

Review Article**A brief review on a Unani Drug: Khatmi (*Althaea officinalis*)**Anju^{1*}, ²Mohammad Idris²¹Research Associate, Central Council for Research in Unani Medicine, New Delhi, India²Principal & Head, PG Departments of Ilm-us-Saidla, Ayurvedic & Unani Tibbia College & Hospital, Karol Bagh, New Delhi, India

Received: 13 May 2018

Revised: 5 June 2018

Accepted: 17 June 2018

Abstract

The use of herbal drugs is as old as human beings. *Khatmi* or marshmallow botanically named as *Althaea officinalis* Linn. belongs to family *Malvaceae* is a perennial species indigenous to North Africa, Europe and Western Asia. The meaning of *Khatmi* is '*Kaseer-ul-munafaye*' (possessing many functions) in Arabic language. It is widely used as a medicinal and ornamental plant. Unani physicians had described various types of *Khatmi*. They extensively used it for a number of human ailments as is evident from Unani classical literature. In current scenario a lot of scientific studies have been performed on *Khatmi* namely phytochemical, physicochemical, pharmacological and clinical studies. In this review, an effort has been made to provide information on medicinal properties of *Khatmi* mentioned in Unani classical literature as well as in recent scientific studies.

Keywords: *Khatmi*, *Althaea officinalis*, Unani, marshmallow, Plant origin drugs

Introduction

The plant origin drug *Khatmi* botanically named as *Althaea officinalis* (AO) Linn. belongs to family *Malvaceae* mentioned in Unani classical literature. The meaning of *Khatmi* is '*Kaseer-ul-munafaye*' (possessing many functions) in Arabic language. The seeds have been incorporated in the composition of *Marham-e-Dakhiliyon*. The ointment is used in vulvo-vaginitis anal fissures, chronic ulcers and other inflammatory conditions. Its seeds and root as *resha-e-Khatmi* are used medicinally. Its carpels are large and pubescent, and are known as *tukhm-e-Khatmi*. Every part of the plant yields mucilage, β -asparagin, betaine, starch, and sugar. *Khatmi* is used as a medicinal plant and ornamental plant. It is used in irritation of mucous membranes for relief traditionally (Baghdadi, 2005; Ibn Baitar, Ynm; Kirtikar & Basu, 2005; Anonymous, 2006; Khare, 2004).

Roots contain mucilage (25-35%), used in making absorbent pills and pastilles. Roots used in tea and salads. Leaves are emollient and demulcent. Fibres from stems and roots are used for paper manufacturing (Dymock, 1995; Anonymous, 1992).

The plant is distributed in temperate regions of the world. Its flowers are ornamental, often cultivated in Punjab, Himachal Pradesh and Kashmir. A native of the British Isles and temperate regions of India, it is now distributed throughout Europe and can be found in parts of the America (Anonymous, 1987; Dymock, 1995; Anonymous, 2007; Pullaiah, 2006).

Ethno-Pharmacological description

The meaning of *Khatmi* is *kaseer-ul-munafaye* in Unani language. It has seven (7) types according to color of flowers. Out of them, the best herb is having white flowers and best seeds are of the herb having black flowers. The herb of *Khatmi* is about 1 meter in height. Its leaves are round shaped beautiful and flowers are bell like whitish and sky color. Seeds are flat and small. One of its types is *Bustani* found in Andlis where it is called *ward-e-jawani*. Other type is popularly named as *sham-ul-marz*. It is the type of *jungli khubbazi*. Flowers are like rose flowers. Its trunk is 1 meter long. In *Tarjumay-e-Nafisi*, according to Dioscorides, *Khatmi* is one of the types of *Malukhayabani* which means *Khubbazi*. Its color is black and carrying insipid taste. In *Zakhira Khwarzam Shahi*, it is mentioned that *Khatmi* is effective in female diseases, such as *waram-e-rahem* and *quruh-e-rahem* (IbnBaitar, Ynm; Baghdadi, 2005; Khan, 1313AH; Ghani, Ynm; Anonymous, 2006; Kabiruddin,

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DOI: <https://doi.org/10.31024/ajpp.2018.4.4.3>2455-2674/Copyright © 2018, N.S. Memorial Scientific Research and Education Society. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Ynm; Krishan, Ynm; Jurjani, 1878).

