



## **Gymnema (*Gymnema sylvestre*) leaf**

### **Common Indications:**

- Blood sugar regulation
- Weight loss
- Unhealthy cholesterol levels

### **General Comments:**

Gymnema comes out of India has a long history in Ayurvedic medical for the treatment of blood sugar or what was referred to as “sweet” urine. Gymnema is used as a natural therapy in the management of insulin resistance, diabetes, hyperinsulinemia.

### **Benefits & Mechanism of Action:**

#### Blood sugar regulation

Gymnema may help improve your body’s ability to regulate blood sugar levels, providing support for the pancreas. The leaves of gymnema are thought to increase insulin secretion, and several studies report control of hyperglycemia and weight in laboratory animals and in vivo and in vitro human studies.<sup>1,2,3,4,5,6,7</sup> A 2013 study using 500 mg of a standardized Gymnema extract reported reduced polyphagia, fatigue, blood glucose (fasting and post-prandial), and glycated hemoglobin and there was a favorable shift in lipid profiles.<sup>2</sup> Gymnema reportedly produced blood glucose homeostasis and increased the activity of the enzymes involved in the utilization of glucose by insulin dependent pathways.

Human studies have reported a significant reduction in blood glucose during therapy with gymnema.<sup>8,9,10,11,12</sup> A reduction in glycosylated hemoglobin and glycosylated plasma proteins has also been reported, with a reduction in conventional drug dosage. In studies patients with diabetes were able to discontinue conventional drugs and maintain their blood glucose homeostasis with gymnema alone. Researchers suggest that beta cells may be regenerated and/or repaired in Type 2 diabetics on gymnema supplementation. They support their claim by the appearance of increased endogenous insulin levels in the serum of individuals after gymnema supplementation. Other studies report that gymnemic acids suppress the elevation of blood glucose levels by inhibiting glucose uptake in the intestine.

## Weight loss

Gymnema may be helpful in weight loss regimens, helping to control blood sugar regulation sweet cravings and to decrease sensitivity to sweet tastes. Gymnema has also been reported to selectively suppress the neural responses to sweet taste stimuli.<sup>13,14,15</sup> Because gymnema leaf powder has an anesthetizing effect on the taste buds which can last for several hours, some researchers feel that gymnema may be a potential agent in weight reduction and sweet cravings.

Gymnema may potentially be used in athletes to develop a higher ratio of lean muscle mass to body fat. This may be due to the reported increase of insulin output associated with long-term use of gymnema. Increased insulin output and utilization encourages the uptake of amino acids into muscle tissue.<sup>16,17</sup>

Gymnema also reduces the digestibility of fat and increases fecal excretion, lowering absorbed calories. This effect decreases food consumption, body weight and organ weight significantly.<sup>18,19,20</sup>

## Unhealthy cholesterol levels

Gymnema may help support healthy cholesterol levels. Laboratory studies reports significant serum cholesterol lowering effects of gymnema.<sup>21</sup>

**Dose:** 250-600mg, 1-3 times a day of a standardized extract

**Standardization:** Gymnema supplements should be standardized to contain 25-75% gymnemic acids.

**Cautions & Side Effects:** Gymnema has been reported to be safe in recommended doses.

## Medication interactions

Medications with increased effects while taking gymnema include:

- Blood sugar lowering medications
- Insulin

## References:

### Blood sugar regulation

1. Al-Romaiyan A, Liu B, Asare-Anane H, et al. A Novel Gymnema sylvestre extract stimulates insulin secretion from human islets in vivo and in vitro. *Phytother Res.* 2010;24(9):1370-6.
2. Kumar SN, Mani UV, Mani I. An open label study on the supplementation of Gymnema sylvestre in type 2 diabetics. *J Diet Supp.* 2010;7(3):273-82.
3. Ananthan R, Baskar C, Narmatha Bai V, et al. Antidiabetic effect of Gymnema montanum

