

# Botanical Medicines for Headache

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## Abstract

Various types of headache, such as tension, migraine, and cluster headaches, cause widespread morbidity. Herbal medicines have long held a place of importance in remedying headaches effectively and safely. This article discusses herbs used for headaches, including camphor, *Capsicum* spp. (cayenne), *Ginkgo biloba* (ginkgo), *Juniperus communis* (juniper), *Melaleuca leucodendron* (cajeput), *Mentha x piperita* (peppermint), *Petasites hybridus* (butterbur), *Piscidia piscipula* (Jamaica dogwood), *Pueraria montana* var *lobata* (kudzu), *Rosmarinus officinalis* (rosemary), *Salix* spp. (willow), *Sinapis alba* (mustard), *Syzygium aromaticum* (clove), *Tanacetum parthenium* (feverfew), and *Zingiber officinale* (ginger).

## Introduction

Various types of headache cause widespread morbidity. Herbal medicines have been historically important in treating these conditions. This is evidenced by the derivation from natural products of two of the oldest and still quite effective drugs for alleviating acute headache pain: aspirin and ergotamine. Unfortunately, both of these treatment agents can have potentially significant adverse effects.

Many of the most common headache medications, including aspirin, acetaminophen, and codeine, can cause rebound headaches when stopped.<sup>1,2</sup> This leads to the no-win situation of enduring a headache without the medicine or stopping the medicine and experiencing the headache. Worse still is the case of headache caused directly by overuse of a headache medication.<sup>3</sup> There is clearly a need for alternative treatments, both to avoid these problems and for use by people who are not helped by such pharmaceutical medications. We will review botanical options to help patients with three major types of headache: tension, migraine, and cluster headache.

## Types of Headache

By many estimates, the most common type of headache is tension-type headache. The official diagnostic criteria for such headaches are given in the box entitled Definitions of Types of Headache. Tension headache is not associated with any significant chronic morbidity in most patients, though an occasional patient may react to the recurrent pain by becoming depressed or losing energy. Before treating patients for tension headache, it is important to identify and eliminate or alleviate various potential causative or contributing factors. These include stress (emotional, mental, or physical), menstrual symptoms, sleep disturbance, eye strain, muscle tension, poor posture, food allergies, and caffeine withdrawal. Once these have been removed or mitigated, herbal therapies can be considered.

Migraine headache is more complex than tension headache, and can sometimes be preceded by an aura (see Definitions of Types of Headache). Migraine headache appears to be caused by a complex interplay of neurologic and vascular changes. Waves of neurologic changes can be observed in the brain during a migraine headache, and can trigger vascular changes that affect the blood supply to the brain. Decreased blood flow may explain the aura experienced in some cases of migraine headache, or may explain the neurologic changes themselves. In either case, the factors causing the neurovascular alterations in migraine must be sought out and eliminated. Hormonal factors, reactions to foods (including reactions to any numbers of allergens, dietary monoamines, and dietary tannins), and stress must all be ruled out as playing a role.

Cluster headache, the third major type of headache, is a trigeminal autonomic phenomenon, and is unusual in being much more common in men than in women. It is now believed that cluster headaches are painful neurologic syndromes that trigger a normal parasympathetic reflex, and that subsequent sympathetic responses are abnormal.

## Counterirritants

Topical application of counterirritant botanicals is one of the simplest, safest, and most effective therapies for interrupting a developing headache or stopping a headache in progress. These remedies include many steam-distilled volatile oils, notably of

### Cayenne for Headaches

As suggested by Agatha Thrash, M.D.

Tell your patient to place 0.25 tsp of good-quality cayenne powder in hot water. Old powder loses its potency and will not burn when applied (nor will it relieve pain effectively). The powder should be allowed to settle at the bottom of the cup. The patient can then dip a cotton swab in the extract and apply to the nasal mucosa on the same side as the headache (both sides for bilateral problems). Instruct the patient to repeat this every 30 minutes if necessary.

Alternatively, a few drops of tincture of cayenne can be placed in 1 oz of water and this solution can be swabbed into the nose.

In both cases, there should be initial burning for approximately 10 minutes, though this will cease after repeated applications.



*Mentha x piperita* (peppermint).

### Mustard Foot Bath for Acute Headaches

As suggested by Silena Heron, N.D.

