

Editorial Board

Contents

1
2-9

Reviews

10-16

Proctologic diseases and their conservative treatment

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Review of the literature on the problems of the occurrence of proctological diseases, in particular hemorrhoids, anal fissures, proctitis and paraproctitis, their prevalence, microflora, treatment with local drugs and prospects for the therapy of proctological diseases with local means based on essential oil. Hemorrhoids, anal fissures, proctitis and acute paraproctitis are among the most common diseases affecting people of working age. A combination of such diseases occurs in 20-25% of patients. Proctological diseases are of particular importance in the conditions of martial law in Ukraine. Military personnel on the front lines have problems due to untimely feeding, different climatic conditions, not always maintaining hygiene, heavy equipment loads, etc. disorders of the gastrointestinal tract can occur, which leads to the inconvenience of performing one's duties and their incapacity. Due to untimely application for qualified medical care, about 30% of patients require surgical intervention, while in the initial stages of the disease, there is a possibility of using conservative treatment. Pathogens that cause pathology of the mucous membrane of the rectum are most often staphylococci, streptococci, *Escherichia coli* and *Proteus*. Pathogenic microflora can penetrate into the pararectal tissue through the ducts of the anal glands, the damaged mucous membrane of the rectum, hematogenous, lymphogenous way, from the neighboring organs affected by the inflammatory process, with the subsequent development of a purulent process in the perirectal tissue and clinical manifestations of HP. The main and more common cause of the development of paraproctitis is considered to be damage to the anal crypt, which accounts for almost 90%. The microflora of the rectum, the skin of the perianal region has more than 20 transient and permanent types of microorganisms, mostly conditionally pathogenic. Paraproctitis can be caused by both non-specific microflora, which is in the rectum, and specific microorganisms. It was established that the microflora of the interstitial wound in patients with acute paraproctitis had a mixed character and a wide variability of sensitivity to different antibacterial drugs. Traditionally, local treatment of proctological diseases includes the use of suppositories and ointments that contain various active ingredients, such as local anesthetics, corticosteroids, antibiotics, and anti-inflammatory agents. The analysis of the pharmaceutical market of Ukraine indicates the absence of local drugs, the composition and action of which would correspond to modern pathogenetic ideas and approaches to the pharmacotherapy of proctological diseases, in particular, combined drugs in the form of suppositories, which effectively reduce inflammatory phenomena of the mucous membrane of the rectum and at the same time have an antimicrobial and analgesic effect. To solve the problem of conservative treatment of this group of diseases, the development of a drug based on essential oil of hops, which has a complex of biologically active substances, and in combination with non-steroidal anti-inflammatory drugs, is able to have a complex effect on the key links of the pathogenesis of their development and the main clinical manifestations.

Key words: proctological diseases, hemorrhoids, anal fissure, proctitis, paraproctitis, microorganisms, conservative therapy, essential oils.

Microbiological substantiation of the use of synergistic polymyxin-nisin combinations (review)

Knysch O. V., Martynov A. V.

Solving the problem of antibiotic resistance requires the development of new antimicrobial drugs and/or new therapeutic strategies. A promising strategy to combat resistant pathogens is to combine antimicrobials with different mechanisms of action, since it is more difficult for bacteria to develop resistance against several mechanisms at the same time. Of particular interest are antimicrobial peptides, resistance to which develops much more slowly than to conventional antibiotics. Most of the superbugs that pose a serious threat to human health today are gram-negative. Their outer membrane plays the role of a barrier for antimicrobial agents whose targets are located in the inner membrane or in the cytoplasm of bacteria. Review of research reports over the past seven years suggests that combining polymyxins with nisin results in a synergistic or additive antimicrobial effect. Polymyxin- nisin combinations have been shown to be effective against clinically significant gram-negative pathogens such as *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Escherichia coli*. The probable mechanism of synergy consists in providing polymyxin due to the violation of the integrity of the outer membrane of nisin access to the target on the inner membrane (lipid II) with the subsequent realization of its antimicrobial potential. The synergistic interaction of an antibiotic with a lantibiotic allows to reduce the concentration of the antibiotic, thereby reducing the likelihood of developing toxic effects. The additive effect also has an important positive value, as it is accompanied by a decrease of antibiotic's minimal inhibition concentration and indicates the possibility of restoring the sensitivity of bacteria to it. Therefore, synergistic polymyxin-nisin combinations deserve further study and application in clinical practice.

Key words: polymyxin, nisin, synergistic combination, antibiotic resistance, gram-negative bacteria, additive effect, outer membrane, lipopolysaccharide (LPS).

