



WILD INDIGO

(*Baptisia tinctoria* or *Sophora tinctoria*)¹

Family: Fabaceae (Leguminosae)

Synonyms: Indigo weed, Wilder Indigo, Indigotier savage, Radix Baptisiae tinctoriae,² Rattle bush, Horsefly bush, Yellow indigo,³ American Indigo, False Indigo, Indigo broom, Yellow broom,⁴ Horse-fly weed,⁵ Yellow clover broom root, Blackroot.⁶

Key Clinical Points

- ❖ Researchers have examined the use of Wild Indigo for upper respiratory infections in combination with Echinacea and Thuja in a German herbal remedy. Clinical trials so far are less rigorous than the animal studies.
- ❖ High doses can cause intoxication.
- ❖ Use with caution in combination with sedatives.

Key Constituents and pharmacology

Wild indigo contains baptitoxine, a substance identical to cytisine and similar to nicotine.² as well as other quinlizidine alkaloids: N-methyl cytisine, anagryne, sparteine isoflavonoids, formononetin.⁵ Baptitoxine has a stronger respiratory and weaker musculoskeletal stimulating effect and than nicotine.² Other compounds in *Baptisia* include glycoproteins (baptisin and baptin), polysaccharides (arabinogalactans), coumarins (scopoletine), and isoflavones (genistein, biochanin A).^{2,5}

German scientists, mostly those affiliated with Schaper & Brummer GmbH & Co KG, have conducted extensive investigation into the medicinal properties of *Baptisia* as a component of their immunoenhancer phytocombination product, Esberitox[®] which also contains *Echinacea pallida* root, *Echinacea purpurea* root, and *Thuja occidentalis* branch tips.⁶ Although the original articles are in the German language, Dr. Wuestenberg et al. published a review of their studies in English in 1999.⁷ In this article, the researchers list the following activities for *Baptisia*: increases number of granulocytes, increases granulocyte phagocytosis, stimulates macrophages and lymphocytes, stimulates B-lymphocytes, increases interleukin-1, increases interferon- α and interferon- β , and increases IgM antibody.⁷

In another study, mice who consumed the herbal combination product exhibited an increase in their antibody response to sheep red blood cells without an increase in their white blood cell count or spleen weight.⁸ Mice with lowered immunity due to age or hydrocortisone therapy showed a normalization of their immune response when exposed to sheep red blood cells after ingesting *Echinacea*, *Thuja*, and *Baptisia*.⁹ In the most recent study, the researchers removed Peyer's patch cells from mice that had ingested the herbal combination and a control population and exposed them to sheep red blood cells. The Peyer's patch cells from the treated mice showed a greater plaque-forming cell response.¹⁰ Mice treated with the herbal product also showed an improved resistance to influenza virus compared with controls.¹¹

Herbal properties: alterative, anticatarrhal, antimicrobial, antiseptic, emetic, emmenagogue, estrogenic, expectorant, febrifuge, and purgative.^{1,2,12,13}

History and traditional use	Indications supported by clinical trials
<p>Native American desert tribes boiled the stems of <i>Baptisia</i> to create a treatment for pneumonia, influenza, and tuberculosis.³ The Eclectic physicians used it to heal infected wounds.² They also treated septic conditions, such as diphtheria, malaria, influenza, scarlatina, and typhus with the herb.⁵ <i>Baptisia</i> was listed in the United States Dispensary from 1831-1842 and in the National formulary 1916-1936.²</p> <p>Modern herbalists consider <i>Baptisia</i> to be a strong herb, valuable in herbal combination therapies for the treatment of ear, nose, and throat infections, including laryngitis, lymphadenitis, pharyngitis, sinusitis, and tonsillitis.^{2,6,13} Other herbalists use <i>Baptisia</i> for wound infections, mouth lesions, and sore nipples.^{1,12}</p> <p>Preparation and dosage:</p> <p>0.75-1.2 ml (1:5 strength in 60% ethanol tincture) mixed with water TID (or 1.5-2.5 ml of a 1:10 tincture).^{2,13}</p> <p>Boil 1 tsp (0.5g) of herb in 1 cup of water for 10-15 minutes, strain, and drink 2 ounces (60 ml) TID^{13,14}</p> <p>Mix one part fluid extract (1:1) with eight parts base (water, ointment, or lotion) and apply externally TID^{2,5}</p> <p>Esberitox[®] dosage for the common cold: three tablets TID for 7-9 days.¹⁵</p>	<p>Effectiveness for treatment of respiratory conditions: unknown. The only clinical trials with this herb involve the proprietary product, Esberitox[®], containing a combination of <i>Baptisia</i>, <i>Thuja</i>, and 2 species of <i>Echinacea</i>. In the trial, the investigators enrolled URI patients at 15 primary care centers in Germany. In the double-blind study, the patients took Esberitox[®] tablets or placebo tablets containing the non-medicinal ingredients. Outcome measures included patient self-assessment of symptoms and physician assessment at day 4 and day 8. The statistical analysis is limited by grouping of symptom scores into summary scores. The researchers report both an intention to treat analysis (259 subjects) and a valid case analysis (238 subjects) (excluding those patients who broke the protocol). The most significant differences between the groups were in the self-estimated general well-being scores (a validated instrument called the Welzel-Kohnen color scale) and in the summary scores including hoarseness, expectoration, chest pain, and shortness of breath: subjects in the treatment group felt better as compared with the control group, though they showed few differences in many of their individual symptoms, making interpretation difficult. Subjects in both the placebo and treatment groups had very few side effects.¹⁵</p> <p>Effectiveness for treatment of wound infections: unknown. Clinical trials for this indication are lacking.</p>
<p>Interactions with other herbs, pharmaceuticals, disease states</p>	<p>Adverse effects/precautions/side effects/contraindications</p>
<p>Interactions with pharmaceuticals: Clinicians should use caution when using <i>Baptisia</i> with CNS depressants.²</p> <p>Interactions with other herbs: Clinicians should use caution when using <i>Baptisia</i> with other herbs that can cause sedation such as Skullcap, Valerian, Hops, Wood Betony.</p>	<p>Side effects: May cause nausea/vomiting, cramping/ diarrhea and mild intoxication at higher doses.^{1,2}</p> <p>Adverse events: One case report of hallucinations and urticaria has surfaced.¹⁶ Overdose may lead to respiratory failure secondary to muscle paralysis, seizures, incoordination, sedation, headache and coma.²</p>

