Khatmī (Althea officinalis L. and Althea rosea): Medicinal importance in the perspective of Unani medicine and pharmacological studies

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Abstract

Althea officinalis L. is an important Unani Medicinal plant belonging to the family Malvaceae. The herb is commonly known as Khatmī and Marshmallow. All parts of the plant such as seeds, leaves, root and flowers are mainly used as medicine in Unani Medicine. It is used for many pharmacological actions like diuretic, lithotriptic, deobstructant, anti-inflammatory, emmenagogue which makes it useful in treatment of kidney stone jaundice, menstrual disorder, hepatitis, headache etc. Many scientific studies are done on the pharmacological actions of this herb. In this chapter both modern and Unani perspective of pharmacological properties of Althea officinalis L. along with its Phytochemistry and pharmacological studies are included.

Keywords: Althea officinalis L.; Khatmī; Malvaceae

Introduction

Khatmī is a common drug used in Unani System of Medicine which is obtained from two sources namely Althea officinalis L. (marsh-mallow) and Althea rosea (garden hollyhock) of Malvaceae family. The generic name of the plant derived from Greek word “Altaia” which means “rich in benefits” and the specific name officinalis means “found officially”. Commonly it is known as Khatmī and marsh-mallow. Mainly its leaves, seeds and roots are used medicinally to cure various common diseases. The root is said to be better when used before one year, seeds before three years and flowers before seven days, after that their medicinal properties become weak. All parts have lubricant, sticky, relaxant, anti-inflammatory, analgesic, astringent, expectorant, anti-catarh, laxative, diuretic, emmenagogue activities etc., which make it useful for the treatment of various diseases such as Nazla (catarrh), Zukām (nasal obstruction), Su‘āl (cough), Warm-i-Am‘ā (enteritis), Ishāl (diarrhoea), Zahīr (dysentery), Sozish-i-Bawl (urinary tract infection), Fālīj (hemplegia), ‘Iqq al-Nasā‘ (sciatica), Warm-i-Pistān (mastitis), Ra’sha (tremor), Ihtībās-i-Hayd (amenorrhhea) and Ihtībās-i-Bawl (retention of urine) etc.1,2,3,4,5

Caffeic, salicylic, vanillic and p-coumaric acids which are responsible for its pharmacological actions. Various experimental studies have been done on this plant which have proved the claims of Unani physicians.

Materials and Methods

All materials available on printed, electronic and online were used to prepare this review. For its description, identification, temperament, pharmacological investigations, actions, therapeautic uses etc both modern, Unani books were consulted and published articles and research papers were searched from Pub Med, Google scholar, Science direct, Scopus etc. The detail about the plant and its parts were searched by the key words Khatmī, Althea officinalis Malvaceae

The detail of various aspect of the plant is as follow:

1. Distribution

Native to Eastern Europe and Western Asia; in India it is found in Kashmir, Uttar Pradesh, Punjab, Rajasthan and Himachal Pradesh6.
2. Botanical description

It is a downy perennial herb, up to 3 m tall, erect, hardy and velvety plant. Stem is hairy, up to 3 to 4 feet high, simple, or putting out only a few lateral branches, die down in the autumn; leaves are large, obovoid, rough, rugose (wrinkled), base scarcely cordate, 5-7 lobed or wavy angled, soft and velvety on both sides, due to a dense covering of stellate hairs; flowers are rosy in axillary clusters, crenate, nearly sessile (resting on the surface) in long racemes or spike, 7-8 cm in diameter; corolla are five heart shaped of all shades of rose, purple, white or yellow, single or double, appears in July to October; carpels many on a small torus ultimately separating, forming mericarps each containing a seed. Stamens numerous united into a tube with kidney-shaped and one-celled anthers. roots are 0.2 to 3 cm in diameter, long thick, tapering (smaller and thinner towards one end), light brown in colour, strongly longitudinally furrowed, often spirally twisted; fracture short, texture rough, internally yellowish white; odour, pleasant; taste, sweet and mucilaginous; fruits flat, round 5-8 mm, breaks up into the mericarps, which are downy on the outside and have fine, branched and radiating ribs, fruiting occurs in November-December; seeds small to moderate size; approximately 6 mm, usually brownish-black, kidney shaped with rugose, hairy at margins and somewhat compressed. It becomes mucilaginous when soaked in water.

