



THE MOST EFFICACIOUS ANTIDIABETIC HERBS & ITS BIOACTIVES

HERBAL REMEDIES FOR DIABETES

The **12** Most Efficacious Antidiabetic Herbs & its Bioactives

HERBAL REMEDIES FOR DIABETES

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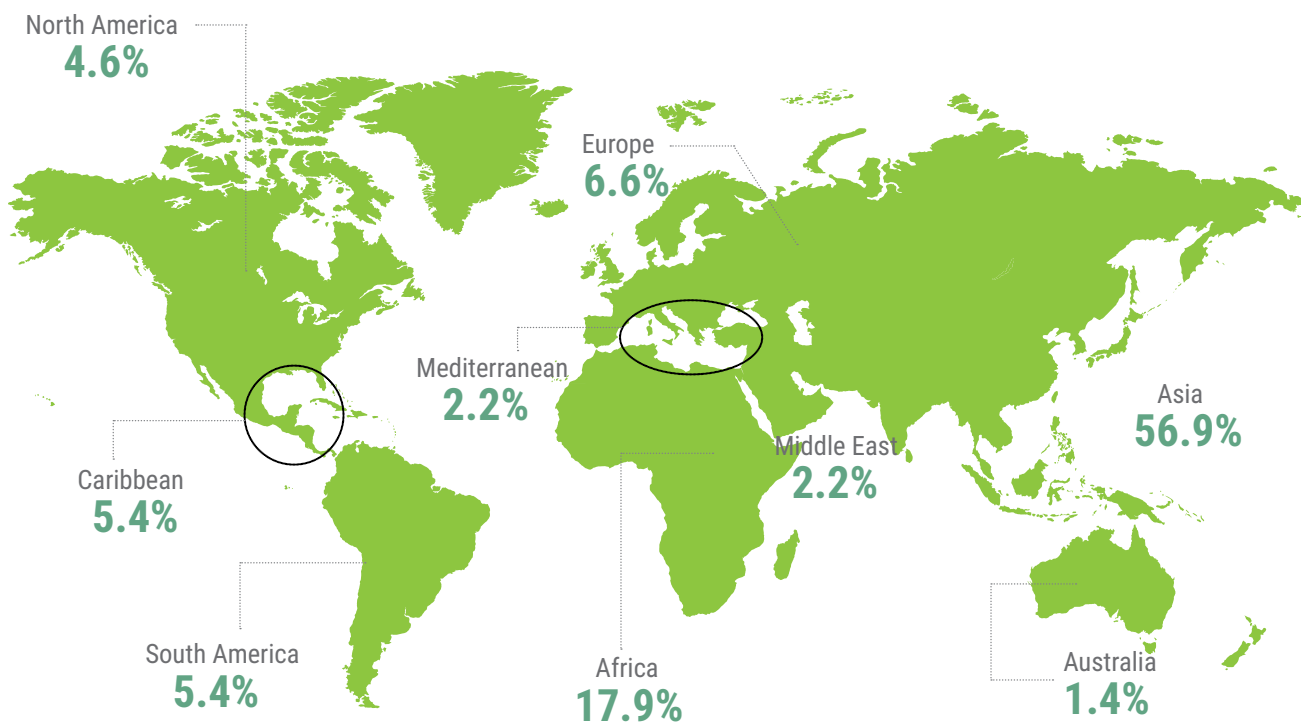
Plants have always been a source of medicine for humans since time immemorial. The Indian traditional system of medicine is replete with the use of plants for the management of diabetic conditions. According to the World Health Organization, up to 90% of population in developing countries use plants and its products as traditional medicine for primary health care. There are about 800 plants which have been reported to show antidiabetic potential. **Sunpure** is aimed to provide details of these herbs, its antidiabetic potential and bioactive compounds present in these Herbs - Banaba, Berberis aristata, Bitter melon, Cinnamon, Eugenia jambolana, Fenugreek, Gymnema, Neem, Ocimum sanctum, Pterocarpus are in used in different formulations worldwide.

Diabetes mellitus is a growing problem worldwide entailing enormous financial burden and medical care policy issues. According to International Diabetes Federation (IDF), the number of individuals with diabetes in 2011 crossed 366 million, with an estimated 4.6 million deaths each year.

