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BEST ANTIDIABETIC HERBAL DRUGS WITHOUT SIDE EFFECT

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ABSTRACT

Plant extracts and their constituents are one of the potential approaches that are used for the prevention and treatment of a large number of disorders. Herbal products and herbal food supplements are the chief components of plant extracts, those are very helpful in retaining healthiness, performing against a range of diseases and they support the good quality of being. Diabetes mellitus is, a multi-factorial chronic metabolic disease causes high blood glucose level, one of them. The systematic researches of the traditional and recent herbal therapies for diabetes give precious leads for the progress of alternative new medicines and therapeutic approaches. Alternatives are required due to the incapability of modern approaches to organizing all of the pathological aspects of diabetes, and the poor availability and high cost of existing therapies for several country populations. This review summarizes the recent and traditional plants with verified antidiabetic potential in pre-clinical and clinical studies for synergistic management of diabetes.

KEYWORDS: Antidiabetics drugs, diabetes mellitus, herbal and natural products.

INTRODUCTION

Diabetes mellitus is a metabolic disorder caused by the increasing excess amount of sugar in the blood due to this reason the metabolism of carbohydrates, fat, lipid, and protein is not in a proper way. Diabetes mainly regulated by insulin causes a rise in fasting and postprandial blood glucose levels in the body or the disorder. This metabolic issue brings about extreme and long-haul diabetic issues like continuous pee, expanded thirst, and expanded craving. On the off chance that we disregard, at that point diabetes can cause numerous inconveniences, similar to diabetic kidney issues, heart stroke, constant kidney disease, foot ulcers, harm to the nerves framework, harm to the eyes, and psychological weakness. [1]

Diabetes prompts disintegrate body proteins that cause auxiliary difficulties, for example, influencing eyes, kidneys, nerves, and conduits. Diabetes is a significant multi-factorial constant metabolic issue, which has across-the-board complexities; it is related to lifetime harm, brokenness, and disappointment of different organs. It is the world's significant endocrine ailment connected by expanded bleakness and death rates. Even though it is a non-transferable illness, it is viewed as one of the five essential drivers of death around the world. As per WHO, about 100 million persons were suffering from diabetes globally in 2006, it is estimated that this number will be doubled by 2030. Diabetes mellitus occurs throughout the world, but most cases are found in developed nations. A large increase in occurrence is estimated mainly in Asia and Africa by 2030. The increased spreading of diabetes in developing nations follows the style of changes in daily life and urbanization. Diabetes is considered in the peak i.e., rank five of the mainly significant disorders in the urbanized world [2].

Diabetes is found to be maximizing in countries example India (32.7%), China (21.8%), and the USA (19.7%). The rate will be expected to increase by 2030 in the above countries. In World Health Organization (WHO) survey on diabetes, it uncovers that among the whole diabetes cases over 95% are record to type-II (National Diabetes Fact sheet, 2005).

The death rate in diabetes is twice as compared to a without diabetes person [3].

The WHO estimated that 85% of the population of developing countries depends on the production and utilization of herbal medicine. Many people's are treating diabetes but the cost of insulin is too high to affordable so they depend on herbal drugs.
Many herbal products have an anti-diabetic effect. Ayurveda has been the first to provide an elaborative explanation of diabetes. Plant drugs are generally viewed as the least harmful and low reaction as a contrast with synthesized drugs. [4]

Types of diabetes mellitus: The World Health Organisation (WHO) explain three main types of diabetes mellitus: IDDM, NIDDM and gestational diabetes (occurring during pregnancy); all diabetes problem has similar symptoms, signs, and consequences, but different reasons and population distributions. Eventually, all occurs due to not proper functioning of the β-cells of the pancreas that is incapable to generate the required amount of insulin to prevent hyperglycemia. [5]

IDDM is due to autoimmune damage of β-cells of the pancreas, which produce insulin. It is caused by an auto-immune reaction where the body's defense system damage the insulin-producing β-cells. Type1 diabetes patient body produces very little or no insulin. This disease usually occurs at a younger age due to this reason patients depend on exogenous insulin to manage the levels of glucose in their blood. Genetic factors are also understood for this problem.