3. Taxonomical classification

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Malvales
Family: Malvaceae (mallow family)
Genus: Althea
Species: Althaea officinalis

4. Description in Unani Literature

The plant of Khatmī is up to 3 m in height; leaves rounded, rough; flowers beautiful bell shaped, white to reddish or bluish colour; fruits appear after shedding of the flowers, bear black and flat multiple seeds. The roots are Reshadâr (fibrous) so called Resha-i-Khatmī, it is yellowish white in colour. According to Ibn Sina some species of marshmallow bear white flowers while some bear red flowers. The species which has red flowers are more detergent. Different parts of the plant such as flowers (Gul-i-Khayrū), leaves (Barg-i-Khatmī) and roots (Bikh Khatmī or Resha Khatmī) are used for the treatment of various ailments. Its seeds and roots both give mucilage when soaked in water. Roots are more mucilaginous than seeds. In Unani System of Medicine the drug has been used medicinally since the time immemorial. Dioscorides (1st Century) mentioned the plant first time in his book De Material Medica. According to
Unani literatures the different aspects of the plant are as follows:

5. **Mutarāḍifāt (Vernacular names):**

*Khatmī* is obtained from the *Althea officinalis* of family Malvaceae. The plant is used by different vernacular names in Unani Medicine as: 6,13.

- **Arabic:** Bazar al-Khatmī, Kathir al-Manfi’at
- **Chinese:** KeZhi Gen
- **Danish:** Altæa
- **Dutch:** Heemst
- **English:** Marsh Mallow, Sweet Weed, Hollyhock
- **French:** Guimauve
- **German:** Eibisch, Ibsich
- **Greek:** Altea, Hibuscos
- **Hindi:** Khatmī, Khryra
- **Italian:** Bismalva
- **Kashmiri:** Sazkül, Sazmul, Sazposh
- **Persian:** Tukhm-i-Khatmī, Resha-i-Khatmī
- **Portuguese:** Malvisco
- **Rumanian:** Nalha mare
- **Russian:** Altei, Dikayaroja
- **Spanish:** Malvavisco
- **Swedish:** Altea
- **Tamil:** Shamaithuthi
- **Turkish:** Hatmi, Herbamalva
- **Urdu:** Khatmī, Khitnī, Gul-i-Khayrū

6. **Ajzā-i-Musta’mala (Parts used):**

Seeds (*Tukhm-i-Khatmī*), flowers (*Gul-i-Khayrū*) and root (*Bikh Khitmi or Resha Khatmī*) are used medicinally in Unani System of Medicine.4

7. **Mizāj (Temperament):**

Cold and wet in 1st degree, but in *Advia Nafisi* it is mentioned to have hot temperament. According to *Ibn Rushd* its leaves and branches are hot and dry in 1st degree; roots hot and dry in 2nd degree; Galen told it cold and dry while Ibn Sina told moderately hot.2,14,15,16

8. **Miqdār Khurārk (Dose):** 4–7 g, 6–9 g, 5–7 g5.

9. **Af’āl (Action):**

- **Root:** Muzliq (lubricant), Mugharri (sticky), Murkhi (relaxant), Malhallil-i-Awarām (anti-inflammatroy), Musakkin (analgistic), Hābis (astringent), Hābis-i-dam (haemostatic), Muhajifi (desiccant), Mānī’-i-Surfā (antitussive), Muftattī-htt-Shāh (Ithotropic); Seed: Munafithī-i-Balgham (expectorant), Mānī’-i-Nazla (anti-catarrh), Nāfī’-i-Sur (antitussive), Mulayyin (latexive), Rādi’-i-Mawād (divergent), Jalū (cleanser), Muqali (demulcent), Mundīz-i-Balgham (concoctive of phlegm), Murkhi-i-Mī’dā wa Adlūt (emollient for stomach and tissues), Mudirr-i-Bawal (diuretic), Mudirr-i-Hayl (emmenagogue); leaves: Malhallil-i-Awarām (anti-inflammatroy); flowers: Mufarrī (exhilarant), Muqawwam-i-Qalb (tonic to heart), Qabād (astringent), Nāfī’-i-Suda’ (analgistic for headache), Nāfī’ Nafaksh-i-Shikam (anti-flatulence) etc. 2,3,4,5,15.

