

## **Antidiabetics**

Diabetes mellitus, one of the most common endocrine metabolic disorders has caused significant morbidity and mortality due to microvascular (retinopathy, neuropathy, and nephropathy) and macrovascular (heart attack, stroke and peripheral vascular disease) complications. Human bodies possess enzymatic and non-enzymatic antioxidative mechanisms which minimize the generation of reactive oxygen species, responsible for many degenerative diseases including diabetes. The disease is rapidly increasing worldwide and affecting all parts of the world. Due to deficiency of the insulin people suffering from diabetes have high blood glucose level. Type 2 diabetes or non-insulin-dependent diabetes mellitus, is the most common form of the disease, accounting for 90%–95% of cases in which the body does not produce enough insulin or properly use it. According to World Health Organization the diabetic population is likely to increase up to 300 million or more by the year 2025.

### **PTEROCARPUS**

#### **Synonyms**

Bijasal, Indian kino tree, Malbar kino.

#### **Biological Source**

It consists of dried juice obtained by making vertical inci-sions to the stem bark of the plant *Pterocarpus marsupium* Linn.,  
Family: Leguminosae.

#### **Geographical Distribution**

It is found in hilly regions of Gujarat, Madhya Pradesh, Uttar Pradesh, Bihar, and Orissa. It is also found in forests of Karnal, Kerala, West Bengal, and Assam.

## Morphology

Colour	Ruby-red
Odour	Odourless
Taste	Astringent
Shape	Angular grains
Size	3 to 5 to 10 mm granules
Solubility	It is partly soluble in water (about 80—90%), completely soluble in alcohol (90%).
Extra features	The pieces of kino are angular, glistening, transparent, breaking with vitreous fracture.

## Chemical Constituents

Kino contains about 70–80% of kinotannic acid, kino-red, k-pyrocatechin (catechol), resin and gallic acid. Kinotannic acid is glucosidal tannin, whereas kino-red is anhydride of kinoin. Kinoin is an insoluble phlobaphene and is produced by the action of oxydase enzyme. It is darker in colour than kinotannic acid.

## Chemical Tests

1. When the solution of drug is treated with ferrous sulphate, green colour is produced.
2. With alkali (like potassium hydroxide) violet colour is produced.
3. With mineral acid, a precipitate is obtained.

## Uses

Kino is used as powerful astringent and also in the treatment of diarrhoea and dysentery, passive haemorrhage, toothache, and in diabetes. It is used in dyeing, tanning, and printing. The aqueous infusion of the wood is considered to be of much use in diabetes. The alcoholic, as well as, aqueous extracts of heartwood are known to possess hypoglycaemic action. The cups made of wood are available with Khadi and Gramodyog commission for treatment of diabetes.

## Marketed Products

It is the one of the components of the preparation known as Gludibit (Lupin Herbal Laboratory) and Diabecon (Hima-laya Drug Company) for diabetes mellitus.

## Gymnema sylvestre

### Synonyms:

*gymnema*, Australian cowplant, and *Periploca* of the woods, and the Hindi term *gurmar*, which means "sugar destroyer".

**Biological Source:** *Gymnema sylvestre*

**Family:** Apocynaceae

**Geographical Source:** It is a perennial woody vine native to tropical Asia, China, the Arabian Peninsula, Africa, and Australia.

**Morphology:** The plant is a climber with leaves having soft hairs on the upper surface. The leaves are elongated-oval in shape. It has a small, yellow, umbelliferous inflorescence that is produced throughout the year

**Chemical Constituents:** The leaves and extracts contain gymnemic acids, the major bioactive constituents that interact with taste receptors on the tongue to temporarily suppress the taste of sweetness.

Its leaves contain triterpenoid saponins, flavonols, and gurmarin. The major biologically active plant molecules are gymnemic acids, a class of triterpenoid saponins, which have the effect of suppressing the taste of sweetness on the tongue from sucrose (sugar), stevia, xylitol, and artificial sweeteners such as aspartame.<sup>1</sup>

The sweet-blocking effect of *G. sylvestre* lasts from 15 to 50 minutes and may even persist for several hours. Gymnemic acids apparently have no long-term effects on taste and they do not influence bitter, salty, or sour taste perception.

### Uses:

#### Effects on sugar absorption & insulin secretion

Gymnemic acid compounds in *Gymnema sylvestre* can also attach to receptors on the intestinal walls, helping to reduce absorption of sugar molecules in the gut. This process can lower blood sugar and promote insulin secretion and release.

Reduction of sugar intake: *G. sylvestre* extracts taken in the form of lozenges, mouthwash, or tea diminishes the consumption of sweet foods and overall caloric intake. Extracts (formulated as a mint lozenge) reduced the desire for high-sugar foods and the pleasant taste of candy.

Research also suggests that *Gymnema sylvestre* extracts reduce cravings for sugar. In a double-blind study, participants who received a gymnemic acid lozenge declined candy (before tasting it) more often than the placebo group.

Diabetes: Early research suggests when a specific gymnema extract (GS4) is taken orally along with insulin or diabetes medications, blood sugar reduction in people with type 1 or type 2 diabetes is enhanced.