

2 | *Althaea officinalis* L.



Common Names

Altea	France	Khatmi	India
Altea	Peru	Marsh mallow	USA
Althea	USA	Marsh mallow	USSR
Bardul Khatmi	India	Marsh mallow	Bolivia
Bon visclo	France	Marsh mallow	Poland
Eibisch	France	Malva blanca	France
Erva molle	Italy	Malvavisco	Bolivia
Guimauve	France	Malvavisco	Peru
Guimauve	Tunisia	Marmolone	Italy
Hobbiza	Tunisia	Suzmool	India
Khairi	Arabic countries	Sweet weed	USA
Khatmi-ka-phool	India	Wymote	USA

BOTANICAL DESCRIPTION

This perennial herb of the MALVACEAE family is a 60–120 cm high hardy, velvety plant that has an erect root up to 50 cm long and a few cm thick with secondary roots. The succulent stem is usually woody at the base and unbranched. The leaves are short-petioled with an ovate, acute leaf-blade. The secondary leaves are narrow and drooping. The lower leaves are 5-lobed, the upper cauline leaves are often triangular, more wide than long. The reddish-white flowers are usually in axillary or terminal clusters; the 6–9 sepals of the epicalyx are fused at the base, and are 8–10 mm long and

pointed; 5 sepals, 5 heart-shaped petals and numerous stamens are fused together with the anthers to a column. The ovaries in a ring, numerous styles; mericarps smooth and downy. The 5-8 mm fruit is disc-like and breaks up into the mericarps that are downy on the outside and often have fine, branched, radiating ribs. The seeds are dark-brown, glabrous, kidney-shaped and somewhat compressed.

ORIGIN AND DISTRIBUTION

A native of the British Isles and the temperate regions of India, it is now distributed throughout Europe and can be found in parts of the Americas.

TRADITIONAL MEDICINAL USES

Arabic countries. Hot water extract of the plant is taken orally as an abortifacient and emmenagogue in Unani medicine^{AO0133}.

Bolivia. Infusion of the plant is taken orally as an expectorant^{AO0134}.

France. Infusion of the flower and leaf is taken orally as an emmolient and externally as an antiseptic^{AO0113}.

India. Infusion of the dried flower is taken orally as an expectorant^{AO0108}. The root, boiled with black pepper, is taken orally for asthma^{AO0114}.

Italy. Decoction of the dried root is taken orally for constipation^{AO0139}. Decoction of the flower and leaf is taken orally as an antiasthmatic^{AO0110}. Infusion of the root is taken orally for bronchial catarrh and as a gastric protective^{AO0110}.

Peru. Hot water extracts of the dried flower and the dried leaf are used externally as an emollient^{AO0138}. Hot water extract of the dried root is used externally as an emollient^{AO0138}.

Tunisia. The dried leaf is used as a cicatrizant^{AO0135}.

USA. Hot water extract of the dried root is taken orally as an expectorant and externally as a demulcent^{AO0141}. Infusion of the dried leaf is taken orally to treat cystitis^{AO0107}. The root is taken orally for coughs and sore throat^{AO0104}.

CHEMICAL CONSTITUENTS

(ppm unless otherwise indicated)

Aesculetin: Aer, Rt^{AO0108}

Aesculin: Aer, Rt^{AO0108}

Alanine: Rt^{AO0105}

Althaea D-glucan: Lf^{AO0131}

Althaea mucilage O: Rt 0.22%^{AO0129}

Althaea mucilage OL: Lf 550^{AO0101}

Althaea mucilage polysaccharide: Rt^{AO0117}

Althaea mucopolysaccharide: Rt^{AO0116}

Arabinofuranan, L: Rt^{AO0115}

Asparagine: Rt^{AO0105}

Asparaginic acid: Rt^{AO0105}

Astragalin: Fl^{AO0111}, Lf^{AO0130}

Benzoic acid, 4-hydroxy: Lf^{AO0130}, Fl^{AO0121}, Rt^{AO0102}

Butyric acid, 4-amino: Rt^{AO0105}

Caffeic acid: Fl^{AO0106}, Lf^{AO0130}, Rt^{AO0102}

Cichorin: Aer, Rt^{AO0108}

Chlorogenic acid: Fl^{AO0121}

Coumaric acid, para: Lf^{AO0130}, Fl^{AO0121}, Rt^{AO0102}

Coumarin: Aer, Rt^{AO0108}

Diosmetin, 8-hydroxy-3-sulfo-8-0-beta-D-glucoside: Lf^{AO0130}

Diosmetin, 8-hydroxy 8-0-beta-D-glucoside: Lf^{AO0103}

Diosmetin, 8-hydroxy 8-0-beta-D-glucoside-3-sulfate: Lf^{AO0103}

Ferulic acid: Lf^{AO0130}, Fl^{AO0121}, Rt^{AO0102}

Herniarin: Aer, Rt^{AO0108}

Hypolaetin, 8-0-gentiobioside: Fl^{AO0125}

Hypolaetin-4-methyl ether-8-0-glucoside-3-sulphate: Lf^{AO0124}

Hypolaetin-4-0-methyl-ether-8-0-beta-D-glucoside: Fl^{AO0125}

Hypolaetin-8-0-gentiobioside: Lf, Fl^{AO0111}

Hypolaetin-8-beta-gentiobioside: Lf^{AO0120}

Hypoletin-8-glucoside: Lf^{AO0120}

Kaempferol, dihydro, 4-0-beta-D-glucoside: Fl^{AO0125}

Kaempferol, dihydro, 4-0- beta-D: Fl 0.76-0.84%^{AO0126}

Kaempferol, dihydro, 4-0-glucoside: Lf, Fl^{AO0111}

Kaempferol-3-0-beta-D-(6-0-para-hydroxy-cinnamoyl)-glucoside: Lf^{AO0130}

Luteolin, beta-hydroxy, 8-gentiobioside: Fl¹³⁰⁵⁹

Mucilage (Althaea officinalis): Pl 18-21%^{AO0122}

Naringenin-4-0-beta-D-glucoside: Fl^{AO0125}

Naringenin-4-0-glucoside: Fl^{AO0124}

Phenyl-acetic acid, para-hydroxy: Lf, Fl^{AO0123}

Phenylacetic acid, para-hydroxy: Rt^{AO0102}, Lf^{AO0130}, Fl^{AO0106}

Polysaccharide (Althaea officinalis): Rt^{AO0119}

Populnin: Fl^{AO0121}

Protocatechuic acid: Lf, Fl^{AO0123}

Quercitrin, iso: Fl^{AO0121}, Lf^{AO0130}

Salicyclic acid: Fl^{AO0106}, Lf^{AO0130}, Rt^{AO0102}

Scopoletin: Lf^{AO0130}, Fl^{AO0123}, Rt^{AO0102}, Aer^{AO0108}

Scopoletin, iso: Aer, Rt^{AO0108}
 Scopolin: Aer, Rt^{AO0108}
 Scutellarein, iso, 4-methyl ether 8-O-beta-D-glucoside-2-potassium sulfate: Rt^{AO0102}
 Scyllitol: Lf 800^{AO0140}
 Sinapic acid: Lf, F^{AO0123}
 Spiraeside: Lf, F^{AO0124}
 Syringic acid: Lf^{AO0130}, F^{AO0106}, Rt^{AO0102}
 Tiliroside: Lf 0.13-0.25%, Fl 0.15-0.19%^{AO0126}
 Umbelliferone: Aer, Rt^{AO0108}
 Valine: Rt^{AO0105}
 Vanillic acid: F^{AO0121}, Lf^{AO0130}, Rt^{AO0102}

PHARMACOLOGICAL ACTIVITIES AND CLINICAL TRIALS

Antibacterial activity. Ethanol (95%) and water extracts of the flower, leaf and root, on agar plate, were inactive on *Escherichia coli* and *Staphylococcus aureus*^{AO0100}. Ethanol (95%), hexane and water extracts of the dried seed, at a concentration of 10.0 mg/ml, were inactive on *Corynebacterium diphtheriae*, *Diplococcus pneumoniae*, *Staphylococcus aureus*, *Streptococcus pyogenes* and *Streptococcus viridans*^{AO0127}.

Anticomplement activity. Polysaccharide fractions of the dried leaf and dried root, at a concentration of 500.0 mcg/ml, were active on human serum^{AO0137}.

Antifungal activity. Ethanol (95%), water and hexane extracts of the dried seed, on agar plate at a concentration of 10.0 mg/ml, were inactive on *Microsporium canis*, *Microsporium gypseum*, *Phialophora jeanselmei*, *Piedraia hortae* and *Trichophyton mentagrophytes*^{AO0127}.

Anti-inflammatory activity. Ethanol (80%) extract of the dried root, administered by gastric intubation to male rats at a dose of 100.0 mg/kg, was inactive vs carrageenin-induced pedal edema^{AO0118}.

Antimycobacterial activity. Ethanol (95%) extract of the flower, leaf and root, on agar plate, was inactive on *Mycobacterium tuberculosis*^{AO0100}.

Antitussive activity. Polysaccharide fraction of the dried root, administered intragastrically to cats at a dose of 50 mg/kg, was equivocal, and a dose of 100.0 mg/kg was active vs cough elicited by laryngopharyngeal and tracheobronchial mucosal stimulation^{AO0128}.

Antiviral activity. Ethanol (80%) extract of the freeze-dried entire plant, in cell culture at variable concentrations, was inactive on adenovirus, coxsackie B2 virus, Herpes virus type 1, measles virus, poliovirus 1 and Semlicki-Forest virus vs plaque-inhibition^{AO0132}. Water extract of the dried leaf, in cell culture at a concentration of 10.0%, was inactive on Herpes virus type 2, influenza virus A2(Manheim 57), poliovirus 11 and vaccinia virus^{AO0136}.

Antiyeast activity. Ethanol (95%), water and hexane extracts of the dried seed, on agar plate at a concentration of 10.0 mg/ml, were inactive on *Candida albicans* and *Candida tropicalis*^{AO0127}.

Common cold relief. Hot water extract of the dried seed, taken orally by adults at a dose of 20 gm/person, was active^{AO0142}.

Cytotoxic activity. Water extract of the flower, leaf and root, in cell culture at a concentration of 10%, was inactive on Hela cells^{AO0136}.

Radical scavenging effect. Ethanol/water (1:1) extract of the dried entire plant, at a concentration of 5.0 mcg/ml, produced weak activity vs superoxide anion when estimated by the neotetrazolium method^{AO0112}.

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