

A CHECKLIST OF COMMON AND SELECTED ANTIDIABETIC MEDICINAL PLANTS OF WEST BENGAL: AN UPDATED REVIEW

Botany

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ABSTRACT

Increasing rate of diabetes in almost every age group of people is becoming a serious threat in the third decades of twenty first century in all corners of the globe. Diabetes is one kind of most common chronic disease that can't be cured permanently but proper medical guidance and ideal daily routine keep it under control and management. Long term continuation of antidiabetic drug has so many side effects in human body. Ethnobotanists suggested that traditional herbal medicine is showing a very good result to control the blood sugar at and from initial to moderate level. The present article reviews a checklist of best antidiabetic medicinal plants widely grown in every part of West Bengal. Local names, useful/edible plant parts and their mode of administration also enlisted in lucid way for the common people. Furthermore investigation, research and phytochemical analysis will surely discover more and more novel bioactive compounds from medicinal plants and marked them as antidiabetic. This enumeration of medicinal plants must help the new botanical/biomedical researchers to find out the new species of the same genera having the antidiabetic role and implications to the diabetic patient.

KEYWORDS

Diabetes, antidiabetic, medicinal plants, traditional-herbal medicine.

INTRODUCTION:

Lifestyle of human being completely depends on plant kingdom since the ancient period of time not only in terms of food, fodder and shelter but medicine also. Medicinal plants are one of the chief components of bioresources for their therapeutics approach against all kinds of common to vital human diseases related to digestive, respiratory, endocrine, reproductive and urinary systems [1]. Diabetes is a chronic metabolic disease of human associated with endocrine system that causes serious damage to eyes, kidneys, hearts, nerves and blood vessels [2]. According to our medical science, three kinds of diabetes have been reported till now. Diabetes mellitus (DM), the most common form of diabetes occurs when the beta (β) cells of islets of Langerhans of pancreas does not produce the sufficient insulin hormone to regulate the glucose level of blood in human body [3]. Diabetes insipidus (DI) is another kind of disorder that is less common and the results of insufficient synthesis of antidiuretic hormone (ADH) which promotes the fluids in the body to become out of balance and causes lots of urine production. In addition, Gastrointestinal diabetes mellitus (GDM) associated with hyperglycemia is very common in pregnant woman [4]. There are no doubt that pharmacological treatment strategies of diabetes have been improved significantly over the last few decades. Several antidiabetic drugs are available in the market such as sulfonylureas, insulin analogues, thiazolidines etc [5]. But, long-term consumption of antidiabetic drugs have serious effects and damage on liver, kidney and other organs of human body [6]. Doctors and biomedical researchers suggested that although diabetes is a fatal chronic disease but it may be under control and regulation by changing food habit, lifestyle and exercise on regular basis. Traditional

medicinal plants having antidiabetic potential are ideal substitute of antidiabetic drugs without having any side effects and showing good results by controlling blood sugar level among the people with the most common DM. In this review, author is going to represent a checklist of common and ideal antidiabetic medicinal plants of West Bengal, locally available in both wild and cultivated form even in market also. Mode of administration, edible parts of plant and their habits are also enlisted in tabulated form. In this context, this review aims to concern the society about the importance of medicinal plants in the regulation of diabetes and their therapeutic approach to the mankind instead of antidiabetic drugs.

MATERIALS AND METHODS:

The present study is based on extensive literature survey on Ethnobotany, Plant Taxonomy, Pharmacognosy and Ethnopharmacological aspects of medicinal plants. All the information given in the followings came from library databases and electronic retrieval systems including Research Gate, Google Scholar, PubMed, Scopus and Science Direct which may provide current and new scientific development and research of antidiabetic medicinal plants.

RESULTS AND DISCUSSION:

Information collected during thorough literature survey is presented in table I. Scientific name of the most common and selected antidiabetic medicinal plants are arranged alphabetically followed by their family, habit and vernacular names. Useful and edible parts of the plants and mode of administration are presented in detail.

Table I. Common And Selected Antidiabetic Medicinal Plants Of West Bengal:

Name of the Plants	Families	Local /Vernacular names (Bengali/English)	Habit	Useful/Edible parts	Mode of administration	References
<i>Azadirachta indica</i> A. Juss	Meliaceae	Neem	Tree	Leaves	Green leaves are consumed orally by chewing or fried by oil	[7]
<i>Apium graveolens</i> L.	Apiaceae	Radhuni	Herb	Leaves and seeds	Leaves are used as salad and seeds are used as spices.	[8]
<i>Annona squamosa</i> L.	Annonaceae	Sitafal	Tree	Fruits	Ripe fruits are consumed orally.	[9]
<i>Coccinia grandis</i> (L.) Voight	Cucurbitaceae	Telakucha	Climber	Leaves	Leaves are fried and used as vegetable.	[10]
<i>Camellia sinensis</i> (L.) Kuntze	Theaceae	Green tea	Shrub	Leaves	Leaves are boiling in hot water and extraction should be taken without addition of sugar.	[11]
<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Thankuni	Herb	Leaves, stems and roots	Orally consumed in form of paste/fried/curry	[12]
<i>Chamaecostus cuspidatus</i> (Neers & Mart.) C. Specht & D. W. Stev.	Costaceae	Insulin plant	Herb	Leaves	Dried leaves are powdered and taken in doses of 1 gram twice daily.	[13]

