

**DOCUMENTATION AND QUALITY EVALUATION OF ANTI-DIABETIC  
INDIGENOUS HERBAL MEDICINES USED IN JALANDHAR DISTRICT AND  
NEARBY AREAS**

**Dissertation 1 Report**

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## **CERTIFICATE**

This is to certify that **Dimple** (Registration No. 11715192) has personally completed M.Sc. dissertation 1 entitled “*DOCUMENTATION AND QUALITY EVALUATION OF ANTI-DIABETIC INDIGENOUS HERBAL MEDICINES USED IN JALANDHAR DISTRICT AND NEARBY AREAS*” under my guidance and supervision. To the best of my knowledge, the present work is the result of her original investigation and study. No part of dissertation has ever been submitted for any other purpose at any University.

The project report is appropriate for the submission and the partial fulfilment of the conditions for the evaluation leading to the award of Master of Nutrition and Dietetics.

Date: 12 May, 2018

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## DECLARATION

I hereby declare that the work presented in the pre-dissertation report entitled “DOCUMENTATION AND QUALITY EVALUATION OF ANTI-DIABETIC INDIGENOUS HERBAL MEDICINES USED IN JALANDHAR DISTRICT AND NEARBY AREAS” is my own and original. I have carried out the work at School of Agriculture, Lovely Professional University, Phagwara, Punjab, India under the guidance of **Dr. Ashwani Kumar**, Assistant Professor (Food Technology), School of Agriculture, Lovely Professional University, Phagwara, Punjab, India, for the award of the degree of Master of Science in Food Technology.

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I certified that the above statement made by the student is correct to the best of my knowledge and belief.

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## 1. Introduction

World health organization (WHO) has defined diabetes mellitus (DM) as a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced (WHO, 1999; ADA, 2015; Li et al. 2004). It is a metabolic disorder of endocrine system which is characterized by hyperglycemia or hypoglycemia. Diabetes is categorized into two types i.e. insulin dependent )type 1( and insulin independent )type 2(. Type 1 diabetes (insulin dependent) is caused due to the failure of pancreas to produce insulin. This form develops most frequently in children and adolescents. On the other hand, Type 2 diabetes (insulin independent) results from impaired action of insulin in body. This type is more prevalent in adults in comparison to type 1 diabetes (Nagalakshmi et al. 2017) and contributes to about 90 percent of the adult cases worldwide. Presently, about 300 million people are reported to be suffering from diabetes worldwide (Tasabang et al. 2016). According to WHO 1999, in entire globe an estimated 3.4 million deaths occurs per annum due to high blood sugar levels. In India, the number of diabetic patients has been increased from 31.7 million in 2000 to 69.1 million in 2016 (Khavane et al. 2017). A record increase of 117% has been noticed in diabetic patients in last 16 years and India has now been declared as “Diabetic Capital” of the world (Times of India, 2017). Diabetes also increases the incidents of hypertension and approximately 70% of diabetic patients suffer from this side effect. Hypertension is related to increased risk of cardiovascular diseases (CVD) in diabetic patients (Dhaliwali et al. 2015). Diabetes has no permanent cure but can be controlled or suppressed with the help of chemical or natural ways. Various chemical drugs like *migliitol*, *acarbose*, *metformin* etc. are used in the management of diabetes (FDA, 2018) whereas traditional medicinal systems rely on herbs to suppress diabetes. Researchers are still trying to find a medicine or product which can eradicate the disease from the roots (Li et al. 2004). Due to the lack of any solid claimant for the treatment of diabetes till date, many people continue to trust the indigenous medicinal systems. Hence, it is important to review the various traditional medicinal systems, important herbs, their bioactive compounds and mechanism of treatment to generate useful information to carry future studies and develop drugs for the treatment of DM. Every civilization has developed indigenous medicinal systems to treat or cure diseases with the help of locally available materials. The age-old experience of thousand years in medical therapy has made these systems more reliable.

Majority of population trusts the traditional medicinal systems over allopathic system due to its lesser known health implications. Among the traditional medicinal systems; Indian Ayurveda system, Chinese traditional medicinal system, Arab traditional medicinal system and African traditional medicinal system are world renowned and a crisp review of these medicinal systems has been presented here. A variety of herbal plants and trees used for the treatment of DM, their bioactive components, mode of action and related animal studies have been discussed here.