10. **Istema’lāt (therapeutic uses):**

Due to the *Mullatif* (demulcent), *Mugharri* (sticky) and *Musakkin* (analgesic) effects of root and seeds, they are used to cure *Naza* (catarrh), *Zukām* (nasal obstruction), *Su’āl* (cough), *Waram-i-Am’ā* (enteritis), *Ishāl* (diarrhoea), *Zahir* (dysentery), *Sozish-i-Bawal* (urinary tract infection) etc. due to the *Jāli* (cleansing) effect it has been found useful in *Bahaq* (pyrhexia).

*Resha Khatmī* has been also found effective in the treatment of *Fālīj* (hemplegia), *Irq al-Nasā* (sciatica), *Waram-i-Maq’ād* (anal swelling), which is attributed due to its Mugharri (lubricant) and Murkhi (relaxant) effects. Leaves are used locally as a paste to cure *Waram al-Thadī* (mastitis). Many other diseases such as *Waram-i-Rahim* (metritis), *Waja’ al-Mafāsīl* (arthritis), *Hāsāh al-Kulvya* (renal calculus), *Naft al-dam* (haemoptysis), *Shahīqa* (whooping cough), *Niqris* (gout), Diāq al-Nafas (asthma), Diāt al-Riyā (pneumonia), Diāt al-jānīb (pleurisy), *Qurāh* (wound), *Qālanj* (colitis), *Ihtilāb-i-Tamthī* (amenorrhea), *Ihtibās-i-Bawal* (retention of urine) etc. are also have been cured by using various parts of the plant 2,3,4,5,15.

11. **Tarkīb-i-Istema’l (Method of administration):**

Mode of administration of drug in various diseases is as follows:

**Amrād-i-A’sab wa Dimāgh (Diseases of Nerve and Brain)**

- *Laqwa* (Bell’s palsy): A massage with *Roghān-i-Khatmī* on cervical vertebrae is very useful, when applied in case of bell’s palsy which occurs due to *Yabaṣāt* (dryness).17

**Amrād-i-Halā (Diseases of throat)**

- *Warm-i-Ghuṣda-i-Nakaf (Parotitis):* A *Dimād* (paste) of marshmallow is applied to remove the swelling of parotid glands 2.

**Amrād-i-Ri’a (Diseases of lungs)**

- Dhāt al-jānīb and Dhāt al-Riyā (Pleurisy and pneumonia): The leaves are incorporated in plasters for pleurisy and pneumonia 2.

**Amrād-i-Mi’dā w Am’ā (Diseases of stomach and intestine)**

- *Hurqa al-Am’ā* (burning sensation of intestine): The decoction of its root is useful in *Hurqa al-Am’ā* (burning sensation of intestine) and *Warm-i-Maq’ād* (inflammation of anus) 2.

- *Ishāl* (diarrhoea): Its leaves are used in severe diarrhoea 2.

**Amrād-i-Kulvya, Hālībayan, Mathāna, wa Raḥim (Diseases of kidney, ureters and urinary bladder)**

- *Hurqa al-Bawal* and *Sozish-i-Bawal* (burning mucrition or urethritis): The decoction of its root is useful in *Hurqa al-Bawal* and *Sozish-i-Bawal* 2.

- *Hasāh al-Kulvya* (renal calculus): Oral intake of decoction of root with wine is useful in dysuria and calculi in urinary tract 2,18

**Salābat-i-Rahim** (hardening of uterus): It is used as a suppository with the gum of *Batam* (terbinth) in uterine hardness 2,18

**Amrād-i-Jīld wa Maṣfīsīl**

- *Bahaq* (Pyrhexia): A paste of *Tukhm Khatmīs* painted over with vinegar and then the patient is exposed to sun light 3.

- *Awarām, Buthūr wa Khanāzīr* (Swellings, furuncles and scrofula): Its local application softens and prevents swellings. It dissolves hematoma, mature furuncles, and helps in relieving flatulent swellings and scrofula. It is applied with Sulphur on scrofula 2.
Waja’al-Mafāsīl (joints pain): It mitigates joints pain specially when used with goose fat.  

Tasmīm (poisoning)  

To remove pain due to insect bite, it is applied as liniment with vinegar or olive oil. Same is used also for honey bee sting.

