

Antimicrobial and Anti-inflammatory Botanicals for Allergies and Chronic Sinus Conditions

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Discussion

Sinus infections can be caused by colds, bacterial infections, allergies, asthma, or other conditions. Acute infections last up to four weeks while chronic conditions can last over 12 weeks, even for months or years, or occur seasonally for months at a time. Sinus infections affect more than 30 million adults in the United States each year, according to the Centers for Disease Control and Prevention.¹

Sinuses are small air-filled spaces located within the skull bones surrounding the nose. Sinusitis typically involves inflammation of membranes lining the paranasal sinuses. There are four pairs of paranasal sinuses: the frontal, ethmoid, maxillary, and sphenoid sinuses. Sinusitis results in facial pain or tenderness because trapped air and mucus put pressure on the sinus membranes and on the facial bones. Inflamed, swollen membranes block the flow of air through sinuses. Thick mucus often secretes directly from the nose or drains down the back of the throat. Such post-nasal drip is usually indicative of sinusitis even if there is no facial pain.¹

Nasal and sinus congestion can produce a wide range of symptoms including headache, tenderness in the cheeks, inner ear discomfort, sinus and eye pressure, neck pain, nasal discharge, as well as general breathing difficulties. Prolonged

sinus inflammation and infection damages the sinus membranes and disrupts their normal function. Botanicals with antimicrobial and anti-inflammatory actions can effectively address the underlying infection, while soothing, demulcent herbs can provide support so the membrane tissues can heal.

The botanical extracts and essential oils outlined in this paper alleviate the symptoms of sinusitis through calming inflammatory pathways, soothing inflamed membranes, and relieving the local mucus and lymphatic stagnation. As membrane swelling decreases, the sinuses can open and air can flow through. When combined, these herbs help calm inflamed tissues and enhance membrane tissue health. These botanicals work on multiple pathways to exert mucolytic, anti-inflammatory, antimicrobial, decongestant, and demulcent activity.

When blended in a formula, the botanicals in this paper can be beneficial for sinusitis, rhinitis, sinus congestion, hay fever, allergies, sinus pressure, and headache. The herbal extracts and essential oils can offer immediate relief and promote the healing response.

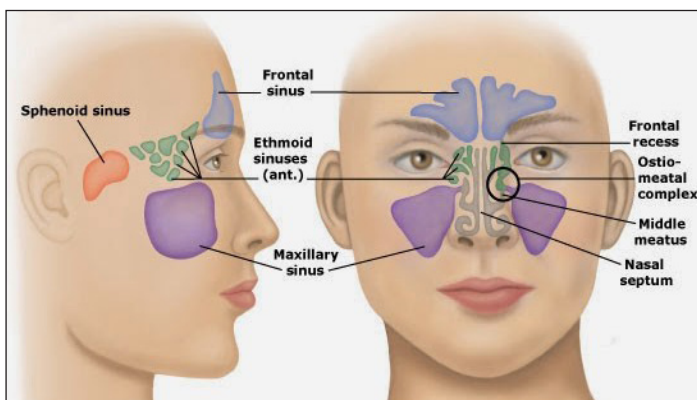


Image source: http://www.aboutcancer.com/paranasal_sinus_cancer.htm

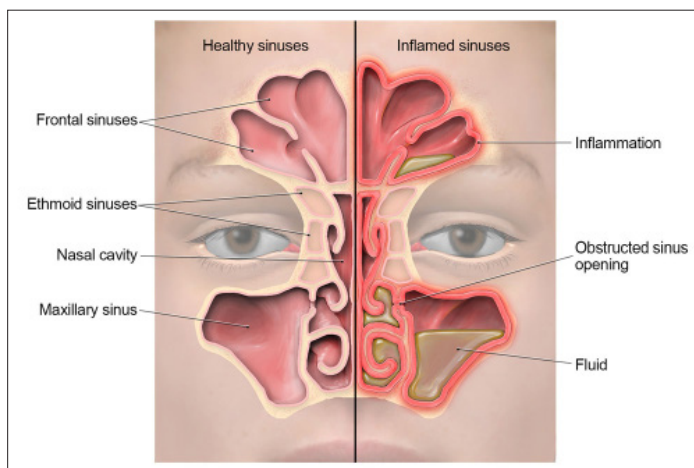


Image source: <http://www.cdc.gov/getsmart/community/for-patients/common-illnesses/sinus-infection.html>