## **2. Problem background**

Diabetes is a chronic metabolic disorder with no permanent cure. In diabetic patients, a regular medication is required to keep the blood glucose level under control. The branded products are more expensive than their indigenous counter parts and hence put a huge burden on diabetic patients. At the same there is no assurance regarding the quality of indigenous medicines as the quality varies significantly. Hence, there is a need of documentation and quality evaluation of indigenous medicines.

### **3. Review of Literature**

#### **3.1 Diabetes Mellitus**

Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced (WHO, 1999).

#### **3.2 Different traditional medicinal systems for the treatment of diabetes mellitus**

Every civilization has developed indigenous medicinal systems to treat or cure diseases with the help of locally available materials. The age-old experience of thousand years in medical therapy has made these systems more reliable. Majority of population trusts the traditional medicinal systems over allopathic system due to its lesser known health implications. Among the traditional medicinal systems; Indian Ayurveda system, Chinese traditional medicinal system, Unani traditional medicinal system and African traditional medicinal system are world renowned and a crisp review of these medicinal systems has been presented here. A variety of herbal plants and trees used for the treatment of DM, their bioactive components, mode of action and related animal studies have been discussed here.

##### **3.2.1 Traditional medicinal system prevalent in India**

Ayurveda is the major traditional system practiced in India. It is primarily based on plants and herbs. A list of indigenous flora i.e. *Neem* (*Azadirachta indica*), *Babul* (*Acacia arabica*), *Kawar* (*Aloe barbadensis*), *Peepal* (*Ficus religiosa*), *Jamun* (*Eugenia jambolana*), *Karela* (*Momordica charantia*), *Lahsun* (*Allium sativum*) etc. are used to treat DM (Modak et al. 2007). These herbs are rich in antioxidants and phytochemicals. Phytochemicals increase antioxidant enzymes like catalase and glutathione, which suppress the high glucose levels and hence increases the insulin production in the body (Rizvi and Mishra, 2013). Many ayurvedic medicines comprising of these herbs or their active components are commercially available in India. A separate ministry Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH) has been constituted under government of India with a purpose to develop education and research in indigenous medicinal system. By seeing the popularity of indigenous medicinal systems, All



India Institute of Ayurveda has been established in national capital Delhi by government of India (Zee News India, 2017).

**Table 3.1: Popular Indian herbs used for treatment of diabetes mellitus**

<b>Plant name (Botanical name/Family)</b>	<b>Parts used</b>	<b>Bioactive compounds</b>	<b>Related animal studies</b>	<b>References</b>
Peepal ( <i>Ficus religiosa/Moraceae</i> )	Leaves, bark, fruits, roots, seeds	Flavonoids, glycosides, alkaloids, steroids, saponins, vitamin C in non- enzymatic, enzymatic constituents are catalase, peroxidase etc.	Aqueous extracts of bark of peepal (50 and 100 mg/kg body weight) showed hypoglycemic effect in streptozotocin induced diabetic rats.	(Makhija et al. 2010) (Pandit et al. 2010)
Blackberry ( <i>Syzygium cumini</i> or <i>Eugenia jambolana</i> /Myrtaceae)	Leaves, roots, bark, stem, seeds	Alkanoids, flavonoids, tannins, saponins, sterols, carbohydrates, polyphenols, ellagic acid, salicylic acid, fibre	Aqueous extract of seeds of <i>Syzygium cumini</i> (2.5 g and 5 g/kg body weight) showed hypoglycemic effect in alloxan induced diabetic rats. Ethanoilc extract of seeds of <i>Eugenia jambolana</i> (100 mg/kg body weight) showed hypoglycemic activity in alloxan induced diabetic rats.	(Prince et al. 1998)  (Sharma et al. 2003)
Bitter melon ( <i>Momordica charantia/Cucu</i> )	Pulp, seeds and	Triterpene, proteid, steroid, alkaloid, inorganic, lipids and	Aqueous extract of bitter melon lowered the glycemic response to	(Alam et al. 2015) (Joseph and

