

# PHARMACOGNOSTICAL REVIEW ON OCIMUM SANCTUM AND ZINGIBER OFFICINALE

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#### ABSTRACT

The use of Ocimum sanctum (holy basil, tulsi) from Lamiaceae family and Zingiberofficinale (ginger, adrakh) from Zingiberaceae is quite common in day to day life of Indian families. It has been widely used for thousands of years in Ayurveda and Unani systems to cure or prevent a number of illnesses. The objective of the study is to promote the traditional use of the plants to cure diseases. O. sanctum commonly known as tulsi consists of cirsilineol, circimaritin, isothymusin, apigenin, rosameric acid, eugeno, eugenol, methyl eugenol, carvacrol and sesquiterpine hydrocarbon caryophyllene. It havevarities of medicinal properties such as hypoglycaemic and hypolipidemic activity, immunomodulatory activity, antimicrobial activity, anti-ulcer activity, antioxidant activity, antiinflammatory activity, anti-stress activity chemopreventive and radioprotective activity, anticoagulant activity, etc. On the other hand Z. officinale which is commonly known as adrakh consist of carbohydrates, lipids, terpenes, phenolic compounds, amino acids, protein, phytosterols, vitamins and minerals. Terpene components of ginger include zingiberene,  $\beta$ -bisabolene,  $\alpha$ -farnesene,  $\beta$ sesquiphellandrene, and  $\alpha$ -curcumene, while phenolic compounds include gingerol, paradols, and shogaol. It is widely used as stomachic, aromatic, carminative, stimulant and flovouring agent, in mouth washes, ginger beverage and liquors. It is also found that it has efficacy in motion sickness and control parasitic infection. It also has anticoagulant effect. Further study on the combined anticoagulant effect of O. sanctum and Z. officinale shows that it prolongs the clotting time.

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## INTRODUCTION

HOLY BASIL:

## **BIOLOGICAL SOURCE:-**

It is obtained from whole plant of *Ocimum sanctum*, commonly known as holy basil,*tulsi* of family Lamiaceae. It is authenticated by Prof. Nawal Kishore Dubey (FNASc, FNAAS, Centre of Advanced Study in Botany, Institute of Science, Banaras Hindu University, Varanasi-221005 [1-7].

#### **VERNACULAR NAMES:-**

Sanskrit: Surasa, Apetrakshasi, Bhutghni, Bahumanjari, Sulabha,

Assamese: Tulasi Bengali: Tulasi

English: Holy Basil

Gujrati: Tulasi, Tulsi



Hindi: Tulasi Kannada: Tulasi, Shree Tulasi, Vishnu Tulasi Malayalam: Tulasi, Tulasa Marathi: Tulas Punjabi: Tulasi Tamil : Tulasi, Thulasi, ThiruTheezai Telugu : Tulasi Urdu : Raihan, Tulsi<sup>1</sup> **PLANT DESCRIPTION:-**

a) MACROSCOPY:



**Leaf**- 2.5-5 cm long, 1.6 - 3.2 cm wide, elliptic oblong, obtuse or acute, entire or serrate, pubescent on both sides; petiole thin, about 1.5-3 cm long hairy; odour, aromatic; taste, characteristic [8-10].

## b) MICROSCOPY



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It consist of single layered epidermis composed of thin-walled, oval cells having a number of covering and glandular trichomes; epidermis followed by 1 or 2 layers and 2 or 3 layers of thin-walled, elongated, parenchyma cells towards upper and lower surfaces respectively; vascular bundles situated centrally; xylem surrounded by phloem [11, 12].