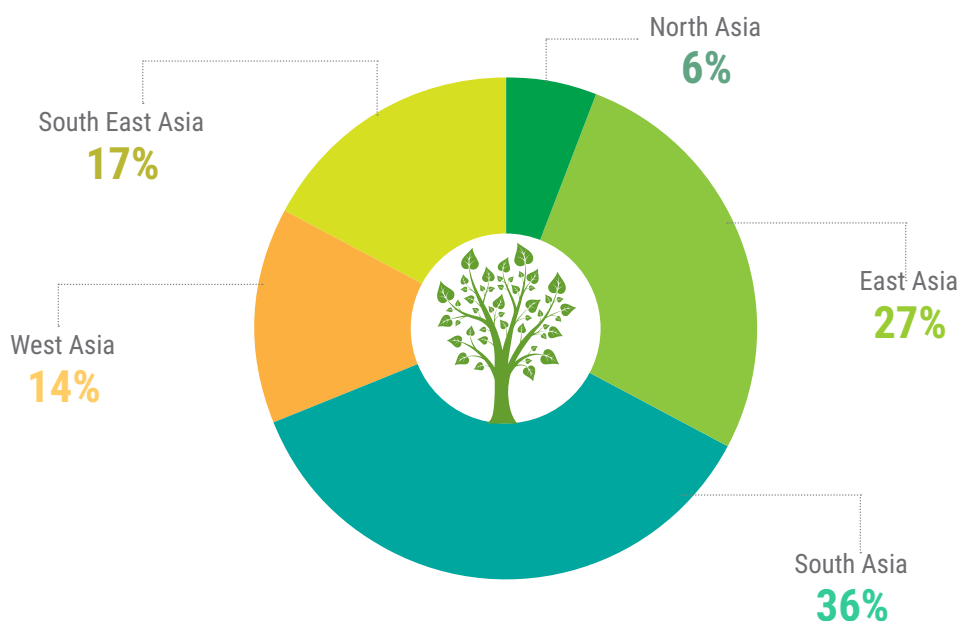
The WHO has listed 21,000 plants, which are used for medicinal purposes around the world. Among these, 2500 species are in India. A wide collection of plant-derived active principles representing numerous bioactive compounds have established their role for possible use in the treatment of diabetes.

GLOBAL DISTRIBUTION OF ANTI DIABETIC PLANTS

Anti diabetic plants were widely distributed in six continental regions, and some specific regions around the world such as in Caribbean, Mediterranean and Middle East. The worldwide distribution of anti diabetic plants is depicted in Figure. This figure shows that Asia (56%) and Africa (17%) dominated the global distribution of the anti diabetic plants.



DISTRIBUTION OF ANTI-DIABETIC PLANTS IN ASIA



The 12 Most Efficacious Antidiabetic Herbs & its Bioactives

1. Banaba leaf extract decreases blood sugar levels

Lagerstroemia speciosa, commonly known as banaba, is a tree widely grown in India & Philippines. Traditional practitioners use it as antidiabetic.

Banaba (*Lagerstroemia speciosa* L.) extracts have been used for many years in folk medicine to treat diabetes, with the first published research study being reported in 1940. This paper summarizes the current literature regarding Banaba and its constituents.



How it works

The hypoglycemic effects of Banaba have been attributed to both corosolic acid as well as ellagitannins. Studies have been conducted in various animal models, human subjects, and *in vitro* systems using water soluble Banaba leaf extracts, corosolic acid, and ellagitannins. Corosolic acid has been reported to decrease blood sugar levels within 60 min in human subjects. Corosolic acid also exhibits antihyperlipidemic and antioxidant activities.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Lagerstroemia speciosa</i>
Common name	Banaba
Plant Part used for Extraction	Leaves
Description	Light dark greenish- brown powder
Identification	By HPLC
Assay (By HPLC) Corosolic acid	1% to 20%

Refernces:

1. Miura T, Takagi S, Ishida T (2012) Management of diabetes and its complications with banaba (*Lagerstroemia speciosa* L.) and corosolic acid. *Evid Based Complement Alternat Med*: 871495.
2. Effect of corosolic acid on postchallenge plasma glucose levels M. Fukushima a,b, *, F. Matsuyama c, N. Ueda a,c, K. Egawa c, J. Takemoto c, Y. Kajimoto d, N. Yonaha e, T. Miura f, T. Kaneko g, Y. Nishi a, R. Mitsui a, Y. Fujita a, Y. Yamada a, Y. Seino.

