

HERBAL REMEDIES AS ALTERNATIVE TO ANTIDIABETIC AND PLANTS ARE AVAILABLE IN BANGLADESH: A COMPREHENSIVE REVIEW

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ABSTRACT

In the last few decades herbal medicine rapidly rise both in developing and developed countries because of their natural origin and less side effects. Several traditional medicines in use are derived from medicinal plants, minerals and organic matter. The existing review focuses on herbal drug planning and plants used in the treatment of different acute and chronic diseases like as arthritis, inflammation, wounds, gonorrhoea, stomach ache, tumors and burns, cough, degenerative joint disease, asthma, urinary calculi, amenorrhoea, diabetes, snake bite and dysmenorrhoea in the world. The exercise of Ayurvedic medicines is common in both adults and children and is increasing in many areas of

the world. This paper will discuss the benefits with use of herbal medicines as Antidiabetic activity. These plants are demonstrates significant antidiabetic effect. Therefore, as the disease is progressing unabated, there is an urgent need of identifying indigenous natural resources in order to procure them, as well as investigate in detail, their potential on different newly identified targets in order to develop them as new therapeutics.

KEYWORDS: Antidiabetis, Medicinal plants, Herbal remedies, Vegetarian food, Bangladesh.

INTRODUCTION

Diabetes is a chronic state marked by abnormally high levels of sugar (glucose) in the blood. populace with diabetes either do not produce enough insulin; a hormone that is needed to convert sugar, starches and other food into energy needed for daily life or cannot use the insulin that their bodies produce. As a result, glucose builds up in the bloodstream. If left untreated, diabetes can lead to blindness, kidney disease, nerve disease, heart disease, and stroke.

Diabetes is widely recognized as one of the leading causes of death and disability in the world. The Centers for Disease Control and Prevention (CDC) recognize diabetes as the 7th leading cause of death in the U.S.

There are two major types of diabetes; Type-1 diabetes: Also known as juvenile or insulin dependent diabetes, which are responsible for producing insulin are destroyed by the immune system. As a result, the pancreas permanently loses its ability to produce enough insulin to regulate blood sugar levels properly. Type-2 diabetes: This form of the disease makes up 90% or more of all cases of diabetes. It usually develops in adulthood. It occurs when the pancreas cannot make sufficient insulin to keep blood glucose levels normal and is made worse by poor a sedentary lifestyle, being overweight and food choices. Numerous people with type 2 diabetes do not know they have it, although it is a serious condition. Type-2 diabetes is becoming more common due to the growing number of older Americans, increasing obesity, and failure to exercise. Type 2 diabetes can be improved by maintain insulin level in body.

Numerous individuals with pre-diabetes go on to develop type 2 diabetes within 10 years. Gestational diabetes is high blood glucose that develops at any time during pregnancy in a woman who does not have diabetes. Four percent of all pregnant women develop gestational diabetes. Although it usually disappears after delivery, the mother is at increased risk of developing type-2 diabetes in future life. Diabetes may also be associated with infections, surgery, genetic syndromes, drugs, malnutrition as well as other illnesses.^[1]

Populaces have long used plant based medicines in the treatment of diabetes. For instance, the plant extract guanidine, which lowers blood glucose, prompted the development and use of biguanides, a commonly used oral medication for diabetes. Other herbs may have a role in the management or prevention of diabetes. Always talk to your health care provider about

any herbs you consider using. Some herbs may interact with medications, and some may lower your blood sugar. When combined with blood sugar-lowering medications, some herbs can bring your blood sugar to a dangerously low level.^[1] New researches on tulsi specifies that it might potentially be an effective treatment for conditions like high cholesterol, Type 2 diabetes, ulcers, obesity and compromised/suppressed immune systems (from conditions like cancers and AIDS). The traditional uses of Tulsi in Ayurveda said by plant cultures may be because of some intrinsic properties in many varieties of Tulsi essential oils containing eugenol, and various acids having antioxidant and anti-inflammatory properties.^[2]

Bitter melon contains a lectin that has insulin-like activity. The insulin-like bioactivity of this lectin is due to its linking together 2 insulin receptors. This lectin lowers blood glucose concentrations by acting on peripheral tissues and, similar to insulin's effects in the brain, suppresses appetite. This lectin is likely a major contributor to the hypoglycemic effect that develops after eating bitter melon and why it may be a way of managing adult-onset diabetes. Lectin binding is non-protein specific, and this is likely why bitter melon has been credited with immunostimulatory activity - by linking receptors that modulate the immune system, thereby stimulating said receptors. Various cautions are indicated. The seed contains vicine and therefore can trigger symptoms of favism in susceptible individuals. In addition, the red arils of the seeds are reported to be toxic to children, and the fruit is contraindicated during pregnancy.^[3]