17-25

Experimental works

Study of carotenoids of momordica harantia

26-30

Iryna Burlaka, Victoria Korol, Andrii Popyk, Olha Miroshnichenko

Introduction. Carotenoids are one of the most promising groups of dietary supplements. The human body is incapable of synthesizing these compounds. Therefore, the search for new, valuable raw materials in Ukraine with the aim of developing dietary supplements, functional food products, and active pharmaceutical ingredients on its basis remains relevant. It can be used to create domestic targeted medicines or products with a predictable physiological effect. These products will have a health-improving effect on the human body and will be able to provide prevention and treatment of a number of diseases. Traditional sources of carotenoids and medicines based on them are sea buckthorn fresh fruits, rose hips fruits, tomatoes, carrots root crops, pumpkin fruit pulp, calendula flowers, etc. This list is constantly expanding due to new species. *Momordica charantia* L. (Indian cucumber, bitter gourd, bitter melon) is an annual vine of the pumpkin family (Cucurbitaceae). It is a vegetable and medicinal plant from Southeast Asia that grows well in Kharkiv, Poltava, etc. regions of Ukraine. This plant exhibits various biological, medicinal and pharmacological functions, namely: anthelmintic, antifertility, antimalarial, laxative, hypoglycemic, antimutagenic, antiulcer, antipolytic, hepatoprotective, antitumor, antiviral, antibacterial, etc. Analysis of literature data showed that bitter melon contains various groups of biologically active compounds (BACs): triterpenoids, peptides, essential and fatty oils, a complex of phenolic compounds, carotenoids, alkaloids, etc. However, information about research into the phytochemical composition of plants cultivated in Ukraine is very limited. That is why the study of ALS groups, namely the carotenoids of *Charantia momordica*, is relevant. **The aim of this research** was to study the qualitative composition and determine the quantitative content of carotenoids in the fruits and seeds of *Momordica Harantia*. **Material & methods.** The objects of the study is the fresh, mature green fruits and seeds of the *Momordica charantia* L. They were harvested in the Poltava region in 2021. The dried raw materials were crushed using an electric grinder. The method of thin-layer chromatography (TLC) was used in accordance with the State Pharmacopoeia of Ukraine (SPhU) monograph to identify the carotenoids of *Momordica charantia* L. fruits and seeds. While their identification was carried out by the values of the mobility coefficients (Rf). Sample preparation for obtaining carotenoids from the studied raw materials for TLC analysis was carried out under cooling and in the shade to avoid oxidation, prevention of photoisomerization, destruction of carotenoids. About 2.0 g of the crushed raw material was placed in a 100 ml conical flask with a ground stopper, 25 ml of hexane was added and extracted at room temperature with periodic shaking for 1 hour. The resulting extract was filtered, concentrated and used to detect carotenoids on Sorbfil plates in an ascending manner. Chromatography conditions: chromatographic plates "Sorbfil, PTSH-P-A". size 10x15 cm. **Results & discussion.** Carotenoids were identified by TLC method. Analytical signals of the identification reactions indicated the presence of carotenoids in the fruits and seeds of *Momordica charantia* L.. Since the separation of pigments was better in mobile phase 3, the results of chromatography in it were taken as a basis. The studied samples contained 4 zones of yellow-brown color on a white background, which were assigned to the class of carotenoids. Then the chromatograms were treated with a 10% solution of phosphoric-molybdic acid in ethanol. After heating the plate at a temperature of 60-80 °C, carotenoids appeared in the form of blue spots on a yellow-green background. The relative speed of movement of one of them coincided with the Rf value of β -carotene, and the others corresponded to the data of the literature and they were identified as lutein (0.373), β -cryptoxanthin (0.612), lycopene (0.802) and β -carotene (0.973). Lycopene was also found to be the dominant carotenoid in the seeds and β -carotene in the fruits. The carotenoids content of the *Momordica charantia* L. fruits was 10.21 ± 0.01 mg/%, calculated on β -carotene, in *Momordica charantia* L. seeds - $9.13 \pm 0.02\%$, calculated on lycopene. **Conclusions.** It is the first time, a study of the carotenoid complex of the *Momordica charantia* L. fruits and seeds was carried out. The presence of lutein, β -cryptoxanthin, lycopene and β -carotene was determined by the TLC method. Lycopene was also found to be the dominant carotenoid in the seeds and β -carotene in the fruits. The content of carotenoids in the *Momordica charantia* L. fruits was 10.21 ± 0.01 mg/%, in terms of β -carotene, in seeds - $9.13 \pm 0.02\%$, in terms of lycopene. These data indicate the possibility of using the studied raw materials for the manufacture of medicinal products and functional food products.

Keywords: *Momordica charantia* L. seeds, *Momordica charantia* L. fruits, carotenoids, thin-layer chromatography (TLC).

Directions for improvement of the system of labor protection management at a pharmaceutical enterprise using digital technologies

31-36

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Introduction: The relevance of the research is due to the need to develop and improve the system of labor protection management at pharmaceutical enterprises in the digital economy. Therefore, occupational safety should become a priority for both pharmaceutical managers and employees. After all, today it is more profitable to invest in creating safe working conditions than then carry colossal material costs in the form of fines, assistance to the families of victims, restoration of premises destroyed after accidents, repair of damaged equipment and equipment. That is why the improvement of the system of labor protection management at pharmaceutical enterprises using digital technologies is an important question of the time. **Aim.** The aim of the study is to consider the prospects and problems of implementing digital technologies in the system of labor protection management, as well as ways to increase the efficiency of using digitalization by specialists in labor protection to improve labor safety indicators at the pharmaceutical enterprise. **Materials and methods:** To achieve the aim of the study, foreign and domestic scientific literature were analyzed. Informational, retrospective, graphic, statistical, and logical methods were used. **Results and discussion.** The relevance of the digitalization of the system of labor protection management in the pharmaceutical industry has been substantiated. A review of the directions for the development of digital technologies in the field of labor protection in pharmaceutical enterprises was conducted. The components of the digitalization of the system of labor protection management in

pharmaceutical enterprises were systematized. Modern tools for implementing digital technologies to ensure the safety of production processes at pharmaceutical enterprises have been analyzed. The conditions that determine the implementation of digitalization in the system of labor protection management have been identified. **Conclusion.** It has been proven that the implementation of innovative solutions in the system of labor protection management, simplification of document flow, and digitalization of the main processes in labor safety will prevent industrial injuries, increase labor productivity, and optimize communications among employees of pharmaceutical enterprises. Certainly, the problem raised in this study does not reveal the whole range of issues related to the implementation of scientific and practical approaches to the national pharmacy regarding the impact of digitalization on the system of labor protection management. The complex of issues related to the substantiation of the choice of directions of improvement of the system of labor protection management at pharmaceutical enterprises in the context of the digital economy, etc., remains unresolved, which will determine the prospects for our further research.

Keywords: pharmaceutical enterprise, system of labor protection management, digitization, digital technologies.

Sensitivity of *Blastocystis* sp. clinical strains to new benzimidazol derivatives

37-44

Pokhil S.I., Martynov A.V., Tymchenko O.M., Kyrychenko I.I.

