ABSTRACT&REFERENCES

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THE ANALYSIS OF UKRAINIAN PHARMACEUTICAL MARKET IN THE ASPECT OF SOLID ORAL DRUGS WITH POSTPONED ACTION

p. 4-8

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Aim. *Detection of the quantitative representation in different ATC classification codes of registered in Ukraine drugs with postponed action.*
Methods. *System analysis, marketing research, documental analysis.*
Results. *In the State Register of Ukraine drugs with postponed action are presented. During the study, quantitative representation in resource of drugs belonging to solid oral was analyzed. It was found that solid oral drugs with postponed action are represented by 7 release forms – tablets with prolonged action, tablets with modified action, capsules with prolonged action, capsules with modified action, pellets (substance) with prolonged action, pellets (substance) with modified action, granules with prolonged action. Both quantitative and relative representation of solid oral dosage forms with postponed action in the State Register of Ukraine according ATC classification codes was analyzed.*
Conclusion. *The solid oral dosage forms with postponed action in the State Register of Ukraine were detected under the codes A, B, C, G, J, L, M, N, R. The largest number of drugs is presented under the code C, the lowest – under the code L. According to the dosage forms, the solid oral drugs with postponed action are represented mainly by tablets and capsules (with prolonged and modified action). The solid oral drugs with postponed action are available in the State Register of Ukraine under code C, L, R and A, that match a socially significant diseases*
Keywords: *solid oral drugs, solid oral drugs with postponed action, prolonged action, modified action*

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THE STUDY OF PS BIOCOMPLEX AS A PROMISING ANTIMICROBIAL PRESERVATIVE IN COMPOSITIONS OF MEDICINAL AND COSMETIC PRODUCTS

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Aim. *Research of efficiency of PS biocomplex as an antimicrobial preservative in composition of medicinal and cosmetic products, as well as determination of its active concentration as a preservative in emulsion systems of various types.*
Methods. *Methods of information search, literature data analysis, microbiological and technological methods were used.*
Results. *To study preserving ability of PS biocomplex and to compare its activity with the known preservatives, emulsion-type bases o/w and w/o were used. Ten emulsions of each type with different concentration of PS biocomplex were developed, as well as its consistent use with parabens, sodium benzoate, benzalkonium chloride and silver nanoparticles.*
PS biocomplex in studied concentrations ranging from 0.025 % to 0.1 % shows effectiveness as a preservative. However, in concentrations of 0.025 and 0.05 % it can be used as a preservative only in w/o emulsions type with low content of aqueous phase. The use of PS biocomplex in concentration of 0.1 % meets pharmacopoeial criteria to the effectiveness of antimicrobial preservatives for emulsions of both types.
The simultaneous use of PS biocomplex with other preservatives can reduce the concentration of the latter in of emulsion products composition, due to increase of preserving activity of the studied emulsions.
Conclusion. *Results of research of PS biocomplex preserving activity show prospects of its further study as an antimicrobial preservative aiming to implement in of medicinal and cosmetic products manufacture, that will help to expand the range of excipients for skin application products*
Keywords: *surfactants, PS biocomplex, antimicrobial preservatives, emulsions, remedies, cosmetic products*

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THE STUDY OF PARKINSON'S DISEASE MAIN ETIOLOGICAL FACTORS

p. 15-18

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Parkinson's disease is the 2nd most common neurodegenerative disease among elderly people. Nowadays, in Europe there are more then 1.2 million people injured with this disease and their number is growing steadily.
Aim. *The study of main etiological factors which determine the origin of Parkinson's disease and its prevalence, as well as determination of the average costs level for Parkinson's disease treatment.*
Methods. *Content analysis, analytical and statistical methods of analysis.*
Results. *Etiological factors influencing on Parkinson's disease development, such as heredity, environmental impact, pesticides, bacterial and viral infections, as well as industrial toxic substances, were determined. Among the surveyed countries, the largest number of patients with Parkinson's disease was found in the United States and Hungary, while the largest average cost – in the UK and the US.*

