

A Review of Antidiabetic Potential of Ethnomedicinal Plants

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Abstract

Objective: Diabetes Mellitus (DM) is a common metabolic disorder throughout the world affecting the people of both developed and developing countries. Diabetes mellitus is caused by the abnormality of carbohydrate metabolism which is linked to low blood insulin level or insensitivity of target organs to insulin. It leads to hyperglycemic condition. Several herbs have been known to cure and control diabetes without causing any side effects.

Key findings: The present review is an attempt to list the plants with anti-diabetic activity, originating from different parts of world. A total of 177 plants belonging to 156 genera and 76 families were described and listed in the review. The plants have been tabulated with botanical, family and medicinal uses.

Conclusions: This study led to the wealth knowledge of traditional medicinal plants that are being used as a diabetic treatment. The further investigation on these medicinal plants may lead to the discovery of novel bioactive compounds in the pharmaceutical industry.

Keywords: Diabetes; Hypoglycemic; Anti-diabetic; Antioxidant; Carbohydrate metabolism

Abbreviations: DM: Diabetes Mellitus; IDDM: Insulin Dependent Diabetes Mellitus; NIDDM: Non-Insulin Dependent Diabetes Mellitus

Introduction

Diabetes mellitus (DM) is a common and epidemic disease affecting the people of both the developed and developing countries. DM is caused by the abnormality or dysfunction of carbohydrate metabolism [1]. The food we eat is broken into simple sugar called glucose. Glucose is the main source to get energy for the body. After digestion, it reaches our blood stream and the body cells utilize it for energy. Insulin is very essential for the glucose uptake into the cells. Insulin is a hormone secreted by the pancreas. If the pancreas does not produce enough insulin, glucose get into the body cells so, glucose stays in the blood. This makes the blood as hyperglycemic condition [2].

Symptoms of diabetes

- Fatigue or severe weakness
- Abnormal thirst
- Irritability
- Unexplained weight loss
- Increased hunger
- Recurrent infections
- Blurred vision
- Increased urination and nocturia

In normal individuals, the liver acts a storehouse of carbohydrates and releases glucose whenever the need arises. The pancreas produces insulin, which circulates in the blood and allows the entry of sugar in the cells. It also helps lowering the blood sugar levels. In case of pre-diabetic patients, the pancreas does not produce enough insulin leading to increased levels of sugar in the blood up to 100-125 mg/dl. Nowadays, Diabetes is 'killer' of mankind when compared to the disease like cancer and cardiovascular disease. In India, the number of adults suffering from diabetes is expected to increase in threefold from 19.4 million in

1995 to 57.2 million in 2025 [3]. The three main important classical symptoms of diabetic conditions are, polyuria (frequent urination), polydipsia (increased thirst), and polyphagia (increased hunger) [2].

Classification of Diabetes mellitus

Diabetes have been identified and mainly classified into 3 types.

Type I Diabetes

It is also referred as IDDM (Insulin dependent diabetes mellitus or juvenile diabetes). Type I Diabetes results the pancreas (a large gland behind the stomach) fail to produce insulin, without insulin, the body's cells cannot use glucose (sugar), which the body needs for energy. It begins to burn its own fats as a substitute. The type 1 diabetic patient needs insulin injection every day, to control the glucose level in blood.

Type II Diabetes

It is also referred as NIDDM (Non-insulin dependent diabetes mellitus or adult-onset diabetes). Type II DM results from insulin resistance, in which cells fails to use insulin properly. This causes glucose (sugar) to accumulate in the blood stream.

Gestational Diabetes

Gestational Diabetes is a form of diabetes consisting of high blood glucose levels during pregnancy and goes away after the baby is born. It develops towards the middle of the pregnancy as a result of the changes in the mother's hormones.

To treating the diabetes without any complication or any side

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effects is a challenging problem in the medical community [4]. For the treatment of diabetes, the traditional medicine is used. More than 1200 plants are used to treat diabetes around the world. About 30% of the traditionally used plants serve as a major source of therapeutic agents for the treatment for diabetes as well as the human disease [5].

Nowadays herbal medicine is an interestingly growing field, because the drugs are having less or no side effects [6]. The treatment of diabetes using the naturally derived agents has more beneficial effects, and does not cause any side effects, or any toxic symptoms. These herbal drugs protect the β -cells during the diabetic condition and reduce the amount of glucose level in the blood [7].