Introduction. *Blastocystis* sp. (formerly *Blastocystis hominis*) is the most common protists of the intestinal tract of humans and many species of animals. *Blastocystis* sp. can cause various diseases of the digestive organs, which are currently combined into a separate nosology called "blastocystosis". To date, there are no international or national recommendations for the treatment of blastocystosis, including approved drugs for this purpose. Data on the clinical and parasitological effectiveness of various drugs used to treat blastocystosis are controversial. This substantiates the relevance of the search for new compounds with pronounced anti-*Blastocystis* activity for the development of drugs based on them for the etiotropic therapy of blastocystosis. The **goal** of this study was to determine the *in vitro* sensitivity of clinical strains of *Blastocystis* sp. to new derivatives of benzimidazole in comparison with metronidazole as well as to investigate the effect of the subinhibitory concentration of the most promising benzimidazole derivative on the level of parasite virulence factors (formation of amoeboid forms and production of proteases). **Materials and Methods.** Five cultures of *Blastocystis* sp. were isolated from faecal samples of patients with irritable bowel syndrome with predominant diarrhoea (IBS-D, Rome IV). Strains of *Blastocystis* sp. was cultured at 37 °C under anaerobic conditions in tubes with containing 5 ml of RPMI-1640 liquid nutrient medium with L-glutamine and enclosed antibiotics (ampicillin 12 mg/ml, streptomycin 4 mg/ml) and 10 % heat-inactivated serum of horse. The group of new benzimidazole derivatives (NBDs) included: tris-benzimidazole of acetic acid (BAA), benzimidazole of histidine (BHI), benzimidazole of lipoic acid (BLA) and bis-benzimidazole of lysine succinamide (BBL). The anti-*Blastocystis* activity of NBDs and metronidazole (MTZ) was evaluated in the range of their concentrations from 1000 µg/ml to 1 µg/ml for four days with daily (after 24 h, 48 h, 72 h and 96 h) determination of indicators for each drug: 50 % of the minimum inhibitory concentration (MIC₅₀) and the minimum lethal concentration (MLC). Cell count of *Blastocystis* sp. was performed in a hemocytometer using the trypan blue dye exclusion test. Morphological changes in *Blastocystis* sp. cells induced by NBDs described according to the results of their phase-contrast microscopy. The effect of subinhibitory concentrations of NBD and MTZ on the formation of amoeboid forms (PAF) of *Blastocystis* sp. was established by counting the specific proportion (%) of these forms among 300 parasite cells in smears of suspensions permanently stained by the modified method according to Field. The level of protease activity (PA) in *Blastocystis* sp. cell lysates grown both in intact RPMI medium and in the presence of subinhibitory concentrations of NPB and MTZ was determined by the method of quantitative colorimetric analysis of azocasein cleavage. **Results and Discussion.** Based on the results of *in vitro* sensitivity studies of 5 clinical strains of *Blastocystis* sp. to the action of 4 NBDs (BAA, BHI, BLA and BBL) and metronidazole (MTZ), it was established that the anti-*Blastocystis* activity of BAA, BHI, BLA and MTZ reflects a direct positive regularity in the "concentration-response" and "contact time-response". That is, as the concentration of these benzimidazole derivatives increases, as well as the time of their action on *Blastocystis* sp. cultures, the manifestations of growth inhibition and death of parasite cells clearly increase. Instead, it was found that the effect of different concentrations of BBL on strains of *Blastocystis* sp., in the context of the "concentration-response" effect, is variable - with different directions of manifestations of this effect. In the stationary growth phase of *Blastocystis* sp. (72-hour parasite cultures) the MIC₅₀ value for BLA was (7.2 ± 2.6) µg/ml and was 1.5 times, 1.6 times, 21.5 times and 1.7 times lower than the level of this indicator for BAA, BHI, BBL and MTZ, respectively (p < 0.05). In addition, BLA is 4 times superior to MTZ in the effectiveness of lethal action on *Blastocystis* sp. cells, which confirms the actual MLC values established for these compounds: 125 µg/ml and 500 µg/ml, respectively (p < 0.05). We discovered a deep destruction of cells of *Blastocystis* sp., which occurs when the parasite cultures are exposed to lethal concentrations of BLA: the central body disappears in the cells, intensive formation of granules and vacuoles is observed, thinning and loss of a clear contour of the outer shell, which is finally completely destroyed, and in place of the cells the detritus of their internal contents is revealed. Unlike MTZ, subinhibitory concentrations of BLA (≤ 2µg/ml) do not stimulate the reproduction of *Blastocystis* sp cells. Subinhibitory concentrations of BLA, compared to MTZ, increase the virulence potential of parasites to a lesser extent by 1.6 times according to the PAF indicator (p < 0.05) with a comparable effect of both ingredients on increasing the PA index.

Conclusion. The obtained results make it possible to recognize BLA as a promising compound for further research aimed at the development of a more effective means than MTZ for the treatment of blastocystosis.

Keywords: anti-*Blastocystis* activity, new benzimidazol derivatives, metronidazole

Comparison of ergonomic methods for inoculation of microorganisms on dense nutritional media

45-48

Pokryshko O., Pyatkovsky T.

Introduction. Bacteriological method with plating techniques is often used for routine microbiological studies. Ergonomics is an important component of the safety and efficiency of work in a microbiological laboratory, the duration of microbiological studies can affect the results and productivity of the laboratory. Routine microbiological studies require the use of disposable and reusable materials and time consumption. Various methods maintain the sterility of experimental materials and allow the successful isolation of bacterial colonies. For plating of liquid samples from the patients or bacterial suspensions in Ukraine, disposable plastic or glass and metal reusable Drigalski spatulas are used.

Abroad, for this purpose, in addition to spatulas, the Copacabana spreading method (also known as the bead method) is also used. **Material & methods.** Two strains of *E. coli* ATCC 25922 and *S. aureus* ATCC 6538 obtained from the culture collection of the Laboratory of Microbiological and Parasitological Research of TNMU were used for the experiments. Drigalski L-shaped glass spatulas with a diameter of 3.6 mm and a length of the working surface of 30.0 mm and glass beads with a diameter of 3.7 mm were used for plating of the suspension of microorganisms. For the experiments, a suspension of each strain was prepared from a broth. The cultures were centrifuged and the pellets were resuspended in sterile physiological solution. Serial dilutions of the suspensions were carried out with plating of 100 µl aliquots on meat peptone agar (MPA) in plastic Petri dishes. *Escherichia coli* suspensions were additionally plated on Endo agar. Petri dishes were incubated at 37 °C for 24-48 h, followed by colony counting. The time for preparation and conducting the experiment was recorded. Time for wrapping spatulas, preparation of test tubes with balls, time for spreading the inoculum by these means was taken into account. Average values of the number of colony-forming units (CFU), expressed in logarithmic values, were used for statistical analysis. The experiment was performed in triplicates, comparison of means was performed using the Student's t-test. Differences at $p < 0.05$ were considered significant. **Results & discussion.** The time for preparing materials and carrying out inoculation was shorter for spatulas. The total time when using spatulas to inoculate five Petri dishes turned out to be shorter on average by 19.4 seconds. The colonies distribution was visually better with the beads method. Plating a dense suspension of microorganisms produced noticeable clusters of colonies. The total plating surface area of the beads exceeded the plating area of the working surface of the spatula by approximately 7.7 times. It was 112.6 mm² for the spatula, and 866.8 mm² for the beads. However, such a difference did not influence the numbers of counting colony-forming units produced by using these methods. There were no statistically significant difference when inoculating *S. aureus* ATCC 6538 suspension on MPA ($p = 0.48$) and *E. coli* ATCC 25922 suspension on MPA and Endo agar ($p = 0.43$). **Conclusion.** The Copacabana method takes more time to prepare and use, but gives better results in dispersing bacteria over the surface of solid culture media to obtain isolated colonies. According to the results of counting colony-forming units, plating with glass beads corresponds to plating with a spatula. The beads method can be used in microbiological studies using serial dilutions for plating large numbers of Petri dishes.

Keywords: ergonomic methods, inoculation of microorganisms, dense nutritional media

Language features of the names of complex homeopathic medicines presented on the Ukrainian pharmaceutical market

49-58

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Annotation. Introduction. The intensity of development, production and use of homeopathic medicines has been increasing both in Ukraine and throughout the world. The relevance of the research is due to the rapid growth of industrial production of combined homeopathic medicines, and hence the need for research and systematization of homeopathic terminology and nomenclature. The purpose of the article is a structural and semantic analysis of the names of complex homeopathic medicines that are most widely represented in Ukraine. The task of the analysis is to investigate the methods of creating the names of combined homeopathic medicines, to identify general approaches to the construction of the names of medicines common to all manufacturers of homeopathic drugs, as well as individual features of individual companies. **Material & methods.** The object of the study is the names of combined homeopathic medicines specified in two documents: the State Register of Medicines (the "Homeopathic Medicines" section, which contains a list of 553 homeopathic medicines, including different dosages of certain medicines) and Order of the Ministry of Health of Ukraine No. 876 dated 18.04 2019. "On the approval of the List of medicines allowed for use in Ukraine, which are dispensed without a prescription from pharmacies and their structural subdivisions." The State Register of Medicinal Products contains the drugs of 37 homeopathic manufacturers, five of which are domestic. The list of medicines contains both a larger number of manufacturers and a larger number of homeopathic medicines. As a basis for the analysis, are taken the names of medicines of those manufacturers that are most widely represented in Ukraine. The main research methods are continuous sampling, comparative, descriptive, statistical, component analysis, semantic analysis, and others. **Results & discussion.** In the analysis process both general approaches to the construction of the names of medicines common to all manufacturers and definite features of individual companies were determined. According to the structure, all the names of homeopathic medicines like the names of allopathic medicines are divided into three groups: one-word, two-word and multi-word. The largest is one-word names group, almost the same number of two-word names is represented while multi-word names are much less common. In general, in the names of homeopathic medicines, there is an indication of the name of the disease, painful condition or organ, on which the action of the drugs is directed, the name of the medicinal raw material from which they are made or the active pharmacological substance, which can sometimes be combined with the characteristic of the drug according to its type or purpose. The homeopathic nomenclature is also characterized by the use of an indication of the manufacturer in the names of drugs: Heel, Dr. Theiss, ARN and others. **Conclusion.** The conducted analysis shows that the names of combined homeopathic remedies are mostly created on the same basis as the trade names of allopathic medicines, i.e. taking into account the consumer psychology. They also share a lexical base: Latin and ancient Greek languages. Some manufacturers of homeopathic products quite consistently follow homeopathic nomenclature traditions, which can be conditionally called "informative", including in the name clear information about the pharmacological and pharmacotherapeutic properties of the medicine, medicinal raw material or active substance. Traditionally, the names of many homeopathic medicines indicate the name of the manufacturing company or the characteristics of the drug by type and purpose. However, recently, the main attention is paid to the linguistic aspects of word creation, the search for short, original, bright and expressive names that would attract attention and be easily remembered. In contrast to short names, the number of descriptive nominative constructions with extended information for a consumer is also increasing: manufacturer, name or list of main ingredients, dosage form, purpose. That is, market priorities come to the fore. This indicates that homeopathic terminology is changing today, developing in the same direction as allopathic, which is also confirmed by the appearance of medicine names formed in national languages, and especially, by the powerful influence of the English language, which is manifested at all levels: lexical, morphological and syntactic, and which has not yet been observed in homeopathic terminology.

Keywords: Latin language, Latin homeopathic terminology, names of combined homeopathic drugs, medicinal raw materials.

The study of fatty acid composition of the raw material of *Cetraria islandica* (L.) Ach., harvested in Ukraine
Shpychak A.O., Khvorost O.P.

59-63

Introduction. The study of the component composition of fatty acids in plant raw materials often attracts the attention of scientists, considering the fact that, this group of compounds plays an important role in adapting plants to environmental stress factors and defining their value as food crops and sources of raw materials for industrial use. Modern scientific works are devoted not only to the search for new natural sources of fatty acids, but also to the study of the fatty acids profile and the new potential aspects of the pharmacological activity of plant raw materials, which are already used as medicinal. In recent years, studies of the component composition of fatty acids have been actively conducted not only for higher plants, but also for fungi, algae and lichens, including studies related to their nutritional value and use as functional food products. Fatty acid profiles also have significant importance for lichen studies, because they are used for the taxonomics and the differentiation of their genera. A lot of recent scientific works are devoted to the study of the chemical composition of Iceland moss (*Cetraria islandica* (L.) Ach.), a member of the *Parmeliaceae* family, namely such groups of biologically active substances as carbohydrates, compounds of phenolic nature, in particular, lichen acids, and amino acids. Pharmacological studies of *C. islandica* have demonstrated a wide range of activity, including antibacterial, antiviral, anti-inflammatory, antioxidant, antifungal, anti-ulcer, and immunomodulatory. In the literature sources there are only fragmentary and outdated data regarding the fatty acid composition of *C. islandica*. Using the method of thin-layer chromatography, dutch scientists have identified in the raw material of *C. islandica* among others such fatty acids as: palmitic, stearic, oleic, linoleic and linolenic, which are also typical for higher plants. In addition, long-chain fatty acids such as behenic and eicosadienoic were also identified. Therefore, the study of the fatty acid composition of thalli of *C. islandica*, harvested in Ukraine, is a relevant issue as a part of the comprehensive study of the component composition of biologically active substances of such raw material. **The aim** of the work was to study the component composition and to determine the quantitative content of fatty acids in thalli of *C. islandica*, harvested in Ukraine, as a part of the systematic pharmacognostic study of domestic raw material of *C. islandica* for the elaboration of new substances and medical products on its basis. **Materials and methods.** For the study, thalli of *C. islandica* harvested in autumn 2019 in the Rakhiv district of the Zakarpattia region were used. The determination of the component composition of fatty acids in the studied raw material was carried out by the method of gas chromatography with mass spectrometric detection (GC/MS). The chromatographic separation was performed on an Agilent 6890N gas chromatograph with a 5973 inert mass detector (Agilent technologies, USA). A HP-5ms capillary column (30 m×0.25 mm×0.25 μm, Agilent technologies, USA) was used. For the further analysis, methyl esters of fatty acids were obtained. The identification of fatty acid methyl esters was based on their retention times compared to the data of the mass spectral library NIST 02. The quantitative analysis was carried out by the method of internal standards. The undecanoic acid solution was used as an internal standard. **Results and discussion.** In the raw material of *C. islandica*, harvested in Ukraine, six fatty acids were identified; among them 3 belonged to saturated. Among the saturated fatty acids arachidic (eicosanoic), pentadecylic (pentadecanoic) and stearic (octadecanoic) acids were found. Among the unsaturated fatty acids, linoleic (octadecadienoic), elaidic and oleic acids were identified. The quantitative content of identified fatty acids differed insignificantly and ranged from 1.57±0.02 mg/g (arachidic acid) to 1.95±0.03 mg/g (linoleic acid). The total content of the sum of fatty acids was 11.10±0.15 mg/g. The content of unsaturated fatty acids was 5.66±0.08 mg/g and slightly exceeded the content of the sum of saturated fatty acids (5.44±0.07 mg/g). The data regarding the quantitative content of saturated arachidic, pentadecylic, stearic and unsaturated linoleic, elaidic and oleic fatty acids in the raw material of *C. islandica* were presumably given for the first time. **Conclusions.** For the first time, the fatty acid composition of the raw material of *C. islandica*, harvested in Ukraine, has been determined. The content of the sum of unsaturated fatty acids (5.66±0.08 mg/g) is comparable to the content of the sum of saturated fatty acids (5.44±0.07 mg/g). Among the saturated stearic acid (1.94±0.03 mg/g) prevailed. Linoleic acid (1.95±0.03 mg/g) predominated among the unsaturated ones. The results obtained provide an opportunity to deepen knowledge about the component composition of biologically active substances in the raw material of *C. islandica*, harvested in Ukraine, and will be used for the elaboration of substances and medical products on its basis.