12. Medicinal uses in Kashmir Folklore  

Root is used as abortifacient, for this purpose cervix is first slightly dilated and then the root of Khatmī is kept in the cervix for some time, due to its mucilaginous property without causing ulceration or irritation the cervix get dilated to the extent that the abortion takes place.

13. Madarrat (Toxicity, side effect and adverse effect)  

Khatmī (Althea officinalis) may cause harmful effects on lungs and stomach if taken excessively.

14. Musleh (Correctives)  

Shahad (honey) and Bādiyān (Foeniculum vulgare-fruits). Zarihkh (Berberis vulgaris-Berries) are the correctives of Tukhm-i-Khatmī (Althea seeds) they are recommended to use along with Khatmī (Althea officinalis) to prevent from side effects.

15. Badal (Substitutes)  

The following drugs are mentioned in the Unani text as substitutes for Tukhm Khatmī, they are Khubāzī (Malva sylvestris L. Fruits), Nilofar (Nymphaea lotus Flower); for roots (Malva sylvestris L. roots) Behman Surkh (Salvia haematodes L. Roots), Samagh-i-Arábi (Actacia arabica Wild. Gum) and Tabāshīr (Bambusa arundinacea-Manna).

16. Compound formulations  

Arq-i-Ambar, Arq ma al-Laḥm Mako Kasniwala; Dawā al-Misk Mu’tadil Jawāharwāli; Davaqūza; Ḥābb-i-Shahīqā; Itīrāf Muqawwī-i-Dimāgh; Khamīra Abresham Sāda, Khamīra Gāozabān Ambarī, Khamīra Gāozabān Ambarī Jadwar Ood Salīb Wala Khamīra Gāozabān Sāda, Khamīra Murakkab, Khamīra Nazlī Jawāharwālā; Labub-i-Saghīr, La’uq Nazlī, La’uq Khyar shambar, La’uq Sapistan, La’uq Sapistan Khyar Shambar; Ma’jūn Muqawwi wa Mumsik; Marham Dakhilyun; Matbukh Nazla; Sharbat Aijaz, Sharbat Khashkhāsh, Ma’jūn Muqawwi wa Mumsik; Qayrūti Arad Bāqla, Qayrūti Bābunawali, Qayrūti Karnab, Qayrūti Ma’mul; Qurs Ḍhāt at al-Janb, Sharbat-i-Aijaz, Dīmād Waram Kulya Qawī.
17. Bioactive Compounds

- Flavonoids: Leaves, roots and flowers contain ypolaetin-8-glucoside, Isoquercitrin, kaempferol. 22
- Polysaccharides: Seeds, leaves and flowers contains hemicelluloses, which is composed of D-xylose, 4-O-methyl-D-glucuronic acid and traces of D-galactose, L-arabinose, 23,24 Pectins25.  
- Phytosterols: Leaves, flowers and seeds contain β-Sitosterol and Stigmasterol. 24  
- Fatty acids: The fatty acid fractions of seeds were found dominating in linoleic and petrolaminic acid. 24,26  
- Saturated fatty acids: Flowers and seeds contain stearic acid, Palmitic acid, Myristic acid. 24  
- Fatty oil: In seeds (15.30%)- Oleic acid- 30.80%, linoleic acid- 52.90%, linolenic- 2.50%, palmitic- 9.70%, stearic- 9.70%. 26  
- Unsaturated fatty acids: In seeds Linoleic acid. 24  
- Mucilage: Mucilage (found in Seeds Leaves, flowers and roots), β-asparagine2 Mixture of colloidal soluble polysaccharides, particularly galacturonichamansns, arabinogalactans, arabans, glucans, acidic heteropolysaccharide. 25

18. Pharmacological studies

1. Wound healing properties

The wound healing property of *Althaea officinalis* flower mucilage in the form of eucerin base ointment in with different concentrations (5%, 10%, and 15%) was studied on full thickness wound model in rabbit. AFM 15% ointments were found to reduce wound healing time without any significant difference with the phenytoin 1% ointment revealed by Valizadeh R et al. (2015) 27

2. Antitussive activity

The antitussive activity of polysaccharide obtained from the flower and plant of *Althaea officinalis* was studied in cough induced cats of both sexes. The results revealed that the tested polysaccharide exhibited statistically significant cough suppressing activity due to the presence of higher proportion of uralnic acid, which was noticeably higher than that of the nonnarcotic drug used in clinical practice revealed by Sutovska M et al. (2007) 26. Another study of Sutovska M et al., revealed the Antitussive Activity of polysaccharides rhamnogalacturonan. Result showed that rhamnogalacturonan isolated from *Althaea officinalis* mucilage possesses very high cough suppressive effect in guinea pig a test which is shortened in conditions of experimentally induced airways allergic inflammation. 29
3. Antioxidant activity
Sadighara P et al. (2012) examined three colours of petals of *Althaea officinalis* flowers, i.e., pink, reddish pink, and white for total antioxidant activity and flavonoids content. The reddish pink flowers of *A. officinalis* have more antioxidant activity (reddish pink > pink > white). The antioxidant activity of aqueous and hydro alcoholic extracts of *A. officinalis* root were assessed using ABTS+ (2,2′-azino-bis (3-ethylbenzothiazoline-6-sulphonic acid), hypochlorous acid scavenging assay and iron-induced lipid peroxidation. The results showed that the extract prepared with water as extraction solvent did not possess antioxidant activity, whereas the extracts obtained using ethanol: water showed well pronounced antioxidant activity. In particular, the extracts obtained at low concentration of ethanol in the mixed solvent (50:50 and 70:30, v/v) showed higher scavenging activity for ABTS+ radicals and hypochlorite ions than the extract obtained with the higher ethanol concentration (90:10 v/v). These results correlated very well with phenolic and flavonoid content of the extracts. The extracts did not show cytotoxic effect on human BV-173 leukemic cells but may have immunomodulating effect due to their antioxidant properties. Tabarsa M et al. (2017) evaluate the Rhamnan polysaccharide gum from *A. officinalis* flower and found that the gum displayed negatively charged carboxyl moieties and high antioxidant activity.

4. Antimicrobial activity:
An in-vitro study of methanolic extract from marshmallow root has been done by European Medicines Agency on periodontal pathogens resident in the oral cavity. The study shown to possess an inhibiting activity on Porphyromonas gingivalis, Prevotella spp. Actinomyces odontolyticus, Veillonella parvula, Eikenella corrodens, Fusobacterium nucleatum, Peptostreptococcus spp. Antimicrobial activity against *Pseudomonas aeruginosa*, *Proteus vulgaris* and *Staphylococcus aureus* has also been documented for chloroform and methanolic extracts of marshmallow roots. The hexane extracts of flower and root of *Althaea officinalis* exerted antimicrobial activity against Gram-positive and Gram-negative bacteria (Escherichia coli, *Pseudomonas aeruginosa*, Klebsiella pneumoniae, Bacillus subtilis, Enterococcus faecalis, *Staphylococcus aureus* and *Staphylococcus epidermidis*), as well as three fungi (Aspergillus niger, Candida albicans and Saccharomyces cerevisiae) Rashidi et al. also found that 80 % ethanolic *A. officinalis* was active against Aspergillus niger, *Aspergillus fumigatus* and *Aspergillus flavus* species. MIC of *Althaea officinalis* 80 % ethanolic extract 50-100 mg/ml. However, ethanol, water and hexane extracts of the dried seed at a concentration of 10.0 mg/ml, were inactive on *Candida albicans* and *Candida tropicalis*.

5. Anti-inflammatory:
Aq. extracts of the *A. officinalis* roots stimulated phagocytosis, and the release of oxygen radicals and leukotrienes from human neutrophils cytokines, interleukin-6 and tumour necrosis factor from human monocytes in vitro. Thereby exhibiting anti-inflammatory and immune stimulant activity. A polysaccharide fraction (500mg/ml) isolated from a root extract had anticomplement activity in human serum in vitro. Marshmallow mucilage polysaccharides administered intraperitoneally to mice at a dose of 10 mg/kg produced a 2.2-fold increase in phagocytic activity of macrophages in the carbon-clearance test. Hypoalgin 8-glucoside has been tested for its anti-inflammatory, analgesic and anti-ulcer activity in rats. This flavonoid (30, 60 and 90 mg/kg) was more potent than phenylbutazone (30, 60 and 90 mg/kg). It suppressed the acute phase of adjuvant carrageenan-induced inflammation but had less effect in the prolonged inflammatory phase. In contrast to phenylbutazone, it did not cause gastric erosions.

