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Review Article

Medicinal efficacy of *Khar-e-Khasak Khurd (Tribulus terrestris Linn)*

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ABSTRACT

Khar-e-Khasak-khurd (*Tribulus terrestris* Linn.) commonly known as *Gokharu*, is used for a long time for treatment of various diseases. Considerable literature is available in Unani system of medicine regarding the medicinal properties of Khar-e-khasak-khurd (*Tribulus terrestris* Linn.). Its various parts contain a variety of chemical constituents which are pharmacologically active, such as Harmine, Chlorogenin, Tribuloside, Trigogenin. Whole plant and seeds are used as traditional herbal medicine and having properties such as diuretic, aphrodisiac, immunomodulatory, antidiabetic, absorption enhancing, hypolipidemic, cardiotonic, hepatoprotective, antiurolithic, anti-inflammatory, analgesic, antispasmodic, and antibacterial. In the present review, an attempt has been made to cover the major pharmacological actions as well therapeutic uses of Khar-e-khasak-khurd (*Tribulus terrestris* Linn.) mentioned in Unani system of medicine.

Keyword: *Tribulus terrestris* Linn. Unani Medicine, Khar-e- Khasak Khurd, Pharmacological Actions.

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Introduction

Khar-e-khasak-khurd (*Tribulus terrestris* Linn) is a common medicinal plant, grows near the Dardanelles and was known to the old Greek Physicians. As far as nomenclature is concerned, some Unani physician named it as "*Akhrasul-Ajooj*" which means Molar tooth of old lady because of its resemblance with the same. Another synonym given by ancient Unani scholars is "*Hastchinghar*" which is given because of cry of elephant due to its prick.^{1, 2,3,4,5.}

In India, two types of *Gokhru* are found, the small one is known as "*Gokhru khurd*" (*tribulus terrestris* Linn) and bigger one as "*Gokhru-kalan*" (*alium murex*)^{6, 3, 7,8,9,10,11.}

Most of the Unani Physicians have described that the *Gokhru* is of two types, one is "*Jangali gokhru*" that grows wild in forests, and another is "*Bustani gokharu*" that grows near the rivers and at the wet ground. Two kinds of medicinal plant that have the name of *Tribulus*, one of them grow on the land while other grows in or upon the water. The first kind is called *Tribolus chersea* in Greek. This kind as described by Dioscorides grows beside water and about old houses. The Second kind grows in or above the water. The leaves are

broad and have a long foot stalk. Water *Tribulus* is called water nut or club nut, as the fruit of it is like club.^{12.}

Scientific Classification

Kingdom	:	Plantae
Division	:	Phanerogams
Sub division	:	Angiosperms
Class	:	Dicotyledonae
Sub class	:	Polypetalae
Series	:	Disciflorae
Family	:	Zygophyllaceae
Genus	:	<i>Tribulus</i>
Species	:	<i>terrestris</i>

Vernaculars

Arabic : Bastitag, Busteyrumi, Khasak, Akhrasul-Ajooj
Zafratul Ajooj.

Urdu : Gokhru.

Persian : Khare-Khasak, Shakarhanj, Kharsa gosha Shakuhanj gosha.

Hindi : Chotu Gokhru, Hatechangara.

English : Caltrops.

Bengali : Gokhru, Gokshura.

Chinese : Chi Li Tsi Li Tse.

French : Criix de Chevalier, Croxi de Malte Hirbe Terrestre, Saligot, Terrestre.

Gujarat : Betagokhru, Gokharu, Mithagokhru, Nanhagokhru.

Malayalam: Neringil, Nerinnil.

Marathi : Gokharu, Lahanagokharu, Sharatle.

Punjabi : Bakhra, Bhukri, Gokhrudes, Lotak.

Pustu : Kandalai Malhundai.

Sanskrit : Ikshugandha, Gokshura Trikaantak.

Suryani : Qarta.

Tamil : Neruji, Sirunerinji.

Telagu : Chirupalleru, Palleru.

Turki : Mootteekan.

