A Review on Traditional Medicinal Plants with Ant Diabetic Properties

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Abstract---In children following asthma and epilepsy, diabetes is the third most prevalent chronic condition. More recently, the cumulative incidence of diabetes has started to grow significantly among children and adults. This has been partly influenced by the obesity pandemic in youth. Understandably, the health agencies and countries coping with the disease’s important morbidity with possible grave complications have been placing an economic strain. More treatment discoveries have since broadened the list of alternatives for the drugs available. The use of plants to treat different human conditions is stated in Ayurveda and other Indian literature. India has approximately 48000 plant species and several thousand of them have claimed to have medicinal properties. Ant’s diabetic properties have been seen in research on plants described or historically used in ancient literature in the last few decades. The area of herbal medicine has grown exponentially in recent years, and both in the development and developed countries these medications are increasingly common due to their natural sources and fewer side effects. This study is aimed to provide information about the plant’s anti-diabetes function based on the main evidence gathered from web search pages from different literature and science publications.
**Keywords**—antidiabetic activity, blood pressure, diabetes mellitus, medicinal plants, traditional medicinal plants.

**Introduction**

WHO studies say that mellitus diabetes is one of the greatest killers of our day. One of the most important causes of diabetes secondary disorders such as angioplasty, neuropathy, retinopathy, an antioxidant response mechanism dysfunction and lipid profile disorders is a long-term spike in glucose (Bnouham et al., 2006). Diabetic problems are not caused by hyperglycemia alone. Rather, glucose toxicity is harmful to chronic hyperglycemia, which is mediated and complicated by oxidative stress (Mamun-or-Rashid et al., 2014). In India there are projected to be about 33 million diabetes-related adults. By 2025, this figure is expected to rise to 57.2 million. Diabetes mellitus is a complex metabolic disease caused by insulin or insulin deficiency (Kumar et al., 2011).

Diabetes mellitus is a primarily known metabolic problem due to loss of glucose homeostasis due to starch, fat and protein digestion disorders caused by imperfections of insulin production, emission, insulin function (Kumar et al., 2011). This will affect organs such as the kidneys, liver, skin, nerves, heart, and veins for a long time. Disruption can lead to death in any of these organs. However, there was recently a significant growth in physical inactivity, obesity and diabetic type 2 patients (Raut & Gaikwad, 2006; Judy et al., 2003). The reality shows that the unhealthy habits of obesity and physical inactivity may be the key reasons why diabetes is increasingly common in developing countries (Patel et al., 2012). Diet is a key influence in a variety of diseases including diabetes. Diet forms a key hand in the general treatment of diabetes and can include diet alone, oral hypoglycemic diet or insulin diet (Chauhan et al., 2010).

Type I diabetes (inflammatory) is caused by insulin deficiency in functional beta cells insulin deficiency (Romano et al., 1998; Ozdemir et al., 2003). Therefore, the patients who experience this are fully dependent on exogenous insulin, while the insulin is unable to react to insulin and can be treated with dietary modifications, exercise and treatment in patients suffering from Type II Diabetes (Patel et al., 2012). Type II diabetes is 90% diabetic. Type II diabetes is the most prevalent form of diabetes (Sulaeman et al., 2018; Mustika & Sudiantara, 2019). Both signs can include: elevated blood sugar levels, uneven appetite, common urination, intense starvation and weight loss, blurred vision, nausea and vomiting, extreme exhaustion and exhaustion, and irritability, mood, etc. While it is still essential to thoroughly understand the pathophysiology of diabetes, experimental data indicates that free radicals are involved in pathogenesis and, particularly, the development of diabetes complications (Kumar et al., 2011).

