

Ginger_Facts And Health Benefits

Dr Neeta Shivakumar*, Archana. S. Kinagi

Department Of Biotechnology, RV College Of Engineering, Mysore Road,Bangalore

ABSTRACT

Ginger is the rhizome of the plant *Zingiber officinale*, consumed whole as a delicacy, medicine or spice. The health benefits of ginger consumption have been known for centuries. Ginger forms an important constituent of many pharmacopoeial ayurvedic formulations. Ginger is carminative, pungent, stimulant used widely for indigestion, stomach ache, diarrhea and nausea. It is a folk remedy for congestion, cough and cold. Chinese medicine involves the oral and intra-gastric application of fresh ginger decoction to produce a stimulant action on gastric secretion. Pharmacology and clinical studies have demonstrated anti-emetic, anti-ulcer, anti-platelet, anti-inflammatory, and antioxidant properties of ginger. Researchers around the world are finding out that ginger works wonders in the treatment of everything from cancer to migranes.

Introduction

Ginger is the rhizome of the plant *Zingiber officinale*, consumed whole as a delicacy, medicine, or spice. It lends its name to its genus and family Zingiberaceae. The health benefits of ginger consumption have been known for centuries and it is said to be the most cultivated spice in the world today, both for cooking and healing purposes.

The ginger plant is an erect perennial growing from one to three feet in height. The stem is surrounded by the sheathing bases of the two-ranked leaves (Kannan, K. and Nair, K.P.V, 1995). A club-like spike of yellowish, purple-lipped flowers have showy greenish yellow bracts beneath. Unfortunately, ginger rarely flowers in cultivation.

Colour & Appearance

Yellowish Brown or light brown. Scraped rhizome with buff external surface showing longitudinal striations and occasional loose fibers, outer surface dark brown (Hoque et al., 1997) and more or less covered with cork which shows conspicuous, narrow, longitudinal and transverse ridges.

Nutrient composition of ginger includes 80% moisture, 2.3% protein, 0.9% fat, 1.2% minerals, 2.4% fiber 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. The composition varies with the type variety, agronomic conditions, curing methods, drying and storage conditions. The rhizome, which is valued for its flavor, contains two constituents such as the essential oils and oleoresins (Guruprasad, V.S., 1982)

Home Remedies using Ginger

For over 2 thousand years Chinese medicine has recommended the use of ginger to help cure and prevent several health problems.

Ginger has many uses in the home remedies department and can be used to help arthritis, diarrhea, flu, headache, heart and menstrual problems, diabetes, stomach upset and motion sickness (O, Hara, M., et al., 1998)

Muscle Strains - Apply warm ginger paste with turmeric to the affected area twice a day.

Sore Throat - Boil some water and add a dash of cinnamon, a little piece of ginger, 1 tsp honey and drink.

For a persistent cough - Take a half teaspoonful of ginger powder, a pinch of clove with a pinch of cinnamon powder and honey in a cup of boiled water and drink it as tea.

Ashma - A teaspoon of fresh ginger juice mixed with a cup of fenugreek decoction and honey to taste acts as an excellent expectorant in the treatment of asthma.

Headaches - Dilute a paste of ginger powder, about 1/2 a teaspoon, with water and apply to your forehead.

Colds - Boil a teaspoonful of ginger powder in one quart of water and inhale the steam - helps alleviate colds.

Ginger Compress - This method stimulates blood and body fluid circulation, helps loosen and dissolve toxic matter eg. cysts, tumors (Schauenberg P & Paris, 1977). Place about a handful of coarsely grated ginger in a cloth and squeeze out the ginger juice into a pot containing 4 liters of hot water (do not boil the water). Dip a towel into the ginger water and wring it out. Apply very hot to the affected area.

Diabetes - Some doctors recommend some drinking ginger in water first thing in the morning to help regulate your glucose level.

Ginger Tea - Make with fresh ginger root. Grate a small piece of ginger, about the size of a nickel, into a mug. Add the juice of a half a lemon. Fill the mug with boiling water. Stir in a teaspoon of organic honey.

For relief of nausea - Ginger is generally taken in doses of 200 mg every 4 hours.

For relief of flatulence - Ginger is generally taken in doses of 250 to 500 mg 2 to 3 times a day.

Ginger Used in Ayurveda

Ayurveda is a unique holistic system of healing based on the interaction of body, mind and spirit. It is thought to be the oldest health care system in the world with its roots going back over 5000 years into the Vedic Age. It evolved on the far reaches of the Himalayas from the deep wisdom of spiritually enlightened prophets or Rishis. Their wisdom was transmitted orally from teacher to disciple and eventually set down in Sanskrit poetry known as the Vedas. These writings, dating approximately 1500 BC distilled the prevailing historical, religious, philosophical and medical knowledge and form the basis of Indian culture. The most important of these texts are the Rig Veda and the Atharva Veda.

