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COMPARATIVE CHARACTERISTICS OF THE EFFECT OF SOME INDUSTRIALLY SIGNIFICANT MEDICINAL HERBS ON THE CARDIOVASCULAR AND LYMPHATIC SYSTEMS OF AN AGING ORGANISM

Abstract. The purpose of this study was to identify the corrective properties of a number of medicinal herbs for age-related changes in the aging body.

In an experimental study on 8 groups of old animals, a number of medicinal herbs of the Kazakh flora were studied: Ziziphora Bunge, Almaty hawthorn, St. John's wort, Echinacea purpurea, kopeechnik, badan thick-leaved on the parameters of the cardiovascular and lymphatic systems. All the medicinal herbs tested by us affected the animal body to some extent and, according to the studied indicators, showed a positive effect in the direction of a younger organism. There was an increase in lymph flow, diuresis, weight loss, changes in the indicators of swellability, blood and lymph viscosity, blood pressure and heart rate. The data from the screening study allowed us to further combine them into a phytocomposition for subsequent studies in order to correct changes in the old body.

Keywords: herbs, lymphatic system, photocomposite old animals.

Plants attract the attention of researchers as a source of valuable biologically active substances: terpenoids, flavonoids, coumarins, and alkaloids, which are promising for practical use in medicine and pharmacy. Recently, there has been a clear trend of wider use in medical practice of herbal preparations, the advantages of which lie in their harmlessness and the effectiveness of therapeutic action. Dietary supplements made from plant raw materials rich in antioxidants, vitamins, trace elements, etc. they have a stimulating effect on the lymph flow, activation of the protein synthesizing apparatus of the cells of the lymphoid organs, thereby increasing their participation in lymphostimulation and lymphocorrection and lymphoprotection [1].

The lymphatic system is anatomically and functionally connected with the circulatory system, it participates in the resorption of water, protein products-cells, in water-salt metabolism, in immune reactions, etc., and the development of pathological processes is also accompanied by the participation of the lymphatic system, which, due to its protective - compensatory, drainage, transport functions, can change the course of the disease and the state of the body [2]. It was of interest to study a number of medicinal herbs of the Kazakh flora on the cardiovascular and lymphatic systems in order to create a phytocomposition that affects the aging process.

The purpose of the study. To identify and study the effect of medicinal herbs such as Ziziphora Bunge, St. John's wort, echinacea, badan, kopeechnik and hawthorn fruit on the main parameters of the cardiovascular and lymphatic systems.

Research methodology. In accordance with the purpose of the study, the experiments were performed on 89 white laboratory rats of the Spraque Davley SD line, of different ages, who were in the vivarium of the institute on a standard food and water regime.The study was approved by the local ethics commission of KNMU. Asfendiyarova (prtokol No. 6 (83) of 29.05.2019). Withdrawal from the experiment and painful manipulations on animals were performed under general ether anesthesia.

In the old age, the study of functional structural processes can be investigated in a short time period only in experiments and in laboratory animals – we chose rats. Determining the ratio of the life expectancy of rats and humans, a coefficient of 1.7 was used [3], which allowed us to attribute animals aged 1-60 days to the young age of humans (1-15 years), animals 10-12 months to the mature age (35-45 years), and animals aged 2 years – to the elderly (over 75 years). The study followed conditionally selected age groups – "young" (2-3 months) and "old" (22-24 months). Anesthesia of animals was carried out by inhalation with ether through a mask, in which a cotton wool with ether was placed. After anesthesia, an incision was made along the white line of the abdominal muscles, then the thoracic lymphatic duct was dissected at the diaphragm, into which a graduated micro-cannula was inserted and through which the lymph nodes were determined and the lymph was collected for research. In the caudal part of the abdominal cavity, after collecting lymph, the abdominal aorta was dissected, and a Teflon catheter was inserted into it to collect blood. Lymph flow and diuresis were determined. In the samples of lymph and blood, the viscosity of biological fluids was determined on the VK-4 viscometer. The volume of blood plasma was determined by the hematocrit. Blood pressure and heart rate in animals were recorded through the sensor of the surgical monitor (DREGOR) model GAMMA.