THE FUTURE WORK ON ANTI DIABETIC PLANT

Diabetes is increasing tremendously. Presently, insulin is the only drug before ailing patients. However, some crude drug of herbal origin is in use in the market. Pills of *Momordica charantia* have already had been prepared by the scientists. The investigators of CDRI Lucknow have worked out that *Swertia chiratai* may be used in diabetes. The future of antidiabetic herbal drugs depends upon the extensive exploration of tribal pockets of India. The promising crude drug must be analysed in clinically manifested hyperglycaemia in the wake of thorough investigation of ethnomedicinal antidiabetic herb.^[4]

IMPLICATION FOR FUTURE RESEARCH

Much work has been carried out on the effect of plant food components on blood lipids, and much still remains to be done, especially in studies where effective plant components are combined in the same diet to maximize the lipid-lowering outcome and provide an alternative to drug therapy (the "portfolio diet").^[5] This concept provides an opportunity for useful new

lant components to be incorporated into the diet as they are identified.^[6] Apart from glycemic index testing, very few studies, by comparison, have been carried out in diabetes to assess the effects of plant foods on glycemic control in the long term. These are needed before the most useful combination of components can be assembled in the same diet to maximize the effect on glycemic control. Furthermore, there is a need for studies to be carried out in diabetes using vegetarian diets where weight loss is not a study objective. In the case of all but one study so far, weight loss has been an objective. However, this has not permitted an accurate assessment of the effect of the diet because of the potent effect of weight loss on glycemic control. Although weight loss in type 2 diabetes may be achieved in studies, it is not part of the natural history of this disease. It is therefore important to test diets in the same situation in which most type 2 diabetes subjects find themselves—at best, weight maintenance.^[7]

PROSPECTS OF MEDICINAL PLANTS IN THE MANAGEMENT OF TYPE-2 DIABETES

Plants have been used for the treatment of diabetes for centuries. However, their scientific evaluation has not constituted a substantial area of front-line pharmacological research in diabetes.

A limited number of these plant species have been studied and validated for their hypoglycemic activities using diabetic animal models and in clinical studies using human subjects. Recently interest in plants has been increased particularly due to the relative lack of progress in the development of proper and safe antidiabetic agents. Better understanding of the etipathogenesis of diabetic syndrome has paved the way for a more targeted use of plant materials in a modern pharmacological sense. In the perspective of the multiplicity of the pharmacological approaches against type 2 diabetes it is evident that plants provide interesting possibilities in these area because they contain thousands of compounds of which some may be useful as antidiabetic agents by themselves. Moreover, the plant compound may form the basis for further manipulate to develop proper antidiabetic agents. Therefore, search for improved drug(s) against diabetes has remained a major goal among the biomedical researchers. Since approach of the scientists for synthesis of the conventional drugs has not yet brought expected results, many of them, in recent years, are focusing their attention on natural compounds to find, at least a lead if not a compound, of such antidiabetic agents.^[8]

ANTI-DIABETIC PLANTS

Diabetes mellitus is a clinical syndrome characterized by inappropriate hyperglycemia caused by a relative or absolute deficiency of insulin or by a resistance to the action of insulin at the cellular level. Plant materials which are being used as traditional medicine for the treatment of diabetes are considered one of the good sources for a new drug or a lead to make a new drug. Plant extract or different folk plant preparations are being prescribed by the traditional practitioners and also accepted by the users for diabetes like for any other diseases in many countries. ^[9] Herbal antidiabetic medicinal plants available in Bangladesh are mentioned in table-1.

Table-1: List of Antidiabetic Medicinal plants available in Bangladesh.

SI. No.	Botanical Name	Common name	Part used	Family	Uses
01	<i>Nephoelepsis tuberosa</i>	Fern	Bulb	Oleandraceae	Antidiabetic
02	<i>Trigonella foenum-gracecum</i>	Methi	Seeds	Fabaceae	Antidiabetic
03	<i>Allium sativum</i>	Garlic	Bulb	Alliaceae	Antidiabetic
04	<i>Costus speciosus</i>	Keukand	Rhizome	Costaceae	Antidiabetic
05	<i>Hemidesmus indicus</i>	Indian Sarsaparilla	Root	Asclepiadaceae	Antidiabetic
06	<i>Acontium carmichaelii</i>	Pinyn	Root	Ranunculaceae	Antidiabetic
07	<i>Allium cepa</i>	Onion	Bulb	Liliaceae	Antidiabetic
08	<i>Capsicum annum</i>	Chilli pepper	Fruit	Solanaceae	Antidiabetic
09	<i>Ganoderma lucidum</i>	Lingzhi Mushroom	Fruit	Ganodermataceae	Antidiabetic
10	<i>Galega officinalis</i>	Goat's rue	Seed	Fabaceae	Antidiabetic
11	<i>Lathyrus japonica</i>	Sea pea	Seed	Fabaceae	Antidiabetic
12	<i>Tinospora cardifolia</i>	Guduchi	Plant	Menispermaceae	Antidiabetic
13	<i>Oriza sativum</i>	Rice	Root	Poaceae	Antidiabetic
14	<i>Momordica charantia</i>	Bitter gourd	Fruit	Cucurbitaceae	Antidiabetic
15	<i>Zingiber officinale</i>	Ginger	Rhizome	Zingiberaceae	Antidiabetic
16	<i>Pterocarpus marsupium</i>	Indian kino Tree	Bark	Fabaceae	Antidiabetic
17	<i>Grewia asiatica</i>	Phalsa	Fruit	Malvaceae	Antidiabetic
18	<i>Cyamospsis tetragonolobus</i>	Gowar plant	Fruit	Fabaceae	Antidiabetic