Dry ginger controls and balances all three doshas, although in excess it may increase Pitta. Fresh ginger can increase Pitta and is forbidden in conditions when Pitta is high, such as heavy bleeding, inflammation, and fever. Ginger stimulates the appetite, intensifies agni (digestive fire), relieves bloating and abdominal distention due to gas, helps with hemorrhoids, prevents menstrual cramps, and supports heart health. Dry ginger is hotter and drier than fresh and is better as stimulant and mucus discharger for educing Kapha and increasing digestion. Fresh ginger is a better perspiration promoter for colds, cough, vomiting and for Vata imbalance.

Ayurvedic Recipes of Ginger

There is a saying in Kerala, 'Chukkillatha kashayamilla' (there is no concoction without 'chukku' or dry ginger). In almost all Ayurveda medicines, 'chukku' is a common ingredient (Kannan, K. and Nair, K.P.V, 1992). because of its carminative and digestive properties. According to Ayurveda, indigestion in all levels of metabolism (Farnsworth, N.R, *et al*, 1992). is the root cause of all diseases. So a daily intake of such an ingredient is good enough to keep sickness away.

The characteristics of 'chukku' (dried ginger), which is used in almost all medicinal preparations especially in decoctions are listed below (Indian Medicinal Plants, 1997).

- a) Decoction of 'mahabala' root and 'chukku' checks malarial fever with rigor and burning sensation in two or three days (Ref: Bhavaprakasam)
- b) Decoction of 'chukku,' added with honey, alleviates loss of appetite, dyspepsia and cough (Ref: Bhavaprakasam)

- c) One should take water processed with `vacha,' `athivisha,' `mustha,' `parpata,' `hribera' and `chukku' for improving appetite and digestion (Ref: Charakam)
- d) In case of toxicity, indigestion, piles and constipation one should use regularly `chukku,' `pippali,' `harithaki' or `dadima' (Ref: Vrinda Madhavam).
- e) Decoction of `chukku' stimulates digestive fire quickly and there is no need of other drugs for this purpose (Ref: Vrinda Madhavam).
- f) Water processed with `kantakari,' `chukku' or `dhanyaka' should be given as post meal drink. It acts as carminative and laxative (Ref: Charakam).
- g) Taking a decoction of `chukku' and `eranda' root added with `hingu' and `souvarchala' gives relief from pain instantaneously.
- h) Hot decoction of `chukku' promotes digestion, alleviates cough, asthma, colic and heart diseases.
- i) Boiled and cooled water processed with `bala' or `prisniparni' or `kautakari' combined with `chukku' should be drunk in all cases of alcoholism (Ref: Charakam).

Ginger Used in Chinese Medicine

Chinese herbs have been used for centuries. Among the earliest literature are lists of prescriptions for specific ailments, exemplified by the manuscript "Recipes for 52 Ailments", found in the [Mawangdui](#) tombs which were sealed in 168 BC. There are roughly 13,000 medicinals used in China and over 100,000 medicinal recipes recorded in the ancient literature. Each herbal medicine prescription is a cocktail of many substances, usually tailored to the individual patient.

[Ginger](#) is a herb and a spice that is used in Chinese cuisine(Chang, H.M *et al*,1987). There are four main kinds of preparations in Chinese herbology: fresh ginger, dried ginger, roasted ginger, and ginger charcoal, all made of the rhizomes. The popular formulations of ginger in the Chinese medicine system are the Sheng Jiang and the Gan Jiang. Sheng Jiang is the fresh ginger rhizome which is used in the treatment of cold, warming the body, cough, nausea, toxicity etc. Gan Jiang is the dried ginger rhizome which is used for warming and unblocking body channels, spleen and stomach.

Ongoing Research

Ginger has been used as a natural remedy for many ailments for centuries. Now, science is catching up and researchers around the world are finding that ginger works wonders in the treatment of everything from cancer to migraines.

Anti-Inflammatory Effects

Ginger contains very potent anti-inflammatory compounds called *gingerols* (Sharma, J.N, *et al*, 1984) These substances are believed to explain why so many people with osteoarthritis or rheumatoid arthritis experience reductions in their pain levels and improvements in their mobility when they consume ginger regularly. In two clinical studies involving patients who responded to conventional drugs and those who didn't, physicians found that 75% of arthritis patients and 100% of patients with muscular discomfort experienced relief of pain and/or swelling.

Protection against Colorectal Cancer

Gingerols, the main active components in ginger and the ones responsible for its distinctive flavor, may also inhibit the growth of human colorