



Gymnema sylvestre

Description

Gymnema sylvestre is a woody, climbing plant, native to India. The leaves of this plant have been used in India for 2,000 years to treat madhu meha, or “honey urine,” an early term for glucosuria detected by pouring the patients urine onto the ground and observing whether or not insects were attracted to it. Chewing the leaves also destroys the ability to discriminate “sweet” taste, giving it its common name, gurmar or “sugar destroyer.”

Active Constituents

Plant constituents include two resins (one soluble in alcohol), six-percent gymnemic acids, saponins, stigmasterol, quercitol, and the amino acid derivatives betaine, choline, and trimethylamine.¹

Mechanisms of Action

Gymnema sylvestre is a stomachic, diuretic, refrigerant, astringent, and tonic.¹ The herb has been found to increase urine output and reduce hyperglycemia in both animal and human studies.

The antidiabetic activity of *Gymnema* appears to be due to a combination of mechanisms. Two animal studies on beryllium nitrate- and streptozotocin-diabetic rats found *Gymnema* extracts to double the number of insulin-secreting beta cells in the pancreas, and to return blood sugars to almost normal.^{2,3} *Gymnema* increases the enzymes responsible for glucose uptake and utilization,⁴ and inhibits peripheral utilization of glucose by somatotropin and corticotrophin.⁵ Plant extracts have also been found to inhibit epinephrine-induced hyperglycemia.⁶

Clinical Indications

The primary clinical application for this botanical is as an antidiabetic agent. *Gymnema* has been the object of considerable research since the 1930s, with promising results for both type 1 and 2 diabetes. Numerous animal studies have confirmed the hypoglycemic effect of *Gymnema sylvestre*.⁷⁻⁹

Type 1 Diabetes

In a controlled study, a standardized extract of the plant was given to 27 type 1 diabetics at a dose of 400 mg daily for 6-30 months. Thirty-seven other diabetics continued on insulin therapy alone and were tracked for 10-12 months. In the *Gymnema* group, insulin requirements were decreased by one-half and the average blood glucose decreased from 232 mg/dL to 152 mg/dL. The control group showed no significant decreases in blood sugar or insulin requirement. In addition, there was a statistically significant decrease in glycosylated hemoglobin (HbA1c) after 6-8 months on *Gymnema* when compared to pretreatment levels or the control group.¹⁰

Type 2 Diabetes

Twenty-two type 2 diabetics were administered 400 mg *Gymnema* extract daily for 18-20 months along with their oral hypoglycemic medications. This group experienced significant decreases in average blood sugar and HbA1c, and an increase in pancreatic release of insulin. Medication dosages were decreased and five participants were able to discontinue their medications entirely.¹¹

Lipid-lowering

Preliminary animal studies indicate *Gymnema* may be beneficial for lowering blood lipids. When fed to rats on either a high- or normal-fat diet for 10 weeks, *Gymnema sylvestre* suppressed body weight gain and liver lipid accumulation to the same extent as chitosan in those on a high-fat diet.¹² In a three-week study in rats, *Gymnema* feeding decreased total cholesterol and triglycerides and increased fecal fat elimination.¹³ Further research is warranted to determine whether *Gymnema* has this same lipid-lowering effect in clinical practice.

Side Effects and Toxicity

No significant adverse effects have been reported, aside from the expected hypoglycemia.¹⁴ Safety in pregnancy has not been established.

Dosage

The typical therapeutic dose of an extract standardized to contain 24-percent gymnemic acids is 400-600 mg daily. It is not clear from examining the studies whether divided doses is ideal but, because it is being used to regulate blood sugar, three divided doses with meals seems preferable.

References

1. Kapoor LD. *Handbook of Ayurvedic Medicinal Plants*. Boca Raton, FL: CRC Press, Inc; 1990:200-201.
2. Prakash AO, Mather S, Mather R. Effect of feeding *Gymnema sylvestre* leaves on blood glucose in beryllium nitrate treated rats. *J Ethnopharmacol* 1986;18:143-146.
3. Shanmugasundaram ER, Gopinath KL, Shanmugasundaram KR, Rojendran VM. Possible regeneration of the islets of Langerhans in streptozotocin-diabetic rats given *Gymnema sylvestre* leaf extracts. *J Ethnopharmacol* 1990;30:265-279.
4. Shanmugasundaram KR, Panneerselvam C, Samudram P, Shanmugasundaram ER. Enzyme changes and glucose utilisation in diabetic rabbits: the effect of *Gymnema sylvestre*, R.Br. *J Ethnopharmacol* 1983;7:205-234.
5. Gupta SS, Variyar MC. Experimental studies on pituitary diabetes IV. Effect of *Gymnema sylvestre* and *Coccinia indica* against the hyperglycemia response of somatotropin and corticotrophin hormones. *Indian J Med Res* 1964;52:200-207.
6. Gupta SS. Inhibitory effect of *Gymnema sylvestre* (Gurmar) on adrenaline induced hyperglycemia in rats. *Indian J Med Sci* 1961;15:883-887.
7. Srivasta Y, Bhatt HV, Prem AS, et al. Hypoglycemic and life-prolonging properties of *Gymnema sylvestre* leaf extract in diabetic rats. *Isr J Med Sci* 1985;21:540-542.
8. Okabayashi Y, Tani S, Fujisawa T, et al. Effect of *Gymnema sylvestre*, R.Br. on glucose homeostasis in rats. *Diabetes Res Clin Pract* 1990;9:143-148.
9. Venkatakrishna-Bhatt H, Srivastava Y, Jhala CI, et al. Effect of *Gymnema sylvestre*, R.Br. leaves on blood sugar and longevity of alloxan diabetic rats. *Indian J Pharmacol* 1981;13:99.
10. Shanmugasundaram ER, Rajeswari G, Baskaran K, et al. Use of *Gymnema sylvestre* leaf in the control of blood glucose in insulin-dependent diabetes mellitus. *J Ethnopharmacol* 1990;30:281-294.
11. Baskaran K, Ahamath BK, Shanmugasundaram KR, Shanmugasundaram ER. Antidiabetic effect of a leaf extract from *Gymnema sylvestre* in non-insulin-dependent diabetes mellitus patients. *J Ethnopharmacol* 1990;30:295-305.
12. Sigematsu N, Asano R, Shimosaka M, Okazaki M. Effect of long term-administration with *Gymnema sylvestre* R.Br. on plasma and liver lipid in rats. *Biol Pharm Bull* 2001;24:643-649.
13. Shigematsu N, Asano R, Shimosaka M, Okazaki M. Effect of administration with the extract of *Gymnema sylvestre* R.Br. leaves on lipid metabolism in rats. *Biol Pharm Bull* 2001;24:713-717.
14. Facts and Comparisons Publishing Group. *The Review of Natural Products*. St. Louis, MO: Facts and Comparisons, a Wolters Kluwer Co; 1996.