

The Calming Actions of *Anemone Pulsatilla*, *Nepeta*, and *Rauwolfia*

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ABSTRACT

Pulsatilla, *Nepeta*, and *Rauwolfia* are important therapeutic agents with nerve-calming effects. Although not as strong as anxiolytic drugs, these herbal remedies are gentle and safe treatments for anxiety and insomnia. They can improve sleep, reduce mood swings and irritability, and moderate the stress-induced 'fight-or-flight' state. Theoretical concerns regarding adverse combination with alcohol or other psychoactive drugs have not been confirmed by clinical or scientific studies. The onset of depression must be monitored carefully when prescribing *Rauwolfia* to pre-disposed patients; however, this side effect does not appear to occur as commonly or severely as previously cited in the literature.

Keywords: *Pulsatilla*; *Nepeta*; *Rauwolfia*; Depression; Anxiety; Herbal remedies

CLINICAL IMPLICATIONS

In 2013, it was reported by NIMH that 18.1% and 9.5% of the American population had been prescribed medication for depression and anxiety, respectively. Given the cost and side effects of these medications, natural agents that restore and tone the nervous system provide a welcome alternative. Although not as strong as anxiolytic drugs, *Anemone pulsatilla*, *Nepeta cataria* and *Rauwolfia* are gentle and safe treatments or alternatives for anxiety and insomnia.

KEY HERBS DISCUSSED

Pulsatilla (*Anemone pulsatilla*, *Pulsatilla chinensis*), Catnip (*Nepeta cataria*), Indian or African Snake Root (*Rauwolfia serpentina*, *Rauwolfia vomitoria*)

PRIMARY INDICATIONS

Anxiety, Insomnia, Emotional lability and irritability

ADJUNCTIVE OR STAND-ALONE TREATMENT

Adjunctive or Stand-Alone

DOSE OF BIOACTIVE CONSTITUENTS

Pulsatilla whole plant extract mg daily containing 4 mg of anemonic acid *per day*, Catnip whole plant, African Snake Root up to 10-40 mcg of reserpine *per day*

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CLINICAL IMPLICATIONS (CONTINUED)

SYNERGISTIC HERBAL FORMULA

Ashwagandha (*Ashwagandha*), Pulsatilla (*Anemone*), Catnip (*Nepeta*) tincture dose (1:2 to 1:5) 3-5 ml. *three times per day*, Lavender (*Lavender*) 1.5 ml per day, African Snake Root (*Rauwolfia*) tincture dose (1:2, 0.1-1 ml per day)

SIDE EFFECTS AND CAUTIONS

A mild hypotensive affect is possible with low doses of *Rauwolfia*. Catnip is safe when used appropriately. *Rauwolfia*, Catnip and Pulsatilla are all contraindicated during pregnancy and when breastfeeding. Pulsatilla is an irritant to skin and mucous membranes and can also cause kidney and urinary tract irritation.

UNSUBSTANTIATED THEORETICAL SIDE EFFECTS

There are theoretical concerns that *Rauwolfia* at low doses, as recommended for anxiety, should not be taken with alcohol, antipsychotics, barbiturates, digoxin, monoamine oxidase inhibitors, propranolol, diuretics, ephedrine, and tricyclic antidepressants. There is some theoretical evidence these herbs may increase lithium levels in patients taking Lithium. No clinical or scientific studies have confirmed the findings.

DISCUSSION

St. John's wort, Valerian, Chamomile and other herbs have been well discussed in the herbal literature, and have been safely and effectively used for decades in the management of anxiety. This review will focus on three other nerve-calming agents (*Nepeta cataria*, *Anemone pulsatilla*, and *Rauvolfia serpentina*) that are less commonly known and used. It should be noted that meditation, stress management techniques, and other anxiolytic herbs including *Bacopa monnieri*, *Scutellaria lateriflora* (Scullcap), *Passiflora incarnata* (Passionflower), *Leonurus cardiaca* (Motherwort), *Verbena hastata* (Blue Vervain), *Polygala tenuifolia* (Chinese Polygala) and *Piper methysticum* (Kava) may complement the herbal treatments discussed in this article.

