Myrrh

Species (Family)

(i) *Commiphora molmol* Engl. (Bursuraceae)
(ii) *Commiphora abyssinica* (Berg) Engl.
(iii) Other *Commiphora* species

Synonym(s)

(i) African Myrrh, Balsamodendron Myrrha, Commiphora, *Commiphora myrrha* (Nees) Engl., Somali Myrrh
(ii) Arabian Myrrh, Yemen Myrrh

Part(s) Used

Oleo-gum-resin

Pharmacopoeial and Other Monographs

BHC 1992[G6]
BHP 1996[G9]
BP 2001[G15]
Complete German Commission E[G3]
ESCOP 1999[G52]
Martindale 32nd edition[G43]
PDR for Herbal Medicines 2nd edition[G36]
Ph Eur 2002[G28]
USP24/NF19[G61]

Legal Category (Licensed Products)

GSL[G37]

Constituents[G2,G6,G41,G48,G52,G64]

Carbohydrates Up to 60% gum yielding arabinose, galactose, xylose, and 4-*O*-methylglucuronic acid following hydrolysis.

Resins Up to 40% (average 20%) consisting of α-, β- and γ-commiphoric acids, commiphorinic acid, α- and β-heerabomyrrhols, heeraboresene and commiferin.

Steroids Campesterol, cholesterol and β-sitosterol.

Terpenoids α-Amyrin. Furanosesquiterpenes, including furaneudesma-1,3-diene (major), furaneudesma-1,4-diene-6-one, lindestrine, curzerenone, furanodiene, 2-methoxyfuranodiene and 4,5-dihydrofuranodiene-6-one.[1,G52]

Volatile oils 1.5–17%. Main constituents are furanosesquiterpenes. Dipentene, cadinene, heerabolene, limonene, pinene, eugenol, *m*-cresol, cinnamaldehyde, cuminaldehyde, cumic alcohol and others.

Food Use

Myrrh is listed by the Council of Europe as a natural source of food flavouring (category N2). This category indicates that myrrh can be added to foodstuffs in small quantities, with a possible limitation of an active principle (as yet unspecified) in the final product.[G16] In the USA, myrrh is permitted for use in alcoholic beverages.[G65]

Herbal Use[G2,G4,G6,G7,G8,G43,G52,G64]

Myrrh is stated to possess antimicrobial, astringent, carminative, expectorant, anticatarrhal, antiseptic and vulnerary properties. Traditionally, it has been used for aphthous ulcers, pharyngitis, respiratory catarrh, common cold, furunculosis, wounds and abrasions, and specifically for mouth ulcers, gingivitis and pharyngitis. The German Commission E approved topical use for mild inflammation of the oral and pharyngeal mucosa.[G3]

Dosage

Myrrh Tincture (BPC 1973) 2.5–5.0 mL; in a glass of water several times daily as a gargle or a mouthwash. For skin, undiluted or diluted.[G52]

Tincture Myrrh Co (Thompsons) (1 part Capsicum Tincture BPC 1973 to 4 parts Myrrh Tincture BPC 1973) 1.0– 2.5 mL.

Pharmacological Actions

In vitro and animal studies

Anti-inflammatory activity Anti-inflammatory (carrageenan-induced inflammation and cotton pellet granuloma)[2] and antipyretic activities in mice[2,3] have been documented for *C. molmol*.

Hypoglycaemic activity Hypoglycaemic activity in both normal and diabetic rats has been reported for a myrrh extract.[4,5] Together with an aloe gum extract, myrrh was found to be an active component of a multi-plant extract that exhibited antidiabetic activity. The mode of action was thought to involve a decrease in gluconeogenesis and an increase in peripheral utilisation of glucose in diabetic rats.

Myrrh is stated to have astringent properties on mucous membranes[G45] and to have antimicrobial activities *in vitro*.[G41]

Anti-inflammatory activity Anti-inflammatory activities have been reported for an Indian plant, *Commiphora mukul*, commonly known as guggulipid. Anti-inflammatory activity was described for a crystalline steroidal fraction of guggulipid in both acute (carrageenan-induced rat paw oedema test) and chronic (adjuvant arthritis) models of inflammation.[6]

Lipid-lowering effects A ketosteroid has been identified as the active hypocholesterolaemic principle in guggulipid.[7] In some animal species, thyroid suppression is required as well as cholesterol administration in order to achieve experimental hypercholesterolaemia. Results of studies in chicks administered a thyroid suppressant and cholesterol indicated that guggulipid prevents endogenous hypercholesterolaemia via stimulation of the thyroid gland.[7] When fed to rabbits, guggulipid has been found to reverse the decrease in catecholamine concentrations and dopamine-β-decarboxylase activity that are associated with hyperlipidaemia.[8]