The medicinal plants used on anti diabetic treatments possess pancreatic β -cells regenerating, insulin releasing activity and also fight

the problem of Insulin resistance. These herbs also used to increase the insulin secretion, enhancing the glucose uptake by an adipose tissue, and inhibit the glucose absorption from the intestine [1].

Methodology

The study aimed to recollect and record, the information on anti-diabetic plants from the published literature [1,5-128]. All the plants recorded were used for the treatment of diabetes to reduce the hyperglycemic condition. In this review, we have collected about 180 plants which are effective for the reduction of hyperglycemic condition. The plants have been listed in the alphabetic order, family and their reported medicinal uses. Table 1 contains the data about medicinal plants with Antidiabetic Activity.

Botanical name	Family	Medicinal uses
<i>Abelmoschus moschatus</i> Medik	Malvaceae	Antidiabetic [7]
<i>Abrus precatorius</i> L.	Fabaceae	Anti diabetic [6]
<i>Acacia Arabica</i>	Mimosaceae	Hypoglycemic activity [8]
<i>Achillea santolina</i>	Asteraceae	Hypoglycemic, antioxidant [9]
<i>Achyranthes aspera</i> L.	Amaranthaceae	Hypoglycemic effect [10]
<i>Achyrocline satureioides</i> (Lam.) DC.	Asteraceae	Lowered blood glucose levels, antioxidant [11]
<i>Aconitum carmichaelii</i> Debeaux	Ranunculaceae	Antidiabetic [5]
<i>Acosmium panamense</i> (Benth.) Yakovlev	Leguminosae	Lowers the plasma glucose levels [12]
<i>Adhatoda vasica</i> Nees	Acanthaceae	Antidiabetic [13]
<i>Aegle marmelos</i> (L.) correa	Rutaceae	Hypoglycaemic effect [14]
<i>Agrimonia eupatoria</i> L.	Rosaceae	Antihyperglycemic [15]
<i>Ajuga iva</i> (L.) Schreb.	Lamiaceae	Use in diabetes mellitus control [16]
<i>Allium cepa</i> (L.)	Liliaceae	Antidiabetic, Anti malarial, Antirheumatic, Antibacterial [17]
<i>Allium sativum</i> (L.)	Liliaceae	Anti-inflammatory, Anticancer, Rheumatism and Bronchitis [18]
<i>Alnus nepalensis</i> D. Don	Betulaceae	Hypoglycemic and Spasmogenic [2]
<i>Aloe vera</i> (L.) Burm.f.	Asphodelaceae	Antidiabetic, cardioprotective activity, hypoglycemic activity [19]
<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	Antidiabetic [21]
<i>Andrographis lineate</i> Nees	Acanthaceae	Control the blood sugar level [6]
<i>Andrographis paniculata</i> (Burm.f.) Nees	Acanthaceae	Chikenguinea, Swine flu and Typhoid, antidiabetic property [22]
<i>Annona squamosa</i> L.	Annonaceae	Anti diabetic activity [21]
<i>Areca catechu</i> L.	Arecaceae	Hypoglycemic [23]
<i>Aristolochia indica</i> L.	Aristolochiaceae	Reduce the blood glucose level [24]
<i>Artemisia dracunculul</i> L.	Asteraceae	Hypoglycemic activity [25]
<i>Artemisia herba-alba</i> Asso	Asteraceae	Reduction in blood glucose level [26]
<i>Artemisia pallens</i> Wall. ex DC	Compositae	Antidiabetic [5]
<i>Astragalus propinquus</i> Schischkin	Leguminosae	Decreases the blood glucose concentration [27]
<i>Averrhoa bilimbi</i> L.	Oxalidaceae	Anti-diabetic [28]
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Antidiabetic, Antihyperlipidemic, antioxidant [29]
<i>Bambusa nutans</i> Wall. ex Munro	Poaceae	Hypoglycemic activity [2]
<i>Bauhinia forficata</i> Link	Caesalpinaceae	Hypoglycemic effect, antioxidant [31]
<i>Bauhinia forficata</i> subsp. pruinosa (vogel) fortunato & Wunderlin	Leguminosae	Hypoglycemic activity [30]
<i>Beta vulgaris</i> L.	Chenopodiaceae	Increases glucose tolerance in OGTT [32]
<i>Bidens pilosa</i> L.	Asteraceae	Preventing autoimmune diabetes [33]
<i>Biophytum sensitivum</i> (L.) DC.	Oxalidaceae	Hypoglycemic effect [34]
<i>Bixa orellana</i> L.	Bixaceae	Decreases blood glucose levels [35]
<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Antidiabetic [5]
<i>Bombax ceiba</i> L.	Malvaceae	Hypoglycemic [36]
<i>Brassica juncea</i> (L.) Czern	Brassicaceae	Antidiabetic [24]
<i>Bryonia alba</i> L.	Cucurbitaceae	Restores Metabolic changes induced in diabetes [37]
<i>Butea monosperma</i> (Lam.) Taub.	Caesalpinaceae	Anti-hyperglycemic [39]
<i>Caesalpinia bonduc</i> (L.) Roxb.	Caesalpinaceae	Antidiabetic, antihyperlipidemic [40]
<i>Caesalpinia digyna</i> Rottler	Leguminosae	Antidiabetic [128]

