

OPTIMIZATION OF EXTRACTION CONDITIONS FOR *SANGUISORBA ALPINE BUNGE* EXTRACT

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Introduction. Plant extracts are widely used in the pharmaceutical industry due to their rich composition of biologically active substances. One promising source of raw plant material is *Sanguisorba alpine Bunge*. *Sanguisorba alpine* is a medicinal plant with anti-inflammatory,

wound-healing, antiseptic, and antioxidant properties. Its composition includes tannins, flavonoids, saponins, organic acids, and polysaccharides. Due to these biologically active compounds, the plant shows potential for use in the production of phytopharmaceuticals. To obtain an extract with a high concentration of biologically active compounds, it is essential to determine the optimal extraction conditions.

Research Objective. To determine the optimal extraction conditions for *Sanguisorba alpine* to achieve maximum yield of biologically active compounds.

Materials and Methods. Dried and ground aerial parts of *Sanguisorba alpine* were used for the study. The extract was obtained using the ultrasonic extraction method under optimized conditions, including temperature, ultrasound frequency, and extraction time, to ensure the maximum yield of biologically active compounds. Three different ethanol concentrations (96%, 90%, and 70%) were used as solvents. The extraction parameters remained the same for all ethanol concentrations:

- Extraction temperature: 25–30 °C
- Extraction time: 30 minutes
- Raw material-to-solvent ratio: 1:5

The yield of extractable substances was determined by the gravimetric method. In this approach, the yield of extractable substances obtained via ultrasonic extraction was compared across the three ethanol concentrations. After extraction, the extract from each ethanol concentration was allowed to settle and then filtered to separate the plant material.

The liquid extract was transferred to a round-bottom flask of a rotary evaporator and concentrated for 30 minutes at 50 °C under a pressure of 300 mbar. The concentrated extract was then dried in a drying cabinet at 100–105 °C. After drying, the extract was weighed using analytical scales with an accuracy of 0.001 g.

Research Results. Experimental data demonstrated that the highest yield of extractable substances was achieved using 70% ethanol as the solvent, at a temperature of 25–30 °C and an extraction time of 30 minutes. This can be attributed to the fact that 70% ethyl alcohol provides an optimal balance between polarity and non-polarity, which facilitates the extraction of biologically active compounds from the plant material. More concentrated alcohol solutions may lead to the denaturation of certain substances and a reduction in their extraction.

Conclusion. The optimal extraction conditions for *Sanguisorba alpine* are the use of 70% ethanol, a temperature of 25–30 °C, and ultrasonic treatment for 30 minutes. These parameters ensure the maximum yield of extract and the preservation of biologically active compounds, which is important for further application in the pharmaceutical industry.