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Research Paper

Investigation of acute toxicity and biological activity of an extract obtained on the basis of a local medicinal herbal collection

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ABSTRACT

Background: Herbal decoctions are used in folk medicine to treat various diseases. The antianemic potential of a combined extract of medicinal plants has not been fully evaluated.
Objective: To evaluate the antianemic effect of a combined herbal decoction extract in experimental alimentary anemia and hemolytic anemia.
Methods: The extract of the combined decoction of medicinal plants [plant names to be stated here] was administered orally to experimental rabbits for 60 days at doses of 10 ml/kg and 25 ml/kg. [Method of inducing anemia, control groups and number of animals to be stated here.] Antianemic activity was assessed by formed blood element counts, general condition of the animals and changes in body weight.
Results: In alimentary anemia, a therapeutic effect was observed from day 7 of treatment. In hemolytic anemia, the effect appeared in less than 21 days and became more pronounced until the end of the experiment. The treatment improved blood cell counts and general condition, significantly increased appetite and restored lost body weight. [Numerical data and p values to be stated here.]
Conclusion: The herbal extract showed antianemic activity in alimentary and hemolytic anemia in rabbits. Further studies on its activity and mechanism of action in various types of anemia are warranted.

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1. INTRODUCTION

It should be noted that the pathogenesis of a significant number of diseases is characterized by oxidative stress and the inflammatory process. Moreover, today modern society is constantly exposed to stressful situations of various kinds, such as: expansion of professional activities, increased rhythm of life, lack of physical activity, sharp deterioration of the environmental situation, abuse of medications, tobacco and alcohol, etc. To increase the body's resistance to damaging stress effects, various means of correction are used, in particular adaptogens, represented mainly by means of natural origin. Thus, phytopreparations are of interest, which differ from drugs of synthetic origin in good tolerability and the absence of pronounced undesirable side reactions even with prolonged use [1], [2], [3], [4], [5], [6]. Currently, a large genus of plants of the family is of the greatest interest to us as a source of biologically active substances, and we have previously described some representatives of this genus, presented the qualitative and quantitative composition of its species and features of their distribution [7].

According to the results of numerous studies, it has been established that extracts of plants of the genus the above-mentioned plant contain a rich complex of biologically active compounds: alkaloids, flavonoids, triterpene saponins, nitrogen-containing compounds, including non-protein amino acids, glycites, phenolic acids and their esters, coumarins, higher fatty acids, polysaccharides, vitamins B, C, E, PP, glycyrrhizic acid salts, trace elements, tannins, essential oils, gum, etc. [8], [9], [10], [11], [12]. Thus, given that the composition of the herb Astragalus includes a large number of biologically active substances, undoubtedly, an extract from this plant can have a number of physiological effects on living systems. Therefore, for complex therapy and prevention of most diseases, drugs with antioxidant and anti-inflammatory activity are recommended. From this point of view, phytopreparations containing both natural antioxidants and anti-inflammatory substances attract attention. Currently, numerous studies are devoted to the search for new plant sources of biologically active substances, methods for the development of phytopreparations are being improved and their fields of application are expanding [13], [14], [15], [16], [17]. I would like to note that the search and study of the raw material base of promising wild medicinal plants in certain regions, including in our region, the identification of new highly productive plant raw materials are undoubtedly relevant.

1.1 The Purpose of the Study

Study of acute toxicity and biological activity of an extract prepared on the basis of local medicinal plants under experimental conditions.

2. METHODOLOGY

In this research work, medicinal plants Matricaria Chamomilla L., Achillea Millefolium L., Polygonum Hydropiper L, Polygonum Aviculare L, Radix Glycyrrhizae were selected from the collection extract, which was taken in a ratio of 1:1 [18], [19]. In a separate experiment, the effect of the studied tincture on alimentary anemia detected with the help of a special diet was studied. It is known from the literature that the state of anemia caused by widespread iron deficiency in our Republic, and iron deficiency occurs mainly due to a deficiency of proteins, vitamins and iron in consumed foods [20], [21], [22]. With this in mind, in an experiment of a separate series, the effect of tincture on alimentary anemia artificially brought to the surface was studied. The model of alimentary anemia was brought to the surface using the method recommended in the manuals. This anemia occurs in laboratory rabbits with an experimental weight of 2.7-3.1 kg with the help of a special dietary diet, that is, 50 g per rabbit in an experiment in one day.from cabbage and brought to the surface with sufficient water for 12-14 days. The analysis of shaped blood elements was carried out before the start of the experiment, after the occurrence of alimentary anemia with the help of a special parquet and during their treatment with the studied tincture, on the 7th, 14th and 21st days of the experiment. When alimentary anemia was detected, rabbits in the experiment were divided into 3 groups of 4 people: rabbits of the 1st and 2nd groups were treated for 2 months with a mass amount of 1 and 2.5 ml / 100 g or a decoction (tincture) of a collection of Medicinal plants of 10 and