2. *Berberis aristata* root extract is a classical natural antidiabetic medicine

Berberis aristata DC. belongs to family Berberidaceae and widely distributed in evergreen regions of temperate and sub-tropical. *Berberis* has about 650 species worldwide, of which 54 have been reported from Indian Himalaya, especially in state of Himachal Pradesh. *Berberis aristata*, known as Daruhaldi, is a large deciduous shrub usually in 1.8–3.6 meter height. Its leaves are obovate or elliptic.



How it works

The ethanolic extract of *B. aristata* showed antidiabetic activity due to its significant dose-dependent reduction effect on the blood glucose levels, which were also reported to be better than glibenclamide and comparable to metformin in diabetic rats. In addition, the aqueous extract of *B. aristata* showed significant antidiabetic activity, Traditional Chinese medicine (TCM) performs a good clinical practice and is showing a bright future in the treatment of diabetes mellitus (DM). TCM treatment has certain advantages of less toxicity and/or side effects, and herbs could provide multiple therapeutic effects. Berberine (BBR) is a classical natural medicine.

Diabetes mellitus is one of the common metabolic disorders with micro and macro vascular complications that results in significant morbidity and mortality. The ethanolic extract of stem bark/roots of *B. aristata* showed a significant hyperglycemic effect in alloxan induced diabetic rats. It reduces blood glucose level 60.4% and 75.46 % at the dose of 25 mg/kg and 50 mg/kg in diabetic rats. *B. aristata* has a significant antidiabetic activity in glucose tolerance test.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Berberis aristata</i>
Common name	Daruharidra
Plant part used for extraction	Root
Description	Yellow crystalline powder,
Identification	By HPLC
Assay (On Dried Basis) Total Berberine	NLT-95%w/w(By HPLC)

References:

1. Efficacy of Berberine in Patients with Type 2 Diabetes Jun Yin,a,b,* Huili Xing,a and Jianping Yeb.
2. Berberine in the Treatment of Type 2 Diabetes Mellitus: A. by H Dong - 2012.

3. Bitter melon fruit extract helps diabetics with insulin secretio

Bitter melon — also known as bitter gourd or *Momordica charantia* — is a tropical vine that belongs to the gourd family and is closely related to zucchini, squash, pumpkin, and cucumber.

Momordica charantia goes under a variety of names and is native to some areas of Asia, India, Africa and South America. Marketed as charantia, it is also known as karela or karolla. The herb may be prepared in a variety of different ways, and able to help diabetics with insulin secretio, glucose oxidation and other processes.



How it works

The main constituents of bitter melon which are responsible for the antidiabetic effects are triterpene, proteid, steroid, alkaloid, inorganic, lipid, and phenolic compounds. Several glycosides have been isolated from the *M. charantia* stem and fruit and are grouped under the genera of cucurbitane-type triterpenoids. In particular, four triterpenoids have AMP-activated protein kinase activity which is a plausible hypoglycaemic mechanism of *M. charantia*.

Bitter melon is also linked to lowering the body's blood sugar. This is because the bitter melon has properties that act like insulin, which helps bring glucose into the cells for energy. The consumption of bitter melon can help your cells utilize glucose and move it to your liver, muscles, and fat. The melon may also be able to help your body retain nutrients by blocking their conversion to glucose that ends up in your blood stream.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Momordica charantia</i>
Common name	Karela
Plant part used for extraction	Fruit
Description	Yellowish brown colour Hygroscopic powder
Identificatio	By TLC
Assay Total Bitters (On Dried Basis % w/w)	5% to 15%
Charantin by HPLC	NLT 0.5%

Refernces:

1. Harinantenaina L, Tanaka M, Takaoka S, et al. *Momordica charantia* constituents and antidiabetic screening of the isolated major compounds. *Chem Pharm Bull (Tokyo)* 2006;54:1017-1021 4. Baldwa V, Bhandari C, Pangaria A, Goyal R. Clinical trial in patients with diabetes mellitus of an insulin-like compound obtained from plant sources. *Upsala J Med* 1977;82:39-41.
2. Ooi CP, Yassin Z, Hamid TA (2012) *Momordica charantia* for type 2 diabetes mellitus. *Cochrane Database Syst Rev* 8.

4. Cinnamon bark extract reduces risk factors associated with diabetes

Cinnamon has been used medicinally since ancient times. This popular spice was used in ancient Egypt, China, and India for culinary and medicinal purposes, and its use has also been documented in the Bible.

