

ZINGIBER OFFICINALE: MAHA-AUSHDHA OF AYURVEDA**Dr. Bhavna Singh*¹ and Professor (Dr.) S.D. Upadhyaya²**

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ABSTRACT

Ginger, (*Zingiber officinale* Roscoe) is one of the important medicinal plants which is being used in Ayurveda from the ancient time. It naturally occurs in various countries like India, China, South East Asia, West Indies, Mexico and other parts of the world. Ginger has different chemical components like Amaldehyde, Gingerol, Shogaol, and Paradol etc. and has various numbers of pharmacological activities and has many beneficial effects on human body and cure various types of diseases. In some laboratory studies it has been shown as an anticancer agent. In *Ayurveda*, it has been referred as *Mahaushadha* meaning a great medicine and also *Vishvabheshaja* i.e. the universal medicine. This review aims at to provide the valuable knowledge related to pharmacological actions, different therapeutical uses and

various formulations related to ginger as described in classics and later works, the different *Nighantus*. Moreover this article also refers the scientific studies conducted on this drug.

KEYWORDS: *Ardaraka, Brihatrayi, Nighantus, Sunthi.*

1. INTRODUCTION

Man's acquaintance with the medicinal properties of plants is of antiquity. India is well known as the 'Emporium of Medicinal Plants'. The use of plants to treat various diseases in India dates back to the times of Rig-Veda (3500 to 1800 B.C.) even being practices more anterior to it as a folk medicine. Later, the monumental Ayurvedic works like Charaksamhita and Sushrutasamhita followed by other Ayurvedic and Siddha treatises have incorporated nearly 700 plant drugs entering into several medicinal preparations used in the management of health care. Until synthetic drugs were developed in nineteenth century, herbs were the

basis for nearly all medicinal therapy. Today, herbs are still found in 40% of prescriptions, and the interest for use of herbal remedies instead of chemical drugs is increasing because of lesser side effects (Craig, 1999). A remarkable increase in the use of medicinal plants products have been observed in the past decade. Due to their health promoting and curative properties, medicinal plants are used as primary health care aid among 80% of the world's population in the form of plant extracts or their active components (World Health Organisation, 2008).

For centuries, Ginger is consumed worldwide as a spice and flavoring agent and is attributed to have many medicinal properties. It has been an important ingredient in Ayurvedic, Chinese, and Tibb-Unani herbal medicines. In traditional Indian and Chinese medicine, ginger has been used to treat a wide range of ailments including stomach aches, diarrhoea, nausea, asthma, respiratory disorders. Ginger has been identified as prostaglandin synthesis suppressor through inhibition of cyclooxygenase-1 and cyclooxygenase-2 and apart from its medicinal properties ginger can also be used as an antioxidant supplement. Studies have shown that, the long term dietary intake of ginger has hypoglycaemic and hypolipidaemic effect¹. (Ahmed and Sharma, 1997)

Ginger commonly known as Ardraka or Shunthi and latin name is *Zingiber officinalis* Roscoe, belongs to family Zingiberaceae. The ginger plant is an erect perennial growing from one to three feet in height. Its rhizomes are 7-15 cm long and 1-1.5 cm broad and laterally compressed. It is cultivated commercially in India, China, South East Asia, West Indies, Mexico and other parts of the world. A numeral of commercial variety of ginger exists. Nigerian Ginger is darker in color, minute size and more pungent taste. Cochin Ginger is habitually larger, well scraped, contains more starch and breaks with a shorter fracture. African Ginger is darker in color, more pungent in taste and less flavor than Jamaica Ginger. *Z. miga* (Japanese ginger) is used as adulterant and can be differentiated from *Z. officinale* having the presence of compound starch grains.

Ginger plant is propagated by rhizome cuttings each bearing a bud. The pieces of rhizome are planted in small dig during March and April in a well- drained clay soil. In December or January rhizomes are unruffled. Ginger requires a warm and humid atmosphere. A well distributed rainfall is required for its cultivation. If the area is getting fewer rainfalls, the crop needs habitual irrigation.

