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Topical issues of new medicines development: матеріали XXVIII Міжнародної науково-практичної конференції молодих учених та студентів присвяченої 150-річчю з дня народження М.О. Валяшка (18-19 березня 2021 р., м. Харків). – Харків: НФаУ, 2021. – 682 с.

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Збірка містить матеріали науково-практичної конференції молодих учених та студентів «Topical issues of new medicines development», присвяченої 150-річчю з дня народження М. О. Валяшка, які згруповано за провідними напрямками науководослідної та навчальної роботи Національного фармацевтичного університету. Розглянуто теоретичні та практичні аспекти синтезу біологічно активних сполук і створення на їх основі лікарських субстанцій; стандартизації ліків, фармацевтичного та хіміко-технологічного аналізу; вивчення рослинної сировини та створення фітопрепаратів; сучасної технології ліків та екстемпоральної рецептури; біотехнології у фармації; досягнень сучасної фармацевтичної мікробіології та імунології; доклінічних досліджень нових лікарських засобів; фармацевтичної опіки рецептурних та безрецептурних лікарських препаратів; доказової медицини; сучасної фармакотерапії, соціально-економічних досліджень у фармації, маркетингового менеджменту та фармакоекономіки на етапах створення, реалізації та використання лікарських засобів; управління якістю у галузі створення, виробництва й обігу лікарських засобів; інформаційних технологій у фармації та медицині; основ педагогіки та психології; суспільствознавства; філології. Для широкого кола наукових і практичних працівників фармації та медицини.

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and enterocolitis. In particular, Japanese quince products have been proposed to treat stomach ailments, relieve diarrheal symptoms and vomiting, and protect against liver disease. Japanese quince contains flavonoids (quercetin, luteolin, catechin, epicatechin, procyanidin B1 and B2), triterpenes (oleanolic acid and ursolic acid), phenolic acids or depsides (chlorogenic acid), carbohydrates, amino acids, proteins and tannins. In the literature, the results of the study of fruits are mainly given.

Aim. The aim of our research was to study the phenolic compounds of Japanese quince seeds by the HPLC method.

Materials and methods. Raw plant materials of *Chaenomeles japonica* were collected in October 2018 in the Botanical Garden – Center for Biological Diversity Conservation in Powsin (Polish Academy of Sciences, Poland) (52°06'17" N, 21°05'42" E). HPLC-DAD-MSn analysis was performed on a UHPLC-3000 RS system (Dionex, Sunnyvale, California, CA, US) with DAD detection and an AmaZon SL ion trap mass spectrometer with ESI interface (Bruker Daltonik GmbH).

Results and discussion. According to HPLC results, Japanese quince seeds are rich in proanthocyanidins and phenolic compounds. The main phenolic group in the seeds of quince (*Chaenomeles japonica*) was phenolic acids. The results showed that the seeds of *Chaenomeles japonica* are extremely rich in polyphenolic compounds, among which the highest concentration of procyanidin oligomers, followed by phenolic acids (caffeylquinic, dicaffeoylquinic, chlorogenic, neochlorogenic, para-couaroylquinic, feruoyl-dicaffeoylquinic acid) feruoyl-cateffeoylquin -O-hexoside, quercetin-O-rhamnnohexoside, quercetin-O-dirhamnoghexaside, kaempferol 3-O-β-D- (6 " -O- (E) -p-coumaroyl) glucoside, kaempferol p-coumaroyl pentoside). Their quantitative content has been established.

Conclusions. The seeds of *Chaenomeles japonica* are very rich in phenolic compounds and are a promising raw material for obtaining new plant phytochemicals with various pharmacological effects.

STUDY OF ACUTE TOXICITY OF LYOPHILIC EXTRACT PLANTAGO MEDIA L.

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Introduction. The experience of many generations proves that the plant world is an inexhaustible source of drugs that have long been used in folk medicine for the treatment of various diseases. The search and creation of medicinal herbs is one of the most important tasks of pharmacy. Purposeful search for biologically active substances and the study of their pharmacological properties are the most important tasks of the pharmacy. According to the literature and the results of previous studies have found that herbs *Plantago media* contains a number of biologically active substances, namely polysaccharides, vitamin K₁, ascorbic acid, hydroxycinnamic acids, flavonoids, amino acids, aukubin, tannins etc.

The rich chemical composition of *Plantago media* L. indicates the multifaceted pharmacological effects of this plant. Plantain is widely used in the form of infusion (1 : 10) in the folk and official medicine around the world, primarily as a hemostatic remedy. It is was discovered that the leaves of these plants are applied to the wounds for rapid healing, as well as for pulling manure. Also established anti-inflammatory and wound-healing effect.

Aim. Study of acute toxicity of lyophilic extract based on infusion of leaves *Plantago media* L.

Materials and methods. For study, was used lyophilic extract based on infusion of leaves *Plantago media* L. Getting lyophilic extracts performed aseptically freeze-drying using alcohol extracts of plant material (1: 5) in the equipment KS - 30 (plant «Frihera», Czech Republic) in terms of production laboratory Zaporizhzhya Regional blood transfusion station. Alcohol extracts based on infusion of leaves *Plantago media* L. poured in 200 ml glass bottles with a capacity of 400 ml and frozen in an alcohol bath ($t = 45\text{ }^{\circ}\text{C}$) for 1 hour, constantly rotating around the axis. In conducting the process, bottles were horizontal at an angle of $3 - 5\text{ }^{\circ}\text{C}$ to prevent ingress of lift on the neck of the bottle. Upon completion of the process of freezing, bottles thoroughly cleaned by alcohol and transferred to a refrigerator ($t = -35\text{ }^{\circ}\text{C}$) to «hardening» (12 hours). The cartridges were cooled ($t = -35\text{ }^{\circ}\text{C}$), filled with vials with frozen extracts. In the sublimator, the vacuum pump was switched on to $60 \pm 10\text{ Pa}$, while the temperature dropped to $-25 - 50\text{ }^{\circ}\text{C}$. After 3 hours the extract temperature should not be lower than $-25\text{ }^{\circ}\text{C}$. Then the temperature of the cassette's heating was gradually increased to $+42\text{ }^{\circ}\text{C}$. The total duration of the process was up to 10 hours. The vials with the obtained lyophilic extract were quickly closed with rubber crust, sealed with aluminum caps, and filled with metalex. The resulting lyophilic extracts were further examined for acute toxicity.

The study of acute toxicity is a mandatory stage in the investigation of new drugs, which allows assessing the health of substances for health in the short-term and determining the class of toxicity and breadth of therapeutic action. Therefore, in the first stage of the study, the acute toxicity of the lyophilic extracts based on infusion of leaves *Plantago media* L. was studied.

The acute toxicity of the leafophylic extract based on infusion of leaves *Plantago media* L. was studied on white non-linear rats of both sexes received from the nursery of the Institute of Pharmacology and Toxicology of the Academy of Medical Sciences of Ukraine (Kyiv). To determine the acute toxicity, LE was injected to white rats intraperitoneally by means of a metal probe in increasing doses of Litchfield-Wilcoxon. Large doses of LE were injected to animals repeatedly at intervals of 30 minutes in 2 - 3 hours (up to 6 repeated injections). Control animals were injected similar maximal volumes of purified water (for 6 introductions). The observation period was 14 days, during which the clinical symptoms of intoxication were recorded, and the indicators of the general condition. Before the beginning of the experiment, as well as at 2, 7 and 14, weighing, taking into account the consumption of food and water.

After 14 days, the animals of all experimental groups were subjected to euthanasia (sodium thiopental 40 mg / kg) and subjected to a pathomorphological study.

For statistical processing of the results, a standard analysis package of statistical results processing (Microsoft Office Excell 2003) was used. The obtained data were presented as a sample average, taking into account the average deviation error. The reliability of the differences in the indices between the study groups was evaluated according to the criterion of Student's t-test and Mann-Whitney U test using the commonly accepted computer program «Statistica for Windows 6.0» (Stat Soft Inc., No. AXXR712D833214FAN5).

Results and discussion. The obtained lyophilic extracts based on infusion of leaves *Plantago media* L. were fluffy amorphous masses of light green color, with characteristic taste and smell. The total yield of LE *Plantago media* L. was $33.62 \pm 3.23\%$. In the study of acute toxicity, it was found that animals that received the maximum allowable volumes of investigated LE in 2 weeks after acute injection did not differ from these parameters from rats from control groups. The obtained data indicate that the LE *Plantago media* L. according to the parameters of acute toxicity refers to virtually non-toxic substances. The value of LD_{50} of the LE from leaves of *Plantago media* L. for white rats with intragastric injection above 20.000 mg / kg. But in one case. the lethal effect was not achieved even with the injection of maximum doses - 40 ml / kg (over 20.000 micrograms of dry matter) with intragastric injection. Also, there were no significant violations of the general condition and behavior of animals. Plant extract with acute intragastric injection at doses of more

than 20.000 mg / kg did not cause death of animals, did not cause macroscopic changes in the brain, internal organs, did not cause hypervolemic edema of internal organs, which is confirmed by the magnitudes of their mass coefficients. Thus, LE *Plantago media* L. are virtually nontoxic substances when injected in the most acceptable doses.

Conclusions. The study of acute toxicity has made it possible to establish that the lyophilic extracts based on infusion of leaves *Plantago media* L. belong to a class of practically non-toxic compounds. In one case. the mortality effects could not be achieved even with the injection of maximum doses - 40 ml / kg (more than 20.000 mg / kg of dry matter) with intragastric injection. There were no significant violations of the general condition and behavior of animals.

HIGHBUSH BLUEBERRY LEAVES EXTRACT AS A PROMISING AGENT FOR THE CORRECTION OF METABOLIC SYNDROME

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Introduction. Metabolic syndrome (MS) is a cluster of abnormalities combining insulin resistance (IR), obesity, hypertension, atherosclerotic hyperlipidemia and some other metabolic disorders. World Health Organization (WHO) first defined MS (or syndrome X, or insulin resistant syndrome) and published criteria in the 1998, several different definitions were proposed but all of them include glucose intolerance, IR, dyslipidemia and hypertension. Currently, WHO experts suggest MS to be a pandemic. One in four citizens in developed countries suffers from MS. Over the next 25 years, an increase in the rate of expected incidence is 50%. MS is strongly associated with diabetes mellitus type 2 (DM2) and cardiovascular diseases (CVD), which are the leading cause of mortality. In the Ukrainian traditional medicine shoots and leaves of the bilberry (*Vaccinium myrtillus*), which belongs to of the genus *Vaccinium* of the Heather family (*Ericaceae*), are widely used, as a hypoglycemic agent. Genus *Vaccinium* contains more than 200 species. We suppose that the medicinal raw materials of this genus species could have the similar pharmacological effects. Herbal raw materials of blueberries *Vaccinium uliginosum* L., a wild plant species, and *Vaccinium corymbosum* L., which is most widely cultivated, are of particular interest.

Aim. To establish the chemical composition of *V. corymbosum* leaves extract and reveal their bioactivity as potential remedies for the management of MS.

Materials and methods. The object of the study was extract obtained with 50% ethanol from the leaves of *Vaccinium corymbosum* L.. Quantification of major phytochemicals was performed using HPLC-DAD-MS analysis. The hypoglycemic activity of the dry extract from the leaves of tall blueberry was studied in adult mature inbred rats.

Results and discussion. The comparison of the content of hydroxycinnamic acids derivatives, flavonoids and total phenolics was carried using the simple chemical methods. Keeping animals for 6 weeks on diet enriched with fructose and saturated animal fats led to the significant hyperglycemia, which accompanied by hyperinsulinemia, indicated the IR state development. Administration of the extract led to a significant decrease in the level of glucose, insulin and TAG in blood serum.

Conclusion. Therefore, the study of chemical composition and pharmacological activity of the extract from the leaves of *Vaccinium corymbosum* L. has proved the prospect of creating a new drug for correcting of metabolic syndrome.