**ABSTRACT**

*Sunthi* (Zingiber officinale) is dried rhizome a known herb in Indian spices. It is widely cultivated in India and introduced to China. A considerable quantity of fresh as well as dry ginger is exported to west Asian countriers, USA, Japan, U.K, Germany, Netherland and several other countries. Ginger oil specially produced from *sunthi* is exported to several countries like France, Japan, and U.K etc. *Sunthi* is termed as *Vishwabheshaja* as it is used in treatement of various diseases ailment. *Sunthi* has multiple uses, it is very cheap, easily available and quick in action in multiple diseases when used as medicine. *Sunthi* posses multiple uses right from kitchen to treat dreadful disease hence it is termed as *Nagara*. A attempt is made in this article to highlights *Sunthi* (dried rhizome), its origin, description, habitat, harvesting storage, Chemical constitution, pharmacological actions and uses, in detail by compiling both ancient and modern text with evidence based researches.

**KEYWORDS:** *Sunthi, Nagar, Pharmacological properties, Chemical constituents.*

**INTRODUCTION**

Drug plays a vital role in the treatment of disease. Therefore it is placed second in the *Chikitsa Chatushpada* next to the physician. Drugs are described as an instrument (Karana) of physician for treating disease. For using the drugs to treat a disease, it is essential to have the complete knowledge regarding the drugs. The consideration of the drugs during the line
of treatment for particular ailment has great importance. Maharshi Charaka has asserted that each substance on this earth is useful in combating illness when applied with planning and for a specific purpose. So if applied the logic, one can fabricate the medicine from a poison.

Sunthi is very well known herb. One of the synonyms of it as vishwa widely used. India is one of the chief gingers producing country in the world. This spice and medicine is recognized for use in major parts of the world especially Europe, Jamaica, Fiji, Indonesia and Australia. A considerable quantity of fresh as well as dry ginger is exported to many countries like West Asian country, Germany, Neitherland, USA, Japan, U. K. A famous oil ginger oil obtained from Sunthi is exported to countries like France, Japan, U.K.[1]

Sunthi is a spice in Indian kitchen also it acts as medicine by having multiple action. In English it is termed as Ginger. Though Sunthi can be used in many diseases Acharya Charaka has said it as vishwabeshaja.[2] As it is Appetizer, Laxative, Stomachic, Stimulant, Expectorant, Carminative, Digestive, Thermogenic, Anthelmintic. Sunthi is indicated in diseases like Agnimandya, Svasa, Kasa, Adhmana, Amavata, Pandu, Udararoga, Slipada. Considering all the points attempt is made in this article to highlights lights on various pharmalogical action of Sunthi(dried rhizome)Gingeber officinalis by collecting research based evidences on various diseases. To focus the qualities, pharmacological action of Sunthi(Zingiber officinalis) by detail review of classical texts, collection of evidence based previous research work on different diseases.

Classical review on Sunthi
1. In veda description of Sunthi is not found but the use of Sunthi is described in all Ayurvedic text and in modern text.
2. Charaka Samhita Sutrasthan 27 chapters mentioned qwath of sunthi and pippali, laijja, dadima which cures kushta,pippasa and it is pathya.
3. In Charaka Samhita Chikitsasthan 21 chapter it is mentioned that draksha parpataka, shunti, guduchi dhanvayasaka at night cures trishna and visarpa.
4. In Sushruta Samhita Sutrasthan 46th chapter it is mentioned that due to katu rasa, ushna veerya and having laghu it is hridya, deepana ,sasneha and rochana.[3]
5. In Ashtanga Hridaya, Chikitsasthan 1st chapter it is mentioned that hima of chandana, sunthi ambu, parataka and ushira cures jwara due to its pachan actions
6. In Kaideva Nighantu it is mentioned that it is having katu rasa, ushna veerya, it is deepan and cures shwasa, kasa, vami, hikka, vibandha, vata and pitta dominant diseases.\[^{[4]}\]

7. In Raj Nighantu it is mentioned that having katu rasa and ushna veerya it is deepana and hridya and it cures shopha and throat diseases.

8. In Bhawprakasha Nighantu it is mentioned that before the meals it is always pathya with the help of lavan for bhakhanartha. It causes Agni sandeepan, ruchya, vishodhana of kantha and jivha it cures kushta, pandhu, raktapitta, daha, vrana, and jwara. It is contraindicated in Daha and sharad ruru.\[^{[5]}\]

9. Madhanpala nighantu mention sunthi having action like ruchya, amvaagni, pachani and laghu, it is having snighda, ushna, guna, katu vipaka and causes vibhanda of kapha and vata.\[^{[6]}\]

10. In Sharanghdhara Samhita it is mentioned that sunthi made into kalka with guda and taila and taken with anupana of milk cures parinam janya shopha and amvata.\[^{[7]}\]

Taxonomical classification

- **Family:** Zingiberaceae.
- **Kingdom:** Plantae
- **Phylum:** Spermatophyta
- **Subphylum:** Angiospermae
- **Division:** Angiospermae
- **Class:** Monocotyledoneae
- **Order:** Zingiberales
- **Genus:** Zingiber
- **Species:** Z. Officinale
- **Common name:** Ginger

Classical names

Sunthi, Muhausadha, Nagara, Srngavera, Visva, Visvabheshaja, Visvaasadh, Ausadha, etc.