There are two types of cinnamon: *Ceylon (Cinnamomum zeylanicum)* and *cassia*, both derived from the bark of evergreen trees. Ceylon cinnamon is grown in South America, Southeast Asia, Srilanka and the West Indies, while cassia cinnamon is grown in Central America, China, and Indonesia. Ceylon cinnamon bark looks like tightly rolled scrolls, while cassia cinnamon is more loosely rolled.

How it works

Results from a clinical study published in the *Diabetes Care* journal in 2003 suggest that cassia cinnamon (cinnamon bark) improves blood glucose and cholesterol levels in people with type 2 diabetes, and may reduce risk factors associated with diabetes and cardiovascular disease.

Cinnamon also possess extrapancreatic actions like, it increases insulin-dependent glucose metabolism in vitro and in experimental animal and delays the gastric emptying rate that reduces post-prandial blood glucose level which could have contributed to its hypoglycemic action with glibenclamide.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Cinnamomum zeylanicum</i>
Common name	Cinnamomum
Plant part used for extraction	Bark
Description	Light to reddish brown coloured powder
Identification	By TLC
Assay : (On dried basis) Total Polyphenols	NLT -20 % w/w

References:

1. Khan A, Safdar M, Ali Khan MM, Khattak KN, Anderson RA (2003) Cinnamon improves glucose and lipids of people with type 2 diabetes. *Diabetes Care* 26: 3215-3218.
2. *The Effect of Cinnamon on Glucose of Type II Diabetes Patients by F Hasanzade - 2013 - Cited by 28 - Related articles.*



5. *Eugenia jambolana* seed extract: A front line antidiabetic medication

Eugenia jambolana (black plum or jamun) belongs to the family Myrtaceae. The most commonly used plant parts are seeds, leaves, fruits, and bark. *Eugenia jambolana* is an evergreen tropical tree. This tree is known to have grown in Indian subcontinent and in other regions of South Asia such as Nepal, Burma, Sri Lanka, Indonesia, Pakistan, and Bangladesh from ancient time.

Jamun has been reported to be used in numerous complementary and alternative medicine systems of India and, before the discovery of insulin, was a frontline antidiabetic medication even in Europe. The brew prepared by jamun seeds in boiling water has been used in the various traditional systems of medicine in India.



How it works

The blood glucose-lowering effect of *Eugenia jambolana* is due to increased secretion of insulin from the pancreas or by inhibition of insulin degradation. *Eugenia jambolana* is also reported to have lipid-lowering effect evidenced by reduction of blood cholesterol, triglycerides, and free fatty acids.

It is evaluated the hypoglycemic activity of different parts of *Eugenia jambolana* seeds such as whole seed, kernel, and seed coat on streptozotocin-induced diabetic rats. Administration of the ethanolic extract of kernel at a concentration of 100 mg/kg of body weight significantly decreased the levels of blood glucose, blood urea, and cholesterol, increased glucose tolerance and levels of total proteins and liver glycogen, and decreased the activities of glutamate oxaloacetate transaminase and glutamate pyruvate transaminase in experimental diabetic rats. Whole seed showed a moderate hypoglycemic effect, and seed coat did not show any hypoglycemic effect. The hypoglycemic efficacy was compared with that of glibenclamide, a standard hypoglycemic drug.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Eugenia jambolana</i>
Common name	Jamun
Plant part used for extraction	Seed
Description	Dark Brown coloured powder
Identification	By TLC
Assay : (On dried basis) Total Bitters (% w/w)	NLT –5 % w/w

References:

1. Chaturvedi A, Bhawani G, Agarwal PK, Goel S, Singh A, et al. (2009) Antidiabetic and antiulcer effects of extract of *Eugenia jambolana* seed in mild diabetic rats: study on gastric mucosal offensive acid-pepsin secretion. *Indian J Physiol Pharmacol* 53: 137-146.
2. Acherekar S, Kaklij GS, Pote MS, Kelkar SM (1991) Hypoglycemic activity of *Eugenia jambolana* and *Ficus bengalensis*: mechanism of action. *In vivo* 5: 143-147.

6. Fenugreek seed extracts have been reported to exhibit antidiabetic potential

Fenugreek (*Trigonella foenum graecum*) self-pollinates. An annual plant belongs to the family of Legumes. It has been called as “Trigonella” of the Latin language which means “small triangle” due to its yellowish-white triangular flower. And the name of the species “Foenum-graecum” means “Greek hay”, indicating its use as a forage plant in the past. Fenugreek is native to the Mediterranean region of Asia and has recently been suggested to originate in Turkey. Fenugreek is known throughout the world.