25 ml / kg; Rabbits of 3-the 1st group was orally administered 0.9% solution for offspring, respectively. From the beginning of treatment, rabbits were transferred to a general diet in a vivarium. In addition, the effect of the Extract of the plant collection with phenylhydrazine hydrochloride on the night camcon released to the surface in a separate experiment had a mass of 35-165-200 g. it was studied on laboratory rats. To do this, phenylhydrazine hydrochloride was injected under the skin in doses of 25 ml/ kg to rats in the experiment for 5 days in turn every day, causing hemolytic anemia. Peripheral blood tests conducted on the 6th day of the experiment showed a sharp decrease in the level of hemoglobin and erythrocytes in rats. In particular, the hemoglobin content in the peripheral blood of rats in the experiment is up to 3.8 g%, and the content of erythrocytes - 4.4 million decreased to. Neutrophilic leukocytosis, paikilocytosis, hypochromia and anisocytosis were recorded in the blood. The general condition of the animals in the experiment was significantly worse after administration of phenylhydrazine hydrochloride, their appearance was completely different from that of the control group rats. Symptoms of regrowth of their fur, licking around the nose and eyes were noted. The appetite of animals for food and water has significantly decreased. The main attention was paid to the general condition of the animals, the concentration of hemoglobin in peripheral blood, the number of erythrocytes and leukocytes, and the lekoformula was taken into account in the new automatic hematology analyzer (BC-6000 MINDRAY). As a result of the conducted studies, the anti-anemic activity of the studied tincture was evaluated by comparison with the control group, and the statistical processing of the results obtained by R.B. was carried out According to the tabular method proposed by Strelkov.

3. RESULTS AND DISCUSSION

The results of the study of acute toxicity of the extract of the collection of local medicinal plants, which was taken in a ratio of 1:1. During the experiments, as noted above, the test substance was administered orally from a dose of 500 mg / kg to a dose of 10,000 mg / kg, followed by administration during the first 3-4 hours and 7-14 days. At doses of 500 mg/kg and 5000 mg/kg, practically no side effects were observed. Initially, no fatal outcome was observed during the first 3-4 hours, and also after 7-14, when the dose was exceeded by 5000 mg/ kg, there was an increase in respiratory rate, palpitation, tremor as the dose increased, general weakness, dull reflex and muscle weakness with pain retention. Thus, the average lethal dose of acute toxicity of the substance studied experimentally exceeds 10,000 mg / kg when administered orally at LD50, and class VI acute toxicity of the substance is considered absolutely non-toxic. With the onset of alimentary anemia, the experience decreased at the level of mathematical accuracy of the shaped blood elements in the peripheral blood of rabbits. In particular, the amount of hemoglobin decreased by 35% compared to baseline values until anemia appeared. Under the same conditions, the number of red blood cells in peripheral blood decreased by 39.7%, and the number of white blood cells decreased by 19.9%. The general condition of rabbits in the experiment has become much more severe, they have become relatively less irritable, their appetite has significantly decreased, their body weight has decreased. In the peripheral blood tests conducted during the experiment, the following results were obtained. On the 60th day of treatment, the medicinal plant collection tincture increased the amount of hemoglobin in the blood of animals at doses of 10 ml/kg and 25 ml/kg by 45% and 50%, respectively, compared with anemia.

During the same period, the number of erythrocytes in peripheral blood increased by 40% and 45.9%, respectively, compared with the background of alimentary anemia. Under the same conditions, the amount of hemoglobin and erythrocytes in the peripheral blood of animals of the control group increased only by 25.5% and 155.7%, respectively. No changes in the number of leukocytes were recorded, and it was approximately within the physiological norm (10 thousand). The general condition of the animals in the experiment was significantly worse after administration of phenylhydrazine hydrochloride, their appearance was completely different from that of the control group rats. Symptoms of regrowth of their fur, licking around the nose and eyes were noted. The passion of animals for food and water has decreased significantly. Blood tests were performed before administration of phenylhydrazine hydrochloride and administration of phenylhydrazine hydrochloride to the surface of anemia, during their treatment with the

