МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ

НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

КАФЕДРА АПТЕЧНОЇ ТЕХНОЛОГІЇ ЛІКІВ

КАФЕДРА ЗАВОДСЬКОЇ ТЕХНОЛОГІЇ ЛІКІВ

Матеріали

III міжнародної науково-практичної конференції

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ФУНДАМЕНТАЛЬНІ ТА ПРИКЛАДНІ ДОСЛІДЖЕННЯ У ГАЛУЗІ ФАРМАЦЕВТИЧНОЇ ТЕХНОЛОГІЇ, ПРИСВЯЧЕНА 100-РІЧЧЮ З ДНЯ НАРОДЖЕННЯ Д. П. САЛА

FUNDAMENTAL AND APPLIED RESEARCH IN THE FIELD OF PHARMACEUTICAL TECHNOLOGY, DEDICATED TO THE 100TH ANNIVERSARY OF THE BIRTHDAY OF D. P. SALO

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Фундаментальні та прикладні дослідження у галузі фармацевтичної технології: Збірник наукових матеріалів ІІІ Міжнародної науково-практичної конференції, присвяченої 100-річчю з Дня народження Д. П. Сала (м. Харків, 24 листопада 2023 р.). Х.: Вид-во НФаУ, 2023.- С. 522 (Серія «Наука»)

Збірник містить матеріали ІІІ Міжнародної науково-практичної конференції «Фундаментальні та прикладні дослідження у галузі фармацевтичної технології», присвяченої 100-річчю з Дня народження Д. П. Сала.

Розглянуті теоретичні аспекти та перспективи розробки лікарських препаратів, висвітлені напрямки наукової роботи спеціалістів фармацевтичної галузі, що стосуються питань сучасної технології створення лікарських препаратів, контролю їх якості, організаційно-економічних аспектів діяльності фармацевтичних підприємств, маркетингових досліджень сучасного фармацевтичного ринку, фармакологічних досліджень біологічно активних речовин.

Для широкого кола наукових, науково-педагогічних і практичних працівників, що займаються питаннями розробки та впровадження сучасних лікарських препаратів.

Матеріали подаються мовою оригіналу.
За достовірність матеріалів відповідальність несуть автори.

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Determination of the sensitivity of bacteria was performed by diffusion in agar. In the Petri dish poured 10 ml of molten nutrient uncontaminated environment. After solidification of this layer placed on it sterile stainless steel cylinders (height - 10 mm inner diameter - 6 mm) and filled them "infected" agar of 15 ml.

For this purpose, melted and cooled agar agar added daily washings cultures of microorganisms. For the second layer of agar solidification cylinders were removed in the the wells formed, made investigational antimicrobial agents in volume (0,3 ± 0,05) ml.

Crops were incubated at 37 °C for 24 - 48 hours, then take into account the results of measuring the area of growth delay test microbe. In an experiment used a 2% solution extracts.

General results. As a result of the study it was found that the phenolic complex of *Paeonia festiva* leaves shows a high activity against *S.aureus, C.albicans, E. coli* and moderate against *B.subtilis* and *P.vulgaris*. The results are shown in Table 1.

Table 1

Retardation of the growth of microorganisms under the influence of *Paeonia festiva* leaves phenolic complex

Growth retardation of microorganisms, mm, (M ± m)					
S.aureus	*E. coli*	*P.aeruginosa*	*B.subtilis*	*P.vulgaris*	*C.albicans*
25,5±0,6	24,8±0,4	15,6±0,4	16,3±0,5	15,0±0,8	20,5±0,5

Conclusions. The antimicrobial activity of phenolic complex of *Paeonia festiva* leaves was established. Phenolic complex has a pronounced antibacterial activity against *S.aureus, C.albicans, E. coli*. Taking into account the obtained results, it can be assumed that this substance can be used to create medicinal forms for external use for the treatment of skin diseases caused by *S.aureus* and *C.albicans* (eczema, dermatitis, dermatosis) and painful conditions caused by *E. coli*.