The parts used for medicinal purpose are mainly seeds, flowers, carpels, leaves, root and seeds (Anonymous, 1987; Baghdadi, 2005; Ibn Baitar, Ynm; Khan, 1313AH, Nadkarni, 2007; Dymock, 1995; Anonymous, 2008; Kabiruddin, 2007).

The *Mizaj* (temperament) of this plant described in Unani classics *Moatadil* in Hot (Baghdadi, 2005; Ibn Baitar, Ynm; Khan, 1313AH; Kabiruddin, 2007) and according to some Unani classical physicians it is Cold and Wet (Ghulam, 2007; Ghani, Ynm; Krishan, Ynm). The seeds of *Khatmi* are shown in figure 1.



Figure 1. Seeds of *Khatm*

Morphological description

A large perennial, uniformly downy herb, stem erect, 60-90 cm. Leaves ovate or ovoid, simple or slightly lobed, annular, base scarcely cordate, unequally toothed, stipules linear-subulate. Flowers peduncled, in auxiliary clusters, 2.5-5.0 cm. diam., rosy, bracteoles linear-lanceolate, half the length of the sepals 5, petals 5. Anthers sub-globose, ovary many-celled, ovules one in each cell, carpels numerous, ultimately separating from a short torus; stamens many, united into a tube, attached to the petals, styles thread-like and seeds are thin, blackish brown, mucilaginous bland in taste and solitary in each carpel, ascending. It is almost odorless, taste insipid and somewhat mucilaginous (Anonymous, 1987; Kirtikar & Basu, 2005). The scientific classification of the drug is given below in table 1.

Table 1. Scientific Classification

Kingdom	Plantae
Superdivision	Embryophyta
Division	Tracheophyta
Class	Magnoliopsida
Order	Malvales
Superorder	Rosanae
Family	Malvaceae
Genus	<i>Althaea</i>
Species	<i>officinalis</i>

Microscopic description

Dorsi-ventral, palisade occupying nearly half the thickness of the lamina, single-layered or, in places, two layers of shorter cells, the inner less well differentiated; occasional crystal cells in the palisade layer, more frequent crystals in the spongy mesophyll, particularly beneath the lower epidermis, and somewhat larger crystals in short files alongside the veinlets; outer periclinal wall of cells of both epidermises only slightly thickened, flat or slightly convex, cuticle smooth; raised stomata in both epidermises. Upper epidermal cells more or less polygonal, isodiametric, anticlinal walls straight or gently curved, some sinuous; stomata numerous, with up to four subsidiary cells, anomocytic or less obviously anisocytic; lower epidermal cells similar to upper, often with more sinuous walls; stomata as in upper epidermis, more numerous, and some with subsidiary cells, paracytic. Both epidermises densely covered with stellate trichomes of two to six, infrequently up to eight, almost-straight, thick-walled, weakly lignified, unicellular components, smooth and slenderly tapering to a point; lumen usually with brownish contents in the lower part, almost occluded towards the apex; few, often longer, single, straight trichomes and, less frequently, shorter, bent or undulate trichomes. Glandular trichomes not numerous, on both surfaces over veins and in interneural regions, small with very short unicellular stalk, rounded to ovoid head with four to eight very thin-walled cells; basal cell somewhat thickened, surrounding epidermal cells in rosette arrangement. Randomly scattered in the epidermises isolated cells filled with mucilage which stains with Ruthenium Red. Entrapped in the dense trichome covering occasional spherical pollen grains, about 90 μ m diameters, exine relatively thick, finely reticulate and covered with short spines, pink in Chloral Hydrate mount. The dull, brownish, elongated-ellipsoidal two-celled spores of *Puccinia mal vacearum* also often present on the leaf surface. The cells of endosperm are thin-walled and polygonal and are filled with fixed oils and aleurone grains. The embryo is straight. The cells of the embryo are polygonal, thin-walled and are filled with aleurone grains (Kirtikar & Basu, 2005; Anonymous, 1987; Anonymous, 2006).

Actions and therapeutic uses of khatmi

Various actions and clinical indications of *Khatmi* are given below in table 2.