How it works

Fenugreek contains a fairly high amount of alkaloids, saponins and flavonoids. Alkaloids and volatiles are the two major constituents of fenugreek seed which causes bitter taste. Fenugreek endosperm contains 35% alkaloids, primarily trigonelline. Flavonoid constitutes more than 100 mg/g of fenugreek seed.

Fenugreek seed extracts have been reported to exhibit antidiabetic potential by delaying both gastric emptying time and rate of glucose absorption. It reduced uptake of glucose in the small intestine mainly due to its high fiber content that slows the metabolism of carbohydrates and lowered blood glucose.

High Fiber helps lower blood sugar by slowing down digestion and absorption of carbohydrates. This suggests they may be effective in treating people with diabetes. Multiple studies have been carried out to investigate the potential anti-diabetic benefits of fenugreek. Of these, several clinical trials showed that fenugreek seeds extract can improve most metabolic symptoms associated with both type 1 and type 2 diabetes in humans by lowering blood glucose levels and improving glucose tolerance.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Trigonella foenum graecum</i>
Common name	Methi
Plant part used for extraction	Seed
Description	Dark yellow colour powder, having characteristic odour
Identification	By TLC
Assay (On Dried Basis) Total Saponin content (%w/w)	NLT-50%w/w

References:

1. Khosla P, Gupta DD, Nagpal RK (1995) Effect of *Trigonella foenum graecum* (fenugreek) on blood glucose in normal and diabetic rats. *Indian J Physiol Pharmacol* 39: 173-174.
2. Clinical observation on *trigonella foenum-graecum* L. total saponins in combination with sulfonylureas in the treatment of type 2 diabetes mellitus F Lu, L Shen, Y Qin, L Gao, H Li, Y Dai - *Chinese Journal of Integrative...*, 2008.

7. Gymnema leaf extract delays the glucose absorption in the blood

Gymnema sylvestre is a medicinal plant; it is a slow-growing, perennial, woody climber found in central and southern India and tropical Africa. In the Ayurvedic system, it is referred to as “Meshasringa” or “Gurmar” and has indications for use in glucose balance. Gymnemic acid—an active component isolated from leaves of *G. sylvestre*—has antidiabetic properties.



How it works

This is attributed to the ability of gymnemic acids to delay the glucose absorption in the blood. The atomic arrangement of gymnemic acid molecules is similar to that of glucose molecules. These molecules fill the receptor locations on the taste buds thereby preventing its activation by sugar molecules present in the food, thereby curbing the sugar craving. Similarly, Gymnemic acid molecules fill the receptor location in the absorptive external layers of the intestine thereby preventing the sugar molecules absorption by the intestine, which results in low blood sugar level.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Gymnema sylvestre</i>
Common name	Gurmar
Plant part used for extraction	Leaves
Description	Greenish brown coloured, hygroscopic powder
Identification	Positive for Gymnemic acid by HPLC
Assay,(On dried basis) Crude Gymnemic acid content	NLT - 75 % w/w
Gymnemagenin acid	NLT 20% by HPLC

Refernces:

1. Shanmugasundaram KR, Panneerselvam C, Samudram P, Shanmugasundaram ER (1983) Enzyme changes and glucose utilisation in diabetic rabbits: the effect of *Gymnema sylvestre*. *J Ethnopharmacol* 7: 205-234.
2. Shanmugasundaram ER, Rajeswari G, Baskaran K, Kumar BR, Shanmugasundaram KR, et al. (1990) Use of *Gymnema sylvestre* leaf in the control of blood glucose in insulin-dependent diabetes mellitus. *J Ethanopharmacol* 30: 281-294.

8. Neem leaf extract improves insulin sensitivity

Neem, scientifically known as *Azadirachta indica*, belongs to the family of Meliaceae or Mahogany. A medicinal plant used extensively for the treatment of several ailments, Neem is one of the herbs which is well known for managing and treating diabetes.

How it works

In Ayurveda, neem is a quite popular natural remedy for reducing sugar levels in people with type 2 diabetes. It is one of the safest medicinal herbs and has been scientifically proven to reduce glucose levels without causing any potential side-effects. Several studies have supported that neem could be beneficial for people with diabetes mellitus and could also delay the onset of the condition in high risk individuals.



Neem extract and the seed oil, both, have been shown to improve insulin sensitivity. This means it allows the body to regulate sugar levels even in the presence of smaller amounts of insulin. Natural neem tablets are also used in Ayurveda to mainly reduce the dependence on insulin and anti-diabetic drugs.