## c) STANDARDIZATION:

## Table 1 Identity, Purity and Strength

Parameter	Results
Total ash	2.3%
Acid –insoluble ash	12.6 %
Sulphated ash	15.7 %
Foreign matter	0.1%
Moisture content	28%
Alcohol – soluble extractive	9.5 %
Water – soluble extractive	20.2 %

## Table 2 Florescence study

S.NO.	Treatment	Under ordinary light	Under UV - Long
			(366nm)
1	Drug as such	Gray	Light brown
2	Drug + Picric acid	Yellowish green	Green
3	Drug + HCl conc.	Gray	Dark Green
4	Drug + H2SO4 conc.	Black	Brown
5	Drug + HNO3 (50%)	Yellowish green	Greenish brown
6	Drug + 1 N Na OH in	Dark brown	Brown
	CH₃OH		
7	Drug + 1 N NaOH in	Greenish yellow	Reddish brown
	Water		
8	Drug + NH4OH	Blackish brown	Green
9	Drug + FeCl3	Greenish brown	Dark green
10	Drug + Acetic acid	Grey	Dark brown

## **CHEMICAL CONSTITUENTS:-**

It consists of alkaloids, glycosides, flavonoids, steroids, saponins, tannins, etc. It also contains cirsilineol, circimaritin, isothymusin, Leishmanicidal, apigenin, rosameric acid, eugeno, eugenol, methyl eugenol, carvacrol and sesquiterpine hydrocarbon caryophyllene. Two flavonoids orientin and andvicenin from aqueous leaf extract of Ocimum sanctum are also present[13-18].

**Table 3** Phyto-Chemical Test

Chemical constituents	Result
Glycosides	+ve
Alkaloids	+ve
Flavonoids	+ve



Saponins	+ve
Tannins	+ve
Steroids	+ve

#### USES:-

It have varities of medicinal properties such as hypoglycaemic and hypolipidemic activity [19], immunomodulatory activity [20, 21], antimicrobial activity [22-27], anti-ulcer activity [28, 29], antioxidant activity [30], anti-inflammatory activity [31-33], cardioprotective activity [34], Hepatoprotective activity [35], Antimelanoma and radioprotective activity [36], antidepressant activity [37], antifungal activity [38] etc. Other uses may include common cold, headache, cough, influenza, earache, fever, colic pain, sore throat, bronchitis, asthma, hepatic diseases, malarial fever, as an antidote for snake bite and scorpion sting, flatulence, migraine headaches, fatigue, skin diseases, wound, insomnia, arthritis, digestive disorders, night blindness and diarrhea.

#### GINGER

#### **BIOLOGICAL SOURCE:-**

It is obtained from the rhizomes of *Zingiber officinale*, commonly known as ginger, *adrakh*, of the family Zingibaraceae. It is authenticated by Prof. Nawal Kishore Dubey (FNASc, FNAAS, Centre of Advanced Study in Botany, Institute of Science, Banaras Hindu University, Varanasi-221005 [39-41].

#### **VERNACULAR NAMES:-**

English : Ginger

Tamil : Inji

Malayalam : Inchi

Telugu : Allam / Allamu / Sonthi

Kannada : Shunti / Alla / AshiShunti / Ardraka

Hindi : Adrak / Adu / Soonth

Bengali : Ada

Gujarati : Aadu / Soonth

Marathi : Aale

Oriya : Ada

Punjabi : Adrak



## PLANT DESCRIPTION:-

a) MACROSCOPY:



- The rhizomes are laterally compressed with a length of around 2.75 to 6 inches and 1 to 1.5 cm width. The rhizome of ginger is buff colored with longitudinal striations or is fibrous with no cork.
- When the rhizome is broken it yields a short fracture with fibro vascular bundle fibers protruding from the broken surface.
- The rhizome is associated with an agreeable aromatic odor and pungent taste, owing to its use as a spice.
- b) MICROSCOPY:

° * * *	Fibres	Outer cork
	Endodermis	Inner cork
	Oleo resin	Cortex



Outer cork consists of irregularly arranged cells and inner cork consists of cells arranged in radial rows. Cortex consists of thin walled, cellulosic rounded parenchyma with intercellular spaces. These cells contain simple, ovate or sac-shaped starch grains with hilum at the pointed end. Cortex contains closed collateral fibro-vascular bundles. Some cells contain yellow brown oleo resin. Endodermis is distinct and consists of tangentially elongated cells containing suberin in radial walls. Starch is absent.