Have the patient prepare a foot bath as hot as possible, while having hot water nearby to add to the bath to keep it hot. The patient should then add 1–2 tablespoons of mustard powder (or cayenne if that is what is available) to the water. This mixture will initially sting, cause a burning sensation, and turn the feet red (in a light-skinned patient), but an actual burn is very unlikely. The patient should keep the feet in the water for 15–20 minutes, and keep ice on the neck throughout this period.



*Rosmarinus officinalis* (rosemary).

## Definitions of Types of Headache

### Cluster headache

- At least five attacks
- Unilateral severe pain lasting 15–180 minutes
- At least one of the following along with headache (each occurring on the same side as the headache): conjunctivitis or tearing, nasal congestion or rhinorrhea, eyelid edema, sweating, miosis or ptosis, or restlessness/irritation (generalized)
- Clusters of up to 8 daily headaches occur at intervals of every other day

### Migraine without aura

- At least five attacks
- Duration 4–72 hours
- Nausea/vomiting and/or photophobia and phonophobia
- At least two of the following: unilateral, pulsatile, moderate-or-severe pain, aggravation by (or deterrence from) routine activities
- Not caused by any other disorder

### Migraine with aura (general)

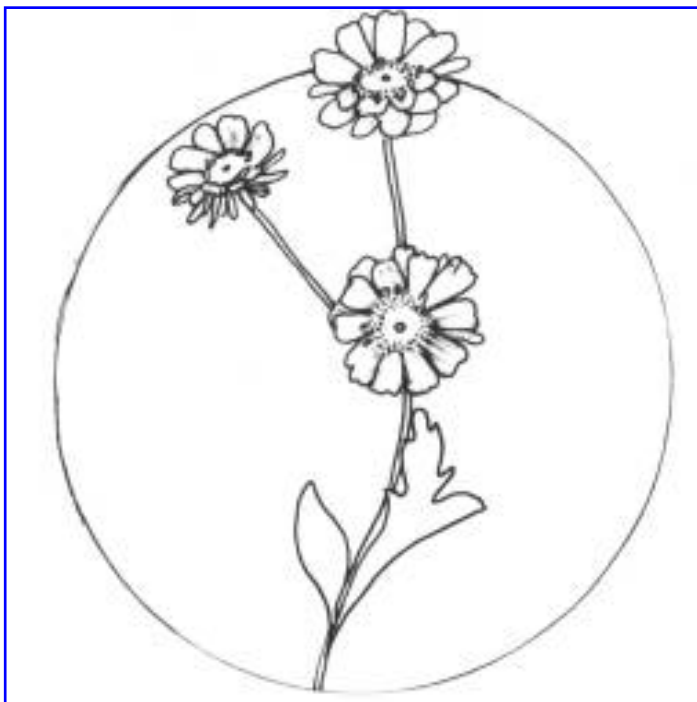
- At least two attacks with one of the following: fully reversible flickering lights or loss of vision, fully reversible paresthesias, or fully reversible dysphasia

- At least two of the following: homonymous visual symptoms, unilateral sensory symptoms, development over 5 minutes, duration 5–60 minutes
- Like migraine without aura, but headache begins during or within 60 minutes of aura
- Many subtypes exist

### Tension-type headache

- At least 10 attacks with the features listed below
- Duration 30 minutes to 7 days
- Headaches on fewer than 12 days a year
- Unaccompanied by nausea or vomiting (though loss of appetite can occur)
- Photophobia or phonophobia alone, but not both, or the absence of both
- At least two of the following: bilateral location, nonpulsatile pain, mild-to-moderate intensity (not prohibiting normal activities of daily living), no aggravation by continuation routine activities

Source: Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders, 2nd ed. Cephalalgia 2004;24(suppl1):1–151.



*Tanacetum parthenium* (feverfew). Drawing © by Kathy Abascal, B.S., J.D., R.H. (AHG).

*Mentha x piperita* (peppermint), *Rosmarinus officinalis* (rosemary), and *Juniperus communis* (juniper). These remedies appear to work in part by directly penetrating the skin and reducing muscular and possibly vascular spasm, and also by affecting nerve function. Supporting the historical tradition of applying these oils to reduce pain was the demonstration that in 32 healthy subjects, topical application of peppermint and *Eucalyptus globulus* (eucalyptus) volatile oils relaxed mental processes, relaxed muscles, and increased cognitive performance without decreasing sensitivity to pain as compared to placebo.<sup>4</sup> In this same study, a combination of the two oils did reduce sensitivity to pain.