Keywords: *Cetraria islandica* (L.) Ach. thalli, component composition of fatty acids, GC/MS.

Comparative study of the anticoagulant activity of combined solutions of dihydroquercetin with hyaluronic acid
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64-66

Introduction. The need for cosmetology procedures grows every year, especially for injection and hardware techniques. In aesthetic correction, among minimally invasive procedures, contour plastic ranks second in popularity after botulinum therapy. One of the most frequent phenomena after injection procedures, which usually do not pose a significant threat, but are aesthetically undesirable, is hemorrhage into soft tissues. Various means are used to eliminate resorption and fading of hematomas: creams, lotions, ointments, etc. Taking into account the literature data on the properties of hyaluronic acid (HA) and a powerful natural antioxidant - the bioflavonoid dihydroquercetin (DHA), we conducted a study on the creation of an injectable drug based on them for a quick effect on subcutaneous hematomas. **Materials and methods.** The study was carried out in vitro according to the Moravys method. The object of the study were samples of injection solutions of DHA with HA: - DHA with PVP (Povidone K-17) 5%, pH 7.28; - DHA with HA and L-arginine, pH 7.42. Up to 2 drops of rat blood (approximately 0.1 ml) were applied to the hour glass, no substances were added (intact control), 0.05 ml of physiological solution was added to the blood (control No. 2), 0.05 ml of DHA was added to the blood (experiment 1), 0.05 ml of DHA with HA and L-arginine was added to the blood (experiment 2). **Results and discussion.** As a result of the conducted research, it was established that the blood clotting time (intact control) in the absence of its contact with any substance was an average of 3.63 seconds. Addition of saline solution to blood by 35% increased blood clotting time, possibly due to its dilution. Addition of DHA solution with 5% PVP significantly increased blood clotting time by 40.36% compared to saline and almost 2 times compared to the intact control. When adding a DHA solution with HA and L-arginine to the blood, the coagulation time increased significantly - 2.7 times compared to

that when adding a physiological solution and 2 times - compared to a DHA solution with 5% PVP Conclusion. An in vitro comparative study of the anticoagulation activity of combined solutions showed that the combined solution (DHA, HA L-arginine) has the most pronounced effect on hemostasis. The conducted studies are important for the further study of the properties of the composition based on dihydroquercetin, hyaluronic acid and L-arginine.

Keywords: solution, anticoagulant activity, dihydroquercetin, hyaluronic acid, hematoma.

Study of phenolic compounds of some members of the aster family (*Asteraceae*)