<i>rbitaceae)</i>	leaves	phenolic compounds, saponins, charantin, resins	both oral and intraperitoneal glucose load in normal mice without altering the insulin response. Aqueous extract powder of fresh unripe whole fruits at a dose of 20 mg/kg body weight reduced fasting blood glucose by 48%.	Jinni, 2013)
<i>Aloe vera (Barbadensis mill/Asphodelaceae)</i>	Leaves extract	Anthraquinones, glycosides, vitamins )A, C, E(, lipids, sterols, gibberlins, pseudoprototinosaponin AIII and prototinosaponins AIII	Anthraquinone extract of leaf pulp of <i>aloe vera</i> (300 mg/kg body weight) showed hypoglycaemic effect in streptozotocin induced adult male albino rats.	(Youssef and Messiha, 2013)
Garlic ( <i>Allium sativum /Amaryllidaceae</i> )	Whole	Alkaloids, saponins, steroids, carbohydrates, tannins, flavonoids, terpenoids, phenolics	Minerals and vitamin extract of garlic juice (1 ml/100 g body weight) showed hypoglycemic effects in alloxan induced diabetic rats. Garlic oil (50 mg/kgbody weight) showed hypoglycaemic effect in streptozotocin induced white male albino rats.	(Divya et al. 2017) (Demerdash et al. 2005)  (Ohaeri, 2001)

### 3.2.2 Traditional medicinal system prevalent in China

In traditional Chinese medicinal system, diabetes is categorised as *Xiaokezheng* and *Xiaodanzheng*. Predominance of *yin* deficiency explains the syndrome differentiation of the disease. According to the religion of China, *yin* deficiency means negative forces which are present in the food and the universe. There should be a positive balance between *yin* (negative forces) and *yang* (positive forces). According to Chinese theory these forces regulate the life of their people. Even if one of these forces is lacking, it results in the symptoms of DM. Inflammation in the stomach, deficiency of kidney *yin*, deficiency of *qi* and *yin* or *yin* and *yang* has been described as the symptoms of DM. The *yin*-deficiency may be due to emotional disorders, overstrain, improper diet and excessive sexual activities. Chinese doctor suggests the use of integrated treatment for diabetes. The treatment includes nourishing *yin*, moistening of dryness and increasing fluid production. They usually mix two or more herbs together to make one formula which shows hypoglycaemic activity as well as suppress the symptoms caused by the DM (Xie et al. 2011). Chinese herbs are reported to be most effective for type 2 DM, when they are consumed in mixture form.

**Table 3.2: Important Chinese herbs for treatment of Diabetes mellitus**

Chinese name/English name	Botanical name/Family	Parts used	Bioactive compounds	Related animal studies	Reference
<i>Shu di huang/Rehmannia root</i>	<i>Rehmannia glutinosa/Scrophulariaceae</i>	Roots	Catalpol, phenethyl alcohol, leucosceptoside, glycosides, monocyclic sesquiterpenes, pinellic acid, mannitol, uracil, ajugol, raffinose,	Oligosaccharide in <i>rehamanniae</i> (100 mg/kg body weight) showed hypoglycemic effects in alloxan induced diabetic rats.	(Zhang et al. 2004)

			terpenoids		
<i>Guang fang ji</i> /Hang fang ji	<i>Stephania tetrandra moore</i> / <i>Menispermaceae</i>	Roots	Alkaloids, tetrandrine, protoberberine, morphinane, phenanthrene, steroids, terpenoids, lignans, coumarins	Alkaloids present in <i>Stephania tetrandra</i> S. Moore has been reported to cause anti-hyperglycemic effects in streptozotocindabetic mice at a dosage of 1 mg/kg body weight.	(Semwal et al. 2010) (Jung et al. 2006)
<i>Huang lian</i> /Coptis goldthread	<i>Rhizoma coptidis</i> / <i>Ranunculaceae</i>	Roots, stem, seeds, leaves	Isoquinoline, alkaloids, berberine, palmatine, jateorrhizine, epiberberine, coptisine	Berberine extract of coptis (200 mg/kg body weight) showed the hypoglycemic activity in alloxan diabetic rats.	(Tang et al. 2006) (Wang et al. 2004)
<i>Huang Qi</i> /Milk vetch root	<i>Radix astragali</i> / <i>Fabaceae</i>	Roots	Isoflavones, isoflavonoids, saponins, galoside 2, astragaloside, polysaccharides	Ethanollic extracts (2 g/kg body weight) showed hypoglycemic activity in db/db induced diabetic mice.	(Xiao et al. 2008) (Hoo et al. 2010)
<i>Bai guo</i> /Maiden hair tree	<i>Ginkgo biloba</i> / <i>Ginkgoaceae</i>	Leaves	Flavonoid glycosides, terpene lactones, ginkgolic acids	<i>Ginkgo</i> protein extracts (200 mg/kg body weight) showed hypoglycaemic	(Rudge et al. 2017)

				activity in pregnant rats and effect on their reproductive outcome.	
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### 3.2.3 Unani medicinal system

