



SELECTION OF OPTIMAL CONDITIONS FOR VACUUM EVAPORATION AND DRYING TO OBTAIN A DRY EXTRACT

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Relevance: In recent years, there has been a growing interest in biologically active food supplements with sedative effects. Of particular importance are phytopreparations containing a complex of flavonoids, phenolic acids, and proanthocyanidins, which have antioxidant and cardioprotective effects. Promising sources of plant raw materials include valerian roots (*Valeriana officinalis*), rosehip (*Rosa canina*), lemon balm leaves (*Melissa officinalis*), and motherwort herb (*Leonurus cardiaca*). The technology for obtaining dry extracts from these plants requires selecting optimal conditions for evaporation and drying due to the high thermolability of the biologically active substances.

Materials and Methods. Vacuum evaporation is the process of removing a solvent at reduced pressure, which lowers the boiling point and helps preserve thermolabile compounds. The key parameters of this process are temperature, residual pressure, and stirring speed. Vacuum drying is used to achieve the desired residual moisture content of the extract while maintaining the stability and pharmacological activity of the active ingredients.

Lemon balm (*Melissa officinalis*) contains essential oils, flavonoids, and phenolic acids, which have a calming, antispasmodic, and antiviral effect.

Valerian (*Valeriana officinalis*) contains valepotriates, isovaleric acid, and essential oils that promote sedation, improve sleep, and have an antispasmodic effect.

Motherwort (*Leonurus cardiaca*) is rich in alkaloids, flavonoids, and glycosides, which help lower blood pressure and support the cardiovascular system.

Rosehip (*Rosa canina*) – is a source of vitamin C, flavonoids, and pectins, providing immunostimulatory, anti-inflammatory, and antioxidant effects.

Experimental data and literary sources indicate that the optimal conditions for evaporation are a temperature range of 40–60 °C and a residual pressure of 60–80 mbar. This mode prevents the destruction of phenolic compounds and minimizes the loss of volatile components. Stirring speed is also important, as it ensures uniform solvent evaporation and prevents localized overheating.

The final stage, vacuum drying, is carried out at a temperature no higher than 50 °C. This mode allows the extract to reach a residual moisture content of 3–5%, ensuring the preservation of thermolabile components. A comparative analysis shows that exceeding the temperature range leads to a decrease in antioxidant activity and the degradation of essential oils.

Results. Optimizing the parameters for evaporation and drying allows for the production of a dry extract with a high concentration of flavonoids and proanthocyanidins. The preservation of the extract's antioxidant activity confirms the feasibility of using vacuum technologies to obtain standardized phytopreparations.

Conclusions. In conclusion, the optimal conditions are vacuum evaporation at a temperature of 40–60 °C and a pressure of 60–80 mbar, as well as vacuum drying at a temperature no higher than 50 °C until a residual moisture content of 3–5% is achieved. Adherence to these parameters ensures the



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preservation of biologically active substances and the formation of a standardized extract suitable for use in sedative biologically active food supplements.