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ФАРМАЦЕВТИЧНА ОСВІТА, НАУКА ТА ПРАКТИКА: СТАН, ПРОБЛЕМИ, ПЕРСПЕКТИВИ РОЗВИТКУ

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НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ
ІМЕНІ О. О. БОГОМОЛЬЦЯ
ФАРМАЦЕВТИЧНИЙ ФАКУЛЬТЕТ

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Матеріали
науково-практичної конференції з міжнародною участю, присвяченої 25-річчю фармацевтичного факультету Національного медичного університету імені О. О. Богомольця

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Results. Results revealed that adjusting mass flow characteristics was imperative due to the pharmacological and technological properties of berberine, which hindered satisfactory capsule filling with a monodrug. Excipients from filler, disintegrant, and antifriction categories were introduced. Traditionally used lactose monohydrate, mannitol, and microcrystalline cellulose served as fillers. Antifriction components included magnesium stearate, a lubricant, and polyethylene glycol 4000, and talcum powder as glidants. Disintegrants encompassed corn starch, sodium carboxymethyl cellulose (swelling agents), and the superdisintegrant sodium croscarmellose.

Combining these excipients led to the creation of 9 experimental samples (№ 1 – microcrystalline cellulose, magnesium stearate, sodium croscarmellose, № 2 – microcrystalline cellulose, polyethylene glycol 4000, corn starch, № 3 – microcrystalline cellulose, talc, sodium carboxymethylcellulose, № 4 – lactose monohydrate, magnesium stearate, corn starch, № 5 – lactose monohydrate, polyethylene glycol 4000, croscarmellose sodium, № 6 – lactose monohydrate, talc, sodium carboxymethyl cellulose, № 7 – mannitol, magnesium stearate, sodium carboxymethyl cellulose, № 8 – mannitol, polyethylene glycol 4000, corn starch, № 9 – mannitol, talc, sodium croscarmellose). An experimental plan was developed. The bulk volume and tapped volume, bulk density and tapped density of berberine encapsulation mass, the compressibility index (Carr index) and Hausner ratio were responses.

Conclusions. By analyzing hard capsule content and formulating experimental samples, the goal was to identify optimal excipient combinations for berberine encapsulation mass, resulting in a semi-product with superior flow characteristics.

OBTAINING OF EMULSION CREAM WITH ESSENTIAL OIL OF CYMBOPOGON CITRATUS FORMULATIONS

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Introduction. Pitted keratolysis adversely impacts the patient's quality of life. Conventional therapeutic approaches involve the administration of antibiotics since Corynebacterium spp, Micrococcus sedentarius, Dermatophilus congolensis, Streptomyces, Actinomyces keratolytica and Bacillus thuringiensis are identified as the causative agents of pitted keratolysis. A potential strategy to address antibiotic resistance involves leveraging essential oils, renowned for their substantial antibacterial properties. Schweitzer et al. (2022) demonstrated the potent inhibitory activity of lemongrass essential oil against pitted keratolysis pathogen strains.

The purpose of the study. The objective of this study was to formulate an oil-in-water emulsion cream incorporating essential oil from Cymbopogon citratus

(lemongrass) and determine a suitable technology for producing a semi-solid dosage form under extemporaneous production conditions.

Research methods. The emulsion cream technology involved the combination of two systems: Span 80 emulsifier in warm purified water (temperature ranging from 40 to 80 °C), polysorbate 80, and a mixture of Shea butter, peach kernel oil, carnauba wax, and cetyl stearyl alcohol (melted together). Emulsification occurred under two temperature conditions: 40 °C and 80 °C for the individual mixture temperatures. The mixing of oil and water phases utilized a laboratory mini-mixer with a stirrer speed of 2000 rpm until complete cooling. Additionally, the ratio of hydrophilic (polysorbate 80) to hydrophobic (Span 80) emulsifiers was varied, altering the hydrophilic-lipophilic balance (HLB) of the emulsifier mixture. Essential oil introduction occurred either before mixing (for the 1st and 3rd formulations) or after cooling to 40 °C (for the 2nd and 4th formulations). The evaluation included stability during a two-week storage at 18 °C, thermal stability, and optical microscopy.

Results. Emulsion creams were prepared with a 10 % content of hydrophilic and hydrophobic emulsifiers in ratios of 9:1 (polysorbate 80:Span 80) and 7:3 (polysorbate 80:Span 80). Emulsifier mixtures with an HLB value exceeding 15 resulted in the formation of unstable macroemulsion systems, exhibiting delamination after one week of storage. Formulations of oil-in-water emulsion cream obtained through emulsification at 40 °C and 80 °C, with a hydrophilic to hydrophobic emulsifier ratio of 7:3, underwent thermostatic conditions for one day at 45 °C, one day in a refrigerator at 8 °C, and one day at room temperature (20 °C). Thermal stability was assessed visually. The oil-in-water emulsion cream formulation obtained by emulsification at 80 °C were stable and underwent microscopic analysis at 10- and 40-times magnification, revealing the homogeneity of oil droplet distribution in the aqueous dispersion medium.

Conclusions. Based on the experimental outcomes, a proposed composition for an oil-in-water emulsion cream with a hydrophilic to hydrophobic emulsifier ratio of 7:3 was established, achieved through emulsification at a temperature of 80 °C.

PHARMACEUTICAL DEVELOPMENT OF A SOFT DOSAGE FORM

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Introduction. The need of domestic medicine for new pharmacotherapeutic agents for the prevention and treatment of proctological diseases, in particular prostatitis and its complications, is steadily increasing, as the computerization of life increases the "sedentary" lifestyle, which contributes to the increase in cases of this pathology. Hemorrhoids are one of the most common diseases of the rectum. According to some literature data, the prevalence of such a problem is, according to some calculations, about 111–147 cases per 1000 adult population.