**Perspective**
Volume 8:4, 2022

Journal of Pharmacognosy & Natural Products

ISSN: 2472-0992 Open Access

# Medicinal Plants Used in the Treatment of Diabetes

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## Introduction

In both developed and developing countries, type 2 diabetes mellitus (T2DM) is a dangerous and increasingly common condition. Its pharmaceutical treatment is insufficient and does not always prevent diabetes development and consequences. Despite the advancement of pharmaceuticals, herbal therapies are still commonly utilised in many countries to cure diabetes or slow its progression.

Hyperglycaemia, as well as changes in lipid, carbohydrate, and protein metabolism, is all symptoms of diabetes mellitus. Diabetes mellitus is the most common chronic and metabolic disease, characterised by an increase in glucose levels caused by a lack of insulin, either absolute or relative. In the long run, the condition is linked to ocular, renal, cardiovascular, and neurological issues. Polyuria, weariness, weight loss, delayed wound healing, hazy eyesight, and elevations in urine glucose levels are all indications of this condition. One of the defects of the immune system's regulation is the destruction of beta-cells in the islets of Langerhans in the pancreas, which leads to the development of insulin-dependent diabetes. Several environmental and genetic factors influence the immune system, causing lymphocyte attacks, particularly lymphocyte attacks, and pancreatitis. Insulitis and diabetes can be caused by this inflammatory reaction [1,2].

## Description

Damage to the heart, arteries, nerves, and kidneys, as well as neuropathy, may result if correct therapy is not received. Diet, exercise, and medication are all part of the treatment plan. Insulin and hypoglycemic medicines are currently the most common and efficient treatments for diabetes, however these medications come with a slew of negative side effects. Medicinal plants have a long history of use, and they are now widely employed to treat a variety of ailments. Increasing the use of medicinal plants is for a variety of reasons. Many plants from all over the world have been studied for their anti-diabetic properties. This review article discussed some of the most important hypoglycemic medicinal plants based on valid clinical and analytical evidence, as well as medicinal plants that are prescribed in Iranian traditional medicine [3].

### Antidiabetic mechanism activity of medicinal herbs

***Trigonella foenum graecum*:** The direct stimulation of an amino acid termed hydroxysolecuine-4 on insulin release from beta cells are at least partly responsible for the therapeutic effect of fenugreek seed on diabetes. Following cell injury, the activity of Ca ATPase and Na / K ATPase pumps reduces the consumption of fenugreek seeds by lowering free radicals, thereby removing these illnesses.

***Carthamus tinctorius:*** The rich source of flavonoids, such as quercetin and camphorol, is linked to its antioxidant and hypoglycemic activity.

***Ferula assa-foetida:*** Gum can reduce the number of intracellular free radicals and boost the manufacture and secretion of insulin or hyperplasia of the remaining beta cells in the pancreas due to the presence of antioxidant components. Anthoczone gum may lower blood glucose levels by promoting insulin production and secretion, as well as hyperplasia of surviving beta pancreatic beta cells [4].

***Bauhinia forficate:*** It's high in flavonoids, a type of polyphenolic antioxidant that lowers blood sugar via boosting insulin production and stimulating glucose transfer through insulin-dependent pathways.

***Gymnema sylvestre:*** Gymnemic acid molecules bind to a receptor on the surface of the intestine's outer layers, preventing sugar molecules from being absorbed, resulting in a drop in blood sugar levels.

***Caesalpinia bonducella:*** Increases pancreatic islet insulin secretion. The plant extracts' anti-hyperglycaemic action could be related to an obstruction of glucose uptake.

***Syzygium cumini:*** The amount of cAMP in the langerhans increases, which is linked to an increase in insulin production. With enhanced catepsin activity, this role aids in the conversion of perinsulin to insulin. It boosts insulin activity while inhibiting Na/K ATPase activity in the patient's erythrocytes.

Diabetes is a disease in which blood sugar levels are abnormally high. The condition affects millions of people around the world. Diabetes research is continuing. When a person gets diabetes, the body's failure to utilise insulin leads sugar to stay in the blood rather than reaching the cells and providing energy. The extra sugar in the blood leads the blood sugar level to rise above the normal range. Diabetic patients were treated with medicinal herbs and traditional remedies before the discovery of insulin and hypoglycemic medicines. Over 1200 herbal medications have been found to have beneficial benefits in lowering blood glucose levels or preventing hyperglycemia-related problems. Each plant could have its own useful component for lowering cholesterol [5].

## Conclusion

The development of diabetes and a variety of other disorders is linked to oxidative stress. As a result, these plants exert their anti-diabetic actions through this mechanism, at least in part. Because oxidative stress is linked to a slew of other diseases, and these plants have antioxidant action, they may also be beneficial for other ailments. It's worth noting that these plants can lessen the adverse effects of hazardous substances or other medications thanks to their antioxidant activity and other mechanisms. They may, however, have harmful effects and should be taken with caution. More importantly, several other plans contain antioxidants. Hence, these plants may also have anti-diabetic activities and/or can reduce diabetes complications.

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**Received:** 09 April, 2022, Manuscript No. jpnp-22-66889; **Editor Assigned:** 12 April, 2022, PreQC No. P-66889; **Reviewed:** 24 April 2022, QC No. Q-66889; **Revised:** 29 April, 2022, Manuscript No. R-66889; **Published:** 05 May, 2022, DOI: 10.37421/2472-0992.2022.8.184

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**How to cite this article:** Pullela, Sushma. "Medicinal Plants Used in the Treatment of Diabetes." J Pharmacogn Nat Prod 8 (2022): 184.