

# Passionflower

## Species (Family)

*Passiflora incarnata* L. (Passifloraceae)

## Synonym(s)

Apricot Vine, Grenadille, Maypop, Passiflora, Passion Vine

## Part(s) Used

Herb

## Pharmacopoeial and Other Monographs

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

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

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

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

ESCOP 1997<sup>(G52)</sup>

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

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

Ph Eur 2002<sup>(G28)</sup>

## Legal Category (Licensed Products)

GSL<sup>(G37)</sup>

## Constituents<sup>(G2,G6,G22,G41,G64)</sup>

**Alkaloids** Indole-type. Harman (major), harmaline, harmalol, harmine and harmol have been reported. Of 17 different samples examined, only one contained alkaloids with a possible harmine content of 0.1 ppm.<sup>(1)</sup>

**Flavonoids** Pharmacopoeial standard, not less than 1.5%.<sup>(G15,G28)</sup> Vitexin, isovitexin and their C-glycosides, apigenin, luteolin glycosides (e.g. orientin, homoorientin and lucenin); kaempferol, quercetin and rutin.<sup>(2-7)</sup>

**Other constituents** Maltol and ethylmaltol ( $\gamma$ -pyrone derivatives), passicol (a polyacetylene),<sup>(8)</sup> fatty acids (e.g. linoleic acid, linolenic acid, myristic acid, palmitic acid and oleic acid), formic acid, butyric acid, sitosterol, stigmasterol, sugars and gum.

**Other plant parts** Coumarins (scopoletin and umbelliferone) are found in the root.

**Other *Passiflora* species** Cyanogenetic glycosides passiflorin, epipassiflorin and passitrifasciatin (*Passiflora biflora*, *Passiflora tamamcensis*, *Passiflora trifasciata*),<sup>(9)</sup> linamarin and lotaustralin (*Passiflora lutea*)<sup>(10)</sup> and prunasin (*Passiflora edulis*).<sup>(11)</sup>

## Food Use

Passionflower is listed by the Council of Europe as a natural source of food flavouring (category N3). This category indicates that passionflower can be added to foodstuffs in the traditionally accepted manner, but that there is insufficient information available for an adequate assessment of potential toxicity.<sup>(G16)</sup> In the USA, passionflower is permitted for use in food.<sup>(G65)</sup>

## Herbal Use<sup>(G2,G4,G6,G7,G8,G32,G43,G52,G54,G64)</sup>

Passionflower is stated to possess sedative, hypnotic, antispasmodic and anodyne properties. Traditionally, it has been used for neuralgia, generalised seizures, hysteria, nervous tachycardia, spasmodic asthma, and specifically for insomnia. The German Commission E approved internal use for nervous restlessness.<sup>(G3)</sup> Passionflower is used in combination with valerian root and lemon balm for conditions of unrest, difficulty in falling asleep due to nervousness.<sup>(G3)</sup> Passionflower is used extensively in homeopathy.

## Dosage

**Dried herb** 0.25–1.0 g or by infusion three times daily; <sup>(G6,G7)</sup> 0.5–2 g three or four times daily;<sup>(G52)</sup> 4–8 g daily.<sup>(G3)</sup>

**Liquid extract** 0.5–1.0 mL (1:1 in 25% alcohol) three times daily.<sup>(G6,G7)</sup>

**Tincture** 0.5–2.0 mL (1:8 in 45% alcohol) three times daily.<sup>(G6,G7)</sup>

## Pharmacological Actions

### *In vitro* and animal studies

CNS sedation, potentiation of hexobarbitone-induced sleeping time, anticonvulsant activity (at high doses) and a reduction in spontaneous motor

activity (at low doses) have been documented for maltol and ethylmaltol in mice.<sup>(12,13)</sup> Subsequent research documenting similar activities in mice was unable to attribute the observed activities to either flavonoid or alkaloid components present in the extract tested.<sup>(14)</sup> An aqueous ethanolic extract of passionflower administered intraperitoneally to rats (160 mg/kg) prolonged sleeping time induced by pentobarbital (50–4000 mg/kg) and reduced spontaneous locomotor activity.<sup>(14)</sup> The same extract (160 mg/kg, intraperitoneal or oral administration) raised the threshold to nociceptive stimuli in tail flick and hotplate tests.<sup>(14)</sup>

