

# Horehound, White

## Species (Family)

*Marrubium vulgare* L. (Labiatae)

## Synonym(s)

Common Hoarhound, Hoarhound, Horehound, Marrubium

## Part(s) Used

Flower, leaf

## 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>(G2,G6,G41,G62,G64)</sup>

**Alkaloids** Pyrrolidine-type. Betonicine 0.3%, the *cis*-isomer turicine.

**Flavonoids** Apigenin, luteolin, quercetin, and their glycosides.<sup>(1)</sup>

**Terpenoids** Diterpenes including marrubiin 0.3–1.0%, a lactone, as the main component with lesser amounts of various alcohols (e.g. marrubenol, marrubiol, peregrinol and vulgarol). Marrubiin has also been stated to be an artefact formed from a precursor, premarrubiin, during extraction.<sup>(2)</sup>

**Volatile oils** Trace. Bisabolol, camphene, *p*-cymene, limonene,  $\beta$ -pinene, sabinene and others,<sup>(2)</sup> a sesquiterpene (unspecified).

**Other constituents** Choline, saponin (unspecified),  $\beta$ -sitosterol (a phytosterol), waxes (C<sub>26</sub>-C<sub>34</sub> alkanes).

## Food Use

White horehound is listed by the Council of Europe as a natural source of food flavouring (category N2). This category indicates that white horehound 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, white horehound is listed as GRAS (Generally Recognised As Safe).<sup>(G65)</sup>

## Herbal Use

White horehound is stated to possess expectorant and antispasmodic properties. Traditionally, it has been used for acute or chronic bronchitis, whooping cough, and specifically for bronchitis with non-productive cough.<sup>(G2,G6,G7,G8,G64)</sup>

## Dosage

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

*Liquid extract* 2–4 mL (1:1 in 20% alcohol) three times daily.<sup>(G6,G7)</sup>

## Pharmacological Actions

### *In vitro* and animal studies

Aqueous extracts have been reported to exhibit an antagonistic effect towards hydroxytryptamine *in vivo* in mice, and *in vitro* in guinea-pig ileum and rat uterus tissue.<sup>(3)</sup> Expectorant and vasodilative properties have been documented for the volatile oil.<sup>(4)</sup> However, the main active expectorant principle in white horehound is reported to be marrubiin, which is stated to stimulate secretions of the bronchial mucosa.<sup>(G60)</sup> Marrubiin has also been stated to be cardioactive, possessing anti-arrhythmic properties, although higher doses are reported to cause arrhythmias.<sup>(G60)</sup> Marrubin acid (obtained from the saponification of marrubiin) has been documented to stimulate bile secretion in rats, whereas marrubiin was found to be inactive.<sup>(5)</sup> White horehound is stated to possess bitter properties (BI 65 000 com-

pared to gentian BI 10 000–30 000) with marrubiin as the main active component.<sup>(G62)</sup>

Large doses of white horehound are purgative.<sup>(G10,G60)</sup> The volatile oil has antischistosomal activity.<sup>(6)</sup>

### Side-effects, Toxicity

The plant juice of white horehound is stated to contain an irritant principle, which can cause contact dermatitis.<sup>(G51)</sup> No documented toxicity studies were located for the whole plant, although an LD<sub>50</sub> (rat, by mouth) value for marrubin acid is reported as 370 mg/kg body weight.<sup>(5)</sup> The volatile oil is documented to be highly toxic to the flukes *Schistosoma mansoni* and *Schistosoma haematobium*.<sup>(6)</sup>

### Contra-indications, Warnings

None documented. Cardioactive properties and an antagonism of 5-hydroxytryptamine have been documented in animals.

**Pregnancy and lactation** White horehound is reputed to be an abortifacient and to affect the menstrual cycle.<sup>(G30)</sup> Uterine stimulant activity in animals has been documented.<sup>(G30)</sup> In view of this and the lack of safety data, the use of white horehound during pregnancy should be avoided. Excessive use during lactation should be avoided.

### Pharmaceutical Comment

The chemistry of white horehound is well documented. Limited pharmacological information is available, although expectorant properties have been reported which support some of the herbal uses. In view of the lack of toxicity data and suggested cardioactive properties, white horehound should not be taken in excessive doses.

### References

*See also* General References G2, G3, G6, G9, G10, G16, G30, G31, G32, G36, G37, G41, G43, G48, G51, G60, G62 and G64.

- 1 Kowalewski Z, Matlawska I. Flavonoid compounds in the herb of *Marrubium vulgare* L. *Herba Pol* 1978; 24: 183–186.
- 2 Henderson MS, McCrindle R. Premarrubiin. A diterpenoid from *Marrubium vulgare* L. *J Chem Soc* 1969; (C): 2014.
- 3 Cahen R. Pharmacologic spectrum of *Marrubium vulgare*. *C R Soc Biol* 1970; 164: 1467–1472.
- 4 Karryev MO *et al.* Some therapeutic properties and phytochemistry of common horehound. *Izv Akad Nauk Turkm SSR Ser Biol Nauk* 1976; 3: 86–88.
- 5 Krejčí I, Zadina R. Die Gallentreibende Wirkung von Marrubiin und Marrabinsäure. *Planta Med*; 1959; 7: 1–7.
- 6 Saleh MM, Glombitza KW. Volatile oil of *Marrubium vulgare* and its anti-schistosomal activity. *Planta Med* 1989; 55: 105.