This age-old practice has also been confirmed in a clinical trial involving subjects with tension-type headache. In this case, a combination of camphor, menthol, *Melaleuca leucodendron* (cajeput) volatile oil, and *Syzygium aromaticum* (clove) volatile oil, given in three topical applications spaced at 30-minute intervals, was as effective as acetaminophen and more effective than placebo in reducing pain.<sup>5</sup>

Another potent counterirritant is *Capsicum* spp. (cayenne) fruit, a major condiment in preparing spicy food. By activating vanilloid receptors, capsaicin and related compounds in *Capsicum* spp. are responsible for the burning sensation caused by cayenne pepper. Capsaicin exerts an analgesic effect by stimulating pain-sensing C nerve fibers and rapidly depleting the neurotransmitter substances by which these fibers convey pain signals to the brain.<sup>6</sup>

At least two clinical trials with capsaicin have shown it to be beneficial in migraine and cluster headache. In one of these trials, thrice daily intranasal application of a capsaicin cream dramati-

cally decreased pain during cluster headaches.<sup>7,8</sup> Though this treatment can initially be quite irritating and cause burning, the latter is rapidly replaced by relief of the headache, which can be well worth the initial discomfort of the treatment. A further trial found that nasal application of capsaicin ipsilateral to the side affected by headache could reduce the recurrence of cluster headache, whereas its contralateral application had no effect.<sup>9</sup> A single, preliminary double-blind trial has been reported of intranasal capsaicin for migraine.<sup>10</sup> This found that as compared to an acidic placebo that also caused burning, capsaicin dramatically reduced the pain of migraine. These findings suggest that capsaicin merits further research in treating cluster and migraine headache. See the box entitled Cayenne for Headaches for a convenient way in which patients can use cayenne for treating such headaches.

Another traditional counterirritant is *Sinapis alba* (mustard) powder. This can be nearly as potent as cayenne, although it seems to have fallen out of favor since the growth of research-based support for capsaicin. A traditional approach to using mustard powder is presented in the box entitled Mustard Foot Bath for Acute Headaches.

Counterirritants work well when used in conjunction with hydrotherapy and massage therapy, which themselves have great potential for relieving headache pain and possibly for treating underlying causes of headache.<sup>11</sup> It is common to use volatile oils mixed into massage oils, and if appropriate ones are chosen they may be beneficial in headache.

## Oral Spasmolytic Nervines

Not every patient with headache is willing to use or is helped by topical therapies. However, many choices also exist for oral herbal treatment, both to prevent and to stop headaches of various types. One of the most common and useful treatments employs the herbs known as “nervines,” which are recognized both for relaxing smooth muscle and for relieving anxiety. We have previously reviewed these herbs, primarily as agents for relieving various psychologic conditions.<sup>12</sup> Here we focus on them as headache remedies.

Perhaps the most familiar nervines in North America have not been studied as headache remedies, but were traditionally used in this way. Some examples, ranging in order from mildest to strongest, include *Eschscholzia californica* (California poppy), *Pasiflora incarnata* (passionflower), *Scutellaria lateriflora* (skullcap), *Valeriana* spp. (valerian), and *Piscidia piscipula* (Jamaica dogwood). The last and strongest of these, Jamaica dogwood, is potentially potent enough to abrogate even a strong migraine or cluster headache. A dose of the tincture of this herb taken orally at 2–3 mL every 2–3 hours may be necessary for this effect. Other herbs may be effective for more mild migraine headaches or to reduce the severity of headaches of other kinds.

*Pueraria montana* var. *lobata* (kudzu) root is a spasmolytic used in traditional Asian medicine. There are older reports of its effective use for migraine.<sup>13</sup> Kudzu has reportedly been found effective in Chinese trials for relieving cerebral artery spasm.<sup>14</sup> Kudzu is also a rich source of phytoestrogenic isoflavones, and so is also probably



*Salix* spp. (willow).



*Ginkgo biloba* (ginkgo).

good for treating menstrual or menopausal migraine headaches. A previous trial involving soy isoflavones and two hormone-modulating herbs not currently believed to be phytoestrogenic, *Angelica sinensis* (dong quai) and *Actaea racemosa* (black cohosh), found them to be significantly more effective than placebo in relieving menstrual migraine headaches.<sup>15</sup> Although it is not proven that kudzu would have the same benefit, this is likely to be so.

The greatest benefit of kudzu probably lies in preventing headaches, but it can also ease or stop headaches in progress. A typical dose of a kudzu-root glycerite or tincture is 3–5 mL taken three times per day (or more often during acute headaches). If the powder is used (only unbleached or brown, medicinal-grade powder should be used, and not the white form used as a cooking starch), the dose is 3–5 g taken thrice daily.