<i>Ficus hispida</i> L.	Moraceae	Dumur	Tree	Fruits	Oral consumption	[14]
<i>Gymnema sylvestre</i> (Retz.) R.Br. ex Sm	Apocynaceae	Gurmar	Climber	Leaves and fruits	Leaf extraction is taken twice a day.	[15], [16], [17]
<i>Hibiscus sabdariffa</i> L.	Malvaceae	Congo jute	Shrub	Flower	Administered in form of tea, jam and beverages.	[18]
<i>Mentha piperita</i> L.	Lamiaceae	Pudina	Herb	Leaves and flower	Leaves and flowers are boiled in hot water to make tea and also used as spices in curry.	[19]
<i>Momordica charantia</i> L.	Cucurbitaceae	Ucche	Climber	Leaves and fruits	Leaves and fruits are fried by oil and consumed as vegetable	[20]
<i>Moringa oleifera</i> Lam.	Moringaceae	Sajne	Tree	Flowers and fruits	Flowers are fried and taken with rice. Fruits are used to prepare different dishes.	[21]
<i>Punica granatum</i> L.	Lythraceae	Bedana	Shrub	Fruits	Administered in form of fruit juice.	[22]
<i>Syzygium cumini</i> (L.) Skeels.	Myrtaceae	Jam/Jamun	Tree	Fruits	Fruits are orally consumed with a pinch of salt. Seeds are taken in dried and dusted form in empty stomach at morning.	[23]
<i>Swertia chirata</i> (Roxb.ex Flem) Karsten	Gentianaceae	Chirata	Herb	Leaves and twigs	Leaves are powdered and 1–3-gram powder mixed with water and taken twice a day.	[24]
<i>Stevia rebaudiana</i> (Bertoni) Bertoni	Asteraceae	Misti tulsi/Chini tulsi	Herb	Leaves	Dried and powdered leaves are used as sugar supplement in tea.	[25]
<i>Tinospora cordifolia</i> (Giloy)	Menispermaceae	Guloncho	Climber	Leaves, stems and roots	Decoction of stem and warm juice of root is administered orally.	[26]
<i>Trigonella foenum-graecum</i> L.	Fabaceae	Methi	Herb	Leaves and seeds	Leaves are used as vegetable and seed dust is soaked in water for overnight and taken in next day at empty stomach.	[25], [26]
<i>Zingiber officinale</i> Roscoe	Zingiberaceae	Ada	Herb	Rhizome	Paste is used to prepare different recipes and widely used in tea preparation also.	[26]

The present study unveils that 20 species of flowering plants (phanerogams) under 20 different genera belonging to 19 families are abundantly grown here and there in different parts of West Bengal. Out of total 20 plants there are 8 species of herbs, 3 species of shrubs, 4 species of climbers and 5 species of trees.

Table 2: Habit Analysis Of Concerned Antidiabetic Medicinal Plants:

Habit	Total no. of plants	Percentage Value (%)
Herb	8	40
Shrub	3	15
Climber	4	20
Tree	5	25

Habit analysis of antidiabetic medicinal plants (percentage value)

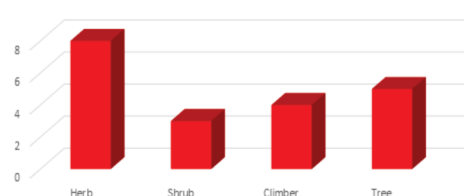
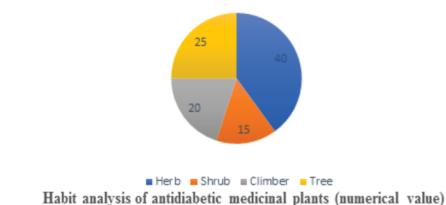
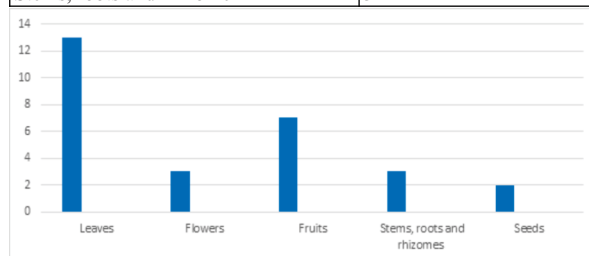


Table 3: Use Frequency Of Different Plant Parts For Administration:

Types of useful/edible plant parts	Total number
Leaves	13
Flowers	3
Fruits	7
Seeds	2
Stems, roots and rhizome	3



CONCLUSION:

From the present study, it is very clear and easily understand about the importance of medicinal plants in diabetes treatment. There are several medicinally valuable and significant plants having the antidiabetic activity. But, the present documentation is mainly based on some selected medicinal plants which show the highest antidiabetic properties and commonly available in every corner of West Bengal. Author is hopeful that this review may help the other biomedical researchers, pharmacists, ayurvedic doctors who intend to study and discover of plant based drugs or medicines and even the common people who are interested or wish to start the natural treatment instead of allopathic drugs for the management of diabetes from early to critical stage.

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