It is experimented that the aqueous extract obtained from the leaves of the plant *A. indica*, produce a hypoglycemic effect observed through the determinations of glucose in the normoglycemic medium. *A. indica* may play a significant role in the management of type-2 diabetes mellitus, by improving the insulin signaling molecules and glucose utilization in the skeletal muscle.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Azadirachta indica</i>
Common name	Neem
Plant part used for extraction	Leaf
Description	Yellowish brown colored powder
Identification	By TLC
Assay (On Dried Basis) Total Bitters	NLT-5%w/w

Refernces:

1. *In vivo* Antidiabetic evaluation of Neem leaf extract in alloxan induced rats, SK Dholi, R Raparla, SK Mankala... - *Journal of applied ...*, 2011.
2. Reversal of diabetic retinopathy in streptozotocin induced diabetic rats using traditional Indian anti-diabetic plant, *Azadirachta indica* (L.), HEMA Hussain - *Indian Journal of Clinical Biochemistry*, 2002.

9. *Ocimum sanctum* leaf extract is found more effective in lowering both fasting and post prandial blood glucose levels

Ocimum sanctum Linn (known as Tulsi in Hindi), a small herb native to India, It is one of the oldest herbs known to mankind, tulsi's healing and healthful properties have been the most treasured knowledge across the world. Holy Basil or Tulsi, is considered sacred in Hinduism and is worshiped as 'Goddess of Devotion' in many of the Indian households. Tusi is cultivated for religious and medical purposes and also for its essential oil which is often used in Ayurveda.



How it works

Ocimum Sanctum is found more effective in lowering both fasting and post prandial blood glucose levels in the patients of type 2 diabetes mellitus.

Treatment with aqueous suspension of *Ocimum sanctum* decrease serum glucose, total cholesterol, triglyceride, creatinine, SGOT, SGPT, ALP and bilirubin level in diabetic group as compared with control group. Aqueous suspension of *Ocimum sanctum* showed antidiabetic activity against diabetes. An experiment clearly indicate that in diabetic increased oxidative stress which causes peroxidative membrane damage. Diabetes inhibited the activities of antioxidant enzymes and insulin secretion by pancreatic beta cells. Oral administration of *Ocimum sanctum* extracts increase insulin activity and reduced oxidative stress complication in diabetic rats. Further human studies are necessary and found the active component of *Ocimum sanctum* and role of these herbal drugs in controlling diabetes and its complications.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Ocimum sanctum</i>
Common name	Tulsi
Plant part used for extraction	Whole plant
Description	Brown to Dark Brown Hygroscopic powder
Identification	By TLC
Assay: (on dried basis) Total Tannins (%w/w)	NLT-10.0% w/w

References:

1. Suanarunsawat T, Songsak T (2005) Anti-hyperglycaemic and anti-dyslipidaemic effect of dietary supplement of white *Ocimum sanctum* Linnean before and after STZ-induced diabetes mellitus. *Int J Diabetes Metab* 13: 18-23.
2. AGRAWAL, P.; RAI, V.; SINGH, R.B. Randomized placebo-controlled, single blind trial of holy basil leaves in patients with noninsulin-dependent diabetes mellitus. *Int. Clin. Pharmacol. Ther.*, v.34, p.406-409, 1996.

10. Costus igneus extract (natural insulin)

Costus igneus, commonly known as insulin plant in India, belongs to the family Costaceae. Consumption of the leaves are believed to lower blood glucose levels, and diabetics who consumed the leaves of this plant did report a fall in their blood glucose levels.

How it work

The rich green leaves comprise of corosolic acid, among various other enriching nutrients. This component, when ingested, works the magic by enhancing the secretion of insulin from the pancreas. It triggers high or abated glucose levels in the bloodstream and cures the condition.



Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Chamaecostus cuspidatus</i>
Common name	Costus igneus
Plant part used for extraction	Leaf
Description	Light brown color powder
Identification	By TLC
Assay Total Saponins by GV	NLT 30%

Refernces:

1. Elavarasi S, Saravanan K. Ethnobotanical study of plants used to treat diabetes by tribal people of Kolli Hills, Namakkal District, Tamilnadu, Southern India. *Int J Pharm Tech Res.* 2012;4:404–11.
2. Jothivel N, Ponnusamy SP, Appachi M, Singaravel S, Rasilingam D, Deivasigamani K, et al. Anti-diabetic activity of methanol leaf extract of *Costus pictus* D. Don in alloxan-induced diabetic rats. *Journal of Health Science.* 2007;53:655–63.
3. Jothivel N, Ponnusamy SP, Appachi M, Singaravel S, Rasilingam D, Deivasigamani K, et al. Anti-diabetic activity of methanol leaf extract of *Costus pictus* D. Don in alloxan-induced diabetic rats. *Journal of Health Science.* 2007;53:655–63.