**Gana/ Mahakashaya**

Charaka–Sheetapraprashamana, Dipaniya, Triptighna, Arshoghna, Shothagana, Nadiuttejaka Grahi, swarya, Bheda, Jwaragna, Vrishya, Shleshmahara, Sravya, Vedanasthapana, Vrishya, Shwashara

Sushruta– Pippallyadi, Trikatu.
Phamacodynamical properties\textsuperscript{[8]}

\textbf{Rasa: Katu}

\textbf{Guna: Laghu, Snighda}

\textbf{Vipaka: Madhura}

\textbf{Virya: Ushna}

**Varieties and Substitues**

Depending on place of origin three varities are found viz.

Japanese Ginger – \textit{Zingeber mioga}

\textit{Martinique ginger} – \textit{Zingeber zerubet Rose}

\textit{Zingeber Casummar Roxb} substitute for \textit{Zingeber officinale}.

**Cultivation\textsuperscript{[9]}**

\textit{Sunthi} is cultivated in moist and warmer part of India. Humid, warm with heavy rainfall is essential for its growth. The ideal type of soil are sandy, clavey loam, red loam require for its growth. The crop is cultivated mostly as pure or an intercrop also in rotation crop with tapioca, chilles, sesamum. The land ploughed a number of times to bring the soil to a fine tilth. Ginger is taken as monsoon crop. Rhizomes are planted 5cm deep it takes 10 to 15 days to sprouts.

**Harvesting**

Crop takes 8 months to mature. When plant attains height of 0.6m, several shoots are formed. When crop matures, lateral shoots shows yellow and get dried. Harvesting of crop done by digging or by uprooting rhizomes carefully.

**Storage**

Buds and roots removed, soaked overnight in water, decorticated and some times treated with lime and dried.\textsuperscript{[5]}

**Botanical description**

Ginger is a creeping perennial rhizomatous herb which can grow to a height of about 0.6-12m tall, leaves are 15-30cm long, Rhizome, laterally compressed bearing short, flattish, ovate, oblique, branches on upper side each having at its apex a depressed scar, pieces about 5-15 cm long, 1.5-6.5 cm wide (usually 3-4 cm) and 1-1.5 cm thick, externally buff colored showing longitudinal striations and occasional loose fibers.
Macroscopic
The rhizome of *sunthi* is compressed, ovate, short, flattish, oblique branches on the upper side each having at its apex, pieces about 5-15 cm long, 1.5-6.5 cm wide, and 1-1.5 cm thick. Externally buff-colored showing longitudinal striations and occasional loose fibers, fracture short, smooth, transverse surface exhibiting narrow cortex, a well-marked endodermis and a wide stele showing numerous scattered fibro-vascular bundles and yellow secreting cells, odor agreeable and aromatic, taste, agreeable, and pungent.[5]

Microscopic
The transverse section of the rhizome shows the cortex of isodiametric thin-walled parenchyma with scattered vascular strands and numerous isodiametric idioblasts of about 40-80 µ in diameter and containing a yellowish to reddish-brown oleo-resin. The endodermis is slightly thick-walled free from starch. The parenchyma cells are arranged radially around numerous scattered, collateral vascular bundles and each consisting of a few un lignified, thin-walled septate fibers up to about 30 µ wide and 600 µ long with the small oblique slit.

The parenchyma of cortex and stele packed with rectangular, ovate, flattened, starch grains, mostly 5-15 µ – 30-60 µ long about 25 µ wide and 7 µ thick, marked by five transverse striations.

Chemical constituents
*Sunthi* contains Volatile Oil containing Cineole zingiberol, and sesquiterpene like zingiberene, bisobolene and gingerosol in the oleo-resin. Heptane, octane, isovaleraldehyde, nonanol, ethylpinene, camphene, β- pinene, subinene, myrecene, limonene, β- phellandrene, 1,8-cineole, a-curcumene, afernesene, β-fernonesene, linalool, β-sesquiphellandrene, dihydrogingerol, hexa- hydrocurcumin (essential oil), diarylheptenones (gingerenone A), gingerenone B, iso gingerenone B, gingerenone C, 6-gingesulphonic acid, gingerglycolipids A, B and C, gingerols I, II and III, monoacyl- digalactosylglycerols (rhizomes), aspartic acid, threonine, serine, glycine, cysteine, valine, isoleucine, leucine and arginine (arial parts and tuber).