Medicinal herbs used in our experiments consisted of the most important Kazakh plants (Ziziphora Bunge-ZB, Almaty hawthorn-BA, echinacea-E, kopeechna-K, badan thick-leaved BT). In our experiments, we used a carbon dioxide substance obtained from the grass Ziziphora Bunge and a substance obtained from the fruits of hawthorn. (By the School of Pharmacy of KazNMU. Asfendiyarov) [5,6].

From herbs: echinacea, St. John's wort, copernicus, badan [7,8,9,10], decoctions were prepared according to standard technology, and the substances were dissolved in drinking water at the rate of 8-10 mg. Ziziphora Bunge and hawthorn 50 mg. per 300-350 g. body weight of the animal per day. The drinking regime of these groups consisted only of decoctions or water with dissolved substances. The animal drank about 100 ml of decoction or water with a dissolved substance per day. We gave the animals decoctions of herbs and dissolved substances for 1 month. The animals were taken for the experiment after 30 days.

The results of the experiments were processed by the method of variation statistics on a computer using the student's T-test. The results were considered reliable at $P < 0.05$.

Results of the study and their discussion.

Determined in animals AD in a group of young 94±11, old rats 108±6 mm/RT.St. After prmeneniya medicinal herbs ZB -104±5, BA-109±8, ZO-102±5,EP-104±5, K-102±7,BT-101±4mm/RT.St.

Recorded heart rate in young 496±15, and old animals 449±14. After the use of medicinal herbs, ZB-398±20, BA-404±16, ZO-440±14, EP-435±18, K-429±12, BT-406±15 beats per minute.

Screening studies of medicinal plant substances
and herbal decoctions on the cardiovascular and lymphatic systems

Old animals + Medicinal herbs	Lymphatic flow µl/min 100g body weight	Diuresis Ml/min 100g body weight	Blood clotting Min.	Lymph clotting Min.	Blood viscosity R.	Lymph viscosity R.	Hematocrit %	Weight г.
Zizifora Bunge	2,3±0,18*	0,0016±0,00007*	3,3±0,4*	3,52±0,6*	4,9±0,4	4,3±0,5*	45,1±3,9	350±20
Hawthorn	2,4±0,16*	0,0018±0,0001	2,9±0,5	3,1±0,5	4,9±0,5	3,9±0,4	45,4±3,8	360±22
Hypericum	1,7±0,15	0,00011±0,00002	3,2±0,4	3,3±0,6	4,4±0,6	4,2±0,5*	44,5±4	344±20
Echinácea	1,8±0,16	0,0001±0,00003	3,1±0,6	3,2±0,5	4,5±0,6	3,9±0,5	44,6±4	332±18*
Hedýsarum	2,4±0,18*	0,00015±0,00004*	3,4±0,6*	3,5±0,6*	4,7±0,7	4,2±0,7*	45,1±4,1	362±23
Bergénia crassifólia	2,3±0,2*	0,00017±0,00004*	3,3±0,4*	3,5±0,7*	5,1±0,7*	4,6±0,6*	44,8±3,8	354±21
Old animals	1,6±0,16	0,00099±0,00002	2,88±0,5	2,95±0,6	4,5±0,5	3,6±0,5	44,3±3,6	384±22
Young animals	5,0±0,3	0,0019±0,0001	3,59±0,4	3,90±0,5	5,5±0,5	4,4±0,5	48,02±42	192±18

In the literature, there is information about the activation of the functions of the lymphatic system after the use of medicinal plants [11-108]. Medicinal plants enhance the drainage function of the structures of the lymph nodes in pathology [12-109]. Bioflavonoids affect the smooth muscles of lymphatic vessels and nodes [13-110]. Medicinal herbs used in our screening study showed that they affect the body of animals: on the lymphatic and cardiovascular systems increased lymphatic and diuresis (ZB, Z, EP, K, BT) improved blood fluidity (ZB,Z,EP,K,BT), lymph fluidity (ZB, Z, K, BT), we are based on the parameters of fluid flowability and viscosity, increased plasma volume (ZB, BA, K,). Blood pressure decreased (ZB, ZO, K, BT). Heart rate decreased (ZB, BA, BT). The weight of the animals decreased. The choice of medicinal plants was justified, since the analysis of the figures in table (1). After the screening study, it was shown that the studied parameters approached the figures obtained in animals of a younger age when compared with our data from Chapter 2.1.