It was projected that by 2030, the prevalence of 366 million diabetes-patient adults worldwide was estimated to increase to 552 million by the International Diabetes Foundation (IDF) (Bhushan et al., 2010). In 2014, however, there was a sharper leap, hitting 395 million, with a growth rate of 93% in Africa and 85% in the Middle East and Northern Africa, up to 425 million by 2017. Currently, multiple medications are used for diabetes care, such as insulin,
pharmacotherapy and nutritional remedies, which are used by various pathways to provide antidiabetic impact (Kumar et al., 2011). Mechanisms of this kind include stimulating sulfonylurea and megalithinide secretion of insulin, increasing peripheral glucose absorption by biguanids and thiazolidinedione, delayed absorption by alpha glycosidase of gluconeogenesis in the gut and reducing biguanides of hepatic gluconeogenesis (Kumar et al., 2009).

Diabetes and its complications appear to be a major medical issue and growing disease burden, considering the substantial improvement that has been achieved in the treatment of diabetes by the use of traditional medications and controlled interventions (Mamun-or-Rashid et al., 2014). Many of the synthetic hypoglycemic oral drugs used for the disease are not ineffective, toxic and expensive, including medication resistance and severe side effects (Jung et al., 2006). Diabetes remedies include dietary improvement, physical exercise, lifestyle modifications, weight control and other treatments, or include addition of oral and injection drugs as well as traditional oral and injectable therapies. Because of their efficacy, little side consequences and very little cost, herbal medicines were commonly prescribed as option medicines (Kayarohanam & Kavimani, 2015).

The international society has been extensively engaged in the use of herbs and natural ingredients for treating and controlling the disease (Singab et al., 2014). Owing to its natural sources and lesser side effects, the interest in herbal medicine in the treatment and management of diabetes has increased in recent years (Patel et al., 2012). Most of these herbs refer to medicinal products such as stems, leaves, bark, flowers and seeds. Despite the high potential and not always of medicinal plants, herbal therapy for diabetes mellitus has been used extensively (Bnouham et al., 2006). Herbal drugs remain an effective medicinal guide to human diseases. Over the past 2500 years, conventional medical legislation like China and the Unani, born and studied mostly in the eastern world, have been extremely strict (Mustaffa et al., 2011). These agreements also prosper, as approximately 80 percent of the general population of the developing countries rely on these prescription frameworks for their basic health care requirements (Kumar et al., 2011). These plants produce compounds, of which drug manufacturing precursors, that can be used for medicinal uses (Elekofehinti, 2015).

Most practitioners devise and deliver their own recipes in Indian medical systems. There are 21,000 plants identified by the World Health Organization (WHO), used worldwide for medicinal purposes (Aba & Asuzu, 2018). Of these 2500 animals, 150 are commercially used in India on a comparatively wide scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world. Studies in India over the past decade have shown not only high diabetes incidence, but also that urban populations are growing rapidly (Grover et al., 2002). It is therefore important to produce a new medication mellitus which is more effective by using natural ingredients that are empirically beneficial as anti-diabetic, with less side effects (Wadkar et al., 2008).

A series of reviews of plants for hypoglycemic behavior in India and elsewhere have been conducted over the past three decades. In recent times, both scientists and laymen have drawn more interest from Momordica charantia, Allium cepa,
**Gymema Sylvester**, etc. (Surya et al., 2014). Water extracts or alcoholic extracts from plants were screened in most animal experiments. Active plant concepts for hypoglycemic behavior have been studied in a few research (Munhoz & Frode, 2018). The Central Drug Research Institute (CDRI), luck now announced positive hypoglycemic activity in 11 plants in the systemic screening programmed for plants available in India for many decades, in October 1989, which none were deemed to be encouraging enough to undertake further tests. Glycoside, alkaloids, glycan, triterpenes, mucilage, polysaccharides, oils, vitamins, saponins, glycoproteins, peptides, amino acids and proteins are part of the main chemical constituents of plants that are mentioned with hypoglycemic action (Patel et al., 2012).

There have been reports of up to 20 hypoglycemic mucilage recently checked. Amongst these isolated mucilage in *Malavaceae* plants displayed hypoglycemic behavior, there was a very interesting chemical structure similar to a structural unit disaccharide providing valuable guidance on the relation between structure and Comportment (Rahimi, 2015). Hyperglyceraia caused by adrenalin, corticotrophin, somatotropin as well as streptozotocin and pancreatectomy in rats has been performed with different animal models including normal, fasting, and rabbits; alloxan-treated rabbits; In plants such as Momordica charantia and Pterocarpus mar supra, various groups of Indian workers have recorded some conflicting findings (Patel et al., 2012).

