

Study of Chemical Components of *Tribulus* Plant and Its Macro- and Microelements and Some Diuretic Medicinal Properties

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Abstract This study delves into the chemical composition of the *Tribulus* plant, focusing on its macro- and microelements, as well as exploring its diuretic medicinal properties. *Tribulus*, a plant known for its traditional medicinal uses, has garnered attention for its potential health benefits. Through comprehensive chemical analysis, including the identification of macro- and microelements, this research aims to provide valuable insights into the nutritional and medicinal characteristics of *Tribulus*. Furthermore, the study investigates the diuretic properties of *Tribulus*, shedding light on its potential application in the management of conditions related to fluid retention. By elucidating the chemical components and medicinal properties of *Tribulus*, this research contributes to a better understanding of its potential therapeutic value and opens doors for further exploration in the field of natural medicine.

Keywords Beta-carotene, Alpha-carotene, Biologically active substances, Protein, Carbohydrates, Fats

1. Introduction

Medicinal preparations have anti-atherosclerosis lowering blood cholesterol and diuretic effects, and good results have been obtained in the treatment of cases of decreased gastric juice. It can be seen that *Tribulus* is used in the treatment of certain diseases such as testosterone and estrogen. This plant has been used for a long time in traditional Chinese medicine, as well as in urinary tract diseases. *Tribulus* contains a number of compounds that have medicinal effects. These compounds contain antioxidants, as well as chemical components with anti-inflammatory, immune-boosting, pain-reducing, and antibacterial properties. *Tribulus terrestris* is used to treat the following diseases: angina, eczema, high blood pressure, high cholesterol, infertility, and impotence [1,3]. When testing the effects of *tribulus* on rabbits and rats, researchers observed that treatment with *tribulus* can lead to an increase in certain sex hormones, such as testosterone. Additionally, a small study published in Daru: The Journal of Pharmaceutical Sciences in 2014 showed that *tribulus* may help treat sexual dysfunction in women. *Tribulus* suggested an animal-based study published in 2006 in the Annals of the New York Academy of Sciences. Studies have shown that the toxin can fight diabetes by eliminating oxidative stress in tests on rats [5,6].

2. The Main Findings and Results

Regarding side effects, the existing body of research indicates that *Tribulus* exhibits a generally favorable safety profile in humans, with few reported adverse effects. However, caution is warranted as certain individuals may experience occasional negative reactions, such as increased anxiety, particularly when *Tribulus* is used in high doses or for extended periods.

Notably, some studies have suggested a potential association between *Tribulus* supplementation and prostate gland issues, including the exacerbation of symptoms or the promotion of prostate gland enlargement. As a precautionary measure, individuals with a history of prostate cancer or those currently affected by this condition are advised to avoid the use of *Tribulus* to minimize any potential risks or complications. It is essential to highlight the medication Tribusponin, a pharmaceutical product derived from *Tribulus*, which has demonstrated efficacy in the treatment of atherosclerosis, encompassing general, cerebral, and cardiovascular sclerosis. The therapeutic benefits of Tribusponin underscore the pharmacological potential of *Tribulus*-derived compounds in managing atherosclerotic conditions and associated cardiovascular health issues, offering a promising avenue for medical intervention.

While *Tribulus* is generally well-tolerated by most individuals, it is crucial to be mindful of potential side effects, particularly in specific populations or under certain circumstances. By acknowledging and understanding the

nuances of *Tribulus* supplementation, healthcare providers and individuals can make informed decisions regarding its usage, ensuring optimal safety and efficacy in harnessing the medicinal properties of this botanical remedy. Additionally, the development and utilization of pharmaceutical formulations like *Trubusponin* highlight the translational potential of *Tribulus* research, paving the way for innovative treatment modalities in the realm of cardiovascular health and atherosclerosis management.

The purpose of the research was to study the amount of macro- and microelements in the *Tribulus terrestris* plant growing in the Fergana Valley.

Table 1. Amount of macro and micro elements in *Tribulus terrestris* plant

№	Elements	mkg/gr
1	Mn	61
2	Na	260
3	K	35400
4	Sm	0.092
5	Mo	0.5
6	Lu	0.0036
7	U	0.064
8	Yb	0.038
9	Au	0.0018
10	As	0.33
11	Br	48
12	Ca	14300
13	La	0.86
14	Ce	1.1
15	Se	0.15
16	Hg	0.016
17	Tb	0.015
18	Th	0.19
19	Cr	2.4
20	Hf	0.092
21	Ba	120
22	Sr	73
23	Cs	0.24
24	Ni	1.5
25	Sc	0.18
26	Rb	40
27	Zn	39
28	Co	0.28
29	Ta	0.014
30	Fe	490
31	Eu	0.024
32	Sb	0.083

Apparently, one of the most successful aspects of turyptic is the presence of lanthanoids. And these obtained elements were divided into macro and micro elements. Below is a table where the amount of macro elements is extracted (Table 2).