Precautions/contraindications: Contraindicated in pregnancy and lactation due to the presence of the alkaloids.² Baptisia should be avoided in conditions of gastric irritation and hyperemia.¹⁷ It should not be substituted for antibiotics for septic conditions.²

Any herb with purported immunostimulating effects should be avoided by those with any autoimmune or proinflammatory disorder, including rheumatoid arthritis and asthma.

Botanical characteristics

Wild indigo, a member of the pea family, grows well in dry woods in the southeastern United States,³ though its range extends north and west to Minnesota and New Mexico.^{2,18} It is a bluish perennial with many branches and grows up to 3 feet tall.^{5,18} The alternating leaves are wedge-shaped at the base, rounded at the tip and are brittle.⁵ The yellow, pea-like flowers appear from May to September on upper branchlets.¹⁸ The fruit is a bluish-black oblong pod and the roots are blackish and woody.³ Growers and collectors dig the root in the fall and use the root and root bark medicinally.^{3,5} Young shoots are available as a food source in the spring though will cause diarrhea once they develop a green color.^{2,3} Dried wild indigo can produce a blue dye as well.³

References

1. Duke James A., Bogenschutz-Godwin Mary Jo, duCellier Judi and Duke Peggy-Ann K. (2002): *Handbook of Medicinal Herbs*. Boca Raton, CRC Press, pp 870.
2. Low Dog T. (2000): *Foundations of Herbal Medicine*. Albuquerque
3. Hutchens Alma R. (1991): *Indian Herbology of North America*. Boston, Shambhala Publications, Inc.
4. Jellin J.M., Gregory P.J., Batz F. and Hitchens K. (2004): Pharmacist's Letter/ Prescriber's Letter Natural Medicines Comprehensive Database. Stockton, CA, Therapeutic Research Faculty. Accessed: 1/12/2004, http://www.naturaldatabase.com/member_home.asp?ph_img=memberhome.gif&ex=0&ex=0
5. Gruenwald Joerg, Brendler Thomas, Jaenicke Christof and Mehtoa Mukesh (eds.) (1998): *PDR for Herbal Medicines*. Montvale, NJ, Medical Economics Company, Inc.
6. Brendler Thomas, Gruenwald Joerg and Jaenicke Christof (eds.) (2003): *Herbal Remedies*. Stuttgart, Germany, Medpharm Scientific Publishers
7. Wustenberg P., Henneicke-von Zepelin H. H., Kohler G. and Stammwitz U. (1999): Efficacy and mode of action of an immunomodulator herbal preparation containing Echinacea, wild indigo, and white cedar. *Adv Ther.* 16(1): 51-70.
8. Bodinet C. and Freudenstein J. (1999): Effects of an orally applied aqueous-ethanolic extract of a mixture of Thujae occidentalis herba, Baptisiae tinctoriae radix, Echinaceae purpureae radix and Echinaceae pallidae radix on antibody response against sheep red blood cells in mice. *Planta Med.* 65(8): 695-9.
9. Bodinet C., Lindequist U., Teuscher E. and Freudenstein J. (2002): Effect of an orally applied herbal immunomodulator on cytokine induction and antibody response in normal and immunosuppressed mice. *Phytomedicine.* 9(7): 606-13.
10. --- (2004): Influence of peroral application of a herbal immunomodulator on the antibody production of Peyer's patches cells. *Arzneimittelforschung.* 54(2): 114-8.
11. Bodinet C., Mentel R., Wegner U., Lindequist U., Teuscher E. and Freudenstein J. (2002): Effect of oral application of an immunomodulating plant extract on Influenza virus type A infection in mice. *Planta Med.* 68(10): 896-900.
12. Tierra Michael (1998): *The Way of Herbs*. New York, Pocket Books
13. Hoffman David (2003): *Medical Herbalism*. Rochester, Vermont, Healing Arts Press
14. --- (1990): *The New Holistic Herbal*. Boston, MA, Element
15. Henneicke-von Zepelin H., Hentschel C., Schnitker J., Kohnen R., Kohler G. and Wustenberg P. (1999): Efficacy and safety of a fixed combination phytomedicine in the treatment of the common cold (acute viral respiratory tract infection): results of a randomised, double blind, placebo controlled, multicentre study. *Curr Med Res Opin.* 15(3): 214-27.
16. Bergner Paul (1995): Side Effects to Baptisia, Vitex., *Medical Herbalism & Bergner Communications: Medical Herbalism: A Clinical Newsletter for the Herbal Practitioner.* 7, pp 15.
17. Brinker F. (1998): *Herb contraindications and drug interactions*. Sandy, Oregon, Eclectic Medical Publications
18. Foster S. and Duke J. (2000): *A Field guide to Medicinal Plants and Herbs of Eastern and Central North America*. New York, Houghton Mifflin