Recently, an alkaloid compound such as glycoside has been apparently extracted from R. aciculate ethanol extract. The effects of glycoside in diabetic rats have been antidiabetic/ant hyperglycemic (Singab et al., 2014). The findings demonstrated the substantial decrease of blood glucose levels and improved body weight, hemoglobin, lipoprotein, and high-density insulin levels, protein and hexokinase production relative to untreated rats, in glucose therapy (p < 0.01) (Rahimi, 2015). Diminished liver function enzymes and urea and creatinine levels were found in rats treated with glycoside (Maledo & Edhere, 2021; Suprapto et al., 2021).

Reports of 33 species of medicinal plants and the hypoglyceremic and wound-cure effects of plants, particularly halophytes and their associates, from the Southeast Indian coastal Kodyampalayam village (Sabu & Kuttan, 2002). Researchers found alkaloids in the stems and barks extracts of B. Sexangida (tropin 2 and tropin esters, ecstasy, isodiac acid, propionic acid, benzoic acid and ethyl 3,4-dihydroxybenzoate esters) (Mustaffa et al., 2011). Atropine alkaloids are natural products of medicinal use. Anticancer, antiemetic medications, antispasmodic drugs, mydrias and cholinergic musculoskeletal antagonists demonstrate their synthesis (Shori, 2015).

**Antidiabetic activity of phytochemicals**

**Alkaloids**

Alkaloids induce antihyperglycaemic activity by improving insulin's pancreatic secretion from β-cells of islets or by increasing blood glucose transfer to the peripheral tissue (Arulselvan et al., 2014).
**Flavonoids**

For alternatives to diabetic ally therapy, flavonoids can prove valuable as they help prevent appose in β cells, promote β cell proliferation, secretion of insulin, and increase the activity of insulin. Mangrove plants like Marina Avicenna and hexangular Brugier have been reported to have a wealth of flavonoids with hypoglycemic activity (Oguntibeju, 2019).

**Phenolic compounds**

Phenol compounds can exhibit hypoglycaemic activity by raising serum insulin levels, increasing the tissue's sensitivity to insulin action, stimulating glucose enzyme activity and inhibiting α-amylase activity (Mancia et al., 1997; Jackson et al., 2005). Mangroves like B. racemosa have phenolic antidiabetic (for instance, gallic acid) (Chukwuma et al., 2019). Therefore, more in-vitro and in-vivo animal studies accompanied by toxic and clinical examinations should be conducted in thorough research of isolated active compounds that have demonstrated anti-diabetes efficacy. This will provide a valuable compound for optimization and use in the development of new antidiabetic medicines (Hasanpour et al., 2020).

**Conclusion**

Herbal medicines, also in the age of highly advanced biology, are a field in which worldwide researchers supplement modern drugs and produce novel drugs (Widana et al., 2021). It was not scientifically determined the process of the majority of the crops used. A significant number of herbal plants and bioactive compounds are being used for diabetes care through different pathways and scientific focus has been seen in studies on medicinal plants historically used for diabetes control. The consequences of this are increased by the effectiveness of new plant-based medicines, increased interest in natural products and serious side effects, high costs, and low availability, especially in developing countries, of modern antidiabetic drugs for a variety of rural populations (Duraipandiyan & Ignacimuthu, 2011; Sharma et al., 2001).

Whatever the presence of antidiabetic medicines identified in the prescription industry (oral antidiabetic or exogenous insulin), natural resources remain future drugs research targets and play a key role in drug production efforts for treatment of the condition. Many conventional plants are empirically used worldwide for the treatment of this disease because it is less poisonous than synthetic medicines. The genus of Rubiaceae comes from one of the plants potentially as antidiabetic. Any researchers conclude that this anti-diabetic activity is mainly caused by the presence of bioactive compounds (Hwang et al., 2004; Rios & Recio, 2005).

**References**