Stimulation of phagocytosis Stimulation of phagocytosis has been documented in mice innoculated with *Escherichia coli* and given with extracts of myrrh by intraperitoneal injecton.[G52]

Cytoprotective activity An aqueous suspension of myrrh administered to rats at oral doses of 250–1000 mg/kg gave significant and dose-dependent protection to gastric mucosa against various ulcerogenic agents.[G52]

Analgesic activity In mice, powdered myrrh (1 mg/kg, orally) had significant analgesic activity in the hotplate test.[G52] Isolated furanoeudesma-1,3-dione (50 mg/kg, orally) was significantly more effective than control ($p < 0.01$) in the mouse writhing test, and the effective dose was reversed by naloxone (1 mg/kg).[G52]

Anti-tumour and cytotoxic activities In mice with Ehrlich solid tumours, an aqueous suspension of myrrh (250 or 500 mg/kg, orally) produced significant decreases in tumour weight ($p < 0.05$) after 25 days.[G52] Aqueous suspension of myrrh increased survival time in mice with Erlich ascite tumours.

Clinical studies

Well-designed clinical studies of myrrh are lacking. Guggulipid has been reported to lower the concentration of total serum lipids, serum cholesterol, serum triglycerides, serum phospholipids and β-lipoproteins in 20 patients.[9] This effect was reported to be comparable to that of two other known lipid-lowering drugs also used in the study.

Side-effects, Toxicity

No reported side-effects were located for *C. molmol* or *C. abyssinica*. Hiccup,[9] diarrhoea,[7] restlessness and apprehension,[9] were documented as side-effects for guggulipid when administered to 20 patients.[9] Myrrh has been reported to be non-irritating, non-sensitising and non-phototoxic to human and animal skins.[G41]

Contra-indications, Warnings

Myrrh may interfere with existing antidiabetic therapy, as hypoglycaemic properties have been documented. Thyroid stimulation and lipid lowering properties have been documented for the related species, *Commiphora mukul*.

Pregnancy and lactation Myrrh is reputed to affect the menstrual cycle[G41] and the safety of myrrh taken during pregnancy has not been established. Excessive use of myrrh during pregnancy should be avoided.

Pharmaceutical Comment

The volatile oil, gum and resin components of myrrh are well documented. The anti-inflammatory and antipyretic activities documented in animals support some of the traditional uses. Phenol components of the volatile oil may account for the antimicrobial properties of myrrh, although no documented studies were located. Lipid-lowering properties via a stimulant action on the thyroid gland have been documented for *C. mukul* in both animals and humans. In view of the lack of toxicity data, excessive use of myrrh should be avoided.

References

See also General References G2, G3, G6, G9, G12, G15, G16, G28, G29, G31, G32, G36, G37, G41, G43, G48, G52 and G64.

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2 Tariq M *et al.* Anti-inflammatory activity of *Commiphora molmol*. *Agents Actions* 1986; 17: 381–382.
3 Mohsin A *et al.* Analgesic, antipyretic activity and phytochemical screening of some plants used in traditional Arab system of medicine. *Fitoterapia* 1989; 60: 174–177.
4 Al-Awadi FM, Gumaa KA. Studies on the activity of individual plants of an antidiabetic plant mixture. *Acta Diabetol Lat* 1987; 24: 37–41.
5 Al-Awadi FM *et al.* On the mechanism of the hypoglycaemic effect of a plant extract. *Diabetologia* 1985; 28: 432–434.
6 Arora RB *et al.* Anti-inflammatory studies on a crystalline steroid isolated from *Commiphora mukul*. *Indian J Med Res* 1972; 60: 929–931.
7 Tripathi SN *et al.* Effect of a keto-steroid of *Commifora mukul* L. on hypercholesterolemia and hyperlipidemia induced by neomercazole and cholesterol mixture in chicks. *Indian J Exp Biol* 1975; 13: 15–18.
8 Srivastava M *et al.* Effect of hypocholesterolemic agents of plant origin on catecholamine biosynthesis in normal and cholesterol fed rabbits. *J Biosci* 1984; 6: 277–282.
9 Malhotra SC, Ahuja MMS. Comparative hypolipidaemic effectiveness of gum guggulu (*Commiphora mukul*) fraction 'A', ethyl-*p*-chlorophenoxyisobutyrate and Ciba-13437-Su. *Indian J Med Res* 1971; 59: 1621–1632.