11. Pterocarpus wood extract controls the diabetes related metabolic alterations apart from controlling the glucose levels

Pterocarpus is a genus of pantropical trees in the Fabaceae family. It contains about 35 species, with *P. marsupium* being one of the most well-known members of this genus. Common names for this tree include the Indian Kino Tree and Malabar Kino Tree.

Pterocarpus originates from dry, hilly areas of India, Sri Lanka and Nepal. Pterocarpus is a deciduous tree that can approach a height of 100 feet.

Pterocarpus marsupium Roxb. (Leguminosae) has a high reputation in the traditional system of Indian medicine (including folklore) and therefore is one of the drugs used in the treatment of diabetes mellitus by Ayurvedic physicians in different parts of India.



How it works

The antidiabetic activity of various subfractions of the alcohol extract of the bark of *Pterocarpus marsupium* Roxb. was evaluated in alloxan induced diabetic rats. The effect of these extracts on lipid profile and liver function tests were also assessed to evaluate their activity in controlling diabetes related metabolic alterations. The parameters measured were plasma glucose, total protein, cholesterol, triglycerides, alkaline phosphatase, SGOT and SGPT. The results indicate the effective role of *Pterocarpus marsupium* on the above mentioned parameters indicating that *Pterocarpus marsupium* can also control the diabetes related metabolic alterations apart from controlling the glucose levels.

Pterocarpol, pterostilbene. Promotes regeneration of the damaged beta cells in the Islet of Langerhans in pancreas, enhanced glucose uptake by skeletal muscle cells in a dose dependent manner. It may primarily be concluded that phenolic-C-glycosides present in *P. marsupium* heart wood are the phytoconstituents responsible for the antihyperglycemic activity and validate the claim of antidiabetic activity of heart wood.

Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Pterocarpus marsupium</i>
Common name	Vijaysar
Plant part used for extraction	Wood
Description	Yellowish brown colour powder
Identification	By HPLC
Assay Total Pterostilbene (On Dried Basis % w/w) By HPLC	NLT 5% to 45%

References:

1. Antidiabetic activity of heart wood of *Pterocarpus marsupium*...by A Mishra - 2013 - Indian J Exp Biol. 2013 May;51(5):363-74.
2. Hypoglycaemic activity of *Pterocarpus marsupium* Roxb. Dhanabal SP1, Kokate CK, Ramanathan M, Kumar EP, Suresh B.

12. *Salacia reticulata*: To treat diabetes and obesity

Salacia reticulata is a large woody climbing shrub naturally found in Sri Lanka and Southern region of India. It is widely used in treating diabetes, a chronic disorder in metabolism of carbohydrates, proteins and fat due to absolute or relative deficiency of insulin secretion.



CONSTITUENTS

Presence of mangiferin ($C_{19}H_{18}O_{11}$), kotalanol ($C_{12}H_{24}O_{12}S_2$) and salacinol ($C_9H_{18}O_9S_2$) have been identified as the antidiabetic principles of *S. reticulata* through pharmacological studies. *Salacia reticulata* effectively improves insulin resistance, glucose metabolism and reduces obesity. A larger evidence base is required from well-planned studies to confirm its efficacy and safety.

How does it work

Compounds in *Salacia* seem to prevent sugars in food from being absorbed by the body.

The antidiabetic property of *Salacia reticulata* has been proved scientifically and it is basically attributed to the inhibitory activity of intestinal enzymes (α -glucosidase and α -amylase). Inhibition of intestinal enzymes delays glucose absorption into the blood and suppresses postprandial hyperglycemia, resulting in improved glycemic control.

Extract has been reported to prevent human postprandial hyperglycemia and to decrease the fasting plasma glucose and body mass index (BMI) in mild type II diabetic patients. *S. reticulata* roots are being used in the treatment of itching and swelling, asthma, thirst and amenorrhea.