<i>Cajanus cajan</i> (L.) Millsp.	Papilionaceae	Reduction in the serum glucose levels [41]
<i>Camellia sinensis</i> (L.) Kuntze	Theaceae	Antidiabetic [5]
<i>Canthium coromandelicum</i> (Burm.f.) Alston	Rubiaceae	Lower blood glucose levels [6]
<i>Capparis spinosa</i> L.	Capparidaceae	Decrease the blood glucose level [42]
<i>Capsicum annum</i> L.	Solanaceae	Antidiabetic [5]
<i>Carum carvi</i> L.	Apiaceae	Potent anti-hyperglycemic [42]
<i>Casearia esculenta</i> Roxb.	Flacourtiaceae	Antihyperglycemic activity [43]
<i>Casearia tomentosa</i> Roxb.	Meliaceae	Antidiabetic [4]
<i>Cassia auriculata</i> (L.) Roxb.	Caesalpinaceae	Reduction in fasting blood glucose [18]
<i>Cassia fistula</i> L.	Caesalpinaceae	Diabetes and Liver disorder [2]
<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Anti-hyperglycemic [125]
<i>Catharanthus roseus</i> (L.) G. Don	Apocynaceae	Reduced the blood glucose [45]
<i>Chamaecostus cuspidatus</i> (Nees & Mart.) C.D Specht & D.W. Stev.	Costaceae	Lower blood glucose levels [52]
<i>Chamaemelum nobile</i> (L.) All.	Asteraceae	Aqueous extract reduces blood glucose level [42]
<i>Cheilocostus speciosus</i> (J.koenig) C.D. specht	Costaceae	Anti diabetic [6]
<i>Cichorium intybus</i> L.	Asteraceae	Hypoglycemic effect [28]
<i>Cinnamomum verum</i> J.Presl	Lauraceae	Reduced the blood sugar level [126]
<i>Clausena anisata</i> (Willd.) Hook.f. ex Benth.	Rutaceae	Reduces the basal blood glucose concentrations [48]
<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Hypoglycemic activity [21]
<i>Cogniauxia podoleana</i> Baill.	Cucurbitaceae	Hypoglycemic [49]
<i>Commelina communis</i> L.	Conimelinaceae	Anti-hyperglycemic [50]
<i>Coriandrum sativum</i> L.	Apiaceae	Antihyperglycemic, increases the activity of the beta cells [51]
<i>Croton cajucara</i> Benth.	Euphorbiaceae	Anti-hyperglycemic [53]
<i>Cuminum cyminum</i> L.	Apiaceae	Antioxidant, antidiabetic [54]
<i>Cuminum nigrum</i> L.	Apiaceae	Hypoglycemic effect, anti-diabetic therapeutic agent [55]
<i>Curcuma longa</i> L.	Zingiberaceae	Antidiabetic, Antihyperlipidemic, antioxidant [56]
<i>Cyamopsis tetragonoloba</i> (L.) Taub.	Fabaceae	Antidiabetic [57]
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	Control blood sugar level [21]
<i>Derris scandens</i> (Roxb.) Benth.	Fabaceae	Antidiabetic [21]
<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Mimosaceae	Antidiabetic [4]
<i>Dioscorea dumetorum</i> (Kunth) Pax	Dioscoreaceae	Hypoglycemic effects [58]
<i>Dregea volubilis</i> (L.f.) Benth. ex Hook.f.	Asclepiadaceae	Anti diabetic [6]
<i>Eclipta prostrate</i> (L.) L.	Asteraceae	Antihyperglycemic activity [59]
<i>Eleusine coracana</i> (L.) Gaertn.	Poaceae	Antihyperglycemic activity [60]
<i>Embellica officinalis</i>	Euphorbiaceae	Antidiabetic, Antihyperlipidemic, antioxidant [61]
<i>Enicostema littorale</i> blume	Gentianaceae	Antidiabetic agent without any toxic effect [62]
<i>Eriobotrya japonica</i> (Thunb.) Lindl.	Rosaceae	Hypoglycemic [63]
<i>Euphorbia nerifolia</i> L.	Euphorbiaceae	Controls the blood glucose level [64]
<i>Ficus bengalensis</i> L.	Moraceae	Antidiabetic [63]
<i>Ficus racemosa</i> L.	Moraceae	Hypoglycemic activity [64]
<i>Fraxinus excelsior</i> L.	Oleaceae	Hypoglycemic activity [81]
<i>Galega officinalis</i> L.	Fabaceae	Antidiabetic [5]
<i>Gandoderma lucidium</i>	Ganodermataceae	Antidiabetic [5]
<i>Garcinia kola</i> Heckel	Clusiaceae	Hypoglycemic effects [58]
<i>Garuga pinnata</i> Roxb.	Burseraceae	Antidiabetic [24]
<i>Gentiana olivieri</i> Griseb.	Gentianaceae	Hypoglycemic, anti-hyperlipidemic [65]
<i>Ginkgo biloba</i> L.	Ginkgoaceae	Hypoglycemic, increases pancreatic beta-cell in NIDDM [66]
<i>Globularia alypum</i> L.	Globulariaceae	Hypoglycemic, increases plasma insulin levels [67]
<i>Glycyrrhiza uralensis</i> Fisch.	Papilionaceae	Decreases the blood glucose levels [68]
<i>Gmelina arborea</i> Roxb.	Verbenaceae	Antidiabetic [21]
<i>Gongronema latifolium</i> Benth.	Asclepiadaceae	Antidiabetic, antioxidant [69]
<i>Grewia asiatica</i> L.	Malvaceae	Antidiabetic [5]
<i>Gymnema nwtanum</i> Hook	Asclepiadaceae	Antidiabetic [70]
<i>Gymnema sylvestre</i> (Retz.) R.Br. ex Sm.	Asclepiadaceae	Anti-diabetic [71]
<i>Helicteres isora</i> L.	Sterculiaceae	Use in the treatment of type-2 diabetes [72]
<i>Hemidesmus indicus</i> (L.) R.Br. ex Schult.	Asclepiadaceae	Antidiabetic [5]
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Antiviral, Antidiabetic, Antioxidant [73]

