

# Guaiacum

## Species (Family)

- (i) *Guaiacum officinale* L. (Zygophyllaceae)
- (ii) *Guaiacum sanctum* L.

## Synonym(s)

Guaiac, Guajacum, Lignum Vitae

## Part(s) Used

Resin obtained from the heartwood

## Pharmacopoeial and Other Monographs

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

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

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

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

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

## Legal Category (Licensed Products)

GSL<sup>(G37)</sup>

## Constituents<sup>(G6,G48,G64)</sup>

**Resins** 15–20%. Guaiaretic acid, dehydroguaiaretic acid, guaiacin, isoguaiacin,  $\alpha$ -guaiaconic acid (lignans), furoguaiacin and its monomethyl ether, furoguaiacidin, tetrahydrofuroguaiacin-A and tetrahydrofuroguaiacin-B (furano-lignans), furoguaiaoxidin (enedione lignan).<sup>(1–4)</sup>

**Steroids**  $\beta$ -Sitosterol.

**Terpenoids** Saponins, oleanolic acid.<sup>(5,6)</sup>

## Food Use

Guaiacum is listed by the Council of Europe as a natural source of food flavouring (category N2). This category indicates that guaiacum 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>

## Herbal Use

Guaiacum is stated to possess antirheumatic, anti-inflammatory, diuretic, mild laxative and diaphoretic

properties. Traditionally, it has been used for sub-acute rheumatism, prophylaxis against gout, and specifically for chronic rheumatism and rheumatoid arthritis.<sup>(G6,G7,G8,G64)</sup>

## Dosage

**Dried wood** 1–2 g or by decoction three times daily.<sup>(G6,G7)</sup>

**Liquid extract** 1–2 mL (1:1 in 80% alcohol) three times daily.<sup>(G6,G7)</sup>

**Tincture of Guaiacum** (BPC 1934) 2–4 mL.

## Pharmacological Actions

### *In vitro* and animal studies

None documented. Antimicrobial properties are associated with lignans and much has been documented for nordihydroguaiaretic acid, the principal lignan constituent in chaparral (*see* Chaparral).

## Side-effects, Toxicity

Guaiacum resin has been reported to cause contact dermatitis.<sup>(G51)</sup> The resin is documented to be of low toxicity; the oral LD<sub>50</sub> in rats is greater than 5 g/kg body weight.<sup>(G48)</sup>

## Contra-indications, Warnings

It is recommended that guaiacum is avoided by individuals with hypersensitive, allergic or acute inflammatory conditions.<sup>(G49)</sup>

**Pregnancy and lactation** The safety of guaiacum during pregnancy has not been established. In view of this, and the overall lack of pharmacological and toxicological data, the use of guaiacum during pregnancy and lactation should be avoided.

## Pharmaceutical Comment

Guaiacum is characterised by the resin fraction of the heartwood and much has been documented on the constituents (principally lignans) of the resin, although little is known regarding other constituents. No scientific information was found to justify

the herbal use of guaiacum as an antirheumatic or anti-inflammatory agent. In view of the lack of toxicity data, excessive use of guaiacum should be avoided.

## References

See also General References G3, G6, G9, G16, G29, G36, G37, G43, G48, G49, G51 and G64.

- 1 King FE, Wilson JG. The chemistry of extractives from hardwoods. Part XXXVI. The lignans of *Guaiacum officinale* L. *J Chem Soc* 1964; 4011-4024.
- 2 Kratochvil JF *et al.* Isolation and characterization of  $\alpha$ -guaiaconic acid and the nature of guaiacum blue. *Phytochemistry* 1971; 10: 2529-3251.
- 3 Majumder PL, Bhattacharyya M. Structure of furoguaiaicidin: a new furanoid lignan of the heartwood of *Guaiacum officinale* L. *Chem Ind* 1974; 77-78.
- 4 Majumder P, Bhattacharyya M. Furoguaiaoxidin - a new enedione lignan of *Guaiacum officinale*: a novel method of sequential introduction of alkoxy functions in the 3- and 4-methyl groups of 2,5-diaryl-3,4-dimethylfurans. *JCS Chem Commun* 1975; 702-703.
- 5 Ahmad VU *et al.* Officigenin, a new sapogenin of *Guaiacum officinale*. *J Nat Prod* 1984; 47: 977-982.
- 6 Ahmad VU *et al.* Guaianin, a new saponin from *Guaiacum officinale*. *J Nat Prod* 1986; 49: 784-786.