*Sunthi* is rich in Essential oil, pungent constituents (Gingerol and Shogaol), resinous matter, starch, etc.[5] The Seeds of *Sunthi* contains Ricinine, Ricine, and lipase enzyme. Oil is rich in Glycerides like recinoleic acid, oleic acid, linoleic acid, & stearic acid.
Identity, Purity, and Strength of sunthi (Zingiber officinale)[10]

**Foreign matter:** Not more than 1 per cent, 2.2.2

**Total ash:** Not more than 6 per cent, 2.2.3.

**Acid-insoluble ash:** Not more than 1.5 per cent, 2.2.4.

**Alcohol-soluble extractive:** Not less 3 per cent 2.2.6.

**Water-soluble extractive:** Not less than 10 per cent 2.2.7.

**Action and Uses**

Appetizer, Laxative, Stomachic, Stimulant, Expectorant, Carminative, Digestive, Thermogenic, Anthelmintic.

**Therapeutic uses**


**Home remedies**

1. In indigestion, its Swarasa 5 ml. along with lime Juice 5 ml and Rock salt 200 mg should be taken.
2. In dry cough, its small roasted pieces should be kept in mouth and sucked their juice.
3. In joint disorders, its powder 1 gm along with Ashwagandha Churna 4 gm should be taken.
4. Ginger is used to spice tea and coffee, especially in winter due to cold climatic condition to produce warmth.
5. In case of sore throat gargle of sunthi, turmeric and salt is used for gargling.
6. Sunthi, castor oil and joggery is used in case of swelling, gas disturbances in stomach.

**Popular formulation of sunthi (Zingiber officinale)**

<table>
<thead>
<tr>
<th>Trikatu Churna,</th>
<th>Ardrakhandaaavaleha,</th>
<th>Saubhagyashunti,</th>
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<tr>
<td>Saraswatarishta,</td>
<td>Panchasama</td>
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<tr>
<td>Ardraka Ghrita,</td>
<td>Erandapaka,</td>
<td>Shamshakara Churna,</td>
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<tr>
<td>Shothagha Lepa,</td>
<td>Kalyanakaavaleha,</td>
<td>Rasanadi Kwath</td>
</tr>
<tr>
<td>Guladракam,</td>
<td>Panchkola Churna</td>
<td>Shunthi Panaka,</td>
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<tr>
<td>Maharasnadi Kwath,</td>
<td>Shothhari Mandur,</td>
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<td>Amritarishta,</td>
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<tr>
<td>Panchasakar Churna,</td>
<td>Abhyarista,</td>
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<td>Talishadi Churna.</td>
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</table>
Dose of sunthi (Zingiber officinale)

The recommended dosage of medicine is given below:

- **Adults:** 250 mg to 1 gram twice daily after meals with lukewarm
- **Children:** 125 mg to 500 mg twice daily after meals with lukewarm water or milk.

Contraindication

- In *Pitta prakruti* person.
- In *Grisha rutu*.

Pharmacological activity


Therapeutic evidences

**Nausea and Vomiting**

A clinical trial clinical study was conducted on 70 pregnant women to determine the effectiveness of ginger for the treatment of nausea and vomiting. Oral administration of ginger 1 gm per day relived the severity of nausea and vomiting in pregnancy.[11]

Sunthi is beneficial in relieving nausea, morning sickness and motion sickness. Studies done on the use of Sunthi in post-surgical nausea and chemotherapy-induced nausea have been encouraging.[12]

Clinical study conducted on 60 women to determine the effectiveness of ginger as an antiemetic agent it was concluded that ginger taken prior to 8- MOP substantially reduce the side effect i.e nausea.[13]

**Hypolipidemic**

*Haritaki vati* composed of seven herbal drugs, viz. *Terminalia chebula, Acorus calamus, Pluchea Lanceolata, Piper longum, Ziniber officinale, Hedychium spicatum, Pluchea lanceolata. Piper longum, zingiber officinale, Hchiium spicatum and Inula racemosa*, was administered 2 tablets t.i.d. to 20 patients of angina pin for 2 months. Chest pain was found to be shifted towards less severe grades and angina frequency was reduced. Reduction in serum Cholesterol and serum Triglyceride levels were significant.[14]
Hepatoprotective
Ten patients of cirrhotic liver were given commercial preparation of Kamilari 850mg, 3times day for 4 months and biochemical parameters were analysed. level of serum enzymes, cholesterol and bilirubin were reduced and that proteins increased. It was concluded that kamilari is hepatoprotective drug.[15]

Anti-inflammatory
Sunthi helps reduce inflammation; hence, it can be used to treat inflammatory disorders such as arthritis.[16]

Out of 24 Patient, treated with sunthi and guggulu combination for rumatoid arthritis 7 shows partial relief while 8 patients got complete relief.[17]

Dyspepsia
The herb has an ameliorating effect on digestive ailments. It helps digest fatty foods and break down proteins. It is also effective in reducing abdominal gaseous distension.[18]

Dhanyaka Panchaka Kashaya prepared from Corianderum sativum, Valeriana walchii, aegle marmelos Cyprus rotunds and Zingiber officinale, has been found effective in dyspepsia and on free HCL of Hypoacidity.

