Passionflower

Passiflora incarnata

Common names

Maypop, passion vine, apricot vine

Family

Passifloraceae (passionflower)

Part used

Aerial parts

Background and traditional uses

Passionflower, also known as maypop, passion vine and apricot vine, is a perennial climbing vine in the *Passifloraceae* family. It grows in warm tropical climates including North and South America, Mexico, West India, Netherlands, Argentina and Italy.[1-5] It has a long history of traditional use in European, Ayurvedic, Siddha and Unani medicinal systems as a powdered herb, tea or herbal extract.[2,4,6,7]

The name *Passiflora* is derived from the Latin word *passio*, following its discovery in Peru in 1569 by Spanish explorers. They believed the flowers appearance symbolised the 'Passion of Christ', with the coronal threads in the centre of the flower representing the crown of thorns, the five stamens, three stigmas and 10 petals symbolising Christ's wounds, the nails on the cross and the 10 true apostles, respectively.[2,5,8]

The ancient and traditional uses of passionflower across many countries are widespread and includes sedative, analgesic, antispasmodic and anxiolytic actions.[4,5,7]

Actions

Primary:[5-11]

- Anxiolytic
- Sedative
- Hypnotic
- Spasmolytic

Secondary:[3,5-11]

- Analgesic
- Anti-inflammatory
- Antimicrobial
- CNS depressant
- Uterine stimulant
- Antiasthmatic
- Aphrodisiac
- Anticonvulsant

Applications and indications

- To benefit generalised anxiety and aid sleep quality.[12-15]
- For restlessness and resulting irritability, insomnia and nervous tension.[16]
- For the treatment of neuropathic pain.[1]

Active constituents and pharmacodynamics

Flavonoids are the main constituents of passionflower and they are concentrated in the leaves. The primary flavonoids are apigenin, luteolin, quercetin and kaempferol. The mono-C-glycosyl flavonoid derivatives include vitexin, orientin, isovitexin, iso-orientin and their 2"-beta-D-glucosides, and the di-C-glycosyl derivatives are schaftoside, isoschaftoside, swertisin, vicenin-2 and lucenin-2.[3,5,7]

Alkaloids detected in source plants of passionflower are the simple indole alkaloids harman, harmol, harmine, harmalol and harmaline.[3,5,7,17]

Investigations into the pharmacodynamics of passionflower and its constituents are primarily in relation to central nervous system (CNS) activity.[5] The flavonoid constituents are considered to be the main constituents responsible for the therapeutic effects. They are reported to have an affinity for gamma-aminobutyric acid (GABA) A and GABA B receptors and inhibitory effects on the uptake of GABA, indicating that modulation of the GABA system may be a key mechanism of action underlying CNS effects.[7,18-22]

Other potential mechanisms of action attributed to flavonoids from passionflower are analgesic effects via opioid and nicotinic receptors[1,4,22] and antagonism of dopamine D2 and 5-HT2 receptors.[4]

Summary of clinical evidence

Sedative

A double-blind, placebo-controlled, crossover clinical trial investigated the efficacy of passionflower herbal tea on human sleep in 41 subjects (18-35 years) with mild fluctuations in sleep quality.[15] All participants were given either a tea bag containing 2g of dried passionflower (leaves, stems, seeds and flowers) or a placebo tea bag containing 2g of parsley to consume once a day for seven days followed by a seven-day washout period before taking the alternate treatment also for seven days. Subjects recorded their sleep details daily in a diary format and on the seventh day of each of the treatment periods, all subjects filled out the Spielberger's State-Trait Anxiety Inventory (STAI).[15] The STAI uses 2 subjective subscales, the State Anxiety Scale (S-Anxiety) and Trait Anxiety Scale (T-Anxiety) to evaluate current feelings of anxiety and aspects of "anxiety proneness," respectively.[23]

The active treatment group demonstrated a significantly better rating for sleep quality (including reduced sleep-onset latency and improved sleep efficiency) compared with placebo ($p<0.01$). These findings indicate that low dose intake of passionflower resulted in short-term subjective sleep benefits.[15]

Anxiolytic

A double-blind placebo-controlled study evaluated the effect of passionflower extract in people diagnosed with generalised anxiety disorder. Thirty subjects (18-50 years old) were given sertraline 50mg daily for two weeks increasing to 100mg/day. Of these, 14 were given passionflower (Pasipay - 15 drops three times daily) or placebo (n=16) for four weeks.[12] Pasipay was obtained from the Iran Darouk Pharmaceutical Co.[12] which is prepared from standardised extract of leaves, flower and fruit of passionflower with the total flavonoid content including vitexin and rutin relating to an equivalent 4% (w/w) dried plant material.[22] The treatment group had a significant decrease in auditory omission errors compared with placebo with low side effects observed. This study suggests that passionflower extract may be a beneficial adjunct in the treatment of generalised anxiety disorder.[12]