Conclusion. *In general, the indexes of the number of patients and average costs among surveyed countries are quite unequal and require further research*
Keywords: *Parkinson's disease, etiological factors, average cost, prevalence, international experience*

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DEVELOPMENT OF MASK-CREAM TECHNOLOGY WITH HERBAL SUBSTANCES FOR THE ANDROGENIC ALOPECIA TREATMENT

p. 19-24

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Aim. *The aim of the study was to develop a rational technology of mask-cream containing Sabal palm extract and Sophora japonica tincture applied for prevention and tratment of androgenic alopecia.*
Methods. *Pharmaco-technological, physico-chemical, rheological and microscopy methods were used.*
Results. *Using microscopy studies aimed to determine the dispersion of the oil phase particles of the mask-cream it was found that the largest percentage of emulsion drops of up to 4 μm, in particular 74.4 %, was in the sample produced by reverse emulsion method. The given sample was characterized by the structural viscosity value at 20 °C and 20 rpm – 9060 mPa·Sec, which was close to the carrier base viscosity. The increase of homogenization speed and period sufficiently reduced the average size of the dispersed phase only to a certain point, therefore, optimal parameters for the cream-mask homogenization were chosen – 2000 rpm, within 20 minutes.*
The active substances (Sabal palm extract, Sophora japonica tincture) and the excipients (preservatives, thickener, flavor) were put into the base gradually, concerning their physical and chemical properties.
Conclusion. *Technological parameters of the mask-cream preparation using emulsion base were determined: reverse emulsion method, homogenization parameters – 20 minutes at 2000 rpm. Technological scheme for production of the mask-cream containing Sabal palm extract and Sophora japonica tincture was developed*
Keywords: *mask-cream, androgenic alopecia, Sabal palm extract, Sophora japonica tincture, technology*

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DEVELOPMENT OF METHOD FOR QUALITATIVE ANALYSIS OF CORN SILK FOR IMPLEMENTATION IN THE STATE PHARMACOPOEIA OF UKRAINE DRAFT NATIONAL MONOGRAPH

p. 25-31

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According to the concept of development and implementation of monographs on herbal material into the State Pharmacopoeia of Ukraine, Corn silk is included into the list of herbal material, which is described in the State Pharmacopoeia USSR XI edition and is absent in European Pharmacopoeia. Therefore, development of the national monograph on this herb is relevant. It was mentioned before, that in the State Pharmacopoeia USSR XI edition modern methods for identification of biologically active compounds of the given herb are absent, and identification is performed only by macroscopic and microscopic diagnostic features.

Aim. *Development of methods for identification of Corn silk by thin-layer chromatography, harmonized with the State Pharmacopoeia of Ukraine requirements concerning herbal material for the further implementation into the draft national monograph "Corn silk».*

Methods. *To reach the goal, unified methods for phenol compounds and sterines analysis by thin-layer chromatography were used.*

Results. *Due to chemical composition, medicinal use and approaches to the standardization, sterines and flavonoids were selected for identification by thin-layer chromatography. The methods development was carried out simultaneously with their validation according to the State Pharmacopoeia of Ukraine General Chapter requirements.*

Conclusion. *Prerequisites for development of "Identification" part were substantiated for implementation to the State Pharmacopoeia of Ukraine monograph "Corn silk". Methods for identification of sterines and flavonoids by thin-layer chromatography were developed. The analysis of different samples of Corn silk was carried out using thin-layer chromatography method under the developed conditions. The possibility of parts "Identification C" and "Identification D" implementation into the draft national monograph "Corn silk" using the developed thin-layer chromatography methods was proved*

Keywords: *the State Pharmacopoeia of Ukraine, Corn silk, sterines, flavonoids*

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THE STUDY OF VOLATILE FRACTIONS OF CARROT RAW MATERIAL OF "BRIGHT" AND "NANTES KHARKIV" VARIETIES

p. 32-37

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Common carrot is widely cultivated in many countries as a food plant. Raw material of this plant has antispasmodic, antibacterial, cytotoxic, antiparasitic, cardioprotective, and hepatoprotective activity.