Nepeta cataria

The *Nepeta* genus is in the mint or *Lamiaceae* family and contains about 250 species. *Nepeta cataria* (catnip) is best known for its effects on cats; catnip is a neuroexcitant in felines. Traditional human uses have been for reducing nervousness and irritability, promoting relaxation, and as a sleep aid. In the historical past, catnip was a popular culinary tea used in children's formulas for head colds and influenza, especially if irritability and poor sleep accompanied the illness. *Nepeta cataria* has reported antimicrobial effects.¹ Further, some *Nepeta* species have demonstrated antiviral activities.² *Nepeta* is described in the herbal literature as a diaphoretic for chills and disturbed sleep at the onset of colds and flu. In *A Modern Herbal*, published in 1931, author Maude Grieve wrote extensively about *Nepeta* under the heading of 'catnep'. Grieve recommended freshly expressed juice (succus) rather than tea, for nervous headaches and menstrual regulation, and as a treatment for hysteria and nightmares.³

Nepeta contains terpene nepetalactone which acts on the central nervous system of cats. Though the effects on the central nervous system of humans has not been elucidated, a case report implicates *Nepeta* for depression of the CNS in a toddler.⁴ In addition, the plant contains iridoid glycosides, including nepeta glucosyl ester. Similar compounds are found in *Valeriana* and contribute to its sedative effects.¹

A third psychoactive compound, caffeoyltartronic acid, is also found in *Nepeta* and has been shown to have relaxing properties.¹

Researchers have found that acute and long-term administration of *Nepeta* to mice increased sleep duration⁵. Tincture of *Nepeta persica* had an anxiolytic activity in animal models.⁶ Although there are no documented clinical trials with this herb, herbalists and naturopathic medical practitioners report *Nepeta* to be a useful herbal tool for reducing symptoms of stress and treating anxiety disorders.

Anemone pulsatilla

Anemone pulsatilla is a perennial plant in the *Ranunculaceae* or buttercup family, with over 30 species in the genus. The plant blooms in the spring and is found most commonly in high altitude, sparse grasslands and prairies. *Anemone* is a genus of over 120 species on calcareous soils. In past botanical nomenclature, the plant was known as *Pulsatilla anemone*. The flower head of *Pulsatilla* frequently moves in a downward direction during rainy or inclement weather, hence, the common name windflower.

Contact with the freshly pulverized leaves and roots may irritate (and even blister or ulcerate) the skin. Thus, dried plant material is usually recommended for therapeutic use. Fresh extracts of *Pulsatilla* yield an oily substance with an acrid and peppery taste that has an ability to irritate the skin and mucous membranes. The oil breaks down into anemonic acid, isoanemonic acid, and anemonin. Anemonic acid is thought to be inert, while anemonin is a powerful irritant on par with cantharidin isolated from Spanish fly (*Lytta vesicatoria*). In hot water, it volatilizes and can irritate the eyes, upper respiratory mucous membranes, and gastric membranes. If injected, it causes tissue necrosis.⁶⁻⁸ Historically, *Pulsatilla* has been used in the treatment of nervous conditions (*i.e.*, nervous exhaustion). The roots have been utilized for centuries as both herbal and homeopathic preparations for emotional distress (*e.g.*, mood swings, irritability, extreme emotional

sensitivity with tearfulness, sudden outbursts and/or hyper-reactivity). Doses of 2-3 drops in water was also used to treat spastic cough, asthma, pertussis and bronchitis.

From the mid 1800s to the 1920s, members of the Eclectic Physicians School recommended a dosage of 5-30 drops in a 4 ounce bottle of water to be taken by the teaspoon every few hours.⁹ However, homeopathic preparations of *Pulsatilla* are even more diluted than that prescribed by Eclectic physicians.