<i>Hintonia latiflora</i> (sesse & Moc. Ex Dc.) Bullock	Rubiaceae	Anti-hyperglycemic [74]
<i>Hypoxis hemerocallidea</i> Fisch., C.A. Mey. & Ave-Lall.	Hypoxidaceae	Hypoglycemic activity [75]
<i>Ibervillea sonorae</i> (S. Watson) Greene	Cucurbitaceae	Acute and chronic hypoglycemic [76]
<i>Ipomoea aquatica</i> Forsck.	Convolvulaceae	Hypoglycemic [77]
<i>Justicia tranquebariensis</i> L.f.	Acanthaceae	Control the blood sugar level [78]
<i>Kalopanax pictus</i> (Thunb.) Nakai	Araliaceae	Anti-diabetic activity, hypocholesterolmic and hypolipidemic [79]
<i>Lagerstroemia speciosa</i> (L.) Pers.	Lythraceae	Reduction in the blood glucose levels [80]
<i>Lantana camara</i> L.	Verbenaceae	Anti hyperglycemic activity [24]
<i>Lathyrus japonicus</i> Willd.	Fabaceae	Antidiabetic [5]
<i>Lawsonia inermis</i> L.	Lythraceae	Antidiabetic [24]
<i>Lepidium sativum</i> L.	Brassicaceae	Hypoglycemic activity [42]
<i>Madhuca longifolia</i> (J. Koenig ex L.) J.F. Macbr.	Sapotaceae	Maintaining normal blood sugar level [21]
<i>Mallotus philippensis</i> (Lam.) Mull.Arg.	Euphorbiaceae	Antidiabetic [4]
<i>Mangifera indica</i> L.	Anacardiaceae	Hypoglycemic activity [82]
<i>Medicago sativa</i> L.	Fabaceae	Anti-hyperglycemic [83]
<i>Memecylon umbellatum</i> Burm.f.	Melastomataceae	Anti hyperglycemic activity [6]
<i>Momordica charantia</i> L.	Cucurbitaceae	Hypoglycemic effect [84]
<i>Morinda lucida</i> Benth.	Rubiaceae	Anti-diabetic effect [85]
<i>Morus alba</i> L.	Moraceae	Protects pancreatic beta cells from degeneration [1]
<i>Morus indica</i> L.	Moraceae	Hypoglycemic [1]
<i>Morus insignis</i> Bureau	Moraceae	Hypoglycemic [1]
<i>Morus rubra</i> L.	Moraceae	Antibacterial, hypoglycemic [86]
<i>Mucuna pruriens</i> (L.) DC.	Fabaceae	Anti diabetic activity [21]
<i>Murraya koenigii</i> (L.) Spreng.	Rutaceae	Hypoglycemic [87]
<i>Musa paradisiacal</i> L.	Musaceae	Reduces diabetes [24]
<i>Myrcia uniflora</i> Barb. Rodr.	Myricaceae	Used for treatment of diabetes [88]
<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Improves glucose tolerance [1]
<i>Nepthoelepis tuberosa</i>	Oleandraceae	Antidiabetic [5]
<i>Nigella sativa</i> L.	Ranunculaceae	Reduces the levels of blood glucose, antidiabetic activity [89]
<i>Ocimum gratissimum</i> L.	Lamiaceae	Hypoglycemic [90]