1.1 Phytochemistry

In the fresh ginger rhizome, the gingerols were identified as the major active components. The pungency of ginger is due to gingerols and shogaols. The powdered rhizome contains 3-6% fatty oil, 9% protein, 60-70% carbohydrates, 3-8% crude fiber, about 8% ash, 9-12% water and 2-3% volatile oil. The volatile oil consists of mainly mono and sesquiterpenes; camphene, betaphellandrene, curcumene, cineole, geranylacetate, terphineol, terpenes, borneol, geraniol, limonene, linalool, alpha-zingiberene (30-70%), beta-sesquiphellandrene (15-20%), betabisabolene (10-15%) and alpha-farnesene. In dried ginger powder, shogaol a dehydrated product of gingerol is a predominant pungent constituent up to biosynthesis. It also contains 5-8% acrid resinous substances.^[2]

Nutritional importance of ginger is also very high Fresh ginger contains 80.9% moisture, 2.3% protein, 0.9% fat, 1.2% minerals, 2.4% fibre and 12.3% Carbohydrates. The minerals present in ginger are iron, calcium and phosphorous. It also contains vitamins such as thiamine, riboflavin, niacin and vitamin C.^[3] It also contains polyphenolm compounds ([6]-gingerol and its derivatives), which have a high antioxidant activities.

2. DISCUSSION

2.1 Ginger in Vedic literature

Ardraka is delineated in *Agnivesa Grhyasutra*. *Jaimini Brahmana* quotes the name *Sringabera*. *Suntha or Sunthi* described in the *Guhya Sutras* is considered as a type of grass but not ginger. *Visvabhesaja* term is used for water and rice in *Rigveda* (1/13/20&1/137/3). *Majumdar* is of the opinion that *Adra* described in *Rigveda* may be *Z. officinale*.

2.2 Ginger in Ayurvedic classics

All the *Ayurvedic* text describes Ginger extensively and it is one of the commonly used herbs in *Ayurveda*. In Ayurvedic system of medicine, the fresh and dried rhizomes of Zinger are described as two different drugs. Fresh rhizome is known as *Ardraka* and dried rhizome as *Shunthee*. They have many similarities as well as dissimilarities in their pharmacological properties. *Shunthi* and *Ardraka* both have been extensively quoted by *Brihatrayi* among *dasaimani Mahakashayas* and *Ganas* respectively. *Charak samhita(Ch.)*, *Sushruta Samhita(Su.)*, *Ashtang Sangraha(A.S.)* all of these collectively known as *Brihatrayee*.

Acharya Charak has extensively quoted *Shunthee* about five times among *dashemani* groups such as *Dipaniya Mahakasay*,^[4] *Trptighana Mahakasaya*,^[5] *Arshoghna mahakashaya*,^[6]

Trishnanigrahana mahakasaya,^[7] *Shoolaprasaman mahakasaya*.^[8] Acharya Charaka states it as “*Vishvabhaishjya*”^[9] i.e. medicine for all types of disease. He described its pharmacology in “*Annapanavidhi adhyaya*” and state it is *snigdha guna, madhur vipaki, ushna virya dravya* and it alleviates *vatakapaha dosha*. According to him it is a very good aphrodisiac and cardiac tonic.^[10]

Acharya Sushruta classified it into *Pippalyadi gana*^[11] and *Tryushna gana*.^[12] He described properties of *Nagar* (dry ginger) and *Ardraka* (fresh ginger) separately and state *nagar i.e. sunthi* is *madhur vipaki, vrishya and hridya* while *ardrak* is *katu vipaki*, and *deepan, rochana*.^[13] He indicated it in fever, piles, gastrointestinal disease, respiratory disease and inflammatory conditions. He recommended shunthee powder with jaggery for the treatment of *kamla* (jaundice).

Acharya Vagbhatta described *ardarak* for treating *ajirna* (improper digestion), dyspepsia, *sannipataja jvara*, loss of appetite etc. According to him Shunthee is one of the distinguished medicines in disease of *vata*. It is the best drug for *Amavata* (rheumatic arthritis).^[14]

2.3 Nighantus

Nighantu is the texts of *Ayurvedic* pharmacopoeia of herbal medicine and gives detail accounts of drugs used during medieval time. Properties of *Sunthi* (dry ginger) as well as fresh ginger (*ardraka*) are described in *Nighantus*. The medicinal properties of fresh and dry ginger including its **terminal buds** described in *Kaideva Nighantu*.^[15] *Sunthi* (dry ginger) is indicated especially in *Amavata*.

