Journal of Chemistry of Goods and Traditional Medicine

J Chem Good Trad Med, Volume 4, Issue 1, 2025 Traditional Medicine

STUDY OF THE CHEMICAL COMPOSITION OF TOMATO AND ITS USE IN THE TREATMENT OF VARICOSE VEINS

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DOI: https://doi.org/10.55475/jcgtm/vol4.iss1.2025.406

Keywords:
Varicose veins, garlic, honey, flavonoids, buffer solution

Annotation
This article presents information about varicose veins, the causes of its occurrence and treatment methods. In addition, the use of a mixture of garlic and honey in folk medicine in a certain proportion for the treatment of varicose veins is considered in detail. The chemical composition of various proportions of a mixture of garlic and honey was determined using modern physical and chemical methods, and its biological activity was proved through antioxidant properties.

How to Cite
Kimsanova, G. S., Askarov, I. R., & Muminjonov, M. M. STUDY OF THE CHEMICAL COMPOSITION OF TOMATO AND ITS USE IN THE TREATMENT OF VARICOSE VEINS. Journal of Chemistry of Goods and Traditional Medicine, 4(1). https://doi.org/10.55475/jcgtm/vol4.iss1.2025.406

Introduction. Varicose veins are one of the most common diseases, affecting more than 20 percent of the world's population today. In developing countries, 40 percent of women and 32 percent of men are infected with varicose veins. The main causes of this disease are an unhealthy lifestyle, poor nutrition, obesity, wearing uncomfortable shoes, as well as heredity and hormonal changes. Failure to treat varicose veins leads to the appearance of nodes in the venous vessels and the transition of these nodes directly to the heart, putting an end to a person's life [1].

Flavonoids are very important for the body in the treatment of varicose veins and, together with salicylic acid, they show their properties more clearly. Folds formed as a result of dysfunction of the venous vessels cause varicose veins.

Antioxidants dissolve bad cholesterol in the vessels, and vitamins restore vascular function [2]. A special mixture of honey and garlic was taken as the object of the study. The main reason for this is the high antioxidant and antiradical properties of both products, as well as the richness of micro- and macroelements that are close to each other.

Honey is a sweet liquid produced by worker bees by processing the nectar of plant flowers in their bodies. Honey contains more than 70 types of substances useful for humans. It has also been

established that honey contains minerals: calcium, sodium, potassium, etc., trace elements, malic, citric acids, and vitamins (B2, B6, PP, C, E, K) from organic acids. Light honey is usually more expensive [3]. The chemical composition of honey depends on where it is mined, the surrounding nature, and the variety of plants growing there. In folk medicine, ointments are prepared by mixing various plants with honey. Also, the use of mixtures prepared with honey in certain proportions is a cure for many diseases [4,5,6].

Garlic is a type of biennial and perennial herbaceous plant, a vegetable crop belonging to the onion family. The leaves are ribbon-shaped, and the roots are small, bisexual, bell-shaped, white, or purple. Onion is a complex, membranous common shell containing 7-30 small bulbs. The chemical composition of garlic onion is very rich, it contains micro- and macroelements, phytoncides, and flavonoids [7]. The place of garlic and onion in folk medicine is incomparable. Garlic is widely used for cardiovascular diseases, and skin diseases, as an antihelminthic agent [4,5,6].

Table 1. Chemical composition of honey and garlic (quantity per 100 g of product)

T/r	Name of compound	Honey	Garlic
1.	Water	17.1 g	58-59 g
2.	Proteins	0.3 g	6.4±0.2 g
3.	Lipids	0	0.5 g
4.	Carbohydrates	82.4 g	33.1 g
5.	Riboflavin (vitamin B2)	0.038 mg	0.1 mg
6.	Niacin (vitamin B3)	0.121 mg	0.3 mg
7.	β-carotene	-	5 mkg
8.	Thiamine (vitamin B1)	-	5 mg
9.	Pantothenic acid (vitamin B5)	0.068 mg	0.7 mg
10.	Pyridoxine (vitamin B6)	0.024 mg	1.2 mg
11.	Folacin (vitamin B9)	2 mkg	3 mkg
12.	Ascorbic acid (vitamin C)	0.5 mg	31±2 mg
13.	Calcium	6 mg	181±25 mg
14.	Iron	0.42 mg	1.7 mg
15.	Magnesium	2 mg	24-26 mg
16.	Phosphorus	4 mg	153±8 mg
17.	Potassium	52 mg	401±26 mg
18.	Sodium	4 mg	17 mg
19.	Zinc	0.22 mg	1.2 mg
20.	Manganese	-	1.7 mg
21.	Selenium	-	14±3 mkg

Results of the study. Honey and dried garlic have been used for many years in the sanatorium "Oltin vodiy tabiati". For this, 4 types of mixture are prepared. In the 1st mixture, 7 tablespoons of pure honey and 1 tablespoon of garlic-onion powder are added, in the 2nd mixture, 6 tablespoons of pure honey and 1 tablespoon of garlic-onion powder, in the 3rd mixture, 5 tablespoons of pure honey and 1 tablespoon of garlic-onion powder, in the 4th mixture, 4 tablespoons of pure honey and 1 tablespoon of garlic-onion powder and mix well. Each mixture is applied to the body affected by varicose veins, 2 times for 21 days and this mixture is consumed 2 times. During the treatment period, patients should take Askalsiy 2-3 times, As-tash 3 times and As-shifo 3 times. It was noted that varicose veins completely disappeared in sanatorium patients who underwent this procedure. The antioxidant properties of these compounds were determined in the scientific laboratory of Andijan

State University and a comparison of the antioxidant properties of their aqueous and alcoholic extracts was made.

The antioxidant activity of the studied samples is expressed as a percentage (AA%) for the inhibition of adrenaline autooxidation and is calculated using the following formula and is presented in Table 2:

$$AA = \frac{(D_1 - D_2) \cdot 100}{D_1}$$

Here, the optical density of the adrenaline tartrate solution is added to buffer D_1, the sample extract is added to buffer D_2, and the optical density of the adrenaline tartrate is added to buffer D_2.

Table 2. Antioxidant activity values of sample extracts

Time (minute)	AF, %							
	4:1		5:1		6:1		7:1	
	water	alcochol	water	alcochol	water	alcochol	water	alcochol
1- minute	-14.35	-22.78	-19.41	-10.55	-4.22	-13.08	-3.80	-16.03
3- minute	-8.37	-11.75	-9.16	-6.18	-2.39	-3.78	-2.39	-5.38
5- minute	3.23	-3.38	-2.15	-1.38	-1.08	2.61	-0.92	2.00
10- minute	**5.66**	**7.45**	**8.55**	**5.93**	**0.55**	**9.52**	**0.55**	**9.38**

The obtained results show that the alcoholic extracts of samples 1, 3, 4 exhibit higher antioxidant activity compared to aqueous extracts.

Experimental part. The samples submitted for analysis were evaluated using the method of inhibiting the adrenaline autoxidation reaction in vitro, i.e. the ability of adrenaline to inhibit the autoxidation reaction and simultaneously prevent the formation of reactive oxygen species (ROS).

Preparation of sample extract:

Extracts of the samples were prepared in two different ways [10].

1. 0.75 g of the plant sample was boiled in 25 ml of water for 10 minutes in a flask equipped with a reflux condenser. The resulting extract was passed through a syringe filter with a pore size of 0.45 μm and used for analysis.

2. 0.75 g of the plant sample was extracted using ultrasound in 25 ml of 96% ethanol for 20 minutes at 60 oC. The resulting extract was passed through a syringe filter with a pore size of 0.45 μm and used for analysis.

Spectrophotometric analysis.

3 ml of 0.2 M carbonate (Na_2CO_3-$NaHCO_3$, pH=10.65) buffer and 0.14 ml of 0.18% adrenaline tartrate solution were added and the optical density D_1 was determined every 30 seconds at a wavelength of 347 nm for 10 minutes in a 10 mm thick cuvette in a K7000 spectrophotometer (YOKE, China).

45 μl of the extract of the studied plant, 3 ml of the buffer solution and 0.14 ml of 0.18% adrenaline tartrate solution were taken, mixed in the manner described above and the optical density was measured at a wavelength of 347 nm (D_2).

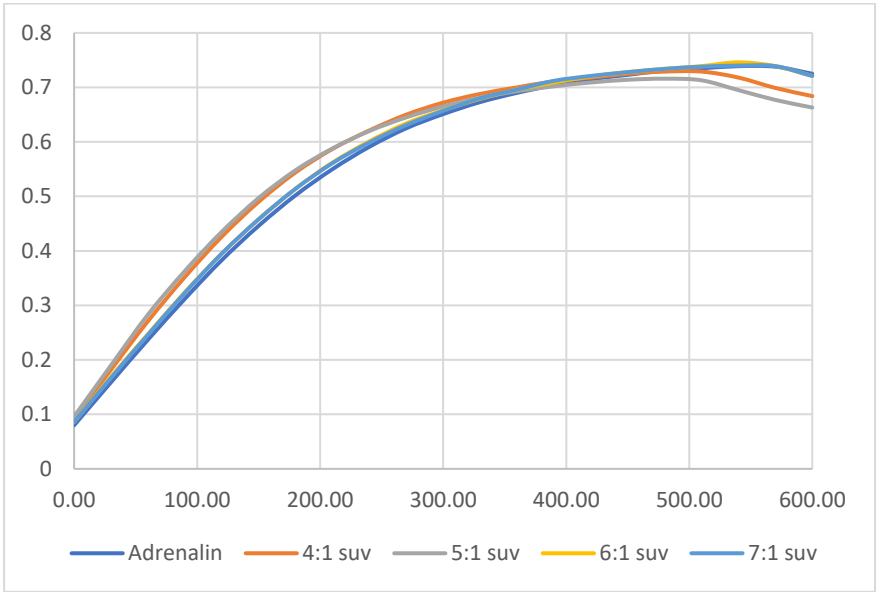


Figure 1. Diagram of the growth of optical density of adrenaline and aqueous extract of samples (l=347 nm).

