

Herbal Medicines for Diabetes Mellitus

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Abstract: *Diabetes mellitus is a systemic metabolic disease characterized by hyperglycemia, hyperlipidemia, hyperaminoacidemia, and hypoinsulinaemia it leads to decrease in both insulin secretion and insulin action.1 It is frequently associated with the development of micro and macro vascular diseases which include neuropathy, nephropathy, cardiovascular and cerebrovascular diseases.2 The disease is associated with reduced quality of life and increased risk factors for mortality and morbidity*

Keywords: Diabetes

I. INTRODUCTION

Diabetes mellitus is a systemic metabolic disease characterized by hyperglycemia, hyperlipidemia, hyperaminoacidemia, and hypoinsulinaemia it leads to decrease in both insulin secretion and insulin action.1 It is frequently associated with the development of micro and macro vascular diseases which include neuropathy, nephropathy, cardiovascular and cerebrovascular diseases.2 The disease is associated with reduced quality of life and increased risk factors for mortality and morbidity. The long-term hyperglycemia is an important factor in the development and progression of micro- and macrovascular complications3 . The worldwide prevalence of diabetes for all age groups was estimated to be 2.8% in 2000 and it is projected to be 5.4% in 2025. Currently available therapies for diabetes include insulin and various oral antidiabetic agents such as sulfonylureas, biguanides, α -glucosidase inhibitors and glinides. In developing countries as products are expensive and not easily accessible.

Presently, there is growing interest in herbal remedies due to the side effects associated with the oral hypoglycemic agents (therapeutic agent) for the treatment of diabetes mellitus. So the traditional herbal medicines are mainly used which are obtained from plants, it plays important role in the management of diabetes mellitus.4 In recent years, herbal medicines have started to gain importance as a source of hypoglycemic agents. Marles and Farnsworth estimated that more than 1000 plant species are being used as folk medicine for diabetes.5 Biological actions of the plant products used as alternative medicines to treat diabetes are related to their chemical composition. Herbal products or plant products are rich in phenolic compounds, flavonoids, terpenoids, coumarins, and other constituents which show reduction in blood glucose levels.6, 7, 8 Several species of herbal drugs have been described in the scientific and popular literature as having antidiabetic activity.9 Due to their perceived effectiveness, fewer side effects in clinical experience and relatively low costs, herbal drugs are prescribed.10 Medicinal and herbal plant products are traditionally used from long ago in many countries for the treatment of diabetes mellitus. The ethnobotanical information reports about 1000 plants that may possess antidiabetic potential among them, this review article enumerates some medicinal plants possessing hypoglycemic properties and elucidating their mechanisms of action such as *Bauhinia forficata*, *Combretum micranthum*, *Elephantopus scaber*, *Gymnema sylvestre*, *Liriope spicata*, *Parinari excelsa*, *Ricinus communis*, *Sarcopoterium spinosum*, *Smallanthus sonchifolius*, *Swertia punicea*, *Vernonia anthelmintica* etc. and method of experiment on animals and therapeutic efficiency of plant extracts were exploited. Some of the important anti-diabetic potential herbal plants source and their active principles are given in the

Important medicinal plants having antidiabetic potential:

Bauhinia forficata *Bauhinia forficata* is the most widely used herbal medicine for control of diabetes in Brazil, where it is known as Pata de Vaca (cows hoof).11 The fresh leaves are the essential part of this plant which shows the hypoglycemic activity and the genus *Bauhinia* belongs to the family *Caesalpiniaceae*.12 The initial reports of *Bauhinia forficata* antidiabetic activity in diabetic patients were made by Juliani (1941) 13 and Juliani (1931). 14 According to M.T. Pepato et al (2002) *Bauhinia forficata* decoction was prepared by boiling 150 g of fresh leaves in 1 litre of water for 5 min, allowed the decoction to stand for 30 min and filtered. The rats which are used for the experiment were fed a

normal laboratory chow diet containing (wt./wt.) 16% protein, 66% carbohydrate and 8% fat and were housed under a 12:12 h light: dark cycle at 22-25°C. In this experiment they divided the rats into two groups i.e., diabetic and non diabetic groups, followed by administered the streptozotocin (STZ) 40 mg/kg body weight, after 3 days the serum and urinary glucose levels were increased. Then one group was injected with *Bauhinia forficata* decoction and another with the drinking-water as control group. After 31 days of treatment the diabetic group treated with decoction showed a significant reduction in plasma glucose and urinary glucose. So the pharmacological, biochemical, histological and chemical studies are needed to elucidate the exact mechanism of action of *Bauhinia forficata* leaf decoction and to isolate any active compounds. Such investigations should also be carried out regarding type 2 diabetes15 .