Phytochemical studies

n-hexacos-2-enyl-1,5-olide (altheahexacosanylactone), 2 β -hydroxycalamene (altheacalamene) and 5,6-dihydroxycoumarin-5-dodecanoate-6 β -D-glucopyranoside (altheacoumarin glucoside), lauric acid,

Table 2. Actions and clinical indications of *Khatmi*

Actions and Clinical Indications	References
<i>Dafa-e-Auram-e-Rahem</i> (Useful in metritis), <i>Waram-e-Rahem</i> (Metritis)	Baghdadi, 2005;IbnBaitar, Ynm; Ghani, Ynm
<i>Quruh-e-Rahem</i> (Uterine ulcer)	Jurjani,1878;Anonymous,1987
<i>Insbab-e-UnqurRahem</i> (Cervical stenosis)	IbnBaitar, Ynm; Khan,1313; Ghani, Ynm
<i>Uqr</i> (Infertility)	IbnBaitar, Ynm; Khan,1313; Ghani, Ynm
<i>Mulatiff</i> (Demulcent)	Nadkarni, 2007; Khare, 2004; Anonymous, 1992; Dymock, 1995; Adnan et al., 2014; Khare, 2007; IbnBaitar, Ynm
<i>Jali</i> (Detergent)	IbnBaitar,Ynm;Khan,1313AH
<i>AmarzKulya</i> (Urinary affections)	IbnBaitar, Ynm; Khan,1313AH; Ghulam,2007; Ghani, Ynm; Nadkarni,2007; Khare,2004; Adnan et al.,2014
<i>Qabiz</i> (Astringent)	Kabiruddin, Ynm
<i>Mugharri</i> (Emollient)	Baghdadi, 2005;Kirtikar& Basu,2005; Nadkarni, 2007; Khare, 2004; Anonymous,1992; Dymock, 1995;Kabiruddin, Ynm
<i>Mulayyin</i> (Laxative)	Baghdadi, 2005; Khan,1313AH; Ghulam,2007; Ghani, Ynm; Kabiruddin, Ynm; Khan,1874
<i>Munziz</i> (Concoctic)	Baghdadi, 2005; Khan,1313AH;IbnBaitar, Ynm; Ghulam,2007; Ghani, Ynm; Krishan, Ynm;Fazalullah, Ynm;Kabiruddin, Ynm
<i>Murkhi</i> (Relaxant)	Baghdadi, 2005; Khan, 1313AH; Ghani, Ynm;Fazalullah, Ynm;Kabiruddin, Ynm; Khan,1874; Khare, 2007
<i>Muhallil</i> (Subsident)	Baghdadi, 2005;IbnBaitar, Ynm; Khan,1313AH, Ghulam, 2007; Ghani, Ynm; Krishan, Ynm; Kabiruddin, Ynm
<i>Muhallil-e-Waram</i> (Anti-inflammatory), <i>Waram</i> (Inflammation), <i>Waram-e-Shobatein</i> (Bronchitis), <i>Waram-e-Unq-ur-Rahem</i> (Cervicitis), <i>Waram-e-Uzv-e-Tanasul</i> (Inflammation of reproductive organ), <i>Auram-e- Miqad</i> (Proctitis)	IbnBaitar,Ynm; Baghdadi, 2005;Khan,1313AH, Ghulam,2007; Krishan, Ynm; Khare,2004;Fazalullah, Ynm;Wyk and Wink,2004; Khan,1874; Pullaiah, 2006; Aziz, 1948; Latafatet al., 1992
<i>Kasir-e-Riyah</i> (Carminative)	Baghdadi, 2005
<i>Mudir-e-Haiz</i> (Emmenagogue)	Dymock,1995; Khan,1874
<i>Radaye</i> (Repellant)	Khan,1313AH; Ghani,Ynm
<i>Dafa-e-Laza</i> (Antiirritant), <i>Kharish-e-Mahbil</i> , <i>Kharish-e-Miqad</i>	Wyk and Wink,2004; Nadkarni,2007; Ghani, Ynm; Nadkarni,2007; Khare,2004; Kabiruddin,Ynm
<i>Musakkin-e-Alam</i> (Anodyne /Analgesic), <i>Waza-ul-Barq</i> (Lumbago), <i>Waza-ul-Uzn</i> (Otagia), <i>Suda</i> (Headache)	IbnBaitar, Ynm; Khan,1313AH; Ghulam,2007; Kirtikar&Basu,2005; Ghani, Ynm; Krishan, Ynm;Fazalullah, Ynm
<i>Qabiz</i> (Astringent), <i>Is 'hal</i> (Diarrhoea), <i>Zaheer</i> (Dysentery)	IbnBaitar,Ynm;Khan,1313; Ghani,Ynm
<i>Mundammil</i> (Cicatrizant)	IbnBaitar, Ynm; Baghdadi, 2005; Khare,2004; Dymock,1995
<i>Tiryaaq</i> (Antidote (locally))	IbnBaitar, Ynm; Ghani, Ynm; Nadkarni,2007
<i>Takassur-e-Jild</i>	Khan,1313
<i>Tahajjur-e-Aasab</i>	Khan,1313
<i>Munaffis-e-Balgham</i> (Expectorant)	Nadkarni,2007;Adnan et al.,2014; Wyk and Wink,2004
<i>Dafa-e-Sual</i> (Antitussive), <i>Sual</i> (Cough)	Baghdadi, 2005;IbnBaitar,Ynm; Khan, 1313AH; Ghulam, 2007; Kirtikar&Basu, 2005; Ghani, Ynm; Nadkarni,2007;Krishan,Ynm; Dymock,1995;Fazalullah, Ynm; Adnan et al.,2014; Kabiruddin,Ynm; Wyk and Wink, 2004; Khan,1874
<i>Zat-ul-Janb</i> (Pleurisy)	Baghdadi, 2005; Khan,1313; Ghani, Ynm;Fazalullah, Ynm;Kabiruddin,Ynm
<i>Zat-ur-Riya</i> (Pneumonia)	Khan,1313; Ghani, Ynm; Adnan et al., 2014; Kabiruddin,Ynm
<i>Nazla</i> (Catarrh)	Kirtikar & Basu,2005; Ghani, Ynm; Khare, 2004