Anti diarrheal
Sunthi is reported to control infectious diarrhea by slowing down bacterial metabolism which suppresses toxin production.[19]

The classical herbal compound, of shalparnyadhi churna was assessed for irritable bowel syndrome (IBS) in group of 15 patient of IBS treated with drug in dose of 3 gm thrice a day for one and result where compared with placebo. The result showed positive response in all cases.

Effect of powdered rhizome of Zingiber officinale on the symptoms of motion sickness were compared with those of dimenhydrinate and placebo in 36 patients who reported very high susceptibility to motion sickness Zingiber officinale was found to be superior to dimenhydrinate in reducing motion sickness.[20]
Hypoglycemic
A herbal medicine Karmin containing Momordica charantia, Azadirachta, Eugenia jambolana, ocimum santum, Commiphora mukul, picorhiza kurroa, Zingiber officinale etc was given two capsules thrice after meals to patients of diabetes for three months and observation were made during regular visits of the patients. Karmin produced marked symptomatic relief and simultaneous correction of blood sugar levels.\textsuperscript{[21]}

Varunadi kwatha was given in 20ml with water before lunch and dinner to patients having urinary complaints. Excellent result was obtained in 64% the patient and 26% showed moderate relief.

Gastrointestinal disorder
A clinical trial of Sunthi was made on 111 patients of grahani. The effect of treatment observed within short period. Regulation of bowel habits, improvement of general health including Anemia and body weight and improvement in gastrointestinal function was noted.\textsuperscript{[22]}

Dental disorder
Toothpaste prepared from Zingeber officinale, Terminalia chebula, Acacia catechu, Piper nigrum, Syzygium aromaticum, Cinnamomum Zylanicum, Camphor etc has been investigated in 50 patients suffering from dental diseases. The paste was reported to be highly effective in controlling dental diseases.

OBSEVATION
As Sunthi is pungent in taste, digestant, appetizer, ant poisonous. It is used for abdominal pain, anorexia, heart diseases, edema, indigestion, arthritis, atonics dyspepsia, bleeding, cancer, chest congestion, chicken pox, cholera, chronic bronchitis, cold extremities, colic, colitis, common cold, cough, cystic fibrosis, diarrhea, difficulty in breathing, dropsy, fever, flatulence, indigestion, disorders of gallbladder, hyperacidity, hypercholesterolemia, hyperglycemia, indigestion, morning sickness, nausea, rheumatism, sore throat, throat ache, stomach ache and vomiting. Ginger form an important constituent of many Ayurvedic formulations.

➢ Also popularly known as Ginger, Sunthi is one of the most widely used herbs in the Ayurveda since time immemorial. Pungent in flavor, Sunthi is known for curing upset stomach and the daily nausea.
Also known as baker’s delight, Sunthi has always been used for making yummy gingerbreads in the Europe, apart from being a core ingredient in many Asian delights.

Mixed with many other herbs, Sunthi is also known to work wonders for children suffering from abdominal discomfort and diarrhea. It originates from Southeast Asia and is grown in countries with warm climatic conditions throughout Asia and Africa.

Sunthi is used in various forms for different kinds of disorders that suppress gastric secretions and help stop nausea and vomiting during upset stomach and pregnancy. It has a number of compounds that work as antipyretic, analgesic and an anti tussive.

Sunthi as an herb has loads and loads of benefits. It not just reduces inflammation but in the end can also treat disorders like arthritis. Digestive ailments can also be cured with the help of the herb as it works wonder for abdominal problems. It breaks down the proteins and hence helps in good digestion. It also cures diarrhea in infants by reducing bacterial growth. Because of its so many healing properties, it is known as “universal herb”.

Also for those who suffer from motion sickness during travel, Sunthi is the best way to enjoy their journey. Unlike the conventional therapy, it does not cause drowsiness and so is completely safe. Its curing properties also keep the intestinal muscles toned.

CONCLUSION

Sunthi is termed as prashastha aushada by observing the references collected from all classical Granthas and its pharmaceutical actions and researches done on diseases it is confirmed and concluded that Sunthi is best drug of choice in Indian kitchen in the form of Spice and best drug in curing diseases in single and in compound form. Also its export in various countries of world it states that sunthi has potential use in foreign countries too.

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