

Lobelia inflata

Lobelia

Indications

Inflammatory respiratory conditions such as asthma, bronchitis, upper respiratory tract infection, pneumonia, and emphysema.

Mechanism of Action

The leaves and seed pods are the most commonly used medicinal parts of *Lobelia*. They have been shown to have antiasthmatic, antispasmodic, emetic, expectorant, and respiratory stimulant effects.¹

α -Lobeline is the most biologically active and frequently investigated alkaloid in *Lobelia*, out of the more than 20 piperidine alkaloids that have been identified. α -Lobeline has been shown to be a partial nicotine agonist with effects on the CNS, neuromuscular system, and peripheral circulation. It is known as a strong respiratory stimulant, activating the carotid and aortic body chemoreceptors.

α -Lobeline relaxes lung tissue and aids in expectoration. Small amounts stimulate respiration and have expectorant activity. Larger amounts have emetic, purgative, and diuretic effects.² α -Lobeline initially causes CNS stimulation and then causes CNS and respiratory depression. Lobelia has been used with success in an array of respiratory conditions including asthma, chronic pneumonia, bronchitis, and laryngitis.³

Evidenced-Based Research

A study on horses tested the respiratory effects α -lobeline. The results revealed a transitory hyperpnea (increased depth and rate of breathing) with an increase in tidal volume and respiratory rate. This increase in respiratory ventilation lasted for about 90 seconds and was accompanied by a sharp rise in the respiratory peak airflows, especially the expiratory flows.⁴ Additional studies have been conducted on pigs⁵ and rabbits⁶ and have produced similar results to the horse study. Currently, clinical trials with lobeline have been limited to investigating its use as a partial nicotine agonist to aid in smoking cessation.

Safety in Pregnancy and Breastfeeding

Lobelia's safety profile for pregnancy is still unknown. because of the acrid nature of this herb, and its ability to affect respiration, heart rate, and blood pressure, caution is recommended.

According to a popular historical herbal text, *Lobelia* acts on the uterus, but not in a way that would contraindicate its use during pregnancy, as a parturifacient. The text notes that *Lobelia* promotes normal uterine contraction after the cervical os is dilated, and it relaxes perineal muscles.⁷

A single dose of 0.03 mg/kg α -lobeline was administered to pregnant women. No adverse effects were reported to mother or fetus.⁸

No studies have been conducted on the safety of *Lobelia* during breastfeeding. Because of the acrid nature of this herb, and its ability to affect respiration, heart rate, and blood pressure, caution is recommended.

General Safety

Clinical trials of the compound α -lobeline have revealed mostly minor side effects. When taken at doses of 0.5 mg, nausea and a burning sensation were experienced in the mouth and throat.⁹ Doses higher than 500 μ g were associated with nausea, vomiting, vertigo, and increased heart rate (tachycardia).¹⁰ One human study showed an increase in blood pressure and variable effects on heart rate.¹¹

Dosage

Lobelia has potential for toxicity. Use caution if exceeding a 1-g daily dosage; 100–400 mg of leaf is a typical dose for most respiratory ailments.¹²

As recently as the 1970s, standard pharmacology texts in the United States recommended doses of up to 20 mg of lobeline hydrochloride as an emergency respiratory stimulant, administered by intramuscular injection. The equivalent amount of lobeline would be found in about 5 g of powdered leaf.

Traditional Uses

Lobelia inflata (also known as Indian tobacco) is a species of *Lobelia* native to eastern North America. The native range extends from southeastern Canada (Nova Scotia to southeastern Ontario) south through the eastern United States to Alabama and west to Kansas.

Lobelia has a long use as a medicinal plant for respiratory and skin diseases, as an entheogenic and an emetic. It had wide use among Native American tribes including the Cherokee, Iroquois, and Penobscot and was used for respiratory and muscle disorders as well as a ceremonial herb. The Cherokee burned the foliage as a natural insecticide.¹³

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