β -sitosterol and lanosterol. Dihydrokaempferol 4'-O-glucoside, Tiliroside, Hypolaetin 8-0-gentiobioside (Adnan et al., 2014).

The root contains mucilage (35%) and starch (37%). Its flowers yield a red dye which may be used as an indicator in acidimetry and alkalimetry. Seeds contain 11.9% drying oil.44 the plant yields fatty oil and phytosterin. Every part of the plant yields mucilage, β -asparagin, betaine, starch and sugar (Kirtikar & Basu, 2005).

Physicochemical studies (Anonymous, 2006; Anonymous, 1996)

Foreign matter : Not more than 2 per cent

Total Ash : Not more than 8 %/ 16 %

Acid-insoluble ash : Not more than 1.5 percent

Alcohol-soluble extractive: Not less than 10 percent

Water-soluble extractive : Not less than 18 %/20 %

Thin layer Chromatography

T.L.C. of the methanolic extract on precoated silica gel 'G' plate (0.2 mm thick) using toluene : ethyl acetate : methanol (85 : 15 : 0.5) shows under UV (366 nm) blue fluorescent at Rf. 0.18, 0.33 and 0.67. On spraying with Anisaldehyde-Sulphuric acid and heating the plate for ten minutes at 120°C, spots appear at Rf. 0.10 (grey), 0.18(grey), 0.32

(green), 0.37 (navy blue), 0.57 (greyish blue) and 0.67 (greyish blue) (Anonymous, 2006).

Pharmacological studies

Acute and chronic analgesic study

Golshani et al., (2015) studied the acute and chronic analgesic activities of the essential oil of AO leaves in adult male mice. On the basis of results of the study, essential oil of AO showed an analgesic activity that might involve both the central and peripheral nervous systems.