Uriya : Gakhura, Gokshra. ^{13,19,20}

Habitat

Khar-e-Khasak Khurd (*Tribulus terrestris* Linn) is an annual or perennial plant growing throughout the India and other warm countries. In India, it grows up to an altitude of about 5400 m. The Plant grows more or less throughout the year or springing up everywhere soon after the first shower. The Flowering starts within 20-35 day from September to December. Fruit matures in 14 days after formation of seed between months of May to June. Fruits are collected during the month of May and June generally by hand but sometimes whole herb is gathered and then the spiny fruits are separated. Fruits are dried in shade, thoroughly garbled and stored in bottles and preserved in cool and dry place. Fruits retain medicinal efficacy for a period of 6 months only. This plant grows wild or at river banks or at sandy areas ^{3, 14, 15, 16, 17, 8, 18, 10, 13}

Plant Description

Khar-e-Khasak Khurd (*Tribulus terrestris* Linn.) is a multiethnic genus of twenty species belonging to the family Zygophyllaceae. Three species, viz, *Tribulus terrestris*, *Tribulus cistoides* and *Tribulus atlas* commonly found in India. Among them, *T. terrestris* L. is a trailing plant commonly found in sandy soil. It is usually branching prostrate herbs, silky with white or yellow flowers and spinous or tuberculate fruits. Root has a slender fibrous root 4 to 5 inches long, cylindrical, light brown in colour odour is faintly aromatic and the taste is sweetish and astringent. ^{17, 13}

Leaf of *Tribulus terrestris* L. is found to be composite abruptly pinnate one of each pair usually smaller than the other, Stipules are lanceolate, hairy leaflet, which are 3-6 pairs of 6-12 mm long, oblong, mucronate. ^{13, 18} Flowers axillary or opposed, solitary Pedicles 12-20 cm long slender hairy. Petals 1 cm long hairy. ^{13, 18} Fruit globose consisting of usually five hairy or nearly glabrous, often muriculate woody cocci, with two pairs of hard sharp spines, one pair longer than the other, several seeds are found in each coccus, with

transverse partitions between them. Average weight of single fruit is 0.182 g. ¹⁸

Chemical constituents

Various chemical constituents present in Khar-e-khasak khurd (*Tribulus terrestris* Linn.) are as listed below-

The preliminary phytochemical studies of Khar-e-Khasak-khurd (*Tribulus terrestris* Linn.) revealed the presence of Diosgenin, Sapogenin saponins, Ruscogenin, Gitogenin, Hecogenin, Ruscogenin 25-D Spirosta-3, 5-diene, Deoxy diosgenin, Electrase, 5% semidrub oil peroxidase, Glucosides, Resins, Proteins and a large amount of inorganic matters.

Other constituents like Harman, Alkaloids like Harmine. Harmaline and Tetrahydroharmine, Vitamin C, Calcium, Quecertine, d-glucose, Rhamnose, amino acids, sodium, potassium are also present in the plant. ^{22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32}

Temperament (Mizaj)

1. Cold and dry in first degree. ^{1, 7, 10}
2. Hot and dry in first degree. ^{33, 34, 35}
3. Murakkabulqua. ^{3, 4, 6, 11}