<i>Origanum vulgare</i> L.	Lamiaceae	Anti-hyperglycemic activity [91]
<i>Otholobium pubescens</i> (Poir.) J.W. Grimes	Papilionaceae	Hypoglycemic effect [92]
<i>Paeonia lactiflora</i> Pall.	Paeoniaceae	Blood sugar lowering effect [93]
<i>Panax ginseng</i> C. A. Mey	Araliaceae	Antihyperglycemic activity [94]
<i>Pandanus odoratus</i> Ridl.	Pandanaceae	Hypoglycemic, increases serum insulin levels [95]
<i>Parmentiera edulis</i> A.DC	Bignoniaceae	Hypoglycemic [96]
<i>Phyllanthus amarus</i> Schumach & Thonn.	Euphorbiaceae	Anti-oxidant activity, reduces the blood sugar [97]
<i>Plantago ovata</i> Forssk	Plantaginaceae	Antidiabetic [5]
<i>Polygala elongata</i> Klein ex Willd.	Polygalaceae	Reduce blood glucose level [78]
<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	Antidiabetic [4]
<i>Psacalium decompositum</i> (A.Gray) H.Rob. & Brettell	Asteraceae	Hypoglycemic [98]
<i>Psacalium peltatum</i> (Kunth) Cass.	Asteraceae	Anti-hyperglycemic [99]
<i>Psidium guajava</i> L.	Myrtaceae	Hypoglycemic activity [100]
<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Antidiabetic [5]
<i>Retama raetam</i> (Forssk.) Webb	Papilionaceae	Hypoglycemic effect [101]
<i>Salacia reticulata</i> Wight	Celastraceae	Used for the prevention of diabetes [102]
<i>Sambucus nigra</i> L.	Adoxaceae	Insulin-releasing and insulin-like activity [103]
<i>Sanguis draxonis</i>	Apocynaceae	Increase insulin sensitivity [104]
<i>Sclerocarya birrea</i> (A.Rich.)	Anacardiaceae	Hypoglycemic [105]
<i>Scoparia dulcis</i> L.	Scrophariaceae	Hypoglycemic, antidiabetic [106]
<i>Senna occidentalis</i> (L.) Link	Caeslpinaceae	Hypoglycemic activity [24]
<i>Senna sophora</i> (L.) Roxb	Caeslpinaceae	Anti diabetic [24]
<i>Senna tora</i> (L.) Roxb.	Caeslpinaceae	Anti diabetic [24]
<i>Sida cordifolia</i> L.	Malvaceae	Anti-cholesterolemia, Antidiabetic, Anti-hyperlipidemia [107]
<i>Sideroxylon obtusifolium</i> (Roem & Schult.) T.D. Penn.	Sapotaceae	Hypoglycemic activity, anti inflammatory activity [38]
<i>Solaria oblonga</i>	Celastraceae	Hypoglycemic and possess anti-oxidant activity [108]
<i>Spergularia purpurea</i> (Pers.) G. Don	Caryophyllaceae	Hypoglycemic effect [109]
<i>Suaeda vermiculata</i> Forssk. ex. J.F. Gmel	Chenopodiaceae	Hypoglycemic effect [110]