Common carrot in non-pharmacopoeial Ukraine, therefore, it requires in-depth pharmacognostic study. In addition, research of its most common varieties in Ukraine, namely "Bright" and "Nantes Kharkiv" remains relevant.

*The **aim** of research was determination of the volatile fractions components of aerial part and roots of Common carrot of "Bright" and "Nantes Kharkiv" varieties.*

***Methods.** Gas chromatography method was used for determination of Common carrot volatile fractions.*

***Results.** In result of the study, 32 compounds were identified in the volatile fraction of Common carrot aerial part of "Bright" variety, 34 compounds were determined in roots of the same sample. 20 components were found in the volatile fraction of Common carrot aerial part of "Nantes Kharkiv" variety, and in its roots 39 compounds were identified.*

All the volatile fractions studied characterized by the presence of Caryophyllene and Caryophyllene oxide in high amount. Sesquiterpene alcohol Carotol was determined in all the samples studied.

***Conclusion.** According to the results of the given research, marker compound Carotol was found in all Common carrot objects studied. The obtained data can be used for standardization of aerial part and roots of Common carrot of "Bright" and "Nantes Kharkiv" varieties*

***Keywords:** Common carrot, "Bright" variety, "Nantes Kharkiv" variety, aerial part, roots, volatile compounds, gas chromatography*

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WOOD ANEMONE. *ANEMONE NEMOROSA L.* ANALYTICAL REVIEW

p. 38-42

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Literature sources were analyzed and the data concerning the range, biologically active compounds content and the use in pharmacy and medicine of Anemone nemorosa were summarized.
*The **aim** of research is implementation of Anemone nemorosa in pharmaceutical and medical practice. Anemone nemorosa is a perennial herb of the buttercup (Ranunculaceae) family. This herb is non-officinal, but it is widely used in traditional medicine as an antitumor, anti-inflammatory, antispasmodic, sedative, diaphoretic, bactericidal, antimicrobial, antifungal, expectorant, and diuretic agent. The main biologically active substances of Anemone nemorosa are alkaloids, glycosides (Protoanemonin, Anemonin, Ranunculine, some types of saponins, tannins), vitamin C, resins, organic acids (chelidonic acid), coumarins, flavonoids and γ-linolenic acid.*
The plant belongs to the regionally rare plants of Ukrainian administrative territories, therefore, despite the results of phytochemical and pharmacological studies, it becomes clear that the further use of Anemone nemorosa as a medicinal herb is an important issue for pharmacy and pharmaceutical biotechnology due to the prospects of research in area of new herbal remedies creation.
Due to extensive experience of use in traditional medicine, a wide range of pharmacological activity, the content of biologically active compounds, Anemone nemorosa is a promising and valuable herbal material for phytochemical remedies production and their practical implementation

Keywords: *Ranunculaceae, Anemone nemorosa, Protoanemonin, biologically active compounds, pharmacological activity*

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DEVELOPMENT OF PROCAINE HYDROCHLORIDE AND SULFANILAMIDE ASSAY METHODS IN COMPOUNDING OINTMENT

p. 43-47

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In the modern pharmaceutical market there is a tendency to compounding revival and expansion. Due to this fact, there is a need to develop of modern methods for quality control and stability testing for the given group of drugs. Since most dosage forms are multicomponent, this complicates the choice of analysis technique due to the similarity of the ingredients properties.

