

## TRADITIONAL HERBAL REMEDIES USED FOR THE TREATMENT OF DIABETES FROM DISTRICT ATTOCK (PAKISTAN)

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### Abstract

The aim of present study was to record the ethnomedicinal uses of indigenous plants to control diabetes mellitus. During the survey, 37 plant species belonging to 33 genera and 23 Angiospermic families were discovered. The most dominant antidiabetic plant bearing family was Fabaceae (5 spp.) followed by Poaceae (4 spp.) and Liliaceae (3 spp.). The inhabitants of the study area used different parts of plants and method of their uses. About 29 phytotherapies were investigated from the rural inhabitants of the area. These traditional recipes include extracts, leaves, powders, flour, seeds, vegetables, fruits and herbal mixtures.

### Introduction

Plant based drugs have been in use against various diseases since time immemorial. The primitive man used herbs as therapeutic agents and medicament, which they were able to procure easily. The nature has provided abundant plant wealth for all living creatures, which possess medicinal virtues (Bhatti *et al.* 1998). The important values of some plants have long been published but a large number of them remain unexplored as yet. So there is a necessity to explore their uses and to conduct pharmacognostic and pharmacological studies to ascertain their therapeutic properties (Baquar, 1989). Despite considerable progress in the management of diabetes mellitus by synthetic drugs, the search for natural anti-diabetic plant products for controlling diabetes is going on. There are many hypoglycemic plants known through the folklore but their introduction into the modern therapy system awaits the discovery of animal test system that closely parallel to the pathological course of diabetes in human beings. Hypoglycemic activity has been reported in many plants during the last twenty years (Anon., 1992). Moreover, their action differs from that of insulin in that they appear to act as antimetabolites, capable of blocking the pathway of oxidation of fatty acids. This depletion of liver glycogen subsequently induces hypoglycemia (Yusuf *et al.*, 1994). Approximately 343 plants of the world have been tested for the blood glucose which found lowering effect in the laboratory experiments. Of them, 158 species are claimed to be used in the ayurved (Rahman & Zaman, 1989). Previously few papers have been written on Ethnobotany by various scientists from the country (Shinwari *et al.*, 1996; Bhatti *et al.*, 1998, 2001; Qureshi *et al.*, 2001, 2009; 2002; Qureshi and Bhatti, 2007; 2008; 2009; Qureshi, 2002).

In fact diabetes now a day is a global problem. So, present study aimed to discover medicinal uses of native plants of the study area used for diabetes. The discovered traditional phytotherapies will provide the basis for clinical research in order to establish their therapeutic properties of various formulae.

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## Materials and Methods

Frequent field trips were conducted during 2007-08 in order to get information, by interviewing with elderly persons, local *Hakeems* (Herbal parishioners) and household women. During field trips, plant specimens were also collected during the survey and then identified with the help of floristic materials (Nasir & Ali, 1970-1989; Ali & Nasir, 1990-1991; Ali & Qaiser, 1993-2001; Matthew, 1981-83; Boulos, 1991). The specimens were confirmed in the Herbarium of Quaid-i-Azam University, Islamabad by matching with already identified specimens. The voucher specimens were deposited in the same herbarium for record.

## Results

The findings of the ethnomedicinal survey revealed that 37 plant species belonging to 23 angiospermic families are used to treat diabetes mellitus. The most dominant antidiabetic plant bearing family was Fabaceae (5 spp.) followed by Poaceae (4 spp.) and Liliaceae (3 spp.). Indigenous plants used for diabetes mellitus by rural inhabitants of the area are arranged alphabetically followed by their English name, local name and family name with their specimen numbers as follows:

### Traditional phytotherapies

#### 1. Antidiabetic Extracts

**a. *Adhatoda vasica* Nees:** Extract obtained from the fresh leaves of plant mixed with water. About 10 ml of extract is used thrice a day to treat sugar.

**b. *Aloe vera* Nill + *Fagonia indica* L. + *Tylophora hirsuta* L.:** Equal quantity of extract obtained from the fresh aerial parts of *Fagonia indica*, fresh leaves and stem of *Aloe vera* and fresh branches of *Tylophora hirsuta* L. Then these three extracts are mixed and used small teaspoon thrice a day. According to the rural inhabitants of the area this formula is very old and 100% effective to lower the blood glucose level of diabetics.

**c. *Ficus bengalensis* L.:** The latex obtained from the aerial parts of the plant (leaves and young branches) and mixed with honey and used orally to control high blood glucose level.

**d. *Psidium guajava* L.:** Hot water extract made from the dried leaves of plant is used to reduce blood glucose level of diabetics. This hot tea was very common among the local people of the area.

**e. *Momordica charantia* L.:** The juice of fresh fruits, used, one small cup daily. This juice exhibits an antidiabetic property.

**f. *Cajanus cajan* and *Vigna mungo* (Burm. f.) Walp.:** The pulse obtained from the seeds of these plants is cooked and is recommended to diabetics.