## c) STANDARDIZATION:

Parameter	Results	
Foreign matter	0.8%	
Total ash	5%	
Acid –insoluble ash	1.5%	
Alcohol – soluble extractive	3%	
Water – soluble extractive	10%	

Table 4 Identity, Purity and Strength



S.NO.	Treatment	Under ordinary light	Under UV - Long (366nm)
1	Drug as such	Brown	Light brown
2	Drug + Picric acid	Yellow	Brown
3	Drug + HCl conc.	Brown	Brown
4	Drug + H2SO4 conc.	Brown	Brown
5	Drug + HNO3 (50%)	Yellow	Greenish brown
6	Drug + 1 N NaOH in CH <sub>3</sub> OH	Dark brown	Brown
7	Drug + 1 N NaOH in Water	Greenish yellow	Reddish brown
8	Drug + NH4OH	Blackish brown	Brown
9	Drug + FeCl3	Greenish brown	Dark green
10	Drug + Acetic acid	Brown	Dark brown

#### Table 5 Florescence study

## **CHEMICAL CONSTITUENTS:-**

The ginger rhizome contains 60-70% carbohydrates, 3-8% crude fiber, 9% protein, 8% ash, 3- 6% fatty oil and 2-3% volatile oil. The characteristic flavor of ginger is due to zingerone, shogaols, gingerols, and volatile (essential) oils that comprise up to 3% of ginger on fresh weight basis. The volatile fragrant essential oil of ginger contains mainly sesquiterpenoids, with  $\alpha$ -zingiberene (30-70%) as the main component, smaller amounts of other sesquiterpenoids:  $\beta$ -sesquiphellandrene (15-20%),  $\beta$ -bisabolene (10-15%), and  $\alpha$ -farnesene, and monoterpenoids ( $\beta$ - phellandrene, camphene, cineol, geraniol, citral, etc.). Ginger also contains diterpenes and ginger glycolipids [42-46].

The pungency of the fresh ginger rhizome is due to gingerols, of which the major pungent principle is [6]-gingerol (1-[4'-hydroxy-3'-methoxyphenyl]-5-hydroxy-3-decanone), an oily liquid, and the most abundant constituent among the gingerols [47]. The pungency of dried or cookedginger is due to nonvolatile phenylpropanoid-derived compounds from gingerols, namely, shogaols. The less pungent zingerone is also produced from gingerols during drying process; which has a spicy-sweet aroma. Ginger also contains acrid resinous substances (5-8%).

Chemical constituents	Result
Starch	+ve
Fat	+ve
Protein	+ve
Flavonoid	+ve
Carbohydrate	+ve

#### Table 6 Phyto-Chemical Test



## USES:-

It have verities of medicinal properties and use such as an anti-inflammatory agent [48-51], antithrombotic agent [48], anti-arthritis agent [51-54], cancer chemopreventive agent [55, 56], Anti-tumor activities [57] etc.Also, it is widely used stomachic, as aromatic, carminative, stimulant and flavoring agent, in mouth washes, ginger beverage and liquors. It works against nausea and vomiting (antiemetic) during motion sickness and seasickness. Apparently, this effect is not mediated through the central nervous system (CNS), but rather, ginger's active principles act directly on the gastrointestinal tract. It is also found that it has efficacy in motion sickness and control parasitic infection. It also has anticoagulant effect. It is also used:

- To reduce vomiting in patients treated with cytotoxic compounds.
- To promote digestion and as an antiflatulent or carminative to reduce gas and bloating.
- To improve blood circulation.
- To lower blood glucose in the treatment of diabetes.
- To treat migraine headache.
- As a sialagogue, to promote salivation.

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