Algesic activity of hypoalgin 8-glucoside has been found to be lower than the one of phenylbutazone. Hypoalgin 8-glucoside was also more potent than troxerutin (both at the doses of 100, 200, 300 and 400 mg/kg s.c.) in inhibiting histamine induced capillary permeability in rats. An ointment containing an aqueous marshmallow root extract (20%) applied topically to the external ear of rabbits reduced irritation induced by UV irradiation or by tetrahydrofurfuryl alcohol. The ointment has been compared to pure dexamethasone 0.05% ointment and a combined marshmallow and dexamethasone product. The anti-inflammatory effect of marshmallow ointment was lower than that of a dexamethasone ointment. The combined product had higher anti-inflammatory effect than the ointments with the individual ingredients.

6. Immunomodulatory effects:
*Althaea-mucilage O*, an acidic polysaccharide isolated from marshmallow root, has been possesses anti-complement activity on normal human serum in concentrations of 100 – 1000 µg/ml. An extract (extraction medium 45 % 1, 3-butylene glycol solution) of marshmallow root was found to inhibit intracellular calcium mobilisation in normal human melanocytes activated by endothelin-1, and to strongly inhibit endothelin-1-induced proliferation of melanocytes. The extract can diminish the physiological effect of endothelin-1 on normal human melanocytes following UVB irradiation. Scopolamine produced dual action on tumoral lymphocytes exhibiting both a cytostatic and a cytotoxic effect on the cell, and also exerted apoptosis. Proliferation of normal T lymphocytes was found due to the interaction with kinase C (PKC) protein. It indicates that scopolamine may be a potential anti-tumoral compound.

7. Demulcent and soothing:
The demulcent effects of Radix Althaeae are due to its high content of polysaccharide hydrocolloids, which form a protective coating on the oral and pharyngeal mucosa, soothing local irritation and inflammation. However, weak inhibition (17%) of mucociliary transport in isolated, ciliated epithelium of the frog oesophagus was demonstrated after treatment of the isolated tissues with 200 ml of an aqueous root macerate (6.4 g/140 ml). Polysaccharides from marshmallow root showed moderate adhesion to epithelial tissue of porcine buccal membranes.

8. Effect on Thyroid Hormones
Effect of Marshmallow’s root extract on Thyroid Hormones concentration in Broilers was studied by Roshangar et al. (2014). Results showed that the concentration of T3 hormone was decreased significantly (p < 0.05) whereas the concentration of T4 hormone was not affected by treatments.

9. Hepatoprotective activity
The hepatoprotective activity of ethanolic extract of *Althaea officinalis* against carbon tetrachloride induced hepatotoxicity in rats was done by Ali Mohd et al. (2011). The serum biochemical analysis showed significant protective effect from hepatic damage in CCI4 induced hepatotoxicity model.

10. Neuroprotective property
Neuroprotective activity of *Althaea officinalis* L extract (10 mg/kg) against 6-OHDA-induced hemi Parkinsonism in rats revealed by Rezaei et. al. (2014). It is also reported that Hollyhock leaf compress combined with performing routine interventions for breast engorgement can improve breast engorgement.

11. Toxicity study
This study was conducted to evaluate the effects of marshmallow extract (*A. officinalis*L) administration on blood...
cells and biochemical parameters of carp liver. A total of 150
carps (Cyprinus carpio, initial body mass of 37.7 ± 4.4 g) were
fed diets containing 0.0 (control diet), 2.5, 5, and 10 g marshmallow extract for 60 days. On days 30 and 60 of the
experiment blood samples were collected and haematological
parameters and liver enzyme activities—aspartate
aminotransferase (AST), alanine amino transferase (ALT),
lactate dehydrogenase (LDH), and alkaline phosphatase (ALP).
were measured. A significant increase was observed in AST,
ALT, ALP, and LDH levels in livers of fish fed with extract 10 g,
which may be attributed to cytotoxicity.\textsuperscript{45}

Conclusion

The present review reveals that there is the tremendous scope
of Unani single drugs Khatmi in management of resolvent of
hard swelling, dysentery, intestinal Colic, ulcer and obstacle of
intestine, bilious diarrhoea, dry cough and dysuria and it can
also be utilized as a potent conventional traditional Unani drug
due to its diverse and related beneficial pharmacological activity and suggest that further phytochemical, clinical and
advance research should be done on this medicinal plant for the
benefit of mankind.\textsuperscript{45}

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Conflict of interest

The authors declare no any conflict of interest.