**g. *Allium cepa* L.:** The juice obtained from the underground bulb is used, one tea spoon thrice a day. This is given for the control of blood sugar and high blood pressure amongst the diabetics.

**h. *Caralluma edulis* (L.) Benth ex Hook. f.:** The aerial parts are cooked as vegetables by the local people for diabetes mellitus.

## 2. Antidiabetic leaves

**a. *Zizyphus jujuba* Mill.:** 4-5 fresh leaves are chewed daily to lower blood glucose level.

**b. *Dodonaea viscosa* (L.) Jacq.:** 2-3 Fresh leaves of the plant are masticated twice a day with glass of water.

## 3. Antidiabetic powder (*Safoof*)

**a. *Ocimum sanctum* L. + *Ocimum album* L.:** Leaves of these plant species are dried under shade, then ground to make powder (*Safoof*). One gm power is given with water twice a day for prophylactic and the treatment of diabetes.

**b. *Momordica charantia* L.:** The fruits of the plant are dried under shade, then ground to obtain powder. One table spoon is administered twice a day to lower blood glucose level.

**c. *Syzygium cumini* Skeels:** Seeds of the plant are dried under shade, then ground to make powder About 25 gm powder is used thrice a day with water. This decreases blood glucose level very significantly.

**d. *Kickxia ramosissima* (Wall) Janchen:** The whole plant is dried under shade and is ground to make powder. This powder is prescribed for treatment of diabetes by the inhabitants of the study area.

**e. *Cichorium intybus* L.:** The roots are dried under shade and then ground to obtain powder. About 15 gm of this powder is taken with glass of water twice a day before meal to lower blood glucose level.

**f. *Melia azedarach* L.:** The dried fruits of the plant are ground to make powder. About half small teaspoon is given with glass of water before breakfast daily for a month. It is claimed by the inhabitants that it is an effective therapy for the treatment of diabetes.

**g. *Hordeum vulgare* L. + *Cicer arietinum* L. + *Elettaria cardamomum* Maton:** Seeds of *Hordeum vulgare* 125 gram are roasted and mixed with each of 50 gm of *Cicer arietinum* and *Elettaria cardamomum* and used @ half teaspoon with water thrice a day to control blood glucose level.

**4. Antidiabetic bread:** Equal quantity of *Cicer arietinum* (Seeds), *Daucus carrota* ((Dried form), *Hordeum vulgare* (Seeds), *Oryza sativa* (Seeds), *Triticum aestivum* (Seeds) and *Zea mays* (yellow variety) are ground and made into powder. The bread is cooked from this mixed flour and taken as breakfast with fresh butter of cow for 2-month. This remedy is used as dietary supplement to control diabetes.

## 5. Antidiabetic seeds

a. *Trigonella foenum-graecum* L.: Twenty five gm seeds are given daily for 21 days with water. The inhabitants claimed that it is one of the effective treatments to reduce blood glucose in diabetic patients.

b. *Withania coagulans* (L.) Dunal.: Fifteen gm seeds of the plant are soaked in water for the whole night. This is given early morning before breakfast to diabetic patients.

## 6. Antidiabetic Potherbs/Vegetables

a. *Solanum nigrum* L.: Fresh aerial parts of the plant are cooked as vegetable and is recommended to control diabetes.

b. *Taraxicum officinale* Weber: Fresh leaves are cooked as vegetable (locally-called Saag).

c. *Cajanus cajan* & *Vigna mungo* (Burm. F.) Walp.: The pulses obtained from the seeds of these plants are cooked and is recommended to diabetic patients.

d. *Allium sativum* L.: The under ground bulb is cooked or uncooked is used for diabetes and hypertension amongst diabetics.

e. *Caralluma edulis* (L.) Bth. ex Hk. F.: The aerial parts are cooked as vegetables by local people for diabetes mellitus.

## 7. Antidiabetic fruits

a. *Vigna sinensis* (L.) Savi ex Hassk.: The immature pods of the plant are used to reduce blood glucose level.

b. *Syzygium cumini* Skeels.: The fresh fruits are used for diabetes.

c. *Olea ferruginea* Royle.: Fruit fresh in summer season are collected, dried and recommended to diabetics in winter season for reducing blood glucose level.

## 8. Antidiabetic herbal mixtures

a. The seeds in 25 gm of *Syzygium cumini*, *Momordica charantia*, 12 gm of *Cyperus rotundus* and *Rosa alba* are made into powder. This compound is given successfully for lowering blood glucose by the inhabitants of an area.

b. The equal quantity of *Tylophlra hirsuta* (leaves), *Trigonella foenum-graecum* (seeds) and aerial parts of *Fumaria indica* is ground and made into powder. This mixture is claimed a significant therapy to reduce blood sugar of diabetic patients.

