American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 05 PAGES: 56-62
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 6.534) (2024: 7.7)
OCLC – 1121105677
Publisher: Oscar Publishing Services

Journal Website: https://theusajournals.com/index.php/ajbspi

Research Article

ANTI-EXUDATIVE EFFECTS OF HYDROGEL PRESERVING FIELD OVEN EXTRACT

Submission Date: May 21, 2024, Accepted Date: May 26, 2024,
Published Date: May 31, 2024
Crossref doi: https://doi.org/10.37547/ajbspi/Volume04Issue05-09

Yakubova Umida Bakhtiyarovna
Urganch Branch of Tashkent Medical Academy, Uzbekistan

ABSTRACT

Even the oldest examples of writing, created in the years before Christ, contain information about the healing properties of plants. Some natural drugs considered valuable were isolated in pure form decades ago. But there are many plants that have not yet been studied and whose medicinal properties have not been scientifically tested.

KEYWORDS

Phlogogens, medicinal substance, alkaloids, histamine, dextran, leaf sap.

INTRODUCTION

Around the world, a number of scientific research works are being carried out in order to improve the effectiveness of treatment and the prevention of side effects of anti-inflammatory drugs. Despite the wide range of anti-inflammatory drugs currently used in practice, there is still a high demand for new drugs with high pharmacological activity, low toxicity and minimal side effects. [1,11- 73, 36].

The purpose of the study. Study of the effect of a hydrogel containing a field ivy extract on the exudative stage of inflammation.

One of such plants is field ivy belonging to the ivy family, widespread in all regions of Uzbekistan. The people of Central Asia have different names for this plant. Turkmens are charapechak, Kazakhs are

American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 05 PAGES: 56-62
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 6.534) (2024: 7.7)
OCLC – 1121105677
Publisher: Oscar Publishing Services

shermatik, Turks are chermashik, and Russians are vyunok polevoy. The Institute of Chemistry of Plant Substances of the Academy of Sciences of Uzbekistan is of great service in finding medicinal plants and extracting alkaloids from them. The effect of medicinal plants on the body depends on the amount of chemical compounds in its composition. These compounds accumulate in different amounts in different parts of the plant. Medicinal substances are collected in the shoots, leaves or fruits of some plants, in the roots or bark of some plants. Therefore, the part of the plants with the most biologically active substances is harvested [9,10- 37, 372].

The field ivy plant is a perennial weed growing in the ground or creeping, the length of the stem reaches 40-100 cm. The leaves are arcuate, spear-like with a sharp tip. Field ivy blooms in March-April. Blooms in March-August. The flower is white or pink, trumpet-shaped. The fruit ripens in June-September. The appearance of the fruit is wide ovoid, hairless length is 6-8 mm. Field ivy grows abundantly on irrigated land. It is spread everywhere in our republic. In order to prepare medicines from the plant, the above-ground part of the plant is collected and dried in a cool, shady place. The above-ground parts of the plant contain flavonoids, caffeic acid, carotene, vitamin C, resins and some alkaloids. Many medicinal preparations are prepared from this plant. Undried leaf juice of the plant mixed with beef fat was used as a cure for lung and ear diseases. Bruised branches are washed with a decoction made from the above-ground part of the plant. The decoction was also used as an anti-scabie medicine. A powder made from the leaves is sprinkled on wounds and sores [4,5-32, 284].

The scientific significance of the results of the research is that it is used for the first time in the form of a gel from local plant sources, the possibility of finding among them highly effective agents that stimulate anti-inflammatory properties, and the main aspects of the mechanism of action of the gel containing the extract of field ivy are highlighted [13, 88].

METHOD

As the object of the study, a gel prepared from a complex of biologically active substances isolated from the above-ground parts of the field ivy plant was taken. The anti-inflammatory effect of ivy extract preservative gel was compared to ibuprofen gel. Due to the complexity of the inflammatory process, it is difficult to choose drugs that will act against it [6, 340].

The anti-inflammatory effect of the studied drugs is determined by the difference between the growth of the paws of experimental and comparison group animals or the difference between the amputated paws of mice. White rats with a mass of 155-180 g were used to perform the tasks set before us. Formalin, dextran, histamine, serotonin and carrageenan were used as phlogogenic agents. It is known that physiologically active substances - inflammatory mediators (histamine, serotonin,

American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 05 PAGES: 56-62
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 6.534) (2024: 7.7)
OCLC – 1121105677
Publisher: Oscar Publishing Services

bradykinin) are released under the influence of various agents that injure tissues. These active substances play an important role in the process of inflammation.

It can be seen that the inflammatory process can be induced by introducing the above-mentioned agents into the body. In the initial period of inflammation, a significant exudation phase is observed. After the primary alteration, in response to the impact of the injurious agent, the increase in vascular permeability, the transfer of blood plasma and shaped elements from the site of inflammation to the surrounding tissues, causes edema, which is characteristic of inflammation [2, 221-222].