NIDDM is explained by tissue-wide insulin resistance, but the destruction of β cell function is essential for its growth. About 90% of diabetes patients are suffering from this problem. It is characterized by insulin resistance and deficiency. This occurs because of the loss of functional β-cells. Type 2 diabetes is related to very serious life ceasing complications. [6]

Gestational diabetes (GDM) is like Type 2 diabetes, in that it includes insulin opposition due to predisposal of pregnancy hormones, i.e., diabetes comprising of high blood glucose levels during pregnancy. It occurs only in 2-4% of pregnancies normally in the 2nd or 3rd trimester. [7]
World Health Organization has expressed that about 80% of residents around the earth utilize herbal medications at an early degree of wellbeing cure similarly and they should be assessed logically for their efficacies.

ANTIDIABETIC PLANTS IN TRADITIONAL MEDICINES

My aim for this review is to collect all available information on medicinal plants showing hypoglycemic activity either via increasing secretion of insulin from the pancreas or by acting similarly. According to research, various Traditional Herbal Medicines are used as antidiabetics; some very important antidiabetics herbal drugs are present there in the form of herbal plants.
Some antidiabetic herbal medicine is present there.

ALLIUM SATIVUM

this is frequently known as garlic and this belong to the family Liliaceae. botanical name of this pant is Allium sativum[8]. when we mix garlic in ehenol then the extract (10ml/kg/day) shows hypoglycemic action [9]. the extract of the garlic is more proficient than against diabetic medication glibenclamide [10]. Ethylacetate, ethanol and oil ether separate is seen to show an enemy of diabetic action in STZ induced rats. Garlic shows different remedial impacts like enemy of platelet, antibacterial, bringing down the circulatory strain and bringing down the cholesterol level in our body [11].

ALOE BORBADENSIS

Aloe Borbadensis in the general way we known the by name of Ghikanvar which come under the Liliaceae family. It looks just like a cactus plant which have green blade-shaped leaves that are heavy narrowing, hairy, and filled with clear viscid gel. by orally taking of watery extract of aloe Vera dose that is 150mg/kg of the body weight that useful to decreases the blood glucose level. the Aloe Vera gel contain many types of therapeutic effects like

anti-dibetic, antioxidant, that increases the decreased level of glutathione by greater the four times in diabetic rats [12].

AZADIRACHTA INDICA

It is a locally named neem that come in under the Meliaceae family . It is grew in India and Burma. when we mix the drug in the ethanol and the aqueous solution then we get the extract by the help of distillation and that extract show the anti-hyperglycemic activity that reduces the blood glucose level. It used in the allopathic medicine then the hypoglycemic activity become increase. Generally type-2 diabetes mellitus are treating by this medicine. When the patient cannot control our diabetics by the help of allopathic medicine then Neem tablet added in the diabetics medicine by which the hypoglycemic activity become increase. Worldwide many patient have treated our diabetics disorder by the herbal drug. Many patients are treating diabetic with natural neem tablets. Its extract improves blood circulation by enlarging the blood vessels and useful in reducing the blood glucose level in the body [13].

Brassica juncea

It is generally known as Rai which come under the family Cruciferae. It is frequently used as a spice in various food items and food industries. when dissolve in water and extracted by distillation then extract is obtained and that extract have good hypoglycemic activity which was observed in alloxan-induced diabetic rats. 250, 350, 450 mg/kg doses.

Carica papaya

It is generally known as papaya which comes under Caricaceae family . Seed and leaves extract shows blood sugar level decreasing activity, lowering of lipid in human body, and also healing of wound activities in alloxan-induced diabetic rats [15].

Catharanthus roseus

It is mainly known as the famous name that is Vinca roseus which comes under the family Apocynaceae this herbal drug generally used to deceases the blood glucose level in alloxan-induced diabetic rats. the main part of this plant is Leaves and twigs that are very useful in the decreasing the blood glucose level. now these day the 500 mg/kg drug dose of leaves and twigs extract which beneficial in animals.
when this drugs dissolved in Methanol and extracted then the extracted material shows good hypoglycemic activity. Catharanthus roseus has increased the synthesis of insulin from β cells of Langerhans[16].

