

## Review on Herbal Antidiabetic Plants

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### ABSTRACT-

Diabetes mellitus is found in all parts of the world and is becoming a serious threat to mankind health . this disease affect people all over the world and is a big health concern. this diseses caused by the deficiency of production of insulin by pancreas which results in increase or decrease in concentration of glucose in the blood .There are many medicines are available to control it, but total recovery from diabetes has not been reported up to this date. Some chemical agent have sever side effect. Alternate to this synthetic agents, many herbal plants[natural plants] with hypoglycemic propertis are known from across the world. The World Health Organization known 21,000 plants used as medicine worldwide.Lots of people, about 60 percent, use traditional plant- based medicines. This review focuses on Indian herbal drugs and plants used in the treatment of diabetes. Especially in used in india. Diabetes ia an important human aliment afflicting many from various walk of life in different countries. In india it is proving to be a major health problem, espically in urban areas. The herbal treatment are liked beacause they have fewer,less side effects and cost less. A list of some medicinal plants with proven antidiabetic and related beneficial effects and herbal drugs are used in antidiabctic treatment are include Allium sativum, Azadirachta Indica, stevia rubidana , Psidium guajaval ,Cinamomum zeylanicum, Zingiber officinale, Momordica charantia, Ocimum sanctum linn, Syzygium cumini.

**KEYWORDS-** Diabetes mellitus, antidiabetic drugs, Medicinal plants, Allium satvium, Azadirachta Indica, stevia rubidana, Psidium guajaval, Cinamomum zeylanicum, Zingiber officinale, Momordica charantia, Ocimum sanctum linn, Syzygium cumini.

### I. INTRODUCTION

Our bodies have ways to fight damage caused by certain molecules,but sometimes its not enough, leading to diseses like diabetes.This illness

affects a lot of people and is expected to keep increasing.The diabetes,the body struggle with insulin ,which controls blood sugars . the most common type ,type2, happens when the body dosent make or use insulin properly.

The world health organization says that by 2025,there might be around 300 million or more people with diabetes. Right now, treatments include insulin,and some pills ,but they can have serious side effects .so, that scientists are looking for better and safer medicines for diabetes. One enzymes,aldose reductase, plays a role in diabetes complications by causing a substances called sorbitol to build up in the body,leading to problems like cataracts and nerve damage.some plants have been found to help lower blood sugar, and researcher are studying how they work.these plants have natural substances yhat might act like insulin or help with how insulin works. Lots plants-more than 400kinds-have been looked at for their ability to lower blood sugar. Scientists are interested in these plants beacuse they contain different natural medicines . these compounds include things like glycosides,alkaloids,and flavonoids , which are belived to have an effect on diabetes.

### CLASSIFICATION OF DIABETES

#### MELLITUS:

1.  $\beta$ - cell destruction (Type 1 diabetes - IDDM) (a) Immune mediated (b) Idiopathy
2. Insulin resistance (Type 2 diabetes - NIDDM)
3. Genetic defects of  $\beta$ - cell function (a) Glucokinase (b) Hepatocyte nuclear transcription factor - 4  $\alpha$  (c) Insulin promoter factor (d) Mitochondrial DNA (e) Proinsulin or insulin conversion
4. Genetic defects in insulin processing or insulin actions defects in (a) Proinsulin conversion. (b) Insulin gene mutation (c) Insulin receptor mutation
5. Exocrine pancreatic defects
6. Endocrinopathy (a) Acromegaly (b) Cushing syndrome (c) Hyperthyroidism (d) Pheochromocytoma (e) Glucocanorama
7. Infections (a) Cytomegalovirus (b) Coxhacivirus
8. Drugs (a) Glucocorticoid (b) Thyroid hormone (c) Thiazides (d) Phenytoins

9. Genetic syndrome associated with diabetes (a) Down's syndrome (b) Klinefelter's syndrome (c) Turner's syndrome  
10. Gestational diabetes mellitus

### CAUSES OF DIABETES:

Multi-factorial, involving several predisposing conditions and risk factors. In many cases genetics, habits and environment may all contribute to a person's diabetes.

#### A.Type 1 Diabetes:

- happens when the body's defense system attacks the cells in the pancreas that make insulin
- Family history might make someone more likely to get it, but it's not as common as with Type 2 diabetes.
- Some infections might also play a role.
- It's seen more in certain ethnic groups and slightly more in men than women.