The most recently popular spasmolytic herb for headache is *Petasites hybridus* (butterbur). Butterbur does not have a strong history of use as a nervine, but two double-blind trials have investigated the efficacy of a standardized extract of butterbur root for treating migraine.<sup>16</sup> Both trials found that a dose of 150 mg taken twice daily was significantly more effective than placebo in reducing the frequency of migraine attacks over a 3–4 month period. Since butterbur contains unsaturated pyrrolizidine alkaloids, which are potentially hepatotoxic, only extracts from which these compounds have been removed should be used for more than 2 consecutive weeks. The exact mechanisms of action of butterbur have not been determined, although it clearly does have smooth-muscle-relaxing effects.

### Modulators of Inflammation

Inflammation and inflammatory intermediates undoubtedly play a significant role in many types of headache. Therefore, many herbs that modulate inflammation have had a prominent place in the treatment of headache. Perhaps most notable of these are the salicylate-rich herbs, including willow (*Salix* spp.), aspen (*Populus tremuloides*), and birch (*Betula* spp.). These herbs have a long history of use in all types of headache, as well as in rheumat-

ic disease, low back pain, and arthritides. Modern aspirin, a semisynthetic variant of salicylic acid, is a well-documented remedy for headache pain, but salicylate-containing herbs can also prevent and decrease headache pain, and do not seem to have the potential of aspirin for causing rebound headaches. A typical adult dose of the tincture of any of the three herbs named here is 3–5 mL every 2–3 hours during an acute attack.

Surprisingly, only one modern trial appears to have been conducted on the efficacy of these herbs for headache. This trial used topical salicin, a glycoside found in *Salix* spp., along with a cloth mask covering the eyes so as to block any headache-inducing component of light, and compared this to the same mask with a placebo, in patients with tension or migraine headache.<sup>17</sup> Topical salicin was significantly more effective than placebo at reducing headache pain.

Another well-known inflammation-modulating botanical for headache is *Tanacetum parthenium* (feverfew). Some meta-analyses of clinical trials support regular intake of the leaves of this herb for reducing the frequency of migraine, while other reviews maintain that evidence for the efficacy of this preparation is inconclusive.<sup>18,19</sup> Trials have used many different types of feverfew products, although all of those that reached a positive result used whole-leaf products—either dried or freeze-dried. Extracted products have generally not done well in clinical trials. The traditional approach is to eat one leaf per day of feverfew taken freshly from the plant, though a greater number of leaves might be more effective. The dose of dried or freeze-dried encapsulated leaf is 500–1000 mg taken twice or thrice daily. Contrary to many reports, there is no evidence that in clinical trials feverfew causes oral ulcers any more often than does placebo. The herb is extremely safe.

A combination of feverfew and willow, consisting of 300 mg of each, and taken twice daily, has been found in an open trial to significantly reduce migraine headache frequency from its baseline value.<sup>20</sup> When headaches did occur they were of reduced intensity. A controlled trial is clearly warranted to find out whether this basic assessment of the synergy principle gave truly valid results.

A related, double-blind trial compared the efficacy of the combination of feverfew at 100 mg, magnesium at 300 mg, and riboflavin at 400 mg to riboflavin alone at 25 mg for preventing migraine headaches.<sup>21</sup> The equal efficacy of the two treatments as found in the trial strongly suggests that the trial was very badly designed, since a higher dose of riboflavin should at least have been more effective than a lower dose. It is possible that the components of the combined treatment interfered with one another. In any event, this trial would argue against the synergy principle with these particular agents.

Two other modulators of inflammation often recommended, particularly for migraine, are *Ginkgo biloba* (ginkgo) and *Zingiber officinale* (ginger). Neither appears to have been studied for this application, but their various mechanisms of action, and in the case of ginger its historical use, recommend them as potentially valuable treatments for headache.

### Conclusion

Many herbal medicines are available to help patients with tension-type, migraine, and cluster headache. Both historical and preliminary modern evidence support the efficacy of many of these remedies. However, further research into their efficacy is clearly needed. Sometimes a simple topical counterirritant can provide a major benefit almost entirely without adverse effects. In other cases complex formulas with herbs of various actions are needed to help patients. The herbs described here, as well as others, should continue to be used and investigated in order to determine their full potential for use in treating headache. □

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