Parts used for medicinal purpose

1. Fruits and seeds. ^{1, 3, 6, 7, 8, 9, 11, 34, 18, 2, 4, 35}
2. Leave. ^{11, 3, 4, 35}
3. Roots. ^{3, 13, 17, 16, 21}

Pharmacological Actions (Afaal-wa- Khawas) in Unani

1. Lithotriptic (Mufattit-e-Hisat). ^{1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 33, 34, 35}
2. Appetizer (Mushtahi). ^{11, 13}
3. Diuretic (Mudir-e-Baul). ^{2, 3, 4, 6, 7, 9, 10, 11, 35}
4. Cooling (Mubarrid). ^{2, 3, 13, 36, 16}
5. Tonic (Moqavvie). ^{11, 17, 13, 36, 37, 16, 21, 20}
6. Aperient (Mulayyan). ^{2, 4, 6, 35, 13, 16}
7. Moghalliz-e-Mani. ^{3, 5, 6, 10, 33, 34}
8. Blood Purifier (Musaffi-khoon). ^{13, 35}
9. Analgesic (Musakkin-Alam). ^{3, 4, 5, 7, 10, 11, 33, 34, 35}
10. Aphrodisiac (Moqavvie-bah). ^{1, 2, 3, 4, 5, 6, 9, 11, 7, 10, 13, 14, 37, 17, 36, 33}
11. Stomachic (Moqavvie-Meda). ^{3, 17, 20, 21}
12. Carminative (Kasir-e-Riyah). ^{7, 10, 11, 13, 3, 33, 35}
13. Anti-inflammatory. ^{2, 3, 4, 5, 11, 8, 6, 10, 35}
14. Antidote (Tiryaque). ^{3, 4, 6, 7, 10, 33}
15. Emmenagogue (Mudir-e-haiz). ^{39, 40}

Therapeutic uses in Unani

1. Renal Calculus (Hisatul Kuliya). ^{7, 10, 33, 11}
2. Dropsy (Istesqa). ^{36, 13}
3. Aphthous Ulcers (Qula). ^{7, 10, 11, 12, 13, 33, 37}
4. Anaemia (Faqrudam-e-Dum). ¹³
5. Burning Micturition (Hurqat-e-Baul). ^{36, 13, 20, 21, 16, 7, 10, 33, 6, 9, 11}
6. Cough (Sual). ^{11, 13, 16, 36}

7. Chronic Cystitis (Warm-e-Masana Muzmin).
7,11,13,36,16,20,38,37
8. Dribbling of Urine (Taqteer-ul-Baul). 3,6,11,13,16,36,7
9. Spermatorrhoea (Jiryane-e-Mani). 3,5,11,36
10. Sterility (Uqr). 11,13,38
11. Antidote (Tiryaque). 6,7,10,3, 33,
12. Dysuria (Usrul Baul). 38,39
13. Amenorrhea (Ihtebase Haiz) 39,40

Pharmacological / Clinical studies

1. Diuretic effect. 41,42
2. Aphrodisiac activity. 43,44
3. Antiurolithic activity 45,46
4. Immunomodulatory activity. 47
5. Anti-inflammatory activity. 48, 49
6. Analgesic. 50
7. Anti-spasmodic activity 51
8. Hypo-lipidemic activity 52
9. Anti-bacterial activity 53
10. Central nervous System activity 54

Adverse effects (Muzir)

Excessive use may be harmful for muscles, Spleen, kidney and produces spasm. 1,3,5, 6,11,33,34,35

Correctives (Musleh)

1. Roghan-e-Badam
2. Roghan-e-Kunjad
3. Roghan-e-Gao
4. Gulqand. 1,3,4,5,6,9,33,34,35,

Substitute (Badal)

1. Kaknaj.
2. Tukhm-e-Khayarian. 3,4,5, 9,11, 35

Recommended dose (Miqdar-e-Khuraque) in Unani

1. 5-7gm. 1,4,5,34
2. 2-5 gm in the form of syrup. 1,2,3

Conclusion

As per traditional system of medicine especially Unani, Ayurvedic and Chinese system of medicine, Khar-e-Khasak Khurd (*Tribulus terrestris*), have good significance in the management of various diseases. Considering the available literature on Khar-e-Khasak Khurd (*Tribulus terrestris*), the plant could have a potential as a herbal medicine for effective Urinary tract infection, Congestive heart failure, Ascitis, Urolithiasis and blood pressure control due to its diuretic activity. Though Khar-e-Khasak Khurd (*Tribulus terrestris*) has been used extensively over the centuries and currently scientific evidence with respect to its pharmacological activities is also being generated, more studies at the molecular level are needed to further understand the mechanism by which it modifies the disease condition. The pharmacological experiments performed on the plant must be extended to the next level of clinical trials to generate novel drugs. This will help Khar-e-Khasak Khurd (*Tribulus*

terrestris) in achieving a status of potent medicine or to be prescribed as a dietary supplement in various disease conditions.

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