Coriandrum sativum

in the general way this is known as coriander which come under the family Apiaceae. now these day it used in spicing the food items and food industries. 200mg/kg seed separate expands the activity of β cells of the Langerhans and because of this explanation diminishes serum sugar in alloxan-incited diabetic rodents and furthermore it will union the insulin from β cells of the pancreas. Extract of this herbal shows blood sugar lowering property and insulin synthesizer.

Eugenia jambolana

It is known as Jamun has a place with the Myrtaceae family. It contains dried seeds and develop products of Eugenia jambolana. It contains malvidin 3-laminaribiosidea and ferulic corrosive as dynamic constituents. Concentrate of dried seeds (200 mg/kg) utilized for the treatment of diabetic patients.

Gymnema Sylvestre

It is known as Gudmar which signifies "sugar obliterating" and come in under Asclepiadaceae family. Leaf concentrate of G. Sylvestre (3.4/13.4 mg/kg) shows a huge control of glucose level in streptozotocin-actuated rodents. Overall this is utilized in Indian ayurvedic prescriptions for the diabetics control. The dynamic constituents in G. Sylvester are alkaloids, flavonoids, saponins, and carbs.
It is likewise utilized in the therapy of malignant growth, irritation, and treatment of different microbial infections.

Mangifera indica

in the general this is known as mango and having a place with Anacardiaceous family. leaves remove (250mg/kg) of this tree shows against diabetic movement however oral administration of fluid concentrate did shows the counter diabetic action and this not perishes the blood glucose level in alloxan-incited diabetic rodents.

Momordica charantia

It is usually known as severe melon (karela) and has a place with the Cucurbitaceae family. The dynamic constituents of Momordica charantia are momordic I, momordic II, and cucurbitacin B. It is utilized in the treatment of diabetes. It comprises of lectin which gives insulin-like movement. Lectin is the nonprotein which is connected to insulin receptors. This lectin diminishes the glucose level by following up on fringe tissues. Organic product concentrate of M. charantia(200 mg/kg) shows hypoglycemic action.

Ocimum sanctum

It is known by the name of tulsi and has a place with the Lamiaceae family. It is broadly found in all over India. It is utilized in Indian ayurvedic prescriptions for the treatment of different infections. Different creature considers demonstrated that extract of Ocimum sanctum leaves (200 mg/kg) shows the hypoglycemic movement in streptozotocin-actuated rodents.

It is likewise utilized for the treatment of viral disease, treatment of contagious contamination, decreases pressure, tumor, and gastric ulcer also[17].

Tinospora cardifolia

It is notable as Guduchi and comprises of the Menispermaceae family. The dynamic constituents of T. cardifolia are diterpene which comprise of tinosporone, tinosporic corrosive, Syringen, berberine, and giloin. The root extract of T. cardifolia (50-200mg/kg) shows a lessening in blood and pee sugar in streptozotocin-actuated diabetic rat during oral administration for six month. It is for the most part utilized in Indian ayurvedic drugs for the treatment of diabetes. Root separate additionally prohibits the decrease of body weight. Different plant parts like roots, stem, leaves, and natural products are extracted by maceration, imbuement, permeation, decoction, and soxhlet extraction by and large. For the most part different solvents are utilized like ethanol, methanol, and petrol ether [18]

Allium cepa

It is regularly known as onion or pyaz has a place in family Liliaceae, and biological name is Allium cepa. The antihyperglycemic action is appeared by the ether dissolvable part and ether insoluble piece of dried onion powder. It contains the synthetic fixing allyl propyl disulfide which is known as APDS and it hinders the insulin annihilation by the liver and incites the creation of insulin by the pancreas which improves the convergence of insulin and diminishes the glucose levels in the blood. Urgent oil (100mg/kg) gathered from red onion much of the time shows antihyperglycemic action, anti-static furthermore, cell reinforcement impacts in alloxan-actuated diabetic rodents. 300 mg/kg is the most helpful rate in the treatment of hyperglycemia and hyperlipidemia. Different clinical preliminaries and creature research gave data that onions are utilized for the treatment of asthma, therapy of diabetes, therapy of malignant growth, and treatment of different viral illnesses.

