



Monograph

Petasites hybridus (Butterbur)

Introduction

Petasites hybridus (butterbur) is a perennial shrub, found throughout Europe as well as parts of Asia and North America, that has been used medicinally for centuries. During the Middle Ages butterbur was used to treat plague and fever; in the 17th century its use was noted in treating cough, asthma, and skin wounds.^{1,2} The plant can grow to a height of three feet and is usually found in wet, marshy ground, in damp forests, and adjacent to rivers or streams. Its downy leaves can attain a diameter of three feet, making it the

largest of all indigenous floras, and their unique characteristics are responsible for the plant's botanical and common names. The genus name, *Petasites*, is derived from the Greek word *petasos*, which is the felt hat worn by shepherds.² The common name of butterbur is attributed to the large leaves being used to wrap butter during warm weather.³ Other common names include pestwurz (German), blatterdock, bog rhubarb, and butter-dock.² Currently, the primary therapeutic uses for butterbur are for prophylactic treatment of migraines, and as an antispasmodic agent for chronic cough or asthma. It has also been used successfully in preventing gastric ulcers, and in treating patients with irritable bladder and urinary tract spasms.^{2,4}

Active Constituents

Extracts of *Petasites hybridus* are prepared from the rhizomes, roots, and leaves. The main active constituents are two sesquiterpenes, petasin and isopetasin. Petasin is responsible for the antispasmodic properties of the plant by reducing spasms in smooth muscle and vascular walls, in addition to providing an anti-inflammatory effect by inhibiting leukotriene synthesis. Prostaglandins are important mediators in the inflammatory process and isopetasin's positive impact on prostaglandin metabolism contributes to the effectiveness of *Petasites* extracts. Extracts of the plant also contain volatile oils, flavonoids, tannins, and pyrrolizidine alkaloids. As these alkaloids are believed to be toxic to the liver and carcinogenic in animals, extracts are available in which the pyrrolizidine alkaloids have been removed.²

Mechanisms of Action

The active constituents of Petasites have an antispasmodic effect on vascular walls and appear to have an affinity for cerebral blood vessels. Petasites' ability to reduce smooth muscle spasm suggests it may be a useful therapeutic tool in treating urinary disorders, menstrual cramps, migraine headaches, kidney stone disorders, obstruction of bile flow, as well as other liver or gastrointestinal disorders associated with smooth muscle spasm.¹ The anti-inflammatory properties of butterbur extracts are attributed to inhibition of lipoxygenase activity and down-regulation of leukotriene synthesis, and are primarily due to the petasin content.⁵

Clinical Indications

Migraine Headache

Two clinical studies using 50 mg of a standardized Petasites extract twice daily for 12 weeks demonstrated its effectiveness as a prophylactic treatment for migraines. Both studies were double-blind, placebo controlled, and involved a total of 128 patients. The results of the two studies showed a significant reduction (as much as 60%) in frequency of migraine attacks compared to placebo. Other improvements in the Petasites group included a reduction in the number of days with migraines per month, a decrease in migraine-associated symptoms, and diminished duration and intensity of pain. No adverse reactions were reported in either study. Butterbur extract's high degree of efficacy and excellent tolerability accentuates its value in the prophylactic treatment of migraines.^{6,7}

Asthma/Bronchitis

Various parts of the butterbur plant have been used for centuries to treat bronchial asthma and whooping cough, and in folk medicine the leaves of the plant were used as a mucus-reducing cough remedy. Butterbur's ostensible effectiveness in treating upper respiratory disorders such as asthma and bronchitis is attributed to the antispasmodic properties of the petasin constituent. The plant's anti-inflammatory action would also help calm the reactive airways seen in both asthma and bronchitis.² A Polish clinical study conducted in 1998 examined the influence of Petasites on lung ventilation and bronchial reactivity in patients suffering from asthma or chronic obstructive bronchitis. The study included three test groups and two control groups. Test Group A exhibited an improvement in forced expiratory volume (FEV1) three hours after an oral dose of 600 mg Petasites extract. Group B experienced a significant decrease in bronchial reactivity two hours after receiving an oral dose of 600 mg Petasites extract. Group C patients were treated for 14 days and received 600 mg of the extract three times daily. Some patients (n=10) were also given corticosteroids due to disease severity. All three groups exhibited a decrease in bronchial reactivity, but the patients in Group C who received no corticosteroids had the most pronounced results.⁸ These results indicate Petasites might be helpful in improving lung ventilation in patients with asthma or chronic obstructive bronchitis.

Gastrointestinal Disorders

Butterbur's use as an antispasmodic for gastrointestinal conditions dates back to the Middle Ages. The leaves and rhizomes were used to treat spasms of the digestive tract associated with colic, plague, and bile flow obstruction.^{9,10} A German study conducted in 1993 found ethanolic extracts of *Petasites hybridus* blocked ethanol-induced gastric damage and reduced ulcerations of the small intestine caused by indomethacin, an anti-inflammatory drug used to treat arthritic conditions. The results of this study were attributed to inhibition of lipoxygenase activity and leukotriene biosynthesis.¹¹

Safety

Until recently, side effects from Petasites extracts had not been reported. In September 2000, a study conducted in Taiwan noted the petasin constituent, responsible for many of butterbur's pharmacological properties, inhibited the production of testosterone in rat testicular cells, but did not speculate whether this effect would be applicable in humans.¹² The plant's pyrrolizidine alkaloids are thought to cause liver damage and to be carcinogenic in animals; however, extracts are commercially available in which the pyrrolizidine alkaloids have been removed. There are no known interactions with either pharmaceutical or over-the-counter anti-inflammatory agents; however, use of Petasites extracts during pregnancy and lactation is contraindicated.¹

Dosage

Typically, Petasites extracts are standardized to contain a minimum of 7.5 mg of petasin and isopetasin. The adult dosage ranges from 50-100 mg twice daily with meals. When used to treat migraines, administration is prophylactic and supplementation should be carried out daily for four to six months and then tapered until migraine incidence begins to increase. Dosage regimens for asthma and gastrointestinal disorders are as yet undefined, dictating the need for further research.

References

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