studied drugs, on the 15th, 30th, 45th and 60th days of the experiment. At the same time, the main attention was paid to the general condition of rats, the amount of hemoglobin and erythrocytes in peripheral blood, the morphology of erythrocytes and the number of leukocytes. Nocturnal hemolytic anemia caused by phenylhydrazine hydrochloride in rats from the Control group was very severe. Changes in the morphology of red and white blood cells were as noticeable as in anemia, which manifested itself with repeated blood secretions. High levels of neutrophilic leukocytosis shifted to the left in blood leukocytes were noted. By the end of the experiment, 43% of the animals (4 out of 10 died) had a fatal outcome, while in the remaining animals, the shaped elements of peripheral blood could not reach their fullness. Under the same conditions, the amount of hemoglobin in the peripheral blood of animals receiving a dose of 5 ml / kg of the studied the medicinal plant collection tincture increased by 0.9 g% on the 15th day of the experiment, the number of red blood cells increased by 0.3 million. In animals receiving the drug at a dose of 10 ml / kg, the amount of hemoglobin and erythrocytes became more intense and increased by 1.3 g% and 0.45 million, respectively. Changes in the morphology of erythrocytes and leukocytes have significantly decreased. The leukoformula has approached the physiological norm. On the 30th day of the experiment, the hemoglobin content on the 15th day of the experiment was 2.3 g, respectively. % and 3.4 g. with an increase to%, the level of erythrocytes increased to 0.85-1 million, the morphology of erythrocytes normalized, while leukocytes were close to the physiological norm. And on the 45th and 60th days there was a clear positive increase in these indicators. The comparison drug coamide increased the level of hemoglobin in peripheral blood by 3.5% on the 15th day of the experiment, and the number of red blood cells - to normal, at doses of 3 mg/kg with phenylhydrazine on the surface of hemolytic anemia. And on the 45th and 60th days there was a clear positive increase in these indicators. It should be noted that in the groups receiving the medicinal plant collection tincture tincture at doses of 5 ml/kg and 10 ml / kg, 2 and 1 rats died, respectively, before the end of the experiment. In the group of rats treated with the drug coamide, which was taken for comparison, no deaths were reported.

4. CONCLUSION

The therapeutic effect of the herbal extract for alimentary anemia manifested itself already on the 7th day of treatment, and it becomes more intense until the end of the experiment. Tincture of medicinal plants had a positive therapeutic effect on animals in the experiment. The general condition of the animals has improved, the appetite has increased significantly. By the end of the experiment, it was noticed that the weight of animals receiving tincture of the medicinal plant increased by 18.5% compared to the control group. So, we can conclude that the studied tincture of phytoferrone had a high degree of anti-anemic effect in alimentary anemia, which was brought to the surface with the help of a special parquet. Thus, as a result of the conducted studies, it was noticed that the extract of the plant collection has a positive effect on the number of shaped blood elements, which makes it necessary to conduct a large-scale scientific study of the activity of this tincture against the background of various anemias and the mechanism of action of the action. In conclusion, it should be noted that the medicinal plant collection tincture tincture has a positive effect on hemolytic anemia, such as the drug coamide, which is widely used in medicine, but its effect on this anemia occurs at a lower level than that of the drug coamide. Consequently, the effect of tincture on the course of hemolytic anemia is noted much slower than its antianemic results in other models of anemia.

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Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu

Akhranova Sokhiba Tazhidinovna	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Informed Consent

All participants were informed about the purpose of the study, and their voluntary consent was obtained prior to data collection.

Ethical Approval

Not Applicable.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

REFERENCES

[1] Меллер-Леймкюллер А.М. Стресс в обществе и расстройства, связанные со стрессом, в аспекте гендерных различий / А.М. Меллер-Леймкюллер // Социальная и клиническая психиатрия. – 2004. – № 4. – С. 5–11.

[2] Сейфулла Р.Д. Адаптогены в спорте высших достижений / Р.Д. Сейфулла, И.М. Кондрашин // Спортивная медицина: наука и практика. – 2011. – № 1. – С. 54–55.

[3] Сейфулла Р.Д. Проблема повышения биодоступности лекарственных средств методами нанофармакологии: фармакокинетика липосомальных препаратов / Р.Д. Сейфулла, А.К. Сариев, Д.А. Абаимов // Экспериментальная и клиническая фармакология. – 2010. – № 11. – С. 34–38.

[4] Siwicka D. Immunotropic and anti-tumor effects of plant adaptogens. III. Astragalus (Fabaceae) / D. Siwicka, E. Skopinska-Ryzewska, P. Bodera // Centr Eur Journal Immunol. – 2011. – Vol. 36, № 2. – P. 104–107.

[5] Сергалиева М.У., Мажитова М.В., Самотруева М.А. Биологическая активность экстрактов растений рода astragalus // Современные проблемы науки и образования. – 2015. – № 5. ; URL: https://science-education.ru/ru/article/view?id=21809

[6] Лежнина М.Г., Ханина М.А., Позднякова С.В., Родин А.П. Биологическая активность и химический состав сухого экстракта надземной части agrimonia pilosa ledeb. // Современные проблемы науки и образования. – 2022. – № 5. ; URL: https://science-education.ru/ru/article/view?id=32030

[7] Сергалиева М.У. Растения рода Астрагал: перспективы применения в фармации / М.У. Сергалиева, М.В. Мажитова, М.А. Самотруева // Астраханский медицинский журнал. – 2015. – № 2. – С. 17–31.