Aim. *The aim of research was development of the methods for Procaine hydrochloride and Sulfanilamide determination in the multicomponent ointment on the basis of produced 3 % tetracycline ointment with the further use of the developed methods for the remedy stability testing.*

Methods. *Spectrophotometric method was used for Procaine hydrochloride determination, and "Primary aromatic amines determination" method was used for Sulfanilamide analysis.*

Results. *Due to impossibility of separation of Procaine hydrochloride and Sulfanilamide during sample preparation, it was necessary to develop a method for determination of one of them with the subsequent determination of their sum. For Procaine hydrochloride quantitative determination spectrophotometric method at wavelength of 522 nm after formation of associate with methyl orange was offered. To eliminate the other components influence on Procaine hydrochloride absorption, other substances and their mixtures spectra were studied. The linearity of Procaine hydrochloride in the range of application of 80–120 % of the nominal concentration in the dosage form was studied. All linear dependence criteria do not exceed the allowable values according to the State Pharmacopoeia of Ukraine requirements.*

For Sulfanilamide analysis, "Primary aromatic amines determination" method according to the State Pharmacopoeia of Ukraine is recommended, taking into account the estimated amount of titrant spent on Procaine hydrochloride titration.

Conclusion. *Spectrophotometry method for Procaine hydrochloride quantitative determination and titration method for Sulfanilamide analysis were developed. Statistical criteria of the obtained results of the both methods were calculated. The relative error for Procaine hydrochloride was 1.1 %, and it was 1.39 for Sulfanilamide; these indexes do not exceed the allowable values which allow recommending the offered methods for the ointment analysis and stability testing*

Keywords: *compounding ointments, spectrophotometry, Procaine hydrochloride, Sulfanilamide*

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THE ANALYSIS OF DIGITAL TIERED PHARMACY FORMATION

p. 48-54

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Aim. *The aim of research was analysis of the use of the certain levels of information networks in Ukrainian pharmacies as the first stage of information networks integration processes of some pharmaceutical organizations and possibilities of digital pharmacy formation.*
Methods. *Marketing analysis method, as well as historical, logical methods, and method of comparison, used for the research.*
Results. *The analysis results of the use of the modern information search and applied technologies and their possibilities for pharmaceutical organizations are given. It was found, that all modern shells and programs need to be adapted to the peculiarities of use in pharmaceutical enterprise considering its features. The meaning of "network society" and the terms Intranet, Extranet and Internet were processed, and the degree of their use in pharmacy was estimated. It was found that in Ukrainian pharmacy networks in addition common cash modules and automated working places the owners implement modern software, which enables both automation of most operations at the pharmacy and establishes two-way contact with end user, creating his loyalty.*
Conclusion. *Information search and applied products used in Ukrainian pharmacy networks were highlighted, the degree of their spread and the possibilities, as well as the tendencies to digital pharmacy formation were found*
Keywords: *digital pharmacy, Intranet, Extranet, Internet, information search technologies*

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INVESTIGATION OF ANTIARRHYTHMIC ACTIVITY OF LIPOSOMAL CYTOCHROME C

p. 54-57

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Aim. *The aim of research was to study antiarrhythmic activity of released and liposomal forms of Cytochrome C.*
Methods. *The liposomes were obtained by lipid film method followed by homogenization at high pressure. The particles size and the degree of inclusion were determined. Arrhythmia was studied using the Barium chloride model. Arrhythmia occurrence and duration in each animal was recorded by the electrocardiographic method. Barium chloride, according to the conventional method, was administered at a dose of 4 mg/kg. Amiodarone was used as a reference sample at a dose of 5 mg/kg. Both forms of Cytochrome C were administered intravenously at a dose of 10 mg/kg.*
Results. *Technology for obtaining the Cytochrome C liposomal form was offered by the authors; the substance inclusion into the liposome composition (not less than 95 %) and the obtained nanoparticles sizes (100–170 nm) were studied. A significant decrease in arrhythmia period during the use of Cytochrome C was observed. The liposomal Cytochrome C (10 mg/kg) shows a higher activity than the released form of the drug and reduces the arrhythmia period compared to the control more than 2 times.*
Conclusion. *Liposomal Cytochrome C is a promising antiarrhytmicagent due to its low toxicity compared to Amiodarone having numerous adverse effects. In the further research, it is planned to study the dose-dependent effect of the liposomal Cytochrome C and membrane-stabilizing properties in model experiments with coronary heart disease and arrhythmia*
Keywords: *arrhythmia, Cytochrome C, liposomes, technology of liposomes obtaining, liposomal Cytochrome C*

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