**Table 1. Indigenous medicinal plant species used for treatment of diabetes.**

S. #	Botanical name	English name	Local name	Family	Voucher No.
1.	<i>Aloe vera</i> Mill.	Aloe	Kunwarghandel	Liliaceae	14
2.	<i>Allium cepa</i> L.	Onion	Piaz	Liliaceae	81
3.	<i>Allium sativum</i> L.	Garlic	Thoom	Liliaceae	75
4.	<i>Adhatoda vasica</i> Nees	Vasaka	Bekkar	Acanthaceae	72
5.	<i>Catharanthus roseus</i> L.	Periwinkle	Sada bahar	Apocynaceae	59
6.	<i>Cajanus cajan</i> (L.) Millsp.	Pigeon pea	Arar ke dal	Papilionaceae	61
7.	<i>Caraluma edulis</i> (Edgew.) Bth. Hk.	Carallume	Choung	Asclepiadaceae	26
8.	<i>Cicer arietinum</i> L.	Gram	Chinnay	Papilionaceae	42
9.	<i>Cichorium intybus</i> L.	Chicory	Kasni	Asteraceae	66
10.	<i>Cyperus rotundus</i> L.	Nutgrass	Deela	Cyperaceae	69
11.	<i>Daucus carota</i> L.	Carrot	Gager	Apiaceae	62
12.	<i>Dodonaea viscosa</i> (L) Jacq.	Switch sorrel	Sanatha	Sapindaceae	6
13.	<i>Elettaria cardamomum</i> Maton	Cardamon	Chotilachi	Zingiberaceae	23
14.	<i>Fagonia indica</i> L.	Fagonia	Dhamana	Euphorbiaceae	24
15.	<i>Ficus bengalensis</i> L.	Banyan	Bohr	Moraceae	8
16.	<i>Fumaria officinalis</i> (Hausskn.) Pugsley	Fumitory	Papra	Fumariaceae	9
17.	<i>Hordeum vulgare</i> L.	Barley	Jo	Poaceae	3
18.	<i>Kickxia ramosissima</i> (Wall.) Janchen	Kichxia	Khunger booti	Scrophulariaceae	18
19.	<i>Melia azedarach</i> L.	Barbados lilac	Herak	Meliaceae	13
20.	<i>Momardica charantia</i> L.	Bitter gourd	Karella	Cucurbitaceae	22
21.	<i>Ocimum album</i> L.	White basil	Chitti Tulsi	Lamiaceae	56
22.	<i>Ocimum sanctum</i> L.	Holy basil	Tulsi	Lamiaceae	5
23.	<i>Olea ferruginea</i> Royle	Indian olive	Kao	Oleaceae	37
24.	<i>Oryza sativa</i> L.	Rice	Chawal	Poaceae	39
25.	<i>Psidium guajava</i> L.	Guava	Amrood	Myrtaceae	10
26.	<i>Rosa alba</i> L.	White rose	Chitta gulab	Rosaceae	11
27.	<i>Solanum nigrum</i> L.	Black nightshade	Kachmach	Solanaceae	15
28.	<i>Syzygium cuminii</i> Skeels	Black plum	Jamoo	Myrtaceae	16
29.	<i>Taraxacum officinale</i> Weber.	Dandelion	Doddak	Asteraceae	17
30.	<i>Tylophora hirsuta</i> L.	Tylophora	Glow	Asclepiadaceae	20
31.	<i>Triticum aestivum</i> L.	Wheat	Karunk	Poaceae	29
32.	<i>Trigonella foenum-graecum</i> L.	Fennugreek	Methri	Fabaceae	21
33.	<i>Vigna mungo</i> (Burm. f.) Walp.	Green gram	Mung	Fabaceae	33
34.	<i>Vigna sinensis</i> (Burm. f.) Walp.	Cow bean	Lobia	Fabaceae	34
35.	<i>Withania coagulens</i> (L.) Dunal.	Wintercherry	Chitta verino	Solanaceae	12
36.	<i>Zea mays</i> L.	Corn/maize	Makai	Poaceae	25
37.	<i>Zizyphus jujuba</i> Mill.	Chinee tree	Beri	Rhamnaceae	44

## Discussion

The aged people of the study area treat the diabetes through indigenous medicinal plants. They believe that traditional medicines are better, permanent cure of their diseases. So the indigenous knowledge continues to provide the building blocks for the development in rural communities (Rahman & Zaman, 1989). During the study, it was found that the traditional phytotherapies were more adaptable and acceptable from old time to present. Due to widespread use, folk herbal remedies appear to be not only a case of preference but also of a situation without alternative choices. Such a system of medical treatment on which majority of the population has been relying upon for generations with considerable success should not be overlooked for further medical investigation. This case is valid for those plants which have not been looked at for medical research, although the same have been in use by local inhabitants over hundred of years.

## Conclusion

Diabetes is a global problem and every year a considerable amount of foreign exchange is involved in import of antidiabetic drugs. The utilization of indigenous drug resources with the collaboration of local industry will minimize the expenditure incurred on the purchase of foreign drugs. In view of the economic importance of indigenous plants, research and developmental efforts should be focused on these plants. So it is strongly recommended to carryout phytochemical and clinical research work on the discovered plant species to prove and substantiate the traditional herbal therapies of the rural people. These plants should be studied for their active compounds responsible for the hypoglycemic activities.

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