralize the problems of traditional extraction techniques, new extraction methods have been introduced, such as supercritical carbon dioxide extraction and subcritical water extraction, which are aligned with strict requirements of the market and green chemistry. In this study, aromatic medicinal plants were extracted using supercritical carbon dioxide extraction and subcritical water extraction to demonstrate the advantage of using these modern and green extraction methods. Considering that obtaining the product with highest content of bioactive components was the primary goal, the advantages and disadvantages of the applied process were classified based on the chemical characterization of the extracts.

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