Butterbur: Beyond Migraines

Introduction

Butterbur (genus *Petasites*) is a Eurasian plant that grows mainly along the damp, marsh areas and riverbanks of Europe and Northern Asia. Upon ripening, it bears a strong resemblance to rhubarb, and it has been utilized as part of the folk medicine of various Eurasian cultures for at least two millennia. One of its earliest recorded uses was by the Greek physician Dioscorides, who prescribed using its grinded leaves to treat skin ulcers in the first century AD. In northern Europe during the Middle Ages, it was used to treat the feverish symptoms of the infamous Black Death, the ominous name given to the plague that wiped out a third of the continent. In the 17th century, butterbur's use was also noted for treating coughs and asthma. Since then, it has consolidated a reputation as an anti-spasmodic and an analgesic, with the latter gaining particular acceptance and recognition in the treatment of migraines. The former, however, holds promise for the treatment of allergies. In fact, butterbur has been clinically tested among patients with seasonal allergic rhinitis, bronchitis and asthma. This research has led to a renewed interest in butterbur, particularly in the Far East and Japan (where pollinosis affects 10% of the population), as a preventative treatment for common allergies.

How Does Butterbur Work?

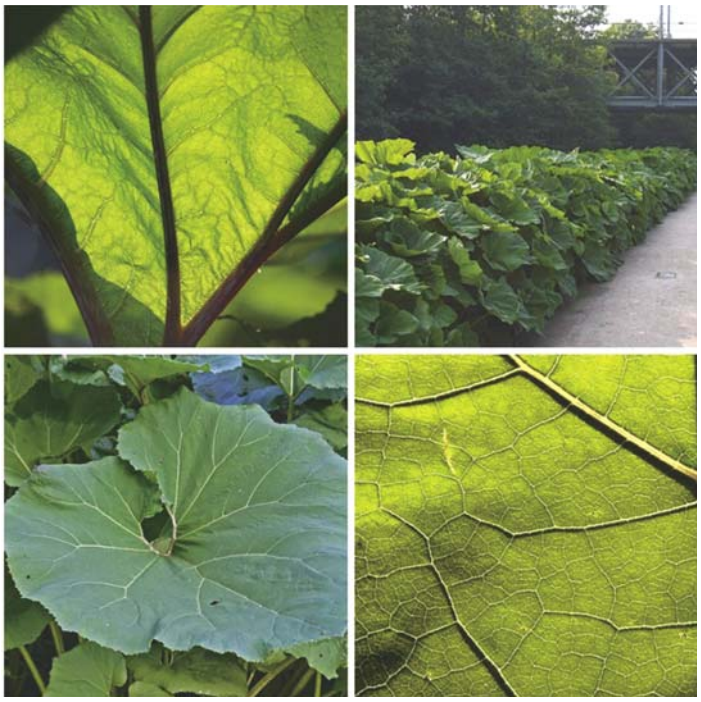
Researchers in Japan have identified within Japanese Butterbur (*Petasites Japonicus*) specific sesquiterpenes – biologically active fractions – with demonstrated anti-allergenic activity.[1] The full biological activity of Japanese butterbur is actually quite diverse, with anti-oxidative[2], anti-inflammatory[3], and vasodilative[4] capabilities (among others) being well documented. While all of these activities contribute indirectly to the alleviation of allergy symptoms, there are some very specific parameters for measuring the inhibition of the allergic response itself, as well as identifying which sesquiterpenes within butterbur affect those parameters.

A primary parameter of the allergic response is degranulation. This happens when the body of an allergy-prone individual produces excess IgE, or Immunoglobin E (a type of antibody meant to protect against infections), which in turn attaches itself to mast cells, causing degranulation. Degranulation is the release of granules from the mast cells in an immune response process called exocytosis. Granules are cytotoxic, antimicrobial molecules whose release is accompanied by a corresponding synthesis and release of histamine, cytokines, and leukotrienes, all of which launch an inflammatory cascade leading to the standard symptoms of an allergic reaction (mucous buildup, runny nose, irritated eyes, etc). Anaphylaxis represents the most severe form of such a reaction.

Defusing Degranulation

Japanese scientists have identified those biologically active sesquiterpenes within butterbur that are most effective in their inhibition of degranulation. The most potent is a particularly novel sesquiterpine glycoside sulfate called fukinolic acid.[5] Fukinolic acid's anti-degranulation effects have been evaluated in both *in-vitro* and *in-vivo* (animal) studies by measuring its impact on beta-hexosaminidase, an antigen-dependent enzyme central to degranulation. These studies reveal that while many fractions of Japanese Butterbur (*Petasites Japonicus*) suppress this enzyme, fukinolic acid does so at a rate that is more than twice as effective as butterbur extract as a whole.[6] It is important to appreciate that degranulation from the mast cells is an early and primary initiator of the allergic reaction (after elevated IgE production) and precedes the release of histamines – which are the point of intervention for most prescribed anti-allergy medications. This helps to define the role of butterbur extract as a natural remedy, which (in general) differ from their pharmaceutical counterparts by eliciting their effects in a manner that is more fundamentally preventative than interventionist.

The biological course of events that follow degranulation is a familiar one: inflammation caused by an increase in leukotriene and TNF-alpha production, leading to the previously mentioned and all too-familiar symptoms of an allergic reaction.



Japanese butterbur extract has also been shown to inhibit both leukotriene release and TNF-alpha production over and above its concurrent inhibition of degranulation.[7]

Real World Results

The clinical studies that have examined butterbur's effectiveness in alleviating the symptoms of allergic rhinitis, asthma and bronchitis have been known for about a decade now. A 1998 Polish study examined the effect of butterbur on the lung ventilation and bronchial reactivity in chronic obstructive bronchitis or asthma patients. Some patients reported 'significant decreases' in bronchial reactivity within just two hours of receiving an oral dose of 600 mg of butterbur extract. Some patients were also given corticosteroids to reduce severity, yet those patients given butterbur extract without concurrent corticosteroid treatment experienced the most pronounced improvements. This led the scientists to conclude that "*Petasites* might be helpful in improving lung ventilation in patients with asthma or chronic obstructive bronchitis."[8] Suffice to say, the symptomatic overlap between these conditions and common allergies is significant.

In a more recent 2004 trial in Germany, 80 subjects diagnosed with asthma (including 16 children) were given butterbur extract in a prospective, non-randomized, open trial. The study permitted the concomitant use of asthma medications. At the end of the study, the number, duration, and severity of asthma attacks decreased, while pulmonary functions improved. Furthermore, more than 40% of the subjects who were using asthma medications at the beginning of the study had reduced the intake of these medications by the study's end.[9] In yet another study, this one conducted in 2002 with 131 seasonal allergic rhinitis patients as subjects, butterbur extract was found to be as effective as the commonly prescribed antihistamine cetirizine in the treatment of symptoms associated with seasonal allergic rhinitis. In addition, about two-thirds of those receiving cetirizine reported symptoms of drowsiness and fatigue (in spite of the fact that cetirizine is not considered a sedative antihistamine), while no such sedative effects were reported in the butterbur group.[10]

In Conclusion

Extracts of the genus *Petasites* have been associated with reports of the potential for hepatic damage and carcinogenic activity due to the plant's pyrrolizidine alkaloids. However, commercial extracts are available that have these alkaloids removed, especially in Europe where the pharmaceutical giant Weber & Weber ® have a patented procedure to remove such alkaloids from their own finished butterbur extract known as Petadolex®. The commercially available Japanese subspecies of butterbur (*Petasites japonicus*) do not contain these alkaloids at all.

References

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