#### B.Type 2 Diabetes:

- Things like high blood pressure, high fat in the blood, and giving birth to a big baby can increase the risk.
- Eating lots of fatty foods, drinking a lot, not moving much, being overweight, and getting older can also lead to Type 2 diabetes.

### SIGNS AND SYMPTOMS:

Early detection and treatment of diabetes can decrease the risk of developing the complications of diabetes. The following symptoms of diabetes are typical. However, some people with type 2 diabetes have symptoms so mild that they go unnoticed. Common symptoms of diabetes:

- Feeling very thirsty
- Feeling very hungry - even though you are eating
- Extreme fatigue
- Blurry vision
- Cuts/bruises that are slow to heal
- Weight loss - even though you are eating more (type 1)
- Tingling, pain, or numbness in the hands/feet (type 2)

**Table 1: Sign & symptoms of Diabetes mellitus**

Prediabetes	Type 1 diabetes	Type 2 diabetes
No symptoms	Increased or extreme thirst	Increased thirst
	Increased appetite	Increased appetite
	Increased fatigue	Fatigue

	Increased or frequent urination	Increased urination
	Unusual weight loss	weight loss
	Blurred vision	Blurred vision
	Fruity odour or breath	Sores that do not heal
	In some cases no symptoms	In some cases no symptoms

### COMPLICATIONS OF DIABETES:

The complications of diabetes mellitus are far less common and less severe in people who have well-controlled blood sugar levels.

#### 1. Micro vascular Complications-

- Diabetic Retinopathy
- Diabetic Nephropathy
- Diabetic Neuropathy

#### 2. Macro vascular Complications-

- Atherosclerosis
- Cardiovascular Disease(CVD)
- Stroke

### PATHOPHYSIOLOGY OF DIABETES:

**Normal insulin release:** The pancreas releases insulin in response to food, especially when there's glucose in the blood from the food you've eaten. Insulin helps cells take in glucose from the blood to use as energy

**Glucose as energy:** Glucose is a key energy source for our body. It comes from carbs in food and is used right away or stored for later use.

**Role of insulin:** Insulin helps cells absorb glucose, use it for energy, or store it. When insulin is low, the liver releases stored glucose back into the blood  
**Glucagon's role:** Glucagon does the opposite of insulin. It raises blood glucose levels by releasing stored glucose when needed

**Impact of insulin issues:** If there's not enough insulin, or the body doesn't respond well to it, glucose can't enter cells properly. This leads to high blood sugar levels and problems with the body's normal functions

**Consequences of high blood sugar:** High blood sugar affects the kidneys, causing glucose in the urine (glycosuria) and increased urine production (polyuria), among other metabolic issues like poor protein synthesis and acidosis.

### DIABETES DIAGNOSIS:

The blood glucose levels of a healthy man are 80mg / dL on fasting and up to 160 mg / dL in the

postprandial state. A number of laboratory tests are available to confirm the diagnosis of diabetes.

1. Finger stick blood glucose.
2. Fasting plasma glucose.
3. Oral glucose tolerance test.
4. Glycosylated haemoglobin or haemoglobin A1C.

#### DIABETES MEDICATIONS:

Many different types of medications are available to help lower blood sugar levels in people with type 2 diabetes. Each type works in a different way. It is very common to combine two or more types to get the best effect with fewest side effects.

- Sulfonylurea: These drugs stimulate the pancreas to make more insulin.
- Biguanides: These agents decrease the amount of glucose produced by the liver.
- Alpha-glucosidase inhibitors: These agents slow absorption of the starches and glucose.
- Thiazolidinediones: These agents increase sensitivity to insulin.
- Meglitinides: These agents stimulate the pancreas to make more insulin.
- D-phenylalanine derivatives: These agents stimulate the pancreas to produce more insulin more quickly.
- Amylin synthetic derivatives: Amylin is a naturally occurring hormone secreted by the pancreas along with insulin. An amylin derivative, such as pramlintide (Symlin), is indicated when blood sugar control is not achieved despite optimal insulin therapy.
- Incretin mimetics: Exenatide (Byetta) was the first incretin mimetic agent approved in the United States. It is indicated for diabetes mellitus type 2 in addition to metformin or a sulfonylurea when these agents have not attained blood sugar level control alone.
- Insulins: Synthetic human insulin is now the only type of insulin. It is less likely to cause allergic reactions than animal-derived varieties of insulin used in the past. Different types of insulin are available and categorized according to their times of action onset and duration.
  - ⊗ Examples of rapid-acting insulins –
    - ♣ Regular insulin (Humulin R, Novolin R)
    - ♣ Insulin lispro (Humalog)
    - ♣ Insulin aspart (Novolog)
    - ♣ Insulin glulisine (Apidra)
    - ♣ Prompt insulin zinc (Semilente, slightly slower acting) ⊗ Examples of intermediate-acting insulins –