Histamine and serotonin are of practical importance for 15-20 minutes after exposure to inflammatory agents, and then the release of proteolytic enzymes in injured cells, the increase in the concentration of biogenic amines leads to an increase in the activity of the kallikrein-kinin system. Kinins are neurovasoactive polypeptide substances that have different effects on smooth muscles, kidney, lung and heart activity, permeability and tone of blood vessels wall.

Among the phlogogenic agents named above, formalin is widely used by many researchers, because the inflammation caused by formalin occurs quickly, the maximum swelling is observed after 5-6 hours and is quickly reabsorbed. In addition, inflammation induced by formalin is very similar to the inflammatory process that occurs in the human body [8, 12-646, 654].

0.1 ml of 0.1% histamine and 0.2% serotonin solution was injected under the aponeurosis of the hind paw of the rat using a syringe. Paw size of rats was measured oncometrically before and every 60 minutes for 4 hours after administration of phlogogenic agents, and for the last time after 24 hours. Inflammation under the influence of histamine and serotonin appears very quickly, the maximum swelling of the paws is observed after 1-1.5 hours and is reabsorbed in the last 24 hours.

RESULTS

In experiments, we conducted studies to determine the antiexudative effect of field ivy extract gel in comparison with ibuprofen gel in aseptic models of histamine and serotonin. The results of these series of experiments show that subplantar administration of histamine caused a 72.3% increase in rat paw size compared to the initial size.

The anti-inflammatory activity of the ivy extract was 38.3%, and the anti-inflammatory activity of the ibuprofen gel was 28.8%, 1 hour after the start of the gel application in histamine-induced animals. It can be seen that the used gels significantly affected the exudation process caused by histamine. (table 1) Histamine (produced in basophilic and mast cells) exerts its effect through 2 different types of N1 and N2 receptors. Pain occurs when histamine acts on N1 receptors. When acting on N2 receptors, it increases

American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 05 PAGES: 56-62
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 6.534) (2024: 7.7)
OCLC – 1121105677
Publisher: Oscar Publishing Services

the production of prostaglandins and thromboxane, reduces chemotaxis and phagocytic activity of neutrophils, and reduces the release of lysosomal enzymes by neutrophils. Acting through both types of receptors, histamine dilates precapillary arterioles at the site of inflammation, narrows vessels in the lungs, and increases the permeability of the vascular wall in the skin and some organs.

Table 1

Anti-inflammatory effects of 5% ivy extract hydrogel and 5% ibuprofen gels against histamine-induced inflammation

Groups	Initial paw size is cm^3	After 1 hour, the size of the paw is cm^3	After 2 hours, the size of the paw is cm^3	After 3 hours, the size of the paw is cm^3	After 4 hours, the size of the paw is cm^3
Control	100%	72,3%	57,4%	38,6%	19,8%
FI	100%	38,3%	48,3%	58,9%	65,0%
IBP	100%	28,8%	34,5%	38,5%	40,0%

Thus, the gel containing the extract of field ivy had a significant anti-inflammatory effect induced by histamine.

The anti-inflammatory activity of the tested drug in the serotonin model was highly effective, and its effect was close to the anti-inflammatory effect induced by histamine. (table 2). The anti-inflammatory activity of the ivy extract gel is superior to ibuprofen gel. The results of the calculation of the anti-inflammatory activity of these drugs showed that.

Serotonin (produced in fat cells of the skin and other tissues and delta cells of platelets) exerts its effects through serotoninergic receptors. These effects include pain, narrowing of venules, increased permeability of the vessel wall, and thrombus formation [3, 45-46].

American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 05 PAGES: 56-62
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 6.534) (2024: 7.7)
OCLC – 1121105677
Publisher: Oscar Publishing Services

Table 2

Serotonin-induced anti-inflammatory effects of 5% ivy extract hydrogel and 5% ibuprofen gel

Groups	Initial paw size is cm^3	After 30 min, the size is cm^3	After 60 min, the size is cm^3	After 90 min, the size is cm^3	After 120 min, the size is cm^3	After 180 min, the size is cm^3	After 240 min, the size is cm^3
Control	100%	74,1%	90,6%	78,8%	54,1%	38,8%	23,5%
FI	100%	39,7%	41,5%	47,8%	47,8%	69,7%	90%
IBP	100%	28,6%	33,7%	35,8%	35,8%	63,6%	80%

It is known from the literature that inflammation caused by dextran develops very quickly (within 1-1.5 hours) and returns quickly. In our experiments, rats were injected with 0.1 ml of a 6% dextran solution under the aponeurosis of the hind paw. The size of the paws was measured by oncometric method before injection of dextran solution and every 60 minutes after injection, the last time after 24 hours (table 3).