67-71

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Introduction. Prospective sources of phenolic compounds are representatives of the aster family (*Asteraceae*) - the Common white or Coltsfoot (*Tussilago farfara* L.) and New York aster (*Symphyotrichum novi-belgii* L.). According to literature data, Coltsfoot leaves contain phenolic acids, chromones, flavonoids, and tannins [8]. In the traditional medicine of various countries of the world, Coltsfoot is used to treat cough, respiratory diseases, inflammation of the lungs, allergies, diseases of the liver, cardiovascular system, gastrointestinal tract, diabetes, osteoporosis, neuropathy, neurodegenerative diseases, breast cancer and colon [8-10]. New York aster is used as an antipyretic, immunostimulant, diuretic, hemostatic, tonic, expectorant, diuretic, analgesic, tonic, antacid, antiseptic agent, in cosmetology for the treatment of skin inflammations. The roots are used for inflammatory diseases of the respiratory tract. The aim of the work was to study a comparative study of phenolic compounds of Coltsfoot raw materials and New York aster. **Materials and methods.** Chemical reactions were used to detect flavonoids and tannins in the studied types of raw materials: cyanidin reaction in the modification according to Briant, with solutions of potassium hydroxide, ferrum (III) chloride, aluminum chloride, lead acetate (flavonoids), ferrum (III) ammonium sulfate, gelatin, quinine hydrochloride (tannins). The study of hydroxycinnamic acids and flavonoids was carried out by chromatography in a thin layer of sorbent with standard samples of hydroxycinnamic acids (chlorogenic, neochlorogenic, n-coumaric, caffeic acid) and flavonoids (rutin, quercetin, hyperoside, luteolin, apigenin) in the mobile phase formic acid anhydrous P - water R - methanol R - ethyl acetate R (2.5:4:4:50). A spectrometric method was used to determine biologically active substances in the studied raw materials. Determination of the quantitative content of hydroxycinnamic acids was carried out in accordance with the methodology of the State Pharmacopoeia of Ukraine (SPU) 2.0, volume 3, monograph "Leaves of Nettle[™]"; the content of the sum of polyphenolic compounds was determined according to the DFU 2.0 method, volume 1, monograph "Determination of tannins in medicinal products of plant origin"; the content of flavonoids was determined according to the DFU 2.0 method, Appendix 1, monograph "Flowers of the pagoda tree". The study of catechins in Coltsfoot leaves and New York aster herb was carried out by the method of high-performance liquid chromatography (HPLC) on an Agilent Technologies 1200 liquid chromatograph. **Research results.** The results of all the conducted reactions had a positive result, which indicated the presence of flavonoids and tannins in the studied types of raw materials. When carrying out the cyanidin reaction in the Briant modification with water-ethanol extracts of Coltsfoot raw materials, the aqueous layer had a more intense red color compared to the organic one, which indicated the glycosidic nature of flavonoids. As a result of the reaction with a solution of iron (III) ammonium sulfate, the presence of tannins of the condensed group (black-green color) was established in the Coltsfoot leaves, and hydrolyzable tannins (black-blue color) in the flowers and rhizomes. Well-known chemical reactions confirmed the presence of flavonoids in the studied raw material of New York aster. As a result of a chromatographic study, hydroxycinnamic acids and flavonoids were detected in all studied types of raw materials of Coltsfoot and of New York aster. Among hydroxycinnamic acids, chlorogenic, neochlorogenic, and caffeic acids were identified, and among flavonoids, rutin, quercetin, hyperoside, and luteolin were identified. As a result of the quantitative determination, it was established that the highest content of hydroxycinnamic acids and flavonoids was found in Coltsfoot flowers – 2,73±0,09% and 1,93±0,07%, respectively. Coltsfoot leaves dominated in the content of the sum of polyphenolic compounds – 4,88±0,15%. In Coltsfoot rhizomes, the content of hydroxycinnamic acids and flavonoids was the lowest – 1,18±0,05% and 1,07±0,05%. The content of the sum of phenolic compounds in this type of Coltsfoot raw material was 4,36±0,15%. Among the studied biologically active substances, the content of polyphenolic compounds and hydroxychoic acids was predominant in the roots of the New York aster, their content was 5,36±0,05% and 2,11±0,07%, respectively, while in the herb it was lower – 3,23±0,10% and 1,68±0,05%, respectively. Almost three times more flavonoids were accumulated in the New York aster than in the roots (3,61±0,02% and 0,86±0,03%, respectively). Analysis of the obtained data showed that 4 compounds were identified in both types of studied raw materials. Catechin prevailed in the content of Coltsfoot leaves (949.17±18.98 µg/g), and epicatechinallate – in New York aster herb (575.32±11.51 µg/g). Among the identified compounds, epicatechin gallate in Coltsfoot leaves (251.71±5.03 µg/g) and halocatechin in of New York aster herb had the lowest content (272.64±5.45 µg/g). The total content of catechins was slightly higher in Coltsfoot leaves (1967.98±39.36 µg/g) compared to New York aster, where their sum was equal to 1900.46±38.01 µg/g. **Conclusions.** Quantitative content of: hydroxycinnamic acids, flavonoids, polyphenolic compounds in terms of pyrogallol was determined by the spectrophotometric method in the studied raw materials of Coltsfoot and New York aster. It was established that polyphenolic compounds in terms of pyrogallol accumulated in the largest amount among the studied raw material samples. HPLC analysis showed that Coltsfoot leaves and New York aster herb contained almost the same amount of catechin compounds, among which epicatechin gallate in Coltsfoot leaves (251,71±5,03 µg/g) and halocatechin in New York aster herb (272,64±5,45 µg/g) had the highest content. Thus, the obtained data can be used in the standardization and development of quality control methods for plant raw materials.

Keywords: Coltsfoot, New York aster, *Tussilago farfara* L., *Symphyotrichum novi-belgii* L., qualitative analysis, quantitative analysis.

Research on the development of technology for the production of emulsion ointment for therapy of cheilitis and analysis of polysaccharides in it

72-78

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Introduction. The problem of the assortment of domestic effective and safe medicines for use in dentistry remains relevant. Despite its widespread prevalence, cheilitis, as a pathology of the oral cavity, is considered insufficiently studied even to this day, as evidenced by clinical and epidemiological studies of some authors, who established the frequency of

their occurrence in a wide range (from 6.8 to 30 %). The most common meteorological (44 %) cheilitis. **The aim of the work.** Experimental studies on the development of technology and determination of control points in the process of production of emulsion ointment for use in cheilitis of various etiologies, as well as analysis of the amount of polysaccharides in it. **Materials and methods.** The subjects of the study were samples of ointment based on «Phytol» extract, glycerol monostearate, petroleum jelly, polysorbate-80, hydroxyethyl cellulose, sodium benzoate. The research was conducted according to the methods of the State Pharmacopoeia of Ukraine and the Quality Guidelines. **Results and discussion.** Based on the results of experimental studies, the technology was developed, as well as the determination of control points in the process of production of emulsion ointment for use in cheilitis of various etiologies. The development of the ointment technology was based on the results of previously conducted experimental studies. For the production of emulsion ointment, standard equipment was used, which is necessary in the production of soft medicines. The technology of the emulsion ointment under the conventional name «Phytolung» consists of the following stages: the stage of auxiliary work, the stage of the main technological process (preparation of a solution of hydroxyethyl cellulose with aqueous extract of «Phytol» and sodium benzoate, preparation of the base of the ointment, preparation and homogenization of the ointment), the stage of packing into containers, packing in bundles and group containers for shipment to the warehouse of finished products. In order to scale the developed laboratory technology of emulsion ointment «Phytolung» into industrial production, the critical points of production and conditions of the technological process have been determined, which will allow obtaining finished products of appropriate quality in accordance with the requirements of regulatory documentation. The gravimetric method proved the presence of the number of polysaccharides in the ointment and determined the validation characteristics of the method: precision, correctness and linearity. **Conclusions.** A technological process to produce an emulsion ointment with the conventional name «Phytolung» in the conditions of a pharmacy and industrial production has been developed, which consists of the following stages: weighing the components of the ointment; preparation of ointment base, obtaining ointment; packaging and labelling of ointment; packing of containers into bundles; packing bundles into boxes. The critical technological parameters of obtaining the drug have been determined. Quantitative determination of the number of polysaccharides was carried out by the gravimetric method and validation characteristics determined that the method is precise, correct and linear.

Keywords: ointment, phytoextract, auxiliary substances, production technology, analysis, validation, production control.