Unani system of medicine deals with various conditions of health and provides promotive, preventive and curative health care. Scientific principles and holistic concepts of health and healing are the basis of Unani treatment system (Subbarayappa, 2001). This system is practiced in India, Bangladesh, Pakistan, Srilanka, Nepal, China, Iran, Iraq, Malaysia, Indonesia, Central Asia, Middle Eastern countries, some African and European countries (Rahman et al. 2013). Arabs developed the Unani medicinal system into elaborate medical sciences and its teaching was started in Greece. So, Unani medicinal system is also known as Greco-Arab medicinal system (Husain et al. 2010). Unani medicinal system is based on four humors. These are 4 fluids of body i.e. blood, phlegm, yellow bile, and black bile which are related to mental, emotional, spiritual and physical causes of any disease. The humors are assigned temperament such as blood is hot and moist, phlegm is cold and moist, yellow bile is hot and dry, and black bile is cold and dry (Rahman et al. 2008). Procedure of diagnosis of any disease in Unani medicinal system includes body heat, urine and stool examination, observation and palpitation.

**Table 3.3: Herbs used for the treatment of Diabetes mellitus in Unani system**

Herb name	Botanical name/ Family	Parts used	Bioactive compounds	Related animal studies	References
Bitter apple	<i>Citrullus colocynthus/Cucurbitaceae</i>	Fruits, leaves, roots and stem	Glycosides, alkaloids, flavonoids, carbohydrates, phenolic acids, tocopherols, carotenoids	Saponin extracts of rind of bitter apple (50 mg/kg body weight) showed hypoglycemic effect in alloxan diabetic rats and	(Abdel-Hassan et al. 2000) (Hussain et al. 2014)

				rabbits.	
Virgin's mantle	<i>Fagonia indica brum or Fagonia cretica/Zygophyllaceae</i>	Whole plant	Glycosides, saponins, tannins, alkaloids, flavonoids, anthraquinones, coumarins, phenols	Methanolic extracts of juice of virgin's mantle (500 mg/kg body weight) showed hypoglycemic effects in alloxan induced diabetic rabbits.	(Anil et al. 2012) (Kamran et al. 2017)
Cape lilac	<i>Melia azedarach/Melia ceae</i>	Fruits, leaves, stem, bark	Flavonoids, phenolic, linoleic acid, saponins, terpenoids, glycosides, rutins, alkaloids	Methanolic leaf extract showed increase in wound healing capacity in alloxan diabetic rats.	(Munir et al. 2012) (Sultana et al. 2014) (Vijaya et al. 2012)
Spiny gourd	<i>Mimordica dioica/Cucurbits</i>	Fruits, seeds	Phytic acid, alkaloids, flavonoids, steroids, saponins, triterpenoids, lectin	Methanol extracts of spiny gourd (300 mg/kg body weight) showed anti-diabetic activities in streptozotocin induced diabetic rats.	(Talukdar et al. 2014) (Gupta et al. 2011)
Hisawarg	<i>Rhazya stricta decne/Apocynaceae</i>	Fruits, seeds, flowers, leaves	Alkaloids, flavonoids, b-carboline	<i>Rhazya</i> (2-4 g/kg body weight) showed anti-diabetic properties in alloxan induced	(Ali et al. 2018) (Ali, 1997)

				diabetic rats. Lyophilized extracts (2.36 g/kg body weight) showed anti- diabetic effects in streptozotocin induced diabetic rats.	(Wasfi et al. 1994)
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### 3.2.4 Traditional medicinal system prevalent in Africa

In Africa, traditional medicinal system is ritually followed in Guinea (Balde et al. 2006) and nearly 45000 species of medicinal plants are used in treatment of various diseases (Mahomoodally, 2013). Herbal medicines used in Africa are very effective and most of them have been approved chemically. According to 2005 data, about 80% of the people in Africa followed herbal treatments and had positive results (Elujoba et al. 2006). Many surveys have been conducted in Africa which proved the effectiveness of traditional medicines. Tsabang et al. conducted a survey on 116 diabetic patients in Cameroon, Africa in 2016 and reported that *Allium cepa*, *Momordica charantia*, *Persea americana* and *Phyllanthus amarus* were the principal plants used for the treatment of DM. Authors concluded that herbal medicine played an important role in the management of diabetes in Cameroon (Tsabang et al. 2016).