Botanicals for Allergies and Chronic Sinus Conditions



Nettle Leaf (*Urtica dioica*)

Nettle is a time-revered herbal panacea and nutritive tonic used as a medicinal, home remedy, and food for thousands of years. Nettle leaf is a traditional remedy for those suffering with allergies. Nettle is also traditionally used for asthma, mucus conditions, and chronic coughs.²

Nutrient-dense Nettle leaf is well-known for its ability to enhance healthy immune response and overall health.² An *in vitro* study found that Nettle leaf extract inhibits inflammatory processes involved with seasonal allergies. It inhibits histamine response and helps prevent mast cell degranulation and subsequent release of pro-inflammatory mediators. Nettle extract is found to inhibit prostaglandin formation through several pathways, including inhibition of the COX-1 and COX-2 pathways that are activated during the allergy response.^{3,4}

Eyebright Herb (*Euphrasia stricta*)



Eyebright has a long history of use in European folk medicine and was a favorite of the American Eclectic Physicians. They valued it to relieve acute catarrhal nasal membrane congestion, particularly in allergy and hay fever presentation with abundant flow of mucus, sneezing, burning, and pain.⁵ Eyebright possesses anti-inflammatory, astringent, antiscarrhal, and antiseptic properties which work on the respiratory tract and benefit sinus membranes. It is also found to act as an antihistamine and to help calm the inflammatory cascade during the allergy immune response.⁵

Goldenrod Herb (*Solidago virgaurea*)



Goldenrod, native to Europe, is found worldwide where a number of Goldenrod species are used medicinally. The genus name *Solidago* means to make whole, as Goldenrod was traditionally used as a vulnerary herb to promote the healing of wounds. Valued by herbalists for a variety of applications, Goldenrod is found to exert anti-inflammatory and antioxidative activity, and is recognized for its antiphlogistic and antiscarrhal activity. It contains quercetin, catechin, tannins, saponins, essential oils, and other compounds.⁶⁻⁹

Red Root Extract (*Ceanothus americanus*)



Red Root is traditionally used for its action on the blood and the lymph systems. It improves the tone and action of these systems, removing dead lymph cells from areas of damaged tissues and supporting

healthy blood flow to enhance the healing process.¹⁰⁻¹²

Native American Indians used Red Root to alleviate sore throats and mucous membrane congestion. It is found to exert astringent, expectorant, and antispasmodic activity. A study finds that Red Root exerts antimicrobial activity against specific oral pathogens which is attributed to the activity of its triterpenes and flavonoids.¹²

Osha Root (*Ligusticum porteri*)



Osha root, found mainly in the southern Rocky Mountains, has a long history of use by cultures indigenous to North America. They found it beneficial for many conditions including upper respiratory tract infections, sore throats, and sinus infections.¹³ Numerous compounds have been identified in Osha including pthalides and monoterpenes. Of these, Z-ligustilide (a pthalide compound) is found to exert antispasmodic, vasodilatory, antibacterial, and anti-inflammatory activity.^{14,15}

Licorice Root (*Glycyrrhiza glabra*)



Revered for thousands of years by herbalists worldwide, Licorice is renowned for its soothing qualities and ability to calm inflammation anywhere in the body. Traditionally used to soothe respiratory tissues and calm irritated mucous membranes, Licorice is a powerful demulcent (soothing to the mucous membranes of the body).

Noted for its anti-inflammatory, antioxidant, and immunomodulatory influence, Licorice acts as an antimicrobial and is found to exert influence against *Staphylococcus aureus* and other microorganisms.¹⁶⁻¹⁹ Multiple flavonoids have been isolated from Licorice, many of which show broad-spectrum antibacterial effects.^{17,20,21}

Bayberry Root (*Morella cerifera*)



The bark of Bayberry root was esteemed by Eclectic physicians as a stimulant for inflamed mucous membranes, among other uses. It was found to increase lymph circulation and lymph drainage to support draining of swollen sinus membranes. It was used specifically for catarrhal conditions, sore throat, and often used as a gargle.²²⁻²⁴