- leaves: effect on lipid peroxidation induced oxidative stress in experimental diabetes. *Pharmacol Res* 2003;48(6):551-556.
4. Ananthan R, Latha M, Pari L, et al. Effect of *Gymnema montanum* on blood glucose, plasma insulin, and carbohydrate metabolic enzymes in alloxan-induced diabetic rats. *J Med Food* 2003;6(1):43-49.
  5. Gholap S, Kar A. Effects of *Inula racemosa* root and *Gymnema sylvestre* leaf extracts in the regulation of corticosteroid induced diabetes mellitus: involvement of thyroid hormones. *Pharmazie* 2003;58(6):413-415.
  6. Gupta SS, Variyar MC. Experimental studies on pituitary diabetes IV. Effect of *Gymnema sylvestre* and *Coccoloba indica* against the hyperglycemia response of somatotrophin and corticotrophin hormones. *Indian J Med Res* 1964;52:200-207.
  7. Jiang H. [Advances in the study on hypoglycemic constituents of *Gymnema sylvestre* (Retz.) Schult]. *Zhong Yao Cai* 2003;26(4):305-307.
  8. Khare AK, Tondon RN, Tewari JP. Hypoglycaemic activity of an indigenous drug (*Gymnema sylvestre*, "Gurmar") in normal and diabetic persons. *Indian J Physiol Pharm* 1983;27:257-258.
  9. Kothe A, Uppal R. Antidiabetic effects of *Gymnema sylvestre* in NIDDM - a short study. *Indian J Homeopath Med* 1997;32(1-2):61-62, 66.
  10. Moghaddam MS, Kumar PA, Reddy GB, Ghole VS. Effect of Diabecon on sugar-induced lens opacity in organ culture: mechanism of action. *J Ethnopharmacol.* 2005;97(2):397-403.
  11. Murakami N, Murakami T, Kadoya M, et al. New hypoglycemic constituents in "gymnemic acid" from *Gymnema sylvestre*. *Chem Pharm Bull* 1996;44(2):469-471. Okabayashi Y, Tani S, Fujisawa T, et al. Effect of *Gymnema sylvestre*.
  12. Xie JT, Wang A, Mehendale S, et al. Anti-diabetic effects of *Gymnema yunnanense* extract. *Pharmacol Res* 2003;47(4):323-329.

#### Weight loss

13. Imoto T, Miyasaka A, Ishima R, et al. A novel peptide isolated from the leaves of *Gymnema sylvestre* - I. Characterization and its suppressive effect on the neural responses to sweet taste stimuli in the rat. *Comp Biochem Physiol A* 1991;100(2):309-314.
14. Kamei K, Takano R, Miyasaka A, et al. Amino acid sequence of sweet-taste-suppressing peptide (gurmarin) from the leaves of *Gymnema sylvestre*. *J Biochem* 1992;111:109-112.
15. Lawless HT. Evidence for neural inhibition in bittersweet taste mixtures. *J Comp Physiol Psychol* 1979;93(3):538-547.
16. Koch RB, Desai D, Cutkomp LK. Inhibition of ATPases by gymnemic acid. *Chem Biol Interact* 1973;7:121-125.
17. Luo H, Kashiwagi A, Shibahara T, Yamada K. Decreased bodyweight without rebound and regulated lipoprotein metabolism by gymnemate in genetic multifactor syndrome animal. *Mol Cell Biochem.* 2006; [Epub ahead of print].
18. Nakamura Y et al. Fecal steroid excretion is increased in rats by oral administration of gymnemic acids contained in *Gymnema sylvestre* leaves. *J Nutr* 129.6 (1999): 1214-

1222.

19. Reddy RM et al. The saponin-rich fraction of a *Gymnema sylvestre* R. Br. aqueous leaf extract reduces cafeteria and high-fat diet-induced obesity. *Z Naturforsch C*. 67.1–2 (2012): 39–46.
20. Shigematsu N et al. Effect of administration with the extract of *Gymnema sylvestre* R. Br leaves on lipid metabolism in rats. *Biol Pharm Bull* 24.6 (2001): 713–717.

#### Unhealthy cholesterol levels

21. 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(6):713-7