PROSPECTS FOR THE DEVELOPMENT OF A SEMI-SOLID DOSAGE FORM FOR THE TREATMENT OF PITTED KERATOLYSIS

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Introduction. Pitted keratolysis is a common bacterial infection that affects the superficial layer of the skin. Clinically, it is defined by the presence of multiple crater-like pits that merge to form erosive areas of irregular shape and different sizes (pit diameter from 0.5 to 7 mm, depth from 1 to 2 mm) on the foot (usually) [1].

Aim. A comprehensive analysis was conducted on existing literature to determine the suitability of semi-solid dosage form with natural active ingredients in pharmaceutical development. This analysis aimed to summarize the information regarding the definition, characteristics, causative agents, and treatment methods of pitted keratolysis.

Methods. Scientific publications were utilized as the primary source of data for this study, employing methods of generalization and data structuring.

Results. The causative agents responsible for pitted keratolysis consist of gram-positive bacteria such as *Corynebacterium*, *Micrococcus sedentarius*, *Dermatophilus congolensis* and *Bacillus thuringiensis*. These bacteria create small tunnels within the outermost layer of the skin, known as the stratum corneum [1, 5].

The presence of high humidity serves as a triggering and exacerbating factor in the development of the condition. Patients with excessive sweating in their feet, often associated with hyperhidrosis, commonly seek dermatological assistance to address the issue of pitted keratolysis. Risk factors for the development of this condition include intense physical activity leading to excessive sweating, the use of rubber footwear (common among farmers and other professionals in similar occupations), residing in humid environments without the ability to maintain proper foot hygiene and change socks and shoes (military personnel, sailors, miners), obesity and diabetes mellitus [2,3].

Pitted keratolysis can cause significant foot odor, which can be socially unacceptable and adversely impact the patient`s overall quality of life. Moreover, it may result in secondary foot pain and limitations in foot function.

Clinical cases described in scientific literature often involve the use of topical antibiotics for the treatment of pitting keratolysis. However, considering the growing problem of antibiotic resistance, there is a justifiable rationale for exploring the use of essential oils that possess potent antibacterial properties [5].

For instance, the essential oil derived from *Cymbopogon (C.) citratus* contains citral, geraniol, and other components known for their antibacterial activity [4]. Schweitzer et al. (2022) conducted an experimental study to evaluate the antibacterial efficacy of *C. citratus* essential oil against the causative agents of pitted keratolysis. The study demonstrated that the essential oil exhibited strong inhibitory activity against three strains of the main pathogens associated with pitted keratolysis [5].

A selection of components was made based on their approved usage, lack of specific storage requirements, and availability to formulate a semi-solid dosage form (oil-in-water emulsion cream) suitable for extemporaneous production. The cream`s base consists of the following components:

1. Oil Phase is composed of Shea butter, carnauba wax, and peach kernel oil.
2. The aqueous phase is formed by an aqueous solution of a hydrophobic emulsifier known as Span 80.
3. Cetyl stearyl alcohol is included in the formulation as a thickener and stabilizer for the emulsion dispersion system. It helps to enhance the viscosity and stability of the cream.
4. Polysorbate 80 is used as a hydrophilic emulsifier.

By combining these components in appropriate proportions, an oil-in-water emulsion cream was prepared.

The stability of the prepared emulsion creams was evaluated visually by examining their quality after being stored at a temperature of 18 ºC for a duration of 2

weeks. Additionally, the thermal stability of the creams was assessed by observing the potential separation of dosage form`s phases.

Microscopic analysis was conducted on the cream formulations to determine the uniformity of the distribution of the dispersed oil phase within the aqueous medium of the emulsion.

Conclusions. We consider the pharmaceutical development of a semi-solid extemporaneous dosage form with *C. citratus* (lemongrass) essential oil for the treatment of pitted keratolysis to be relevant.

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