- ♣ Isophane insulin, neutral protamine Hagedorn (NPH) (Humulin N, Novolin N)
- ♣ Insulin zinc (Lente) ⊗ Examples of long-acting insulins –
- ♣ Extended insulin zinc insulin (Ultralente)
- ♣ Insulin glargine (Lantus)
- ♣ Insulin detemir (Levemir) 23, 24

#### DIABETES TREATMENT

Treatment involves medicines, diet, and exercise to control blood sugar and prevent symptoms and problems.

##### Diabetes Diet:

A healthy diet is a key to controlling blood sugar levels and preventing diabetes complications.

- Diet: Eat regularly, with balanced meals high in fiber and low in unhealthy fats and sugary foods. If weight loss is tough, ask a professional for help.
- Exercise: Even just 20 minutes of walking three times a week helps a lot. It lowers diabetes risk and keeps complications away.
- Control Blood Sugar: Keeping your sugar levels stable daily is the best thing for diabetes.
- Quit Smoking: Smoking makes diabetes worse. If needed, seek help to quit.
- Maintain Healthy Habits: Keep a healthy weight, drink enough water, watch salt intake, take care of your skin, teeth, and feet.
- Alcohol: Limit alcohol as it can mess with blood sugar levels.
- Keep Track: Check blood sugar levels regularly and keep a log of what you eat, when you take meds, and any issues you face.
- Get Educated: When diagnosed, your healthcare team will teach you how to manage diabetes
- Follow-up: Stick to the treatment plan, track your blood sugar, and contact your doctor if you have any problems or concerns.
- Prevention: For type 2 diabetes, focus on a healthy diet, exercise, limit alcohol, avoid smoking, take meds if needed for high cholesterol or blood pressure, and consider lifestyle changes to prevent it.

#### AYURVEDIC HERBS IN THE TREATMENT OF DIABETES MELLITUS

Diabetes mellitus in Ayurveda is known as Madhu-meha. Several Ayurvedic formulations have been used in the treatment of Diabetes Mellitus for centuries. In addition to herbs, Minerals find wide application in Ayurvedic Prescription for diabetes. Medicinal herbs like Momordica charantia, Gymnema sylvestre, Elicostermma littorale, Pterocarpus marsupium,

Salacia reticulata, Coccinia gluaca and Trigonella foneum graceum are prescribed as Single powder drugs or in combition (poly-Herbal). Scientists have studies the chemical Composition of the Antidiabetic medicinal herbs Used in Ayurveda. The article deals with work Done on Indian medicinal plants with anti Diabetic potential. (Sadhu, 2005)

How do herbs work? For most herbs, the specific ingredient that causes a therapeutic effect is not known. Whole herbs contain many ingredients, and it is likely that they work together to produce the desired medicinal effect. The type of environment (climate, bugs, soil quality) in which a plant grew will affect its components, as will how and when it was harvested and processed.

How are herbs used? For the reasons described in the previous section, eczema, premenstrual syndrome, rheumatoid arthritis, migraine, menopausal symptoms, chronic fatigue, and irritable bowel syndrome, among others. Herbal preparations are best taken under the guidance of a trained professional. What is the future of herbal medicine? Although a renaissance is occurring in herbal medicine in the United States, the FDA still classifies herbs as dietary supplements forbids manufacturers to claim that their and products are able to treat or prevent specific diseases. In some countries in Europe, however, herbs are classified as drugs and are regulated. The German Commission E, an expert medical panel, actively researches their safety and effectiveness. (Fugh-Berman. 2000)

### 1. Allium Sativum (Lahsun)-

Synonyms: Garlic (eng), Lasan (Guj), Lasun (Hindi), Lashuna (Sanskrit).

Biological Source- Garlic consists of ripe bulbs of Allium sativum

Family: Liliaceae.

Parts used: Ripe Bulbs

Geographical source: Central Asia, Southern Europe, insulin. It also improved diabetic conditions.

A.Kingdom-Plantae

b.Subkingdom-Tracheobionte

c.Superdivision-Spermatophyta

d.Division-Magnoliophyta

e.

Class-Equisetopsida

f.Subclass-

Magnoliidae

g.Superorder-Liliana

h.Order-Aspergales

i.Family-

Liliaceae

j.Genus.