Acharya Bhavprakash a renowned physician and author of *Bhavaprakash Nighantu*, states that *Sunthi* is beneficial for the rheumatic arthritis (*Amavata*), and similar conditions, vomiting, colic, heart disease, filaria, piles, cough, respiratory disease, and GIT disorders etc. He classified it in the groups as *Trikatu*,^[16] *Panchakola*^[17] and *Shadushana*.^[18] He indicated famous *Ardraka-Lavana yoga* i.e. fresh ginger pieces with salt before meal for the treatment of *aruchi* (dyspepsia) and indigestion.^[19] Acharya Bhavprakash contraindicated fresh ginger to the patient suffering from disease such as skin disease, anemia, dysuria, wound, ulcer, *raktapitta* (bleeding disorder), burning sensation, and it is also prohibited in summer and autumn season as well.^[20]

Though there are no varieties of *Ardraka* in classics, but *Kaideva* has described *Ardra Nagaram* and *Ardrakam (Sunthi)* separately as they are different. In *Amarkosha* dry ginger is denoted as *Nagar* and *Vishvabhesaja* etc. while describing fresh ginger as *Ardraka* and *Shringbera* etc. In *Ayurveda*, dry ginger is more preferable than fresh ginger. Dry ginger has *laghu, snigdha* guna and *madhur vipaka* while *Ardarak* or fresh ginger has *guru, ruksha, tikshna* guna and *katu vipaka*. Due to the difference in properties dry ginger is used as well as an aphrodisiac drug.

2.4 Pharmacological Activities

Ginger being used extensively for more than 2000 years, around the world in foods as a spice and as natural additives. It is used in traditional medicine as carminative, antipyretic, anti colic, and for the treatment of waist pain, rheumatism, cough, corhyza and bronchitis. It is very useful in the treatment of gastrointestinal disorders particularly dyspepsia. The British Herbal Compendium also reported its action as carminative, anti-emetic, spasmolytic, peripheral circulatory stimulant and anti-inflammatory. Today, the pharmacological properties of ginger have been evaluated by many studies in both humans and animals.

In *Ayurveda*, ginger is reported to be useful in treating inflammation and rheumatism. Now its anti-inflammatory action has been proved, it is particularly useful in treating chronic inflammation because it partially inhibits two important enzymes that play a role in inflammation cyclooxygenase (COX) and 5-lipoxygenase (LOX). Anti-inflammatory drugs can cause side effects, such as ulcers. Ginger does not cause stomach irritation; instead it helps protect and heal the gut. Thomson et. al. 2002 examined that ginger administered orally (500 mg/kg) caused significant changes in the serum PGE2 and suggest that ginger could be used as an anti-thrombotic and anti inflammatory agent.^[21] Now it has been proved that a highly purified and standardized ginger extract has statistically significant effect on reducing symptoms of osteoarthritis. This effect was moderate but safe.^[22] Many studies have been revealed that ginger has a strong analgesic effect due to its chemical constituent Gingerol and its derivatives, especially [8]-paradol, have been reported to be more potent anti-platelet and cyclo-oxygenase-1 (COX-1) inhibitors than aspirin.^[23]

Obesity, diabetes, and heart disease are the most common cause of death. Many studies have suggested that increasing consumption of plant foods like ginger decreases the risk of **obesity, diabetes** and **heart disease**. Ginger is having stimulatory action on heart muscle, and stimulated blood circulation throughout the body. Cardio-tonic effect of gingerol has

been observed in guinea pig atrial muscle (Kobayashi M. *et. al.*).^[24] A number of pieces of evidence, mainly from rat studies, have suggested that ginger exerts many direct and indirect effects on blood pressure.^[25] It also has been found that ginger possesses hypoglycaemic, hypocholesterolaemic and hypolipidaemic potential and as well as it is effective in reversing the diabetic proteinuria in the diabetic rats (Al-Amin *et al.*, 2006).