Pulsatilla contains triterpenoid saponins,¹ including hederagenin, which is a natural pesticide.¹⁰ It also contains the glycoside ranunculin and proto-anemonin, common in *Ranunculaceae*, a precursor to the acrid oil of anemonin. In small doses, anemonin acts as a central nervous system depressant, lowering heart rate and respiration.¹¹ This depressant capacity may account for the herb's ability to treat anxiety and emotional hypersensitivity.¹²

Pulsatilla also contains cinnamic acid (cinnamate), a natural tyrosinase inhibitor.^{13,14} Tyrosinase is the enzyme responsible for both synthesizing catecholamines (especially in the absence of tyrosine hydroxylase) and oxidizing excess dopamine. There is no published research on *Pulsatilla* and catecholamines, but it is reasonable to hypothesize that perhaps the cinnamate in *Pulsatilla* would affect dopamine synthesis in these cells. Indeed, cinnamic acid and related compounds from *Pulsatilla* have been studied as neuroprotective agents.¹⁵⁻¹⁷

Rauwolfia serpentina and Rauwolfia vomitoria

Rauwolfia serpentina and *Rauwolfia vomitoria* are both members of the *Apocynaceae* family—with *R. serpentina* being native to India, Sri Lanka, Myanmar, and Malaysia and *Rauwolfia vomitoria* native to tropical regions of Africa. There are 85 species in the *Rauwolfia* genus. In India, *Rauwolfia serpentina* is specifically indicated for abdominal pain and colic in children, and it has also been used for insomnia, hypochondria, and “insanity.” As a treatment for anxiety, *Rauwolfia serpentina* was introduced into European herbal medicine at least 300 years ago.

Rauwolfia serpentina contains over 20 alkaloids including reserpine yohimbine, ajmaline, sparteine, deserpidine, rescinnamine, and serpentinine.

Rauwolfia and its alkaloid, reserpine, were among the first drugs introduced into neuropharmacology in the 1930s. It was used briefly in the treatment of psychosis and schizophrenia, and reserpine's effect on dopamine and neurotransmitters was investigated at the inception of the field of neuropharmacology.

Reserpine alters the sympathetic-parasympathetic balance within the central nervous system. Neurotransmitter studies in animal models have shown that very small amounts of reserpine trigger the release of serotonin.¹⁸ At larger doses, reserpine is noted to deplete stores of 5-hydroxytryptamine (serotonin) and catecholamines. Likewise, reserpine promotes parasympathetic nervous activity (mostly by reducing sympathetic tone), and via this mechanism, *Rauwolfia* reduces heart rate, blood pressure, and other functions that are under control of the sympathetic nervous system. Another component of *Rauwolfia*, raubasine, is a benzodiazepine receptor agonist.¹⁹ Due to these actions, *Rauwolfia* is a valuable therapeutic tool in treating individuals with stress and anxiety disorders.

SUMMARY

Pulsatilla, *Nepeta*, and *Rauwolfia* are important therapeutic agents in the treatment of anxiety. They can improve sleep, reduce mood swings and irritability, and moderate the stress-induced ‘fight-or-flight’ state (sympathetic activation). It is certainly important to watch for the onset of depression when prescribing *Rauwolfia* to pre-disposed patients; however, this side effect does not appear to occur as commonly or severely as previously cited in the literature.²⁰

DISCLOSURE OF INTERESTS

Dr. Saunders reports personal fees related to employment or seeing patients from CCM, the Dundas Naturopathic Centre, and from Beaumont Health Systems, Troy Hospital, MI, outside the submitted work. Dr. Winston reports personal fees from Herbalist & Alchemist, Inc, outside the submitted work. Dr. Stansbury has nothing to disclose.

REVIEW ESSAY

Many nutrients and herbs that have not been the subject of randomized controlled studies are used

regularly by clinicians. They have also been used traditionally for hundreds, sometimes thousands of years. Review Essays contain the opinions of professionals and experts in the fields of nutritional and botanical medicine on how to most effectively use herbs and nutrients in clinical practice. The dosages

recommended are based on clinical experience. Side effects that are described in “Unsubstantiated Theoretical Concerns” have not been seen in clinical practice or clinical studies but are speculative based on, for example, possible mechanisms of action.

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