[8] Гужва Н.Н. Биологически активные вещества астрагала эспарцетного, произрастающего в Предкавказье / Н.Н. Гужва // Химия растительного сырья. – 2009. – № 3. – С. 123–132.

[9] Лобанова И. Е. Динамика содержания аскорбиновой кислоты в органах астрагала сладколистного и чины весенней / И. Е. Лобанова // Сибирский вестник сельскохозяйственной науки. – 2010. – № 4. – С. 19–23.

[10] Козак М. Ф. Перспективы использования астрагалов Астраханской области в качестве источника лекарственного сырья / М. Ф. Козак, И. А. Скворцова // Электронный научно-образовательный вестник «Здоровье и образование в XXI веке». – 2012. – Т. 14, № 8. – С. 181–182.

[11] Путырский И. Н. Универсальная энциклопедия лекарственных растений / И.Н. Путырский, В.Н. Прохоров. – М.: Махаон, 2000. – 605 с.

[12] Шабанова Г. А. Дикорастущие хозяйственно-ценные растения заповедника «Ягорлык» / Г. А.Шабанова, Т. Д. Изверская, В. С. Гендов. – Кишинев: Eco-TIRAS, 2012. – 262 с.

[13] Цымбал М. В. Использование биологически активных веществ и адаптогенов в хирургии повреждений и опухолей двигательного аппарата / М.В. Цымбал, А.Т. Гречко, Ю.К. Антонов // Вестник службы крови России. – 2012. – № 1. – С. 34–36.

[14] Nabiev U.N., Nazarkulova Sh.U., Xasanova G.S., Rakhimzoda T.E. (2023). Evaluation of the effect of harvesting plants with high biological activity on the central and peripheral nervous system. EURASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES, 3(1), 28–33. doi.org/10.5281/zenodo.7559644

[15] Николаева И.Г. Разработка и стандартизация средств растительного происхождения, обладающих адаптогенной активностью: Автореф. дис. д-ра фарм. наук. – Улан-Удэ, 2012. – 49 с.

[16] Т.Т.Ҳамроев, Н.М.Маматқулова, П.А.Нурмахмадова, С.З.Рашидов, И.Т.Абдиназаров, С.Д.Раҳимбоев, Н.Қ.Хидирова, У.М.Якубов. (2022). Adonis turkestanica ўсимлигининг экстракция жараёнида ҳосил бўлган қолдиқ моддаларнинг ўткир заҳарлилиги ва биологик фаоллигини скрининг тадқиқотларда ўрганиш. EURASIAN JOURNAL OF ACADEMIC RESEARCH, 2(12), 447–454. doi.org/10.5281/zenodo.7332870

[17] Антонов А.К. Применение адаптогенов в онкологии / А.К. Антонов, О.А. Бочарова, А.В. Белоусов, М.В. Цымбал, А.Т. Гречко // Вестник службы крови России. – 2011. – № 2. – С. 23–26.

[18] Муҳаммаджонов Баҳриддин Баҳромжон ўғли, Ҳамроев Толмас Толибович, Ғаниев Рустам Равшан ўғли, Нурметова Юлдуз Балтаевна, Мадвалиев Баходиржон Толибжон ўғли, Илмияминов Отабек Алишер ўғли. (2022). Доривор хусусиятга эга ўсимликлар йиғмасининг анемияга қарши фаоллигини баҳолаш. EURASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES, 2(11), 322–327. doi.org/10.5281/zenodo.7248323

[19] Muhammadjonov Bakhriddin Bakhromjon ogli, Ganiev Rustam Ravshan ogli, Nurmetova Yulduz Baltaevna, Madvaliev Baxodirjon Tolibjon ogli, Ilmiyaminov Otabek Alisher ogli, & Khamroev Tolmas Tolibovich. (2022). Evaluation of the Effect of Collecting Plants with Medicinal Properties on the Course of Hemolytic Anemia in the Study Conditions. International journal of health systems and medical sciences, 1(5), 45-51.

[20] Аллаева М.Ж., Ҳамроев Т.Т. Matricaria chamomilla L., Polygonum hydropiper L., Achillea millefolium L., Polygonum aviculare L., Radix glycyrrhize асосида олинган ўсимлик йиғмасининг антианемик хусусиятини ўрганиш. “YOSHLAR kelajak bunyodkori” ADTI 2017.2-3.

[21] Авазов А.Х. – Темир танқис камқонлик, Шифо– инфо, Тошкент, \ \2008, № 16 бет

[22] Фармонқулов Х.К., М.Э.Давронов – Организмда темир алмашинуви, темир танқислиги ва соғломлаштиритш (амалий қўлланма). Жиззах. 2005., 166 бет.

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