The efficacy of passionflower extract in subjects with anxiety during dental procedures was also assessed in a randomised, placebo-controlled clinical trial.[13] Subjects required to undergo dental procedures were randomised into three groups: treatment (Pasipay passionflower extract drops - 20 in the evening before and 20 following the procedure; n=21), placebo (administered as per the treatment group; n=21) or negative control group (nothing administered; n=21). Anxiety levels were measured by a Numeric Rating Scale (NRS) before treatment and 10, 30, 60 and 90 minutes following administration. There was a significant difference in mean anxiety scores in the treatment group before and after administration and between the treatment vs placebo and control groups ($p<0.0001$; $p<0.001$ respectively). This study indicates that passionflower could be considered effective in reducing anxiety as a premedication to medical procedures.[13]

A similar result was observed in another randomised, double-blind, placebo-controlled study investigating the effect of passionflower extract in subjects undergoing surgery.[14] Sixty patients were randomised to treatment with 500mg Pasipay passionflower (n=30) or placebo (n=30) 90 minutes before undergoing surgery. Anxiety levels were measured by a Numeric Rating Scale (NRS) before treatment and 10, 30, 60 and 90 minutes following administration. The treatment group had significantly lower NRS anxiety scores compared to the control group ($p<0.001$). This study suggests that passionflower is beneficial for reducing anxiety.[14]

Analgesic

Two separate animal studies assessed the analgesic activities of passionflower leaf extract.

In a study with mice, extracts of passionflower leaves (BEPl) and flowers (BEPlF) were dosed at 150, 300 and 600mg/kg and resulted in significant reductions in duration of paw licking in neurogenic and inflammatory phases and in the number of sodium chloride-induced eye wiping compared with the control group. The higher the dose of passionflower used, the greater the efficacy of treatment.

The study demonstrates that the extract had significant analgesic effects potentially via modulation of opioid and nicotinic receptors.[4]

A subsequent study evaluated the analgesic and antiallodynic effects of passionflower extract in a rat model of streptozotocin-induced neuropathic pain using the abdominal constriction assay and hot plate test.[1] A non-ethanol based semisold extract of passionflower (no dried herb equivalent was provided) was dosed at 200mg/kg and 600mg/kg to test subjects. Dose-dependent medication-reversible analgesic and anti-allodynic effects were observed by an increase in paw withdrawal threshold and withdrawal latency.[1]

These results suggest that passionflower extract has significant analgesic effects and that it may be effective for management neuropathic pain.

Anticonvulsant

Several animal studies have investigated the anticonvulsant properties of passionflower extracts.

Following repeated administration of pentylenetetrazol to induce sub-convulsive seizures at an interval of five days for 15 days, mice were given different doses of passionflower extract daily (150, 300 and 600mg/kg) versus a control group (no further information was provided on dosing). The extract-treated group had significantly reduced seizure severity and immobility phases compared with the control group ($p<0.05$) as well as retention of serotonin and noradrenaline levels in the brain.[24]

Two other studies highlight the possible mechanisms underlying the anticonvulsant effect of passionflower. Passionflower extract was observed to prolong time to seizure onset and reduce seizure duration, possibly via the GABA receptor complex.[21,22]

Antiaddiction

A randomised, double-blind placebo controlled trial assessed the efficacy of passionflower extract on symptoms of opiate withdrawal syndrome. A total of 65 opiate addicts undergoing drug detoxification taking clonidine were randomly administered passionflower extract (20 drops three times daily) or placebo for 14 days. No further dosage information was provided. Severity of withdrawal symptoms were assessed on days zero to four, seven and 14 using the Short Opiate Withdrawal Scale (SOWS).[25]

The herb-drug group had significantly reduced mean mental symptom scores on days two to four, seven and 14 and mean total scores on days four and 14 compared with the drug only group. These results indicate that passionflower extract may be an effective adjunct in opiate withdrawal protocols.[25]

Hypoglycaemic

The hypoglycaemic and hypolipidaemic effects of orally administered passionflower leaf extract was investigated in an animal study.[26] The passionflower leaf extract was produced from 100g of leaf material extracted with petroleum ether (200mL) and methanol (200mL). The methanolic extract (100mg) (MEPLI) was dissolved in 10mL of distilled water to prepare a stock solution of 10mg/mL. The MELPI was orally administered in doses of 100 and 200mg/kg to streptozotocin-induced diabetic mice and compared to standard medication protocols.

In the 200mg/kg passionflower group there was a significant decline in fasting blood glucose levels ($p<0.001$), urine glucose levels, estimated liver glycogen content ($p<0.001$), oral glucose tolerance test ($p<0.001$), serum lipid profiles ($p<0.01$) and body weight ($p<0.05$) compared with the medication and control group. Pancreatic histopathological analysis also observed cellular regeneration of streptozotocin-induced necrosis in the herb treated mice.[26] This study indicates passionflower extract may have hypoglycaemic and hypolipidaemic activity.

Dosage summary

Liquid extract (1:1): 3.5-56mL weekly[7]
Liquid extract (1:2):15-40mL weekly[27]
Dried herb equivalent: 2g three to four times daily[7]

Safety information

- Safety during pregnancy and lactation has not been established however no adverse effects have been reported.[7]
- Contraindicated in individuals with hypersensitivity to the active substance.[7]
- Concomitant use with alcohol or pharmaceutical sedatives may have an additive effect so is not recommended unless advised by a healthcare professional.[7]
- May impair ability to drive and use machinery so caution is advised when driving or operating heavy machinery.[7]
- Orally, passionflower may cause dizziness, confusion, sedation and ataxia in some patients.[11]

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