Herbal used for treatment of diabetes mellitus

Sn	**Plant name**	**Family**	**Part use**	**Type of extract**	**activity**
1	Alangium lamarckii	Alangiacea	Leaves	Alcoholic	antidiabetics
2	Albizia odoratissima	Mimosaceae	Bark	Methanol	antidiabetics
3	Axonopus compressus	Poaceae	Leaves	Methanol	Antidiabetic
4	Berberis vulgaris	Berberidaceae	Root	Aqueous	Hypoglycaemic
5	Brassssica juncea	Cruciferae	Seed	Aqueous	Hypoglyceamic
6	Caesalpinia digyna	Fabaceae	Root	Methanol	Antidiabetics
7	Catharanthus roseus	Apocynacea	Leaf	Methanol	Hypoglycemic
8	Centaurium erythrea	Gentianacea	Leaf	Aqueous	Antidiabetics
9	Chaenomeles sinensis	Rosaceae	Fruits	Ethyl acetate	Antidiabetics
10	Cocos nucifera	Arec aceae	Leaf	Hydro methenol	Antihyperglycemic
11	Costus speciosus	Costaceae	Rhizome	Hexane	Antidiabetics

12	Cyclocarya paliurus	Cyclocaryaceae	Bark	Aqueous,PE, chloroform,	Hypoglycemic
13	Dillenia indica	Dilleniaceae	Leaves	Methanol	Antidiabetics
14	Embelia ribes	Myrsinaceae	Berries	Hexane	Antidiabetic
15	Hybanthus enneaspermus	Violaceae	Whole plant	Alcoholic	Antidiabetic
16	Lippa nodiflora	Verbenaceae	Whole plant	methenol	Antidiabetics and hypolipidemic
17	Lithocarpus polystachyus	Fagaceae	Leaves	Ethanol & Aqueous	Hypoglycemic
18	Marrubium vulgare	limeacea	Aerial part	Methanol	Hyperglycemia
19	Ocimum sanctum	Lamiaceae	Aarial part	Hydro alcoholic	Antidiabetic
20	Opuntia streptacantha	Cactaceae	Leaves	Ethanol	Antihyperglycemic
21	Psidium guajava	Myrtaceae	Fruits	Ethanol	Antihyperglycemic
22	Semecarpus anacardium	Anacardiacea	Nut	Milk	Antidiabetic
23	Prosopis glandulosa	Fabaceae	Whole plant	Gelatine/Jelly	Antidiabetic
24	Ophiopogon japonicas	Asparagacea	Root	Ethanol	Hypoglycemic
25	Setaria italica	Poaceae	Seed	Aqueous	Antihyperglycemic
26	Cassia auriculata	Caesalpiniacae	Leaves	Aqueous	Antihyperglycemic
27	Zygophyllum album	Zygophyllaceae	Whole plant	Ethanol	Antidiabetic
28	Vitex negundo	Lamiaceae	Leaves	Methanol	Antihyperglycemic
29	Viscum schimperi	Viscaceae	aerial parts	Methanolic	Antihyperglycemic & Hypolipidaemic
30	Symplocos cochinchinensis	Symplocaceae	Leaves	Hexane	Antidiabetic
31	Enicostemma littorale	Gentianaceae	Whole plant	Aqueous	Antidiabetic
32	Vaccinium arctostaphylos	Ericaceae	Fruit	Ethanolic	Antidiabetics
33	Solanum xanthocarpum	Solanaceae	Leaves	Aqueous and Methanol	Antihyperglycemic

Conclusion:

In this review we are studied about the antidiabetic medicinal plant which is obtained from the natural sources and now this day the whole world is suffering from this problem so its very important to search a genuine herbal drug which have less side effect. It the allopathic medicine causes much more side effect as compare to herbal drug like constipation Skin rash or dermatitis, is reason diarrhea, dizziness, drowsiness, dry mouth, Headache, Insomnia etc and for over come to this problem we are searching and using a new herbal medicine which is less side effect or we can say then no side effect so due to this reason the demand of herbal drug is increasing day by day so I hope my this review investigate the antidiabetic medicinal plants and may be useful to the health professionals, scientists and scholars working in the field of pharmacology and therapeutics to develop antidiabetic drugs.

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