

## **Name of Herb**

Gymnema

## **II. Scientific and Common Names**

Scientific Names: *Gymnema sylvestre*, *Asclepias geminata*, *Asclepias geminata*, *Periploca sylvestris*, *Gymnema melicida*<sup>1,2</sup>.

Common Names: Gurmar, Merasingi, Meshashringi, Gurmarbooti, Peiploca of the Woods, rams' horn, small Indian ipecac<sup>1,2</sup>.

## **III. Description of Active Ingredients**

The leaves and sometimes stems of this woody, vine-like plant are used medicinally for treatment of diabetes, hyperglycemia, and dyslipidemia<sup>1</sup>.

Majority of the scientific studies were focusing on the leaf when trying to evaluate the constituents of *Gymnema sylvestre* plant<sup>3-4</sup>. These studies indicate that the herb contains several substances that can lower blood sugar and lipid levels. Acidic glycosides, such as gymnemoside b, gymnema acid V and VII, appear to be the key components<sup>4</sup>. Other active components of the *Gymnema* leaf include gurmarin, conduritol A, and triterpene glycosides<sup>4</sup>.

## **IV. Mechanism of Action**

Effect on hyperglycemia/ diabetes: It appears that gymnemic acid reduces intestinal absorption of glucose in diabetic rats and rabbits<sup>1</sup>. It also might act by enhancing insulin secretion by increasing the number of beta cells in the pancreas<sup>2</sup>. Other proposed mechanisms include stimulation of the release of endogenous insulin and/or increase in glucose utilization<sup>1,4</sup>.

Effect on lipids: Serum triglycerides, total cholesterol, VLDL, LDL lowering effects have been considered in a few animal studies<sup>2</sup>. The proposed mechanism is via a decrease in the synthesis or increase in the metabolism of cholesterol or through decreased intestinal fat absorption<sup>2,5</sup>.

Effect on taste: *Gymnema*, or more specifically the gurmarin peptide, has been reported to block the ability to taste sweet or bitter flavors<sup>1</sup>. Interference with Na<sup>+</sup>/K<sup>+</sup> ATPase activity of taste receptors has been proposed as a possible mechanism of action<sup>5</sup>. The transient effect on taste is only present when the fresh or dry leaves are chewed<sup>1</sup>.

## **V. Current Indications and Efficacy**

Type 1 and 2 diabetes mellitus: *Gymnema* is possibly effective in reducing blood glucose levels and HbA1c when taken orally by patients with type 1 or 2 diabetes mellitus<sup>2</sup>.

Evidence from small human trials revealed that *Gymnema* extract when taken orally as a supplement to conventional therapy resulted in reduction in blood glucose, HbA1C, and lowering of conventional drug therapy dosing<sup>6,7</sup>. This effect was observed in both type 1 and type 2 DM patients. In addition, serum insulin levels were augmented in Type 1 DM patients, suggesting insulin-realizing effect. Even though the trials were conducted on an average of 20 months, the favorable effects of *Gymnema* on blood glucose were seen as early as 6 months. These findings suggest that therapy with *Gymnema* is of a chronic

nature and a minimum treatment period of 20-25 months is recommended<sup>6,7</sup>. The studies utilized GS4 leaf extract (the ethanolic acid precipitated extract of gymnema, recrystallized and packaged into gel capsules)<sup>6,7</sup>.

Dyslipidemia: Gymnema is possibly effective in reducing total cholesterol and triglycerides when taken orally in type 2 diabetes mellitus patients<sup>2</sup>.

Evidence: Reductions in serum TG, total cholesterol, VLDL, and LDL have been observed in animals<sup>2,5</sup>. Studies of gymnema in type 1 and 2 diabetes patients evaluated the effects of gymnema on lipid profile as a secondary outcome assessed in these trials<sup>6,7</sup>. The authors reported that gymnema decreased cholesterol and triglyceride levels in these patients<sup>6,7</sup>. The studies used GS4 extract (the ethanolic acid precipitated extract of gymnema)<sup>6,7</sup>.

Appetite-suppression: The theory is that loss of sweet and bitter taste will lead to a decreased desire to eat<sup>1</sup>. There is no reliable evidence from primary literature evaluating the effectiveness of gymnema as an appetite-suppressant remedy.

## **VI. Contraindications/ allergies**

Allergy: Allergies to *Asclepiadaceae* (milkweed) family<sup>5</sup>

Precautions: Use cautiously in diabetic patients on hypoglycemic medications, due to additional hypoglycemic effect provided by gymnema. Serum glucose levels should be monitored, and doses of hypoglycemic medications may require adjustment.

Hypoglycemia may also occur in non-diabetic patients<sup>2,5</sup>.

Pregnancy and Lactation: Safety in pregnancy and lactation has not been established. Is not recommended due to insufficient safety information<sup>2</sup>.

## **VII. Dosage Forms, Recommended Doses, Duration**

Adult Dose (18 years and older):

Oral:

In Type 1 or 2 DM patients, 200mg extract GS4 orally twice daily (or 2ml of an aqueous decoction [10g of powdered leaves per 100ml] three times daily) to be taken in conjunction with other hypoglycemic agents is recommended<sup>2,5</sup>. Studies have shown that the use of gymnema for the duration of 20 months was not associated with any significant adverse drug reactions<sup>6</sup>. Historically, it has been documented that gymnema can safely be taken for years<sup>3</sup>.

Pediatric Dose (< 18 years):

There is insufficient evidence available on the use of gymnema in pediatric population. Thus, it is not recommended in patients < 18 yo<sup>2</sup>.

## **VIII. Drug Interactions and Drug-Disease Interactions**

Hypoglycemic agents, insulin: Gymnema may enhance the blood glucose lowering effects of insulin and hypoglycemic agents, potentially causing hypoglycemia. Blood glucose levels should be frequently monitored<sup>2</sup>.

Lipid lowering agents: Gymnema may enhance the cholesterol and triglyceride lowering effects of lipid lowering agents<sup>5</sup>.

Fat absorption: In an animal study, absorption of fatty acids was decreased by gymnema<sup>8</sup>. No human data is available.

Iron absorption: Gymnema may decrease absorption of iron. However, the GS4 extract has not been shown to interfere with iron absorption<sup>2</sup>.

Diabetes: Gymnema can affect blood glucose control, and blood glucose levels should be monitored closely<sup>2</sup>.

#### **IX. Other Safety Issues**

There is no significant adverse drug reactions reported for gymnema.

#### **X. References**

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8. Wang LF, Luo H, Miyoshi M, et al. Inhibitory effect of gymnemic acid on intestinal absorption of oleic acid in rats. *Can J Physiol Pharmacol* 1998; 76: 1017-1023.