It is also found that ginger extract has a neuroprotective role against monosodium glutamate toxicity effect.^[26] Mustafa T and Srivastava KC, reported that ginger is useful to provide relief from migraine attack, it was administered in the dose of 500-600mg in the powder form at the onset of migraine for 3-4 days at interval of 4 hours.^[27]

In all the Ayurvedic text ginger has been described as a good appetizer. Now, some active components of ginger are reported to stimulate digestion, absorption, relieve constipation and flatulence by increasing muscular activity in the digestive tract.^[28] As well as it is significantly reduces the nausea and vomiting.^[29] In the another study that it has been found a good suppressant of gut- colic and diarrhea (Ghayur and Gilani, 2005).^[30] Some constituents of ginger inhibit the growth of some colon bacteria like *Escherichia coli*, *Proteus* species, *Staphylococci*, *Streptococci* and *Salmonella*. It has been found that out of 29 plant extracts, ginger extract had the broadest range of anti-fungal activity measured either by the fungi inhibition or as the average diameter of the zone of inhibition.^[31]

Ginger also possesses chemopreventive and antineoplastic properties. Numerous preclinical studies have reported that it is effective in ameliorating the side effects of γ -radiation and of doxorubicin and cisplatin; inhibits the efflux of anticancer drugs by P-glycoprotein (P-gp) and possess chemosensitizing effects in certain neoplastic cells *in vitro* and *in vivo*. Ginger extract may bring its antitumor effects on colon cancer cells by suppressing its growth, striking the G0/G1-phase, reducing DNA synthesis and inducing apoptosis (Abdullah *et. al.*).^[32]

The antioxidant properties of [6]-gingerol has been studied both *in-vitro* & *in-vivo*. It is very effective agent for anticipation of ultra violet B (UVB) and a promising therapeutic agent against UV induced skin disorders. It also has a protective role to toxicity and lethality against some agent like carbon-tetra chloride, cisplatin *etc.*^[33] Ginger is also known to possess antioxidant properties.^[34] Shirin Adel P. R. and Jamuna Prakash has been concluded in a study that ginger is a good source of antioxidant and most of the antioxidant components

exhibit higher activities in alcoholic media as determined by different assays. Hence, apart from its medicinal properties, ginger can also be used as an antioxidant supplement.^[35]

CONCLUSION

Careful and critical studies of the classical and modern texts show that *Zingiber officinalis* widely used in Ayurveda since long ago is undoubtedly the very important medicine. The fresh rhizomes is known as to be Ardraka and dried rhizomes as to be Shunthee. Both are same in rasa and virya but differ in vipaka and guna. Ardraka has katu vipaka and ruksha guna while Shunthi has madhur vipaka and snigdha guna. Sunthi is vrishya (aphrodisiac) and has no contraindication. Ginger performs many therapeutic functions and it is recommended by ayurvedic physicians in various diseases. Its various properties are widely used in different disease like Amavata, GIT disorders, respiratory disease, fever, anorexia, dyspepsia, malabsorption, hemorrhoids, chronic fever, anemia, oedema and paralysis etc. Its popular preparations are Saubhagyasunthi, Trikatu churna, Ardrakakhanda-avaleha, Sarasvatarishta, Saubhagya vati, Samsharkara churna, Panchasama churna. Ginger has also been used extensively in folklore medicine to treat common ailments. Now scientific evidences are also available in support of enormous number of pharmacological activities of ginger such as cardio protective, hypoglycemic, hypolipidemic, anti-inflammatory, antiemetic, anti-microbial, antioxidant, anti-proliferative, neuro-protective, hepatoprotective activities. It is a plant of high commercial and economical importance and its use as a bioavailability enhancer can be explored in various formulations. Recently CCRAS has recommended dry ginger powder for the treatment of dengue fever in its guideline on its site. Thus, it can be said that the synonyms for ginger in Ayurvedic text such as Vishva, Vishvaaushadha and Mahaushadh are justified. Scientists at the Department of Complementary and Alternative Medicine, John A. Burns School of Medicine, University of Hawaii call the Ginger a herb that supports normal digestion and circulation, integrating East with West and old with new, prompting its 'universal remedy' reputation. These all virtues have facilitated to protect human beings from several types of diseases and by this way ginger serves as a Mahaushadha for the promotion of mankind.

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