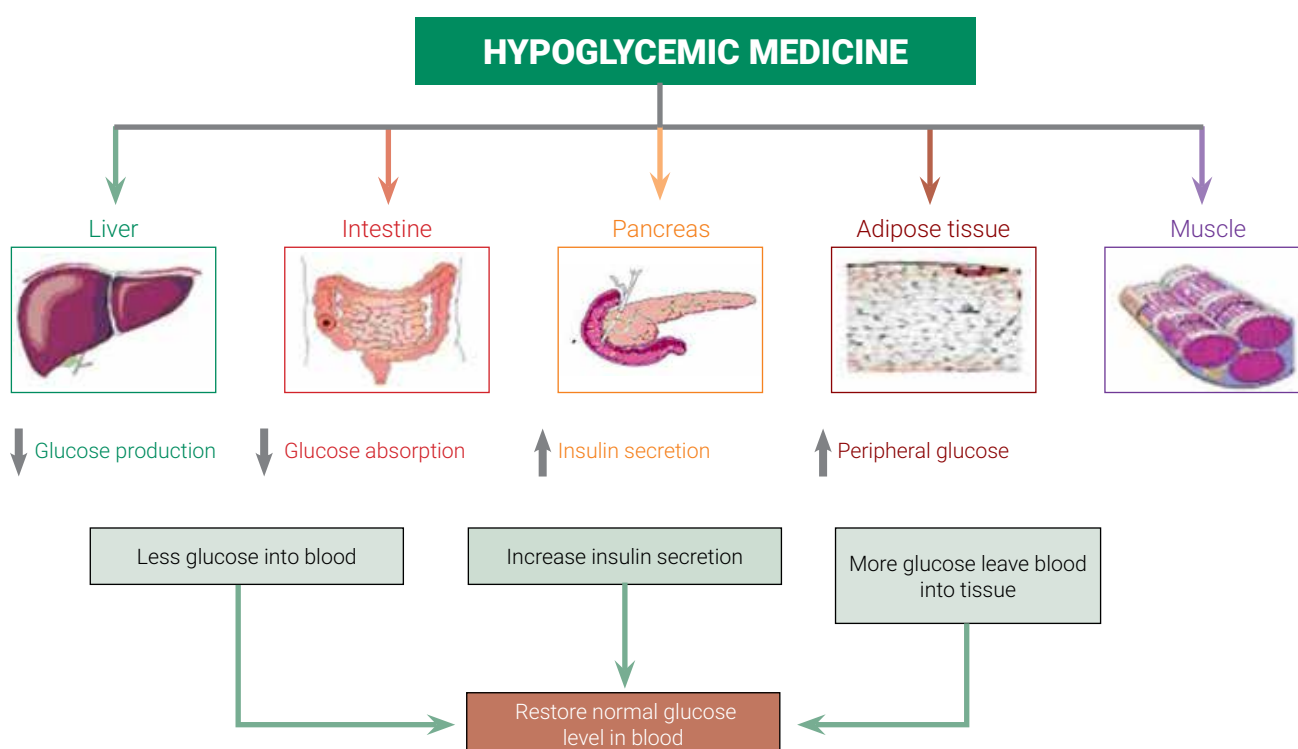
Specification of the Extract offered by SEPL:

TEST PARAMETERS	SPECIFICATION
Botanical name	<i>Salacia reticulata</i>
Common name	Salacia reticulate
Plant part used for extraction	Root
Description	Pale brown to brown powder
Identification	By HPLC
Assay Total Saponins (On Dried Basis % w/w) By HPLC	NLT 20% to 40%

References:

1. E. L. Cooper, "Ayurveda is embraced by eCAM," *Evidence-Based Complementary and Alternative Medicine*, vol. 5, no. 1, pp. 1–2, 2008.
2. M. Tsunakawa, T. Shimada, W. Suzuki et al., "Preventive effects of Daisaikoto on metabolic disorders in spontaneous obese type II diabetes mice," *Journal of Traditional Medicines*, vol. 23, pp. 216–223, 2006.

HOW FORMULATION WORKS IN DIABETES TREATMENT



Sunpure Extracts Private Limited has evolved a frontrunner in botanical extracts and nutraceutical ingredients in India & global platform with a cutting-edge cGMP manufacturing plant spread in pristine pollution-free environment, **Sunpure Research Incubation Centre (SRIC)** has team of dedicated scientists and full spectrum testing facilities. **SRIC** supports company in achieving new bioactives / derivatives along with filing DMFs, Dossiers, patents and working in compliance and tandem with Global Regulatory Bodies.



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