Table 3

Effects of ivy extract and ibuprofen-containing gels on dextran-induced inflammation

American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 05 PAGES: 56-62
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 6.534) (2024: 7.7)
OCLC – 1121105677
Publisher: Oscar Publishing Services

Groups	Paw size, cm^3				
	Дастлабки	1 соат	2 соат	3 соат	4 соат
Control	0,96±0,04	1,85±0,08*	1,90±0,09*	1,77±0,08*	1,66±0,06*
FI (1%)	0,90±0,04	1,70±0,09*	1,75±0,08*	1,67±0,08*	1,58±0,08*
FI (3%)	0,91±0,03	1,52±0,07*	1,53±0,08*	1,43±0,07*	1,35±0,09*
FI (5%)	0,95±0,05	1,49±0,07*	1,51±0,05*	1,41±0,04*	1,30±0,05*
Ibuprofen	0,95±0,05	1,53±0,08*	1,55±0,09*	1,45±0,10*	1,37±0,10*

CONCLUSION

1. Field ivy extract preservative gel showed high antiexudative activity in aseptic inflammations induced by various phlogogens when applied to the surface. At the same time, it is not inferior to ibuprofen, a well-known non-steroidal anti-inflammatory agent, in terms of its pharmacological activity.

2. The absence of significant changes in hematological and biochemical parameters during continuous use of the gel made from the extract of field ivy showed that its side effects are few.

3. Field ivy extract preservation gel has practical value as a potential anti-inflammatory drug.

REFERENCES

1. Хакимов З.З., Рахманов А.Х., Шукурлаев К.Ш., Якубова У.Б. Противовоспалительная активность экстракта вьюнка полевого при местном применении. // Назарий ва клиник тиббиёт журнали. – Тошкент, 2020. №3. –С. 73-75.
2. Khakimov Z.Z., RakhmanovA.Kh. ShukurlaevQ.Sh., Yakubova U.B.Study of Antiexudative effect of gel containing extract of convolvulus arvensis. // American journal of Medicine and Medical Sciences. – 2021, 11 (3): – P. 219-223.
3. Якубова У.Б. Фармакологическое изучение геля содержащий экстракт вьюнка полевого-convolvulus arvensis. // Academic Research in Educational Sciences. –2021. Volume 2, Issue 7. – С.44-51.
4. Yakubova U.B. Study of the effect of Convolvulus arvensis extract gel on the aseptic arthritis caused by different phlogogens in white rats. // Биомедицина ва амалиёт журнали: 2021. № 4 –С. 31-36.
5. Хакимов З.З., Рахманов А.Х., Якубова У.Б. Эффективность геля, содержащего экстракт Convolvulus arvensis, в лечении ожоговых ран.// Инфекция, иммунитет и фармакология.-2021. №5-С. 284-290.

American Journal Of Biomedical Science & Pharmaceutical Innovation
(ISSN – 2771-2753)
VOLUME 04 ISSUE 05 PAGES: 56-62
SJIF IMPACT FACTOR (2022: 5. 705) (2023: 6.534) (2024: 7.7)
OCLC – 1121105677
Publisher: Oscar Publishing Services

6. Якубова У.Б. Изучение влияния геля содержащий экстракт Convolvulus arvensis на течение экссудативных и пролиферативных процессов воспаления.// Инфекция, иммунитет и фармакология.-2021. №5 - С. 338-345.
7. 7. Khakimov Z.Z., Rakhmanov A.Kh., Yakubova U.B. Pre-clinical study of the safety of gels containing convolvulus arvensis extract. // Re-Health journal. – 2021. №2 (10). – P. 214-219. (DOI:10.24411/2181-0443).
8. Khakimov, Z., Rakhmanov, A. K., Yakubova, U. B., & Shukurlaev, K. S. (2021). Experimental substantiation of anti-inflammatory activity of a gel containing Convolvulus arvensis extract in carrageenan-induced aseptic arthritis. National Journal of Physiology, Pharmacy and Pharmacology, 11(6), 645-648.
9. Якубова У.Б. Convolvulus arvensis экстрактидан тайёрланган гелнинг хар хил агентлар билан чақирилган яллиғланишга қарши таъсири. // Халқ табобати: 2021. – №3 – С.36-39.
10. Yakubova U.B. The importance of field bindweed in folk medicine// Journal of biomedicine and practice — 2023 — Vol/8, Issue 2 — P. 371–374.
11. Якубова, У. Б., & Мискинова, Ф. Х. (2022). антифлогистическая активность и побочные действия некоторых нестероидных противовоспалительных средств. Academic research in educational sciences, 3(1), 35-42.
12. Якубова У.Б. Влияние гидрогеля экстракта вюнка полевого на течение воспаления индуцированного формалином.// PHARMACOTHERAPY OF PARKINSON'S DISEASE. P. 654
13. Шукурлаев, К. Ш., Якубова, У. Б., & Кутлиева, Ф. А. (2023). ВЬЮНОК ПОЛЕВОЙ-ЛЕЧЕБНЫЕ СВОЙСТВА И ПРИМЕНЕНИЕ В МЕДИЦИНЕ. Образование наука и инновационные идеи в мире, 18(4), 88-95.