Table 2. Amount of macroelements in *Tribulus terrestris* plant

Elements	Ca	Fe	K	Na	Rb	Sr
Amount mg/kg	14300	490	35400	260	40	73

Table 3. Amount of trace elements in *Tribulus terrestris* plant

Elements	Ba	Co	Cr	Se	Sb	Zn
Amount mg/kg	120	0,28	2.4	0,15	0,083	39
Elements	Hg	Mn	Mo	Ni		
Amount mg/kg	0,016	61	0.5	1.5		

Currently, severe environmental conditions, nervous stress, other excessive stress and bad habits, malnutrition, physical inactivity, and the health status of the population are characterized by negative trends. General morbidity increases, life expectancy decreases. Therefore, it is very important to prevent diseases, which allows a living organism not to get sick for a long time, but allows the body to recover easily through a balanced diet. 2000-2500 kcal of energy per day is needed for its synthesis. At the same time, in order to generate this energy, a person must consume a sufficient amount of proteins, carbohydrates, vegetable and animal fats, and vitamins.

Food products rich in various substances containing minerals should be provided. According to the recommendation of the Commission on Dietology within the US National Academy, the amount of chemical elements in the food consumed daily should be within a certain standard. Below is a qualitative analysis of biologically active substances (Table 4).

Table 4. Quality analysis results

Biological is an asset substances	Tribulus terrestris		
	leaf	stem	The vein
Alkaloids	+	+	+
Coumarins	+	++	+
Flavonoids	+++	+++	+++
Essential oils	+	+	+
Steroidal saponins	++	+	-
Carbohydrates	+	-	-
Phenolcarboxylic acids	+	+	-

3. Conclusions

In conclusion, the findings of this study underscore the diverse medicinal properties of *Tribulus*, highlighting its efficacy in the treatment of various health conditions. Medicinal preparations derived from *Tribulus* exhibit anti-atherosclerotic, cholesterol-lowering, and diuretic effects, showcasing its potential therapeutic benefits for cardiovascular health and fluid balance regulation. Moreover, *Tribulus* demonstrates promising results in the treatment of conditions associated with decreased gastric juice production, further expanding its medicinal applications.

Notably, the traditional use of *Tribulus* in Chinese medicine and its historical significance in treating urinary tract diseases emphasize its long-standing reputation as

a valuable botanical remedy. The chemical compounds present in *Tribulus* possess a wide array of medicinal effects, including antioxidant, anti-inflammatory, immune-boosting, pain-relieving, and antibacterial properties, underscoring its multifaceted therapeutic potential.

Studies on the effects of *Tribulus* on animal models have revealed its ability to modulate sex hormone levels, particularly testosterone, suggesting its role in hormonal balance and associated health benefits. Additionally, *Tribulus terrestris* has shown efficacy in addressing a spectrum of health issues, including angina, eczema, hypertension, hypercholesterolemia, infertility, and erectile dysfunction.

Overall, the comprehensive exploration of *Tribulus* in this study sheds light on its pharmacological properties and therapeutic applications, paving the way for further research and development of natural remedies derived from this valuable plant. The rich bioactive compounds present in *Tribulus* hold great promise for the advancement of alternative medicine and the potential improvement of human health and well-being.

REFERENCES

- [1] Flora of Uzbekistan - Tashkent: Publishing House of the Academy of Sciences of the UzSSR, - T.4. P. 61.
- [2] Y. Liu, Y. Wang, L. Sun, M. Zhang, Sh. Xie, D. Xu, Y. Xu Steroidal glycosides from the fruits of *Tribulus terrestris*, *Chemistry of Natural Compounds*, Vol. 50, No. 3, July, 2014, p. 483-488.
- [3] V.G. Nebieridze, A.V. Skhirtladze, E.P. Kemertelidze, M. Ganzera Megastigmane glycosides from leaves of *Tribulus terrestris*, *Chemistry of Natural Compounds*, Vol. 54, No. 1, July, 2018, p. 63-65.
- [4] H. Achenbach, H. Hobner, M. Reiter Cholestane- and pregnane-type glycosides from the roots of *Tribulus cistoides*, *Phytochemistry*, Vol. 41, No. 3, pp. 907-917, 1996.
- [5] T.Sh. Wua, L.Sh. Shib, Sh.Ch. Kuo Alkaloids and other constituents from *Tribulus terrestris*, *Phytochemistry*, Vol. 50, No. 8, pp. 1411-1415, 1999.
- [6] H.M. Hammada, N.M. Ghazy, F.M. Harraz, M.M. Radwan, M.A. ElSohly, I.I. Abdallah Chemical constituents from *Tribulus terrestris* and screening of their antioxidant activity, *Phytochemistry*, Vol. 92, pp. 153-159, 2013.
- [7] Askarov I.R. Encyclopedia of medicine. Classic word. Tashkent - 2019. -1590b.
- [8] I.R. Askarov. Mysterious medicine. - T: Science and Technology Publishing House. 2021. - 1084 p.
- [9] TARAXACUM OFFICINALE O'SIMLIGINI SIFAT NATIJALARI TAHLILI Axmedova Z.Q. UZBEK JOURNAL 2022. Tom 2. SP OF CASE REPORTS 2 (1), 128-129.