Allium

Chemistry: It contains a wealth of sulphur

compounds; most important for the taste is Allicin , which is produced enzymatically from allin. It also contain 65% water, 28%carbohydrate, 2.3% organosulphur compound, 2% proteins, 1.2% free amino acid(mainly arginine) , 1.5% fiber, 0.15% lipids, 0.08%phytic acid, peroxidation better than glibenclamide andinsulin. It also improved diabetic conditions. SACS also stimulated in vitro insulin secretion from beta cells isolated from normal rats.Apafrom this, Allium sativum exhibits antimicrobial, anticancer and cardioprotective Activity.



### 2. Syzygium Syzygium ( Jambul) –

Synonyms- Black jamun

Biological source -Jamun , Syzygium Cumini

Family- Myrtaceae

parts used- seeds, leaves, fruits, and bark.

Geographical source- Thistree is known to have grown in Indian subcontinent and in other regions of South Asia such as Nepal, Burma, Sri Lanka,Indonesia, Pakistan, and Bangladesh from ancient time

Scientific Classification-

a. Kingdom: Plantae

b.Division- Magnoliophyta

c. Class: Magnoliopsida

d. Order: Myrtales

e. Family: Myrtaceae

f.Genus: Syzygium

g.Species: cumini

Chemistry- The plant is rich in compounds containing anthocyanins, glucoside, ellagic acid, isoquercetin, kaempferol, myricetin, andhydrolysable tannins (1-0- galloyl castalagin and casuarinin).

The seeds also contain alkaloid jambosine and glycoside jamboline, which slows down the diastatic conversion of bounce into sugar .

The blood glucose-lowering effect of Eugenia jambolanamay be due to increased secretion of insulin from the pancreas or by inhibition of insulin degradation



FIG. 1. PICTURES OF THE *COGNACUM* PLANT STAGED EDITED AND KEED.

### 3. Azadirachta Indica- Neem-

Synonym: Limdo(Guj), Neem(Hindi).

Biological source- Neem consists of almost all the part of the plant which are used as drug of Azadirachta indica. It is also known as margosa, indian Lilac and Azadirachta indica.

Family: Meliaceae

Parts used: Whole plants.

Geographical source- Azadirachta indica is widely distributed throughout India, Pakistan and Bangaldesh. That's normal name is neem.

Scientific Classification -

Botanical description- Taxonomic Postion of Azadirachtaindica,neem

a.Order-Rutales

b.Suborder-Rutinae

c.Family- Meliaceae

d.Subfamily- Melioideae

e.Tribe – Melieae

f.Genus-Azadirachata

g.Species- indica

Chemistry: Nimbidin is major source from seed oil, It is crude bitter principle. It also contain nimbin, nimbinin, nimbidinin, nimbolide, nimbilic acid. Gedunin obtained from neem's seed. It also contain mahmoodin, Azadirachtin. It also contain some tannins like, Gallic acid. There are also present of Margolonon, Polysaccharide.

Pharmacological study: Researchers least partially reducing diabetics' need for insulin at India's University of Madras in the early 1990s found that high doses (40 gm of dried herb daily) of Azadirachta Indica extracts may actually help to repair or regenerate the pancreas's beta cells, which play a crucial role in the production and secretion of insulin. Few other substances, synthetic or natural, offer such promise for reversing beta cell damage and at least partially reducing diabetics' need for insulin and other drugs. On the other hand, studies indicate that animals that do not have

diabetes do not produce more insulin after consuming Azadirachta Indica (Neem).



### 4. Stevia Rabudiana –

Synonym-Honey leaf  
Biological Source- Stevia rebaudiana Bertoni is the botanical name of stevia. It is a perennial shrub belongs to the (Asteraceae) Compositae family. Geographical Source-Stevia is native to Paraguay and Brazil . Scientific

Classification-

a.Kingdom-Plantae

b.Division-Magnoliophyta

c.Class-Magnoliopsida

d.Subclass-Asteridae

e.Order-

Asterales

f.Family-Asteraceae

g.Genus-Stevia

h.Species-

rebaudiana

i.Common name-Sweet leaf  
Chemistry: Steviol is the basic building block of stevia's Sweet Glucoside: Stevioside and rebaudioside A are constructed by replacing the bottom hydrogen atom with glucose and the top hydrogen atom with two or three linked glucose groups, respectively.