References

   University; 1998.
   Research in Unani Medicine; 2008.
   Research in Unani Medicine; 2010, pp. 79-83.
   133-135.
   Delhi: Springer Science+Business Media, Berlin/Heidelberg: LLC;
PMCID:PMC2705749
   New Delhi: Central Council for Research in Unani Medicine; 2001,
   pp. 37.
   New Delhi: Central Council for Research in Unani Medicine; 2008,
   66,67,70,76-82,84, 85
    1989. 1.
    [updated 2021 May 21; cited 2021 May 21]. Available from:
12. Fahamiya N, Shiffa M, Aslam M, Muzn F. Unani perspective of
    Khatmi (Althaea officinalis). Journal of Pharmacognosy and
    2014.
    Research in Unani Medicine; 1987, pp. 274
    Qaisari Publisher; 1980, pp. 98-99.
    Research in Unani Medicine; 1996.
    Research in Unani Medicine New Delhi, 2005, pp. 284.
    New Delhi: Central Council for Research in Unani Medicine; 2007,
    35,136,137,139.
20. HifzalKabir. Introduction to Ilmul Advia. Shamsher Publisher and
    New Delhi: Central Council for Research in Unani Medicine; 2011,
    61,62,67,77,125.
22. Al-Snafi AE. The pharmaceutical importance of Althaea officinalis
    1387-5.
23. Rastogi RP. Compendium of Indian Medicinal Plants. Vol. II.
    New Delhi: Central Drug Research Institute, Lucknow and National
    Institute of Science Communication; 1999, p. 37.
24. Rastogi RP. Compendium of Indian Medicinal Plants, Vol. III.
    New Delhi Central Drug Research Institute, Lucknow and National
    Institute of Science Communication; 1999, p. 36.
    p. 207,208.
    Wound healing potential of Althaea officinalis flower mucilage in
    rabbit full thickness wounds, Asian Pacific Journal of Tropical
    https://doi.org/10.1016/j.japtbj.2015.07.018
28. Sutovska M, Nosalova G, Franova S, Kardosovova A. The antitussive
    effect of polysaccharide from Althaea officinalis L var. Robusta,
    Arctium lappa L var. Herktules, and Prumus persica L. Batsch.
29. Sutovska M, Capek P, Franova S, Joskova M, Sutovsky J, Marcinek J,
    et al. Antitussive activity of Althaea officinalis L polysaccharide
    rhamnogalacturan and its changes in guinea pigs with oval
    bumine-induced airways inflammation. Bratisl Lek Listy, 2011,
    112(12): 670-675.
30. Sadighara P, Gharibi S, Jafari AM, Khaniki GJ, Salarie S. The
    antioxidant and Flavonoids contents of Althaea officinalis L
    flowers based on their colour. Avicenna Journal of Phytomedicine
31. Benbasat N, Yoncheva K, Hadjimtova V, Hristova N, Konstantinov
    S, Lambov N. Influence of the extraction solvent on antioxidant
    activity of Althaea officinalis L root extracts, Central European
32. Tabarsa M, Anvari M, Joyner HS, Behnam S, Tabarsa A. Rheological
    behaviour and antioxidant activity of a highly acidic gum from
    https://doi.org/10.1016/j.foodhyd.2017.02.009
33. European Medicines Agency Evaluation of Medicines for Human
    Use. London: Assessment report on Althaea officinalis L
34. Valiei M, Shafaghat A and Salimi F. Chemical composition and
    antimicrobial activity of the flower and root hexane extracts of
    Althaea officinalis L. Journal of Drug Delivery & Therapeutics.
    2023; 13(12):270-277.
35. Valiei M, Shafaghat A and Salimi F. Chemical composition and
    antimicrobial activity of the flower and root hexane extracts of
    Althaea officinalis L. Journal of Drug Delivery & Therapeutics.
    2023; 13(12):270-277.


