

# Marshmallow

## Species (Family)

*Althaea officinalis* L. (Malvaceae)

## Synonym(s)

Althaea

## Part(s) Used

Leaf, root

## Pharmacopoeial and Other Monographs

BHC 1992<sup>(G6)</sup>

BHP 1996<sup>(G9)</sup>

BP 2001 (root)<sup>(G15)</sup>

Complete German Commission E<sup>(G3)</sup>

ESCOP 1996<sup>(G52)</sup>

Martindale 32nd edition<sup>(G43)</sup>

PDR for Herbal Medicines 2nd edition<sup>(G36)</sup>

Ph Eur 2002 (root and leaf)<sup>(G28)</sup>

## Legal Category (Licensed Products)

GSL<sup>(G37)</sup>

## Constituents<sup>(G2,G6,G41,G48,G52,G60,G64)</sup>

**Polysaccharides** Mucilage polysaccharides (5–10%), consisting of galacturono-rhamnans, arabinans, glucans, arabinogalactans.<sup>(1,G52)</sup>

**Flavonoids** Hyolaetin 8-glucoside, isoscutellarin 4'-methylether-8-glucoside-2''-sulfate.<sup>(2)</sup>

**Phenolic acids** Caffeic, *p*-coumaric, ferulic, *p*-hydroxybenzoic and syringic.

**Other constituents** Asparagine 2%, calcium oxalate, coumarins (scopoletin), pectin, starch and tannin.

## Food Use

Marshmallow is listed by the Council of Europe as a natural source of food flavouring (category N2). This

category indicates that marshmallow can be added to foodstuffs in small quantities, with a possible limitation of an active principle (as yet unspecified) in the final product.<sup>(G16)</sup> In the USA, marshmallow is approved for use in foods.<sup>(G41)</sup>

## Herbal Use<sup>(G2,G4,G6,G7,G8,G43,G52,G54,G64)</sup>

Marshmallow is stated to possess demulcent, expectorant, emollient, diuretic, antilithic and vulnerary properties. Traditionally, it has been used internally for the treatment of respiratory catarrh and cough, peptic ulceration, inflammation of the mouth and pharynx, enteritis, cystitis, urethritis and urinary calculus, and topically for abscesses, boils and varicose and thrombotic ulcers. The German Commission E approved use of root and leaf for irritation of oral and pharyngeal mucosa and associated dry cough and root for mild inflammation of gastric mucosa.<sup>(G3)</sup> Marshmallow root is used in combination with anise fruit, eucalyptus oil, liquorice and with anise fruit, liquorice and primrose root and with anise fruit and primrose root for catarrh of the upper respiratory tract and resulting dry cough.<sup>(G3)</sup>

## Dosage

**Dried leaf** 2–5 g or by infusion three times daily;<sup>(G6,G7)</sup> 5 g.<sup>(G3)</sup>

**Leaf, liquid extract** 2–5 mL (1:1 in 25% alcohol) three times daily.<sup>(G6,G7)</sup>

**Ointment** 5% Powdered althaea leaf in usual ointment base three times daily.<sup>(G6,G7)</sup>

**Dried root** 2–5 g or by cold extraction three times daily;<sup>(G6,G7)</sup> 6 g.<sup>(G3)</sup>

**Root, liquid extract** 2–5 mL (1:1 in 25% alcohol) three times daily.<sup>(G6,G7)</sup>

**Syrup of Althaea** (BPC 1949) 2–10 mL three times daily.<sup>(G6,G7)</sup>

## Pharmacological Actions

### *In vitro* and animal studies

Antimicrobial activity against *Pseudomonas aeruginosa*, *Proteus vulgaris* and *Staphylococcus aureus* has been documented for marshmallow.<sup>(3)</sup>

The mucilage has demonstrated considerable hypoglycaemic activity in non-diabetic mice.<sup>(4)</sup>

Inhibition (17%) of mucociliary transport in ciliated epithelium isolated from frog oesophagus was observed with 200 µL of cold macerate of marshmallow root (6.4 g/140 mL).<sup>(G52)</sup>

Marshmallow root extract is reported to stimulate phagocytosis, and to release oxygen radicals and leukotrienes from human neutrophils.<sup>(G52)</sup> In addition, release of cytokines, interleukin 6 and tumour necrosis factor from monocytes occurs, demonstrating potential anti-inflammatory and immunomodulatory effects. In mice, intraperitoneal administration of isolated polysaccharide (10 mg/kg) resulted in activity of macrophages in a carbon clearance test, and was indicative of non-specific immunomodulation.<sup>(G52)</sup> A lack of anti-inflammatory activity has been observed for marshmallow in the carrageenan-induced rat paw oedema test.<sup>(5)</sup> The anti-inflammatory effect of an ointment containing 0.05% dexamethasone was enhanced by addition of aqueous extract of marshmallow (20%) as assessed in a rabbit ear irritancy test using UV irradiation or furfuryl alcohol.<sup>(G52)</sup>

A total extract of root and isolated polysaccharide (100 and 50 mg/kg, respectively) have been tested for their antitussive activity in unanaesthetised cats.<sup>(6)</sup> The polysaccharide gave a statistically significant decrease in the number of cough efforts from laryngopharyngeal and tracheobronchial areas. The root extract was less effective than the isolated polysaccharide.

A polysaccharide enriched extract showed moderate concentration-dependent adhesive properties in porcine buccal membranes *ex vivo*.<sup>(7)</sup>

### Side-effects, Toxicity

None documented.

### Contra-indications, Warnings

Marshmallow may interfere with existing hypoglycaemic therapy and the absorption of other drugs taken simultaneously may be retarded.<sup>(G52)</sup>

*Pregnancy and lactation* There are no known problems with the use of marshmallow during pregnancy or lactation.

## Pharmaceutical Comment

*In vitro* and animal studies provide some supporting evidence for the use of marshmallow in the treatment of cough, irritation of the throat and gastric inflammation. Antibacterial and anti-inflammatory activities, effects on mucociliary transport, adhesion of polysaccharide to buccal membranes and reduction of cough are reported. However, there is a lack of clinical studies investigating the effects of marshmallow. Although no toxicity data were located, the chemistry of marshmallow and its use in foods indicate that there should not be any reason for concern regarding safety.

## References

See also General References G2, G3, G6, G9, G10, G16, G31, G36, G37, G43, G48, G52, G54, G60, G64,

- 1 Blaschek W, Franz G. A convenient method for the quantitative determination of mucilage polysaccharides in *Althaeae radix*. *Planta Med* 1986; 52(Suppl.): 537.
- 2 Gudej J. Flavonoids, phenolic acids and coumarins from the roots of *Althaea officinalis*. *Planta Med* 1991; 57: 284–285.
- 3 Recio MC *et al.* Antimicrobial activity of selected plants employed in the Spanish Mediterranean area Part II. *Phytother Res* 1989; 3: 77–80.
- 4 Tomodo M *et al.* Hypoglycaemic activity of twenty plant mucilages and three modified products. *Planta Med* 1987; 53: 8–12.
- 5 Mascolo N *et al.* Biological screening of Italian medicinal plants for anti-inflammatory activity. *Phytother Res* 1987; 1: 28–31.
- 6 Nosálova G *et al.* Antitussive Wirkung des extraktes und der polysaccharide aus eibisch (*Althaea officinalis* L., var. *robusta*). *Pharmazie* 1992; 47: 224–226.
- 7 Schmidgall J *et al.* Evidence for bioadhesive effects of polysaccharides and polysaccharide-containing herbs in an *ex vivo* bioadhesion assay on buccal membranes. *Planta Med* 2000; 66: 48–53.