

THERAPEUTIC ASSETS OF GINGER

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Zingiber officinale is a tropical herbaceous perennial that grows from a knotty, tuber-like rhizome (horizontal stem) with thick lobes that vaguely resemble stubby fingers or thumbs and widely branching fibrous roots. The colour of the rhizome varies from buff to dark brown according to the soil and climatic conditions it's grown under.

A leafless flower stalk grows from the root alongside the stem, terminating in a coniferous looking conical spike from which pale green-yellow flowers develop in clusters of 2 or 3 between the bracteal scales. However, these flowering stems rarely develop in cultivated plants. The flowers have an aromatic odour, and the stems when bruised are also mildly fragrant, but ginger essential oil is extracted from the rhizome.

Ginger was exported from India to the Roman Empire 2000 years ago. Ginger became one of the largest ginger producing states, accounting for about 33 per cent of the total production in India. World trade in ginger is estimated at \$190 million per year. India's share in ginger trade is only 6 percent, while China's share is 57 percent. In ginger oil and oleoresin trade India dominates with 50 percent share. Garbled/ungarbled and bleached/unbleached variants occupy predominant position in ginger export.



Ginger is a herb which has been widely used as traditional medicine or spice in many cultures throughout the world. Ginger is referred to as a root, but it is actually an underground stem (called rhizome). The rhizome is branched with small "limbs". It has brown skin that is thin if harvested when young, or becomes thick when harvested at maturity. The color of the flesh varies from pale yellow to white or pink, or even red, depending on the variety.

Aromatic, pungent and spicy, ginger adds a special flavor and zest to Asian stir fries and many fruit and vegetable dishes. Fresh ginger root is available year round. Ginger is the underground rhizome of the ginger plant with a firm, striated texture.

HEALTH BENEFITS

Alzheimer's disease

The ginger's most important antioxidants, curcumin and gingerol, have been shown to inhibit and even reverse the deposition in the brain of the amyloid plaques that are associated with Alzheimer's disease. Zingerone, another of ginger's antioxidants, neutralizes the powerful oxidant, peroxy nitrite,

which has also been implicated as an aggravating factor in Alzheimer's and other neurodegenerative diseases.

Anti-Inflammatory

Cancer is often associated with inflammatory processes and ginger's potent anti-inflammatory activity reduces the risk of inflammation-induced malignancy. Ginger is an effective COX-2 inhibitor, curtailing the activity of potentially damaging COX-2 enzymes, the overproduction of which may cause harm to several tissue types.

Cancer Cell Death

The pungent vanilloids, gingerol and paradol found in ginger, are very effective in killing cancer cells. They achieve this both by direct cytotoxic activity against the tumour and indirectly by inducing apoptosis in the cancer cells. Reducing tumour initiation and growth: The phytochemical zerumbone antagonises the processes of both tumour initiation and promotion. It does this by inducing antioxidant enzymes and by weakening the pro-inflammatory signalling pathways associated with communication between cancer cells.

Prevents DNA Damage

Melatonin is an antioxidant produced by the body that is also found in some plants, such as ginger. It has the valuable property of being able to access most parts of the body, including brain and nervous tissue, and protects DNA against carcinogenic free-radical damage.

Improves absorption

Ginger improves the compression and stimulation of essential nutrients chemistry. It does this by means of stimulating gastric and pancreatic enzyme secretion.

Combats Respiratory Difficulties

Respiratory diseases for instance a cough, ginger aids in increasing your lungs and loosening up phlegm because it is a natural expectorant that breaks down and removes mucus.

Cardiovascular disease and cholesterol

Ginger has been shown to lower dangerously high cholesterol and triglyceride levels, while raising the levels of beneficial HDL. These lipid-modulating effects are partly due to the inhibition of fat absorption from the intestines. In addition, ginger's cardio protective effects are enhanced by its ability to reduce platelet stickiness and in so doing further reduce the risk of heart attacks and thrombotic strokes.

Anti -Inflammatory Properties

Ginger has a long-valued role in treatment for arthritis and other inflammatory mechanisms. It is a strong inhibitor of COX-2 enzymes, pro-inflammatory cytokines and prostaglandins that are important components of the inflammatory response. Abnormal tissue inflammation occurs when an excess of prostaglandins, cytokines and COX-2 enzymes are released by cells in joint tissue. The more of these molecules that are released, the more inflammatory cells and chemicals are attracted to the joints where they cause pain and damage to the joint surfaces.