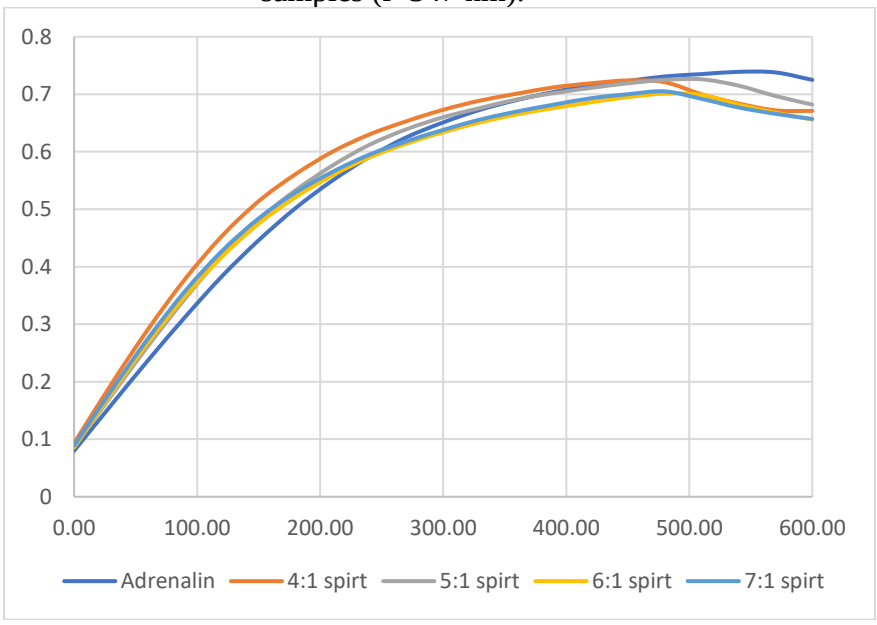


Figure 2. Diagram of the growth of optical density of adrenaline and alcohol extract of samples (l=347 nm).

Conclusion. Prevention and treatment of varicose veins are of great importance in folk medicine. The use of special mixtures of garlic and honey helps patients suffering from this disease to overcome the disease. In conclusion, it can be said that the alcoholic extract of the 6:1 sample has a higher antioxidant activity than the extracts. This is important for the complete recovery of patients when these compounds are used together with the food additives "Askalsii", "As-tash", "As-shifo".

References

1. Веденский А.Н. Варикозная болезнь. Л.: Медицина, –1983. –С. -207.
2. Babajanov A.S., Toirov A.S., Ruziboyev S.A., Axmedov A.I. Oyoq venalari varikoz kasalligi va uni davolash usullari. T.: “Qamar media”. –2022. –B. 7-16.

3. Кривцов Н. И., Крылов В. Н., Лебедев В. И., Сокольский С. С. Продукты пчеловодства для здоровья. К.: “Агропромполиграфист”. –2002. –С 272.
4. Asqarov I.R. Sirli tabobat. T.: "Fan va texnologiyalar nashriyot-matbaa uyi". –2021. 112-116.
5. Asqarov I.R. Tabobat qomusi. T.: “Mumtoz so’z”. – 2019. –B. 692-693.
6. Asqarov I.R. Fitoterapiya. T.: “Fan va texnologiyalar nashriyot-matbaa uyi”. –2023. –B. 664-665.
7. Алексеева М. В. Чеснок. М.: “Россельхозиздат”. –1979. –С. 88
8. Патент. RU2144674C1. Способ определения антиоксидантной активности супероксиддисмутазы и химических соединений. 2000. Url:https://patentimages.storage.googleapis.com/4b/17/a7/c0848d28409d60/RU2144674C1.pdf.
9. Рябинина, Е. И., Зотова, Е. Е., Ветрова, Е. Н., Пономарева, Н. И., & Илюшина, Т. Н. (2011). Новый подход в оценке антиоксидантной активности растительного сырья при исследовании процесса аутоокисления адреналина. Химия растительного сырья, (3), 117-121.
10. Askarov, I. R., Abdullaev, S. S., Mamatkulova, S. A., & Abdulloev, O. S. (2024). ANTIOXIDANT ACTIVITY AND ELEMENTAL COMPOSITION OF MIXTURES OF FIG AND COMMON UNABI FRUITS. Journal of Chemistry of Goods and Traditional Medicine, 3(3), 179–205., https://doi.org/10.55475/jcgtm/vol3.iss3.2024.320.