**Table 3.4: Important herbs used in African medicinal system for the treatment of Diabetes Mellitus**

Name of the herb (Botanical name/Family)	Parts used	Bioactive compounds	Related animal studies	Reference
Roiboss tea plant ( <i>Aspalathus linearis/Fabaceae</i> )	Leaves, stem, seeds	Aspalathin, dihydrochalcone, orientin,	Alkaline extracts of rooibos tea (500 mg/kg body weight) showed	(Marnewick et al. 2009) (Ulicna et al.

		flavones, isovitexin, flavanones, tannins, flavanols	hypoglycemic activity and reduced the oxidative stress in streptozotocin induced diabetic rats.	2006)
<i>Gotu kola</i> ( <i>Centella asiatica</i> /Apiaceae)	Leaves	Alkaloids, flavonoids, phenols, tannins, glycosides, steroids, saponins	Ethanollic and methanolic extracts of leaves of this plant (250 mg/kg body weight) showed anti-diabetic effects in alloxan induced diabetic rats.	(Devi et al. 2012) (Chauhan et al. 2010)
Honey bush/ kustee/ herbal tea ( <i>Cyclopia intermedia</i> /Fabaceae)	Leaves	Xenthone, magniferin, flavone, glycoside, flavanones, luteolin, isomagniferin, hesperetin, eriocitrin	Hot water aqueous honeybush extract (5 mg/kg body weight) showed anti-diabetic activities in streptozotocin induced diabetic rats as well as in diet induced diabetic rats.	(Muller et al. 2011)
Wood spider or devil's claw ( <i>Harpagophytum procumbens</i> /Pedaliaceae)	Leaves, roots	Flavonoids, phytosterols, glycosides, acteoside, isoacteoside	Secondary aqueous root extract of devil's claw plant (800 mg/kg body weight) showed hypoglycemic activity in streptozotocin induced diabetic rats.	(Mncwangi et al. 2012) (Mahomed et al. 2004)
Umckalaabo ( <i>Pelargonium graveolens</i> /Gerani)	Leaves	Terpenoids, flavonoids, phenolics,	Essential oil of leaves of <i>Pelargonium graveolens</i> (two doses of 75 mg/kg	(Asgarpanah et al. 2015) (Boukhris et al.



<i>aceae)</i>		cinnamic acids, tannins, coumarins, isomenthone	and 150 mg/kg body weight along with reference drug glibenclamide) showed hypoglycemic activity in alloxan induced diabetic rats.	2012)
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### 3.3 Herbal formulations available in market, their dosage and health claims

The traditional herbal medicine system has entered a new era of nutraceuticals. Many formulations of these herbal plants are available in market in the form of pills, capsules, oils and syrups. These products may either be a preparation of single herb or formulation of two or more herbs. Health claims for many disorders like obesity, DM, CVD and sex irregularities has been reported for these products. These are known to control diabetes either by controlling glycemic index or enhancing the effectiveness of insulin.

**Table 3.5: Herbal medicines available in Indian market, their dosage and their health claims**

Medicines/ Dosage	Herb present	Health claims	References
Pitambri Karela Tablets/2 in a day, Himalaya Karela Tablets/2 in a day, Gluco Care Karela Medicine/2 in a day, Deemark Diaba Amrit/50 mg in a day	Bitter melon	Used in the treatment of DM, kidney stones, fever, reducing obesity, hypertension, in cancer, improving immune functions.	(Indiamart, 2017)  (Indiamart, 2017)  (Indiamart, 2017)  (Indiamart, 2017)
Durkee Garlic Oil/2- 5 mg,	Garlic	Helps to cure diabetes, CVD, hyperlipidemia,	(Amazon, 2017) (Bongiorno et al.

		hypertension, helps in cancer, fungal infections, have antimicrobial effects.	2008)
Patanjali Aloe vera Juice/10-20 ml daily, Triphala Aloe vera Juice/1 cap twice a day	<i>Aloe vera</i>	Helps to treat diabetes, hypertension, skin problems, rashes, wounds and hyperlipidemia.	(Indiamart, 2017) (Indiamart, 2017) (Loots et al. 2007)
Planetary Herbals Rehmannia Endurance 150 Tabs/1 tablet 3 times a day	Rehmania root	Helps to cure DM, treat menopause, impotence, hair loss and other hormone deficiencies.	(Amazon, 2017)
Radiant Natural Whole Herb Berberine 900mg/2 capsules daily	Coptis goldthread	Helps to cure diabetes, maintain healthy cholesterol levels, manage triglycerides and support healthy lipid levels.	(Amazon, 2017)
Pure Mountain Botanicals Immuno Well RX Capsules/1 capsule twice daily	Milk vetch root, mushroom, garlic	Helps to cure diabetes, fight ageing signs, CVD and sometimes cancer.	(Amazon, 2017)
Shri ji Herbal Spenai Bitter Powder Anidiabetic Medicine/2-3	Spiny gourd	Helps to cure diabetes, reduces weakness, controls excessive hunger, excessive thirst,	(Indiamart, 2017)