Antimicrobial Effects

Ginger has traditionally been used as a treatment for stomach ailments, and kills all nineteen pathogenic *Helicobacter pylori* species. The regular ingestion of ginger should help to kill these dangerous bacteria before they become established, and thereby pre-empt the need for antibiotics which destroy many valuable intestinal bacteria, in addition to their intended targets.

Obesity

Ginger has a dual anti-obesity effect. The phytochemicals gingerol and shogaol increase the metabolic rate and thus help to "burn off" excessive fat and also suppress the absorption of calorie-dense dietary fats from the intestines.

Antioxidant effects

Ginger is a source of a large number of important antioxidants, reduces lipid oxidation by enhancing the activities of crucial internally produced antioxidants. Melatonin, in particular, is not only a highly effective free-radical scavenger itself, but also stimulates production of the main antioxidant enzyme of the brain, glutathione peroxidase.

Ginger oil

Ginger oil can vary in color from pale yellow to a darker amber color and the viscosity also ranges from medium to watery. It is strong smelling oil - spicy, sharp, warm and with a hint of lemon and pepper, which smells of actual ginger. Ginger oil is well suited to help ease colds flu, nausea, motion sickness, morning sickness, muscle aches and pains, as well as poor circulation and arthritic pain. Its

warming qualities are good to use for feelings of loneliness and winter depression, and its energizing properties make it a good aphrodisiac.

Burners and vaporizers - In vapor therapy, it can be used to help relieve catarrh, lethargy, nausea, colds, flu, and feeling of loneliness and loss of libido.

Blended oil or in the bath - In blended massage oil or diluted in the bath, it can be used for arthritis, rheumatism, lethargy, nausea, colds and flu, muscle aches, poor circulation and digestive upsets.

Blended in base cream - As a part of a cream or lotion it can be used for arthritis, muscle aches, rheumatism, and also to help with poor circulation and to disperse bruises.

Hot compress -When used with hot compresses, ginger oil can be used for arthritis, rheumatism, muscle aches and digestive upsets.

Ginger oil fusions- Ginger oil is strong smelling, it can overpower weaker oils, but blends well with all citrus and spicy oils such as bergamot, frankincense, neroli, rose, sandalwood and ylang-ylang.

In Ayurvedic tradition, ginger is highly regarded as having many diverse healing properties, and is used prominently in treating ailments of the digestive tract. It is also appreciated for its value as a stimulant, enhancing the flow of saliva, making it a beneficial treatment of maladies of the throat, such as laryngitis and sore throat.

Dried ginger/Sukku

Dried ginger is a modified form of fresh ginger which undergoes a drying process before being used. The fresh rhizomes are soaked in water overnight after which the outer peel is carefully removed using a knife or a peeler. They are washed again and then sun dried. During this period, they are turned periodically. The end result is a pale white dried ginger. Dried ginger is then powdered in a mixer to obtain dried ginger powder. It's a fine off whitish powder which has a strong aroma and slightly pungent flavour.

Nutritional Properties and Health Benefits of Dry Ginger



The medicinal value of dry ginger has been well documented for its anti-inflammatory, anti-flatulent, anti-emetic and anti-microbial properties. Low in cholesterol and sodium, dried ginger is a good source of Dietary Fibre, Vitamin B₆, Iron, Magnesium, Potassium, Vitamin E and Manganese.

- The root contains essential oils such as gingerol, zingerone and shogaol. Gingerol portrays anti-inflammatory, analgesic, anti-emetic, anti-pyretic as well as anti-bacterial properties. It also aids in the production of gastric juices in the stomach.
- Zingerone, which is responsible for the pungent flavour, has been found to be effective against the bacteria E.Coli which causes diarrhoea especially in small children.
- Dry ginger is a potent anti-emetic and is effective in relieving nausea and vomiting during pregnancy, or for motion sickness. It is also known to decrease nausea caused by radiation and chemotherapy.

In Ayurveda it is believed to enhance the healing properties of other herbs. Being hot and pungent by nature, it is said to combat excess of **vata**, (which govern all the activities of the mind and body), in the gastrointestinal tract and regulate digestive functions. It is also used in various combinations to combat various health disorders including digestive, gastrointestinal and respiratory. It's warm and stimulating properties help stimulate circulation and enhance the absorption of nutrients by encouraging the secretion of digestive enzymes.