Antibacterial study

Ozturk and Ercisli (2008) carried out a study for antibacterial activity of the crude methanol and aqueous extracts of aerial parts of AO and *Althaea cannabina* L. (*Malvaceae*) by using disk diffusion assays against 137 strains belonging to 52 bacteria species. The results of the study showed that the aqueous extracts from aerial parts of both species had no antibacterial effects against the test micro-organisms, whereas the methanol extracts of both species tested and showed significant antibacterial activity, especially against *Acidovorax facilis*., *Bacillus. sp.*, *Enterobacter hormachei*., and *Kocuria rosea*. It was concluded that *Althaea officinalis* was the most effective against the bacteria as compared to other drug used in this study.

Rezaei et al., (2015) evaluated antibacterial activity and wound healing potency of the AO leaf extract in the rat model of excision wound creation. The results of the study showed that AO extract was not effective on gram-negative bacteria but it was efficacious on gram-positive bacteria; on the other hand, the wound healing percent was significantly increased in comparison with controls, in the extract-treated wounds.

Babu et al., (2007) studied the aqueous and different solvent extracts and isolated constituents of seven higher medicinal plants viz., *Althaea officinalis* L. (*Malvaceae*), *Origanum vulgare* Oregano (*Lamiaceae*), *Plantago lanceolata* L. (*Plantaginaceae*), *Polygonum bistorta* L. (*Polygonaceae*), *Satureja hortensis* L. (*Lamiaceae*), *Solanum dulcamara* L. (*Solanaceae*), and *Quercus robur* L. (*Fagaceae*) for their anti-bacterial activity by cup diffusion method against important phytopathogenic *Xanthomonas* pathovars viz., *Xanthomonas axonopodispv. malvacearum*, *Xanthomonas axonopodispv. Phaseoli* and *Xanthomonas campestrispv. Vesicatoria* associated with angular leaf spot of cotton, common blight of beans and bacterial spot of tomato. On the basis of results of the study, all the plants showed antibacterial activity against *Xanthomonas* pathovars, whereas, among the seven plants tested methanol extract of *Origanum vulgare*. It was observed that AO had highly significant antibacterial activity against all pathovars.

Antimicrobial study

Gautam et al., (2015) carried out a study in which AO seed

extracts and, essential oil were screened for antimicrobial activity against five bacteria and one fungi responsible for dominant, lethal or opportunistic infection of respiratory regions. On the basis of results of the study, the maximum inhibition was noted by essential oil against *Streptococcus pyrogens* and *Haemophilus influenza* at 200 mg/ml. The minimum inhibitory concentration values for methanol extract were 3.12-12.5 mg/ml. The antifungal activity noted highest with 41.28% by essential oil and 36.27% inhibition by aqueous extract represented by dosage-response curve.

Cough suppression study

Sutovska et al., (2009) studied on possible mechanisms of dose-dependent cough suppressive effect of AO rhamnogalacturonan in Guinea Pigs Test system. Therhamno-galacturonan, isolated from the roots of medicinal plant AO showed various biological effects on the citric acid-induced cough reflex and reactivity of airways smooth muscle *in vitro* and *in vivo* conditions. The results of the study showed that AO possessed dose-dependent cough suppression effect comparable with opioid agonist codeine.

Clinical studies

Antitussive study

In a study by Rouhi and Ganji (2007) carried out a study on angiotensin- converting enzyme inhibitor drugs which were the leading drugs for the treatment of hypertension, heart failure and some of nephropathy. But it was found that one of the most frequent side effects of these drugs was cough. In this study, AO was used for the treatment of this cough. On the basis of results of the study, it was concluded that AO had an important role in decreasing and treatment of the cough of ACEI drugs.

Conclusion

In India more than most of the population use herbal drugs for their health. There is vast experience-based evidence mentioned in Unani classical literature for many of these drugs. *Khatmi* is widely used as a medicinal and ornamental plant. Unani physicians had described various types of *Khatmi* and they extensively used it for a number of human ailments as is evident from Unani classical literature. In present time a lot of scientific studies have been performed on *khatmi* namely phytochemical, physicochemical, pharmacological and clinical studies. Many studies found its strong anti-inflammatory, antibacterial and antimicrobial property. Therefore, more researches can be done to exploit the unexplored potentials of *Khatmi* which have already been mentioned in Unani classical literature. Also, more clinical trials are warranted to validate the therapeutic efficacy of this Unani/herbal drug.

Conflict of interest

There is no conflict of interest.

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