teaspoons a day		maintains functions of organs, improves digestion and clears the bowel.	
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#### **4. Proposed Research Objectives**

1. To conduct survey to explore the indigenous medicines used for diabetes mellitus in Jalandhar district and nearby areas.
2. To collect and evaluate different herbal medicine samples.

## 5. Proposed Research Methodology

### Experiment 1: Survey and documentation of indigenous medicines used for diabetes treatment in Jalandhar district and nearby areas

A survey will be conducted in different regions of district Jalandhar and nearby areas. Local *hakims/ vaidas* dealing with indigenous herbal medicines for diabetic treatment will be visited and information will be collected from them depending upon a pre-designed questionnaire. The questionnaire is provided in Appendix 1.

### Experiment 2: Collection of samples and their quality evaluation:

- **Collection of samples in areas of Jalandhar district and nearby areas:**

Kapurthala, Maksuda, Ramamandi, Alawalpur, Adampur, Jalandhar

- **Test to be performed:**

- Moisture content (Elezabeth and Subramanian, 2013)
- Total Sugars and reducing sugars (AOAC 2000)
- Proteins (Lowry et al. 2009)
- Fats (AOAC 2000)
- Crude fibre (AOAC 2000)
- Ash content (Elezabeth and Subramanian, 2013)
- Dietary fibre (AOAC 2000)
- Phenols (Blainski et al. 2003)
- Tannins (Durai et al. 2016)
- Flavonoids (Majaw and Moirangthem, 2009)

FTIR analysis of collected sample.

## **6. Expected Research Outcome**

The proposed research will help in the documentation of indigenous medicines used to cure diabetes mellitus in the Jalandhar district and nearby areas. Further quality evaluation of these indigenous herbs will help patients to select medicines on the bases of their composition and hence reliability on the traditional medicinal systems has been increased.

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## Appendix 1

### Questionnaire for the survey of indigenous anti-diabetic herbal medicines available in Jalandhar district and nearby areas: (sample)

DATE:

PLACE:

1.	Name of the medicine:	
2 .	Ingredients:	a. b. c. d. e. f.
3 .	Procurement of ingredients	a. Self-Grown () b. Procured from other sources, Name _____
4 .	If ingredients are easily available in local market	<input type="radio"/> Yes <input type="radio"/> No
5 .	Pre treatments	a. b. c. d. e.
5 .	Ratio of ingredients used	a. b. c. d. e.
6 .	Methods of preparation	a. Traditional

		<p>Details</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>b. Modern</p> <p>Details</p> <p>_____</p> <p>_____</p> <p>_____</p>
7.	Post treatments after preparations, if any	
8 .	Storage before consumption, if any	<p>a. 2 days ( )</p> <p>b. 3 days ( )</p> <p>c. One week ( )</p> <p>d. Other ( )</p>
9.	Method of Storage	<p>a. Room temperature ( )</p> <p>b. Cooling ( )</p> <p>c. Freezing ( )</p> <p>d. Dry ( )</p>
10.	Effectiveness of the medicine	<p>a. Cures completely ( )</p> <p>b. Just a preventive measure ( )</p>
11 .	Recommended consumption duration	<p>10 days ( )</p> <p>20 days ( )</p> <p>30 days ( )</p> <p>Others ( )</p>
12.	Possible Drug Food Interaction	
	Inhibitors	<p>a. _____</p> <p>b. _____</p> <p>c. _____</p> <p>d. _____</p>
	Enhancers	<p>a. _____</p>

		b. _____ c. _____ d. _____
13.	Side effects of the medicine <input type="radio"/> Yes <input type="radio"/> No	
	If yes, Name	a. _____ b. _____ c. _____
14.	Precautions during consumption	a. _____ b. _____ c. _____
15.	How many cases you solved till now?	