Development of the Composition of Extemporaneous Ointment for the Treatment of Musculoskeletal Conditions

79-84

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Introduction. Approximately 1.71 billion people worldwide have musculoskeletal conditions (MSCs), which include over 150 conditions. They range from the sudden onset and short-lived conditions to lifelong conditions associated with ongoing functional limitations and disabilities. Usually they are characterized by pain and limited mobility, which reduces the ability of people to work. Nonsteroidal anti-inflammatory drugs (NSAIDs) are the first-line drugs for symptomatic treatment of MSCs. Skin delivery of NSAIDs offers several advantages over the oral route associated with potential side effects. The efficacy and safety profile of meloxicam is largely determined by the mechanism of its action and makes it a promising ingredient to treat diseases of MSCs, namely for the creation of topical dosage forms of combined action. Meloxicam, unlike some other anti-inflammatory medicines, is chondroneutral: it does not destroy cartilage and does not suppress the activity of chondrocytes, substances that ensure its renewal. It is also known that meloxicam in the body does not interact with other drugs, which is of great importance for the rational therapy of patients with concomitant diseases, especially in old age. **The aim** of this work is to develop an extemporaneous ointment with meloxicam of combined action to treat musculoskeletal conditions. **Material and methods.** Ointment samples were made on hydrophilic and emulsion bases, considering the solubility of the active pharmaceutical ingredients. Thermal and colloidal stability, pH values, biopharmaceutical research were determined by accepted methods. **Results and discussion.** Samples of the ointment containing meloxicam are a homogeneous mass of soft consistency with yellowish color and specific odor of menthol. While valuating the thermal stability of five samples of ointment to treat MSCs, it was found that this indicator did not match for sample 2. When centrifuging this sample; the ointment was separated into a fatty and aqueous phase. The pH value for all ointment samples corresponded to the pH of the skin. When studying release of meloxicam from the ointment using the agar gel diffusion method, it was found that an ointment containing dimethyl sulfoxide based on a PEG alloy provides the best release within 24 hours. **Conclusion.** For the MSCs treatment has proposed the composition of the extemporaneous ointment which contains meloxicam and menthol. The technology of ointment on a hydrophilic base with introducing dimethyl sulfoxide has been developed. Thermal and colloidal stability, pH values, were studied. The conducted biopharmaceutical studies made it possible to verify the rationality of the choice of the base and auxiliary substances of the ointment, which was characterized by the best release of meloxicam.

Keywords: nonsteroidal anti-inflammatory drugs, musculoskeletal conditions, ointment, technology, stability.

Study of rheological and texture properties of emulsion ointment bases using modern emulsifiers

85-93

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Introduction. Dermatological diseases are not only a medical, but also a social problem, which significantly worsens the quality of life of people suffering from them. Emulsion-based ointments are the most adapted to human skin medicinal form in extemporaneous practice. They have high therapeutic efficiency and satisfactory consumer properties due to the presence of two phases at once, are able to provide improved diffusion of active pharmaceutical ingredients (API), maintain optimal concentration in the area of application, have high adhesive properties, which allows them to be well distributed on the skin; provide close contact with tissues and high bioavailability of API, have an immediate or, if necessary, prolonged effect of the drug. In view of the above, the development of new modern emulsion bases will make it possible to solve a number of urgent issues: to expand the range of effective extemporaneous MLF for use in dermatology, to individualize the approach to the patient and to ensure an increase in the quality of life of patients. **The purpose of this work** there was a textural analysis of samples of emulsion ointment bases, designed to replace the vaseline base, on which ointments are traditionally made in pharmacies. The composition of the foundations was chosen based on the results of previous research. **Materials and methods.** The following emulsifiers were chosen for the study:

Olivem 1000® (Cetearyl Olivat / Sorbitan Olivat) (Hallstar) and Emulpharma 1000 (Cetearyl alcohol, Glyceryl stearate, Sorbitan stearate, Cetearyl glucoside). As oil, corn oil was chosen for the oil phase. Steady shear behavior. Rheological studies were performed on a BROOKFIELD HB DV-II PRO viscometer (USA). Textural properties. The tests were carried out using a TA-XT2 texturometer (Stable Micro Systems, UK) BackExtrusion Cell (A / BE). **Results and discussion.** Analyzing the obtained data, it can be seen that the quantitative indicators differ slightly in terms of the ratio both within one sample when the temperature changes and between sample No. 1 (25 °C) and No. 1 (32 °C) in comparison with sample No. 1 (25 °C) and No. 1 (32 °C). Also, when the samples were measured three times, the value of the standard deviation was greater in sample No. 1 both at 25 and 32 °C. These data demonstrate that the emulsifier Emulpharma 1000 is more stable to mechanical and temperature effects on the emulsion system. **Conclusion.** The results of the study of the rheological and textural properties of the samples showed that the behavior of the developed emulsion bases did not change significantly, however, in the comparative analysis of all parameters and their standard deviation values, sample No. 2 using Emulpharma 1000 had more acceptable values.

Keywords: texture, back extrusion, semi-solid dosage forms, emulsion.

Study of phenolic compounds in *Cosmos bipinnatus* Cav. raw materials by HPLC

94-98

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Introduction. The genus *Cosmos* has approximately 25 species. Representatives of this genus are common in the southwestern United States and Mexico. *Cosmos bipinnatus* (Cav.) of the aster family (*Asteraceae*) is one of the most famous ornamental plants of this genus, which are widely cultivated in Ukraine. The chemical composition of the plant is being studied by scientists from many countries around the world. Phenolic compounds, which cause a wide range of their pharmacological activity, attract the special attention of researchers. This fact determines the expediency of studying these compounds in the raw materials of bipinnate cosmea of domestic origin for the selection of promising raw materials, further standardization and development of medicinal products based on it. **Materials and methods.** Grass, leaves, flowers, stems and seeds of *Cosmos bipinnatus* (Cav.) were used for research. Grass, leaves, flowers and stems were collected in the flowering phase of the plant in July-August, seeds - in August-September 2021/2022 in the Kharkiv region (Ukraine). To remove phenolic compounds, the raw material was extracted as follows: 0.500 g of crushed raw material was placed in a 100 ml conical flask equipped with a reflux condenser, 25 ml of 70% ethanol was added and heated in a water bath for 45 minutes. The resulting solution was then cooled to room temperature and filtered through a red tape filter into a 25.0 ml volumetric flask. The volume of the solution was adjusted to 25.0 ml with 70% ethanol. The chromatographic study of tested herb specimens was performed at a Shimadzu HPLC-system, ser.20 liquid chromatograph equipped with a diode matrix detector under the following conditions: Phenomenex Luna C18 column, dimensions: 250 mm x 4,6 mm, particle size 5 µm; column temperature 350C; detector wavelength 330 nm; mobile phase flow rate 1 ml/min; introduced sample volume 5 µl. The components were identified by their retention time and conformity of their UV spectra to standard substance. **Research results.** 11 flavonoids and 11 phenolic acids were identified in the grass and flowers of *Cosmos bipinnatus* (Cav.), in the leaves of this plant - 10 flavonoids and 11 phenolic acids, in the stems - 10 flavonoids and 10 phenolic acids. Luteolin-7-glucuronide was not detected in the leaves and stems of *Cosmos bipinnatus* (Cav.), vanillic acid was not identified in the stems. The qualitative composition of the phenolic compounds of the seeds differed from the composition of the other studied types of raw materials. In terms of quantitative content, isoquercitrin, quercetin, rutin, hydroxybenzoic and p-coumaric acids prevailed in the grass and leaves of *Cosmos bipinnatus* (Cav.), in stems - rutin, luteolin, apigenin, hydroxybenzoic, ferulic and p-coumaric acids, in flowers - isoquercitrin, luteolin, apigenin, hydroxybenzoic, p-coumaric, chlorogenic and caffeic acids. Quercetin, quercetin-3-O-β-glucopyranoside and ferulic acid were the major flavonoids in the seeds of *Cosmos bipinnatus* (Cav.). The content of the identified substances was higher in the grass, leaves and flowers of the studied plant. The lowest value of their content was recorded in the stems and seeds of *Cosmos bipinnatus* (Cav.). **Conclusions.** The obtained experimental data indicate the predominant accumulation of flavonoids and phenolic acids in the grass, leaves and flowers of cosmea bipinnate of Ukrainian origin. Research results will be taken into account when choosing promising raw materials bipinnate cosmea, further standardization and development of medicinal products based on it.