Active compounds identified in Bayberry species include volatile oils, tannins, triterpenes, flavonoids, and resins. Some of Bayberry's flavonoids are found to exhibit anti-inflammatory activity.²⁵



Fenugreek Seed (*Trigonella foenum-graecum*)

Fenugreek is a renowned culinary spice and potent herb used for multiple medicinal purposes throughout the world. It is widely known as a mucolytic that helps decongest sinus passages and is traditionally combined with Thyme or other herbs for this purpose. Fenugreek is soothing to mucous membranes of the sinuses. Recognized as an anti-inflammatory, its active constituents include alkaloids, flavonoids, plant sterols, and saponins.^{26,27}



Thuja Leaf (*Thuja occidentalis*)

Thuja was long used by Native Americans, Canadians, and Europeans. It contains essential oils, polysaccharides, minerals, and monoterpenes. Thuja is found to possess antiviral activity and to stimulate production of cytokines, antibodies, and macrophages as part of the immune response. Thuja has primarily been studied in conjunction with other herbal medicines where it is found to enhance immune response and to benefit respiratory tract infections.²⁸



Ginger Root (*Zingiber officinale*)

This world-renowned and well-loved herb has been used as cooking spice, herbal remedy, and revered medicine for centuries. It is a daily household remedy for digestive upset, sore throat, colds, and flu. Its active ingredients are its many volatile oils.²⁹⁻³¹ Ginger demonstrates antioxidant and anti-inflammatory activity.³²⁻³⁴



Thyme Herb (*Thymus vulgaris*)

Rich in natural essential oils, Thyme is an age-old medicinal and cooking spice that is well-known for its potent antibacterial and antiseptic qualities. A perennial herb from the Mediterranean region, Thyme contains an abundance of volatile oils including thymol, along with flavonoids, tannins, and saponins. Thyme is traditionally revered as a respiratory stimulant and for its mucolytic, expectorant, and antispasmodic properties. It is found to be highly antibacterial and antifungal. Modern research attributes these actions to its volatile oil and flavonoid components.^{35,36}



Wasabi Rhizome (*Wasabia japonica*) and Horseradish Root (*Armoracia rusticana*)

The Wasabi plant, native to Japan, is traditionally found growing in or near cold mountain streams.

Cultivated in Japan since around the tenth century, Wasabi is a member of the Brassica family and is a highly-prized culinary ingredient in Japan.²⁹ Wasabi contains a dozen or more isothiocyanates (ITCs), which are partially responsible for its unique taste. ITCs are widely known for their anti-inflammatory influence and antimicrobial effects. Wasabi contains a number of unique ITCs including one known as 6-Methylthiohexyl isothiocyanate (6-MTITC), which is found to suppress COX-2 expression and to exert antibacterial activity. Because of these qualities, Wasabi is studied for its potential benefits to help relieve allergies.^{37,38}

Horseradish, another member of the Brassica family, is also high in ITCs and other sulfur compounds and has a long history of use in traditional medicines and foods. Studies find it exerts powerful antioxidative and anti-inflammatory effects.³⁹

Essential Oils: Cinnamon (*Cinnamomum cassia*), Peppermint (*Mentha piperita*), and Star Anise (*Illicium verum*)



Essential oils have been valued worldwide for their antimicrobial properties for centuries by many cultures. Their aromatic qualities can help open sinus passages and calm inflammation to give relief. Modern research widely studies and tests essential oils for their known influence against respiratory tract pathogens. Among those found to demonstrate some of the strongest antimicrobial activity are the essential oils of Thyme, Cinnamon Bark, and Peppermint.^{27,40,41}

Peppermint essential oil demonstrates analgesic, antibacterial, and mucolytic actions. It relaxes smooth muscle, relieves catarrh of the respiratory tract, exerts a cooling activity, and calms inflammation of the oral mucosa. Peppermint essential oil contains menthol, phenolic acids, and is terpene-rich.^{42,43} Anethole, the major component of Star Anise essential oil, is reported to exert antibacterial, anti-inflammatory, and antioxidant activities.⁴⁴

For more information on any of the ingredients listed here, including extensive research or individual monographs compiled by Donnie Yance, please email info@naturaedu.com.

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