

## OPTIMIZATION OF THE COMPOSITION AND IMPROVEMENT OF THE MANUFACTURING METHODS OF “GEPAGAL” CAPSULES

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**Annotation:** In recent years, the demand for medicinal plant raw materials in the production of pharmaceuticals, therapeutic cosmetics, and biologically active supplements (BAS) has significantly increased. Compared with synthetic analogues, herbal-based products have notable advantages, including a wide spectrum of therapeutic effects and reduced risk of adverse reactions. In this context, the hepatoprotective dry extract “GEPAGAL” was developed at the Tashkent Pharmaceutical Institute. The aim of this study was to optimize the composition of “GEPAGAL” capsules and improve their manufacturing technology to ensure quality, safety, and therapeutic efficiency.

**Keywords:** Dry plant extract, biologically active supplement, gelatin capsule, technology, composition, excipients, technological properties, quality indicators.

**Materials and Methods :** The research used “GEPAGAL” dry extract derived from a 5:1 mixture of *Silybum marianum* seeds and *Calendula officinalis* flowers. The extract, with amorphous structure and brownish powder form, was evaluated for technological properties crucial for solid dosage formulation. Excipients commonly applied in pharmaceutical technology were tested, including microcrystalline cellulose, magnesium hydrocarbonate, lactose monohydrate, potato starch, calcium stearate, and magnesium stearate. Standard pharmacopoeial methods were used to assess quality indicators (appearance, identity, average mass and deviation, and disintegration).

**Experiment:** Preliminary studies showed unsatisfactory technological properties of the dry extract. Therefore, a wet granulation method was applied with excipients to improve flowability and compressibility. Several capsule formulations with different excipient ratios were tested. Fractional composition, bulk density, flowability, and capsule performance were measured and compared with pharmacopoeial standards.

**Results and Discussion:** The results demonstrated that the inclusion of microcrystalline cellulose, potato starch, and suitable lubricants improved the technological parameters of the capsule mass. The optimized formulation ensured uniform filling, acceptable disintegration, and mechanical stability. The final product complied with normative requirements for appearance, purity, average weight, and permissible deviations. These findings confirm the feasibility and appropriateness of the selected capsule composition and manufacturing method. An optimal formulation and improved technology for “GEPAGAL” capsules were proposed. The study demonstrated that the selected excipient combinations and wet granulation method significantly enhanced the technological properties of the capsule mass, ensuring compliance with pharmacopoeial quality standards.

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