Keywords: *Cosmos bipinnatus* (Cav.), phenolic compounds, HPLC.

History of science

Photodynamic inactivation of viruses. Prototypes. Understanding and grounding

99-107

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Introduction. Discussions around the problem of photodynamic methods of virus inactivation, considering the effectiveness of using their most verified results in the creation of vaccines (live, inactivated, subunit, recombinant, synthetic; toxoids), orient the scientific community to a detailed analysis and non-pragmatic objectification of key prototypes as means scientific and theoretical grounding of issues by topic. The leading prerogative of such an approach (meta-analytical) is the aggregation of information to a higher degree of statistical power, greater assessment reliability than can be obtained from the results of individual studies. The study of abstract analyzes (retrospective, including) based on the results of photodynamic inactivation of viruses with the aim of applying the obtained phenomena for the creation, testing and production of vaccines showed the presence of a small number of sources on the search topic (both in Ukraine and abroad). Taking a careful approach to the tasks and being aware of the fact that it is impossible at this stage to develop a unified assessment that is close to the general truth that is little known to us today (the production of vaccines by photodynamic inactivation methods), the analysis of the specific problems of scientific sources was carried out on several hundred informative annals. In accordance with the given search parameters, the principles recommended by the compilers of the Cochrane Collaboration were followed, using a combination of evidence / information from qualitative studies, for the evidential context of systematic reviews (by prototypes: viruses, identification, characterization, metabolism and cellular structures; inactivation; photodynamic methods; vaccines. By the way, a successful solution to

the problem of photoinactivation of viruses is unequivocally focused on the plane of comprehensive awareness of the biological essence of the latter). **Purpose:** to conduct an analysis of modern and retrospective analyzes of reference sources regarding the problem of photodynamic inactivation of viruses and the subsequent application of the results for the creation of vaccines. **Materials and methods.** The material of the study was the reference annals (retrospective, including), archives, copies of laboratory samples based on the results of photodynamic inactivation of viruses with the aim of applying the obtained phenomena for the creation, testing and production of vaccines. The scope of the study was completed with data from many years of development (primary material from experimental studies, copies of excerpts from reports; fragments-sections of current research works on the problem of photoinactivation of viruses on the bacteriophage model), obtained in the laboratory of viral infections of the State Administration "Institute of Microbiology and Immunology named by I.I. Mechnikov of National Academy of Medical Sciences of Ukraine" (2021-2023). In order to objectify the work, an extended analytical review of thematic sources of scientific-theoretical, methodological, patent information was conducted (according to the key prototypes specified above). The search was conducted using the databases of bibliographic resources of search engines "Google", "Yandex", "Rambler" and others. **Results& Discussion.** The authors note that the identification of viruses contributes to the application of refined photoinactivation algorithms, obtaining decisive results in terms of qualitative and quantitative parameters. It is an obvious factor in the objectification of the latter. Virus identification is the basis of thorough data verification. One of the pragmatic goals of the universal taxonomic system (UTS) is the identification of viruses. Despite the fact that it is built on conventionally chosen hierarchical levels (family, genus, species, strain, variant), the adjective "unequivocal" is firmly implanted in the term "identification". The brevity of the UTS does not prevent researchers from indicating the belonging of each of the viruses used in scientific development to the appropriate taxon. Characteristics of viruses are obtained due to visualization and the results of ultramicroscopic studies using negative contrast, serological methods, determination of resistance to various factors (changes in pH, temperature, effects of certain types of solvents (lipids), etc.). An important integral parameter remains the morphology of the virion. The specified identification and characterization have proven effectiveness over the years, which contributes to the optimal selection and support of experiments on photoinactivation of viruses and their extrapolations into practice. The article emphasizes that the accumulated data on metabolism and cellular structures testify in favor of the implementation of several cardinal principles of detection of inhibitory properties of physicochemical (photodynamic, including) effects on viruses. Studies of the common physical factors affecting the viability of viruses today are focused, first of all, on certain types of exposure. Irradiation is not only a factor of inhibition and destruction of viruses, but also a rather effective measure in the study of their structural and functional dominance. It is shown that in the study of viruses, their adaptation potential to environmental conditions, radiobiological methods have acquired one of the most appropriate applications. Research on the use of X-ray irradiation to promote the development of torpidity of viruses is known to the scientific chronicle; short-wave high-energy radiations of radioactive substances and those obtained under the conditions of modern accelerators. Solving the complex and multifaceted problem of virus inactivation (photodynamic as an example) is inextricably linked to the use of the host's immune resources. The authors analyzed the results of the use of model bacteriophages, showed the prospects of the specified methods. The article also emphasizes the photodynamic inactivation of viruses as one of the ways to obtain vaccine preparations. **Conclusions.** A successful solution to the problem of photoinactivation of viruses is clearly focused in the plane of comprehensive awareness of the biological essence of the latter, leading aspects of their identification, characteristics, metabolism and participation of host cell structures. Photodynamic inactivation is a comprehensive multicomponent process, for the effective implementation of which complex approaches and an assortment of "stimulators" are extremely necessary. Photoinactivation is impossible without basic efficiency markers and consideration of potential compensatory reactions.

Key words: viruses, identification, characterization, metabolism and cellular structures; photodynamic inactivation, methods, photosensitizers, photoreactivation; lysis; immune resources of the host.