Clinical study: Jeppesen, et al. 2004 Stevioside is present in the plant Stevia rebaudiana Bertoni (SrB). Extracts of SrB have been used for the treatment of Diabetes in, for example, Brazil, although a positive effect on glucose metabolism has not been unequivocally demonstrated. They studied the acute effects of stevioside in type 2 diabetic patients. We hypothesize that supplementation with stevioside To a test meal causes a reduction in postprandial blood glucose. Twelve type 2 diabetic patian acute, Paired cross-over study. A standard test ents were included in meal was supplemented with either 1 g of stevioside or 1 g of maize starch (control). Blood samples were drawn at 30 minutes before and for 240 minutes after ingestion of the test meal. Compared to control, stevioside reduced the

incremental area under the glucose response curve by 18% ( $P = .013$ ). The insulinogenic index ( $AUC_i$ , insulin/ $AUC_i$ , glucose) was increased by approximately 40% by stevioside compared to control ( $P < .001$ ). Stevioside tended to decrease glucagon levels, while it did not significantly alter the area under the insulin, glucagon-like peptide 1, and glucose-dependent insulinotropic polypeptide curves. In conclusion, stevioside reduces postprandial blood glucose levels in Type 2 diabetic patients, indicating beneficial effects on the glucose metabolism. Stevioside may be advantageous in the Treatment of type 2 diabetes



#### 5. *Momordica charantia*: (bitter melon) -

Synonym- Balsam apple, balsam pear, Bitter guard.  
 • Biological source- *Momordica charantia* is grown for its fruit, young shoot and edible flower  
 • Scientific name- *Momordica charantia*  
 Family- cucurbitaceae Parts used- Whole section of this plant, such as fruit pulp, seeds, leaves and whole plant extracts.  
 Geographical Sources- *Momordica charantia* is used more frequently as a hypoglycemic agent in India.

	Scientific	classification
a)	Kingdom-	plantae
b)	Division	- magnoliopsid
c)	Order	- cucubiales
c)	Order	- cucubiales
d)	Family	- Cucurbitaceae
e)	Genus-	momordica
f)	Species-	charantia

• Common name- Karla, Bitter guard.  
 • Chemistry- Antidiabetic constituent Polypeptide-p or p-insulin is an insulin-like - Polypeptide-p. Antidiabetic properties of Bitter melon - Bitter melon is one of the most commonly used vegetable that contains polypeptide-p and is used to control diabetes. hypoglycemic protein, shown to lower blood glucose levels



#### 6. *Zingiber officinale*, Ginger-

Synonym- Adarak, Aal, Zingiber, Zingiberis  
 • Biological source- ginger herbaceous perennial plant probably native to southeast Asia, or its pungent aromatic rhizome (underground stem) used as a spice, flavouring, food, and medicine.

Family- zingiberaceae

Parts used- Rhizomes, root, shoot

Geographical Source- It probably originated in southeast Asia, it is cultivated in many tropical regions, including Africa, China, India

• Scientific Name- *Zingiber officinale*

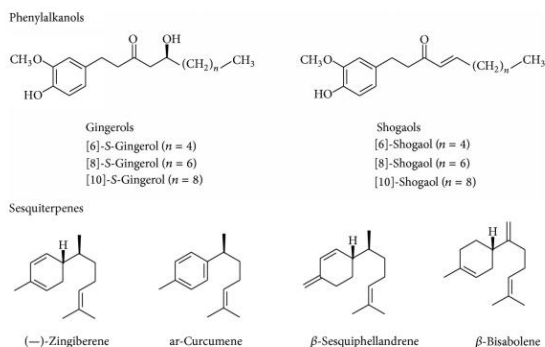
• Scientific classification

- Kingdom- plantae
- Division- magnoliophyte
- Class – liliopsida
- Order – zingiberales
- Family- zingiberaceae
- Genus – zingiber

g. Species - *zingiber officinale*.

• Common Name- Ginger, Adrak.

• Chemical constituent - Antidiabetic constituent- Alpha- zingiberene Antidiabetic properties of Ginger- Anti-diabetic effects through restorative effects on pancreatic  $\beta$ -cells, increasing insulin sensitivity, insulin-like action and peripheral utilization of glucose.



### 7. *Cinnamomum zeylanicum* ,Cinnamon-

Synonym- Cinnamon bark, Kalmi, Dalchini.