<i>Swertia chirayita</i> (Roxb)	Gentianaceae	Stimulates insulin release from islets [111]
<i>Syzygium alternifolium</i> (Wight) Walp.	Myrtaceae	Hypoglycemic, antihyperglycemic and antihyperlipidemic [112]
<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Anti-hyperglycemic [86]
<i>Tamarindus indica</i> L.	Caesalpiniaceae	Used to treat mild diabetic (MD)[114]
<i>Telfairia occidentalis</i> Hook.f.	Cucurbitaceae	Hypoglycemic activity [115]
<i>Terminalia arjuna</i> (Roxb. Ex DC.) Wight & Arn.	Combretaceae	Antidiabetic activity [116]
<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Stimulates insulin secretion [117]
<i>Terminalia chebula</i> Retz.	Combretaceae	Antidiabetic, increases insulin release from the pancreatic islets [118]
<i>Tetraena gaetula</i> (Emb. & Maire) Beier & Thulin	Zygophyllaceae	Hypoglycemic [1]
<i>Teucrium polium</i> L.	Lamiaceae	Increases insulin release, antioxidant and hypoglycemic [119]
<i>Tinospora crispa</i> (L) Hook. f. & Thomson	Menispermaceae	Anti-hyperglycemic, stimulates insulin release from islets [121]
<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Antidiabetic, Antihyperlipidemic, antioxidant [120]
<i>Trigonella foenum -graecum</i> L.	Papilionaceae	Decrease in the blood glucose levels [122]
<i>Urtica dioica</i> L.	Urticaceae	Anti-hyperglycemic [123]
<i>Urtica pilulifera</i> L.	Urticaceae	Hypoglycemic [124]
<i>Withania coagulans</i> Dunal	Solanaceae	Anti hyperglycemic [1]
<i>Withania somnifera</i> (L) Dunal	Solanaceae	Hypoglycemic [126]
<i>Zizyphus sativa</i> Gaertn	Rhamnaceae	Hypoglycemic [127]
<i>Zizyphus spina-christi</i> L.	Rhamnaceae	Hypoglycemic [1]

Table 1: Medicinal plants with antidiabetic and their reported effect.

Conclusion

Herbal medicines can be used for healing purposes and to promote wellness and are powerful nutritional agents that support the body naturally to produce immunity against harmful diseases. They promote health and serve as excellent healing agents without side effects. A total of 177 plants belonging to 156 genera and 76 families were identified, which are being used for the treatment of diabetes. Identifying more number of medicinal plants to cure diabetes is highly beneficial and useful in the modern era. Curing the diabetes without any side effects is possible in traditional medicine by using plants. From this review, it is clear that the medicinal plants play a main important role in pharmaceutical industry to treat diseases without any side effects. From the review it is concluded that, the medicinal plants, which possess anti-diabetic activity is more abundant in nature. More investigations are needed to analyze the mechanism of action of the compounds and standardization of herbal drugs using different models and this in turn would be useful to provide many links to develop various kinds of anti diabetic drugs in low cost.

Conflict of Interest

The authors declare that they have no conflicts of interest to disclose.

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