II. LITERATURE REVIEW

Sanjeev Kumar:

Beet root juice work as anti-diabetic and hematinic agent. So this plant root will be helpful in treating the diabetes in ruler India due to low cost, easily availability and lesser side effects associated with the use of this plant root.

Pravin Mirmiran

The research show that the health promotional properties of beetroot and its by-product, as a potential therapeutics treatment for various metabolic disorder including hypertension, diabetics, insulin resistance and kidney dysfunction.

AIM AND OBJECTIVE

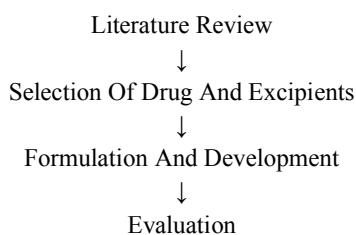
Aim :

To Formulation and evaluation of anti-diabetic herbal decoction.

Objective :

1. To formulation herbal decoction that has anti-diabetic activity.
2. To formulation the decoction that will maintain blood glucose levels.
3. To formulation decoction using cinnamon that has anti-diabetic, antihyperglycemic activity
4. To formulation herbal decoction that has less side effect.
5. To formulation herbal decoction that is inexpensive.

PLAN OF WORK





INGREDIENTS USED

Beetroot :

- Synonym : Beta Vulgaris
- Biological Source : it Consist of fresh root of beta vulgaris
- Scientific Classification :
- Kingdom – Plants
- Family – Amaranthaceous
- Order – Caryophyllales
- Genus – beta
- Common Name : beetroot, common beet, garden beet.
- Anti-diabetic Constitution : Betamin.



METHOD OF PREPARATION

1. Take 5 beakers. Wash all beakers.
2. Collect the prepared extract as per quantities given in table no 6.
3. Take another 500ml beaker clean the beaker.
4. Add the prepared extarets in 500ml beaker.
5. Mix all the extracts well.
6. Add 50 ml distilled water to above extarets.
7. Boil the extracts in 500ml beaker at 100 degree for 10 minutes.
8. After 10 minutes cool the prepared decoction.
9. Add 10 ml vinegar to prepared decoction after cooling down.
10. Mix it well.
11. Pour the herbal decoction in a container.

QUALITY CONTROL PARAMETER

• Determination of pH:

The pH of various formulations is determined by using digital pH meter. About 30 ml of decoction and stored for 2 hrs. The measurement of pH of formulation is then done.



II. RESULT

The prepared herbal decoction shows antidiabetic activity by reducing blood glucose levels increase production of insulin, maintain glucose level in blood and it is effective against type 1 and type 2 diabetes mellitus. It is cost effective, herbal and has no side effects

Result of Determination of pH

The pH of herbal decoction is determined by using digital pH meter The pH of decoction was found to be 5.4

Result of Physical Appearance

The formulated Decoction is Reddish brown

Result of Viscosity

Viscosity was measured by Brookfield viscometer and it was found to be 33 Pas Viscosity determinations were performed at room temperature

Result of odor of Decoction

Odor of decoction was found to be Aromatic

Result of Taste of Decoction

Taste of decoction was found to be Pungent

III. CONCLUSION

The present study focusses on formulation and evaluation of herbal antidiabetic decoction containing beetroot, bitter melon, garlic, cinnamon, guava. All these herbs have ability to maintain blood glucose levels in blood. Extraction of all the herbs is done by boiling method and extract is collected and mixed. This decoction help to increase the production of insulin, lower blood glucose levels, and is effective against type 1 and type 2 diabetes mellitus.

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