- Scientific name- *Cinnamomum verum*.
- Biological Source- Cinnamon is the dried inner bark of the coppiced shoots of *Cinnamomum zeylanicum*

Family- Lauraceae

Parts used –dried inner bark

- Scientific Classification
- a. Kingdom- Plantae
- b. Division- Magnoliophyta
- c. Class –magnoliopsida
- d. Order –magnoliales
- e. Family -Lauraceae.
- f. Genus – *cinnamo schaeff*
- g. Species- *cinnom tamala*

•Chemistry- Antidiabetic constituent – cinnamaldehyde Antidiabetic properties of Cinnamon- Antidiabetic effects through inhibiting gastro-intestinal enzymes, modulating insulin response and sensitivity, improving glucose uptake, inhibiting gluconeogenesis and increasing glycogen synthesis .

The main constituents of cinnamon are cinnamaldehyde, cinnamate essential, cinnamic acid, and numerous oils. They all contribute to the odor and to the several biological activities observed with cinnamon. It also contains

procyanidins tannins, mucilage, and a bit amounts of coumarin. Cinnamaldehyde (trans-cinnamaldehyde) is the foremost constituent in cinnamon barkoil However, the principal component of leaf oil is eugenol.



### 8. *Psidium guajaval* ,Guava-

- Synonym- *Guajava pyrifera*
- Scientific Name- *Psidium guajaval*
- Biological Source- Guava trees are native to tropical America and are grown in tropical and subtropical areas worldwide. Guava fruits are processed into jams, jellies, and preserves and are common pastry fillings
- Family- myrtalecae
- Plant parts used- leaves,bark, whole parts
- Geographical sources- It is now cultivated in Southern Florida, Bermuda, and throughout the West Indies from the Bahamas and Cuba to Trinidad, and south to Brazil
- Scientific classification
- a. Kingdom- Plantae
- b. Order – myrtales
- c. Family- myrtalecae
- d. Genus -*Psidium* e. Species- *P.guajava*.
- Chemistry- Antidiabetic constituent- Polyphenol compound. Antidiabetic properties of Guava leaves - Reduced blood glucose level, increased plasma insulin level in an oral glucose tolerance test, and stimulated activities of some glucose metabolic enzymes .

Guava contains broad spectrum of phytochemicals including minerals, enzymes, proteins<sup>29</sup>, sesquiterpenoid alcohols and triterpenoid acids<sup>30,31,32</sup>, alkaloids, glycosides, steroids, flavanoids, tannins, saponins<sup>33,34</sup> . Guava is very rich in antioxidants and vitamins and also high in lutein, zeaxanthine and lycopene<sup>35,36</sup>. The guava leaves contain several chemical constituents such as α-pinene, β-pinene, limonene, menthol, terpenyl acetate, isopropyl alcohol, longicyclene,

caryophyllene,  $\beta$ -bisabolene, caryophyllene oxide,  $\beta$ -copanene, farnesene, humulene, selinene, cardinene and curcumenone, mallic acids, nerolidiol,  $\beta$ sitosterol, ursolic, crategolic, and guayavolic acids, cineol, quercetin, 3-L-4-4-arabinofuranoside (avicularin) and its 3-L-4-pyranoside (essential oil), resin, tannin, eugenol.



### 9. *Ocimum sanctum* Linn. (Tulsi)-

Synonym- Holy basil :- (*Ocimum sanctum*) , tulsi  
Biological source-It consists of Fresh and dried leaves of *ocimum* species like *ocimum sanctum* l, and *ocimum basilicum* l

Family: Labiatae

Parts used- leaves, roots ,whole plant

Geographical sources- mostly in india. Malaysia, Australia, West Africa and some of the Arab countries.

Scientific classification -

Kingdom : Plantae

Subkingdom : Tracheobionta

Superdivision : Spermatophyta

Division : Magnoliophyta

Class : Magnoliopsida

Subclass : Asteridae

Order : Lamiales

Family : Lamiaceae

Genus : *Ocimum*

Species : *O. sanctum*

Chemistry: Volatile oil (containing eugenol and caryophyllene), triterpenoid (rosmarinic acid and ursolic acid) Flavonoids and Saponin.

Tulsi is also known as "the elixir of life" since it promotes longevity. Different parts of the plant are used in Ayurveda and Siddha systems of medicine for prevention and cure of many illnesses and everyday of medicine for prevention and cure of many illnesses and everyday ailments like common cold, headache, cough, influenza, earache, fever, colic pain, sore throat, bronchitis, asthma, hepatic diseases, malar fatigue, skin diseases, wound,

insomnia, arthritis, digestive disorders, night blindness and diarrhoea. The leaves are good for nerves and to sharpen memory.



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