19	<i>Acacia arabica</i>	Indian gum Arabic	Seed	Leguminosa	Antidiabetic
20	<i>Aloe vera</i>	Aloe	Leaf pulp extract	Aloaceae	Antidiabetic
21	<i>Aegle marmelos</i>	Holy fruit tree	Root	Rutaceae	Antidiabetic
22	<i>Annona squamosa</i>	Sugar apple	Leaf extract	Annonaceae	Antidiabetic
23	<i>Artemisia pallens</i>	Davana	Aerial parts	Compositae	Antidiabetic
24	<i>Azadirachta indica</i>	Neem	Plant extract	Meliaceae	Antidiabetic
25	<i>Andrographis paniculata</i>	King of Bitter	Plant extract	Acanthaceae	Antidiabetic
26	<i>Biophytum sensitivum</i>	Life plant	Plant leaf extract	Oxalidaceae	Antidiabetic
27	<i>Cassia auriculata</i>	Tanner's Cassia	Flower extract	Leguminosae	Antidiabetic
28	<i>Boerhavia diffusa</i>	Tar vine	Aqueous leaf Extract	Nyctaginaceae	Antidiabetic
29	<i>Coccinia indica</i>	Ivy gourd	Leaf extract	Cucurbitaceae	Antidiabetic
30	<i>Catharanthus roseus</i>	Madagascarp eri Winkle	Leaf extract	Apocynaceae	Antidiabetic
31	<i>Casearia esculenta</i>	Carilla fruit	Root	Flacourtiaceae	Antidiabetic
32	<i>Mangifera indica</i>	Mango	Leaf extract	Anacardiacea	Antidiabetic
33	<i>Camellia sinensis</i>	Green tea	Leaf extract	Theaceae	Antidiabetic
34	<i>Ocimum sanctum</i>	Holy basil	Leaf extract	Lamiaceae	Antidiabetic
35	<i>Punica granatum</i>	Pomegranate	Flower extract	Punicaceae	Antidiabetic

CONCLUSION

From this study, it is clear that the medicinal plants play a vital role against various diseases. Various herbal plants and plants extracts have significant antiulcer, Antipyretic, Anti-diabetic and Anti cancerous activity in different animal models. Our review result shows that above-mentioned medicinal plants could prevent from Fever, Ulcer, Diabetes, and Cancer with the principle on dose-dependent. Hence the review study is concluded that the herbal drug possesses antiulcer, antipyretic, anti-diabetic, anti cancerous activity and it has been proved by different animal models which give many links to develop the future trials.

Medicinal plants still remains as thriving source of life-saving drugs for the large majority of people treating health problems. During the past two decades, remarkable progress in medicinal plants research such as chemical characterization, biological, pharmacological, and toxicological activity of the plants has been witnessed. However, further exploration for development of new drug molecules and to elucidate the mechanism responsible for its therapeutic action is of paramount importance. Further research works need to be initiated to look for the possible role of this plant extract and its chemical constituents to variety of diseases in human models. Diabetes is a serious metabolic disorder. Differences in social structure, psychic stress, obesity, hormonal imbalance and heredity are optimizing the growth of pandemic. At present, the treatment of diabetes mainly involves a sustained reduction in hyperglycemia by the use of biguanides, thiazolidinediones, sulphonylureas, D-phenylalanine derivatives, meglitinides and α -glucosidase inhibitors in addition to insulin. However, due to unwanted side effects the efficacies of these compounds are debatable and there is a demand for new compounds for the treatment of diabetes. Hence, plants have been suggested as a rich, as yet unexplored source of potentially useful antidiabetic drugs. However, only a few have been subjected to detailed scientific investigation due to a lack of mechanism-based available in vitro assays. These efforts may provide treatment for all and justify the role of novel traditional medicinal plants having anti-diabetic potentials.

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