Rats showed reduced activity in a one-arm radial maze test after one week of daily oral administration of an aqueous ethanolic extract of passionflower (10 mg/kg).<sup>(G52)</sup> In mice, a 70% ethanol extract (1000 mg/kg, intraperitoneally) administered 10 minutes prior to sodium pentobarbital (40 mg/kg, intraperitoneally) resulted in a significant prolongation (40%) of sleeping time.<sup>(15)</sup> When given by gastric tube 1 hour prior to amphetamine (5 mg/kg, subcutaneous), the same extract (500 mg/kg) caused significant reduction in hypermotility. Oral treatment of mice with an ethanol extract of passionflower (25 and 50 mg/kg) reduced exploratory and spontaneous motor activities, prolonged sleeping time induced by pentobarbital, and inhibited aggressiveness and restlessness caused by amphetamines.<sup>(G52)</sup> The sedative activity was comparable with that of meprobamate (250 mg/kg), and greater than that of diazepam (10 mg/kg) and chlordiazepoxide (10 mg/kg). In another study in mice, sedative action, as assessed by prolongation of hexobarbital-induced sleeping time, was decreased by a 30% aqueous ethanol extract of passionflower (1.75 mg/kg, orally).<sup>(16)</sup>

A dry extract of passionflower (800 mg/kg, orally) containing 2.6% flavonoids resulted in a significant ( $p < 0.01$ ) anxiolytic effect, as assessed by prolongation of hexobarbital-induced sleeping time, whereas locomotor activity remained unaffected.<sup>(G52)</sup>

It has been suggested that the sedative effects of maltol and ethylmaltol mask the stimulant actions of harman alkaloids.<sup>(12)</sup> The CNS-depressant effect exhibited by *P. edulis* has been attributed to alkaloid and flavonoid compounds<sup>(17)</sup> and to a protein-like substance.<sup>(18)</sup> The pharmacological evidence generally supports sedative and anxiolytic effects of passionflower, although there are conflicting results. It is not clear which constituents are the active principles, and clinical data are lacking.<sup>(19)</sup> Maltol is reportedly an artefact and not a relevant constituent.<sup>(19)</sup>

Passicol exhibits antimicrobial activity towards a wide variety of moulds, yeasts and bacteria.<sup>(8)</sup> Group

A haemolytic streptococci are stated to be more susceptible than *Staphylococcus aureus*, with *Candida albicans* of intermediate susceptibility.<sup>(8)</sup>

### Side-effects, Toxicity

In mice, the acute toxicity of a fluid extract of passionflower (intraperitoneal injection) was stated as being greater than 900 mg/kg.<sup>(14)</sup> In rats, subacute oral treatment with an aqueous ethanol extract of passionflower 10 mg/kg for 21 days showed no changes in weight, rectal temperature or motor coordination.<sup>(G52)</sup>

Cyanogenetic glycosides have been documented for related *Passiflora* species.

### Contra-indications, Warnings

Excessive doses of passionflower may cause sedation.

**Pregnancy and lactation** No other data regarding the use of passionflower during pregnancy or lactation were located. In view of this, excessive use of passionflower during pregnancy and lactation should be avoided.

### Pharmaceutical Comment

The active constituents have not been clearly identified. CNS-sedative properties have been documented in animals, thus providing some data to support some of the traditional uses of passionflower. However, well-designed clinical trials assessing the reputed sedative properties of passionflower are lacking. In view of the lack of toxicity data, excessive use of passionflower should be avoided.

### References

See also General Reference G2, G3, G5, G6, G9, G15, G16, G22, G28, G30, G31, G32, G36, G37, G41, G43, G48, G52, G54, G56 and G64.

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