Preparation and Processing

Ginger is used in numerous forms, including fresh, dried, pickled, preserved, crystallized, candied, and powdered or ground. The flavor is slightly sweet, with a strong and spicy aroma. Ginger is commonly pickled in sweet vinegar, which turns it a pink color; this form is popular with sushi. Ginger harvested at 8-9 months has a tough skin that must be removed before eating, and the root is more pungent and is used dried or pulverized into ground ginger. Candied or crystallized ginger is cooked in sugar syrup and coated with granulated sugar. Ginger harvested at 5 months is not yet mature and has a very thin skin, and the rhizomes are tender with a mild flavor and are best used in fresh or preserved forms.

Culinary Benefits of Ginger Root

Fresh Ginger root has few calories (80 calories per 100 g) and contains no cholesterol. Ginger is a rich source of B group vitamins such as pyridoxine (vitamin B6; 12% of daily allowance), pantothenic acid (vitamin B5; 4% of daily allowance). It also has moderate levels of dietary fiber (2 g per 100 g). One hundred grams of ginger also contains moderate amount of minerals like potassium (9% of daily allowance), manganese (10% of daily allowance), magnesium (11% of daily allowance), iron and copper. Potassium is an important in maintaining cell and body fluids. It helps control heart rate and blood pressure in association with sodium.

Nutritional value of Fresh Ginger Root

Serving 100g fresh ginger root	Nutrient Value	Percent of recommended daily allowance
Energy	80 Cal	4%
Carbohydrates	17.77 g	14%
Protein	1.82 g	3%
Total Fat	0.75 g	3%
Cholesterol	0 mg	0%
Dietary Fiber	2.0 g	5%
Vitamins		
Folates	11 mcg	3%
Niacin	0.750mg	4%
Pantothenic acid	0.2 mg	4%
Pyridoxine	0.16 mg	12%
Vitamin A	0 IU	0%
Vitamin C	5 mg	8%
Vitamin E	0.26 mg	2%
Vitamin K	0.1 mcg	0%
Vitamin B6	0.1 mg	1%
Electrolytes		
Sodium	13 mg	1%
Potassium	415 mg	9%
Minerals		
Calcium	16 mg	2%
Copper	0.1 mg	
Iron	0.60 mg	7%
Magnesium	43 mg	11%
Manganese	0.23 mg	10%
Phosphorus	34 mg	5%
Zinc	0.34 mg	3%
Potassium	84 mg	4%

High fiber content of ground ginger

High fiber foods like ground ginger may reduce your risk of cardiovascular disease, diabetes and obesity. Eating high fiber foods like ground ginger normalizes bowel movements and helps maintain bowel integrity and health. Because of its fibers, ground ginger is useful for controlling blood sugar levels and it lowers blood cholesterol levels.

Calories		335 kcal.	
Fat		4.24 g.	
Cholesterol		0 mg.	
Sodium		27 mg.	
Carbohydrates		71.62 g.	
Fiber		14.1 g.	
Sugar		3.39 g.	
Protein		8.98 g.	
Vitamin A	0 µg.	Vitamin C	0.7 mg.
Vitamin B12	0 µg.	Calcium	114 mg.
Iron	19.8 mg.	Vitamin B3	9.62 mg.

Forms of Ginger



There are two forms of ginger: extract and tea. Extracts may be purchased, but be aware that there are two forms of extract, water and alcohol based. With many herbs, water based extracts are fine. However, alcohol based ginger extract has proven to be far superior over and over.

Consumption Guidelines

Use a teaspoon to scrape off the ginger skin. When adding ginger in cooking, add at the beginning of cooking for a milder taste, or near the end for a much more pungent taste. Add a little (about 1 tsp) fresh ginger juice in vegetable or fruit juices whenever possible. Start with a little and gradually increase the amount according to your taste.

Chukkukappi

Dried ginger -Chukkukappi is a traditional South Indian beverage which is very spicy and sweet. It has a rich aroma that even opens nasal blocks that are caused due to cold and give relief to throat infections very good remedy for slight cold or fever.

Safety

Ginger is very safe for a broad range of complaints, whether it is taken in a concentrated capsule form, eaten fresh or sipped as a tea or ginger ale. Ginger contains moderate amounts of oxalate. Individuals with a history of oxalate-containing kidney stones should avoid over consuming ginger. Ginger Oil is slightly phototoxic. Do not use if the area of application will be exposed to sunlight for 24 hours due to its photo toxicity.

The Future of India's Ginger Export

Dried ginger conforming to the requirements of the buying countries will have demand in the world market. Conformity to the quality requirements of the buying countries and price competitiveness are the key factors. Improved productivity and quality will enhance the farmers' income and increase the country's foreign exchange earnings much needed for our prosperity and Progress.