When analyzing the data after the use of medicinal herbs, it can be seen that they have an effect on the body of animals after a month of their administration and showed lymphostimulating, corrective, protective effects on the body. All the parameters studied are close to the figures obtained in animals of a younger age . All the medicinal herbs and substances tested by us affected the body in one way or another and showed a positive effect from our point of view on the studied parameters.

Conclusion. All the medicinal herbs tested by us affected the body in one way or another and showed a positive effect on the studied indicators in the direction of young age.There was an increase in lymph flow, diuresis, weight loss, changes in blood clotting, blood and lymph viscosity, blood pressure and heart rate. The data from the screening study allowed us to further combine them into a phytocomposition for subsequent studies.

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БІРҚАТАР ӨНЕРКӘСІПТІК МАҢЫЗЫ БАР ДӘРІЛІК ШӨПТЕРДІҢ ҚАРТАЙҒАН АҒЗАНЫҢ ЖҮРЕК-ТАМЫР ЖӘНЕ ЛИМФА ЖҮЙЕЛЕРІНЕ ӘСЕРІНІҢ САЛЫСТЫРМАЛЫ СИПАТТАМАСЫ

Аннотация. Осы зерттеудің мақсаты қартаю организміндегі жасқа байланысты өзгерістерге бірқатар дәрілік шөптердің түзету қасиеттерін анықтау болды.

Эксперименттік зерттеуде кәрі жануарлардың 8 тобында Қазақстандық флораның бірқатар дәрілік шөптерін зерттеді: зизифора Бунге, Алматы доланасы, зверобой, Эхинацея, копеечник, баданның жүрек-тамыр және лимфа жүйелерінің параметрлеріне әсері зерттелді. Біз сынаған барлық дәрілік шөптер белгілі бір дәрежеде жануарлардың денесіне әсер етті және зерттелген көрсеткіштер бойынша жас ағзаға оң әсер етті. Лимфа ағымының жоғарылауы, диурез, салмақтың төмендеуі байқалды, қан мен лимфаның тұтқырлығы, қан қысымы және жүрек соғу жиілігі өзгерді. Скринингтік зерттеу деректері кәрі ағзадағы өзгерістерді түзету мақсатыннан кейінгі зерттеулер үшін оларды фитокомпозицияға біріктіруге мүмкіндік берді.

Түйін сөздер: дәрілік шөптер, лимфа жүйесі, фитокомпозиция, кәрі жануарлар.

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СРАВНИТЕЛЬНАЯ ХАРАКТЕРИСТИКА ВЛИЯНИЯ НЕКОТОРЫХ ПРОМЫШЛЕННО ЗНАЧИМЫХ ЛЕКАРСТВЕННЫХ ТРАВ НА СЕРДЕЧНО-СОСУДИСТУЮ И ЛИМФАТИЧЕСКУЮ СИСТЕМЫ СТАРЕЮЩЕГО ОРГАНИЗМА

Аннотация. Целью настоящего исследования было выявить коррекционные свойства ряда лекарственных трав на возрастные изменения стареющего организма.

В экспериментальном исследовании на 8 группах старых животных изучили ряд лекарственных трав казахстанской флоры: Зизифора Бунге, боярышника Алматинский, зверобоя продырявленного, эхинацеи пурпурной, копеечника, бадана толстолистого на параметры сердечно-сосудистой и лимфатической систем. Все испытанные нами лекарственные травы влияли в той или иной мере на организм животных и по изученным показателям проявляли положительный эффект в сторону более молодого организма. Наблюдалось увеличение лимфотока, диуреза, снижение веса, изменялись показатели свертываемости, вязкости крови и лимфы, артериального давления и частоты сердéчных сокращéний. Данные скринингового исследования позволили нам в дальнейшем обьединить их в фитокомпозицию для последующих исследований с целью коррекции изменений в старом организме.

Ключевые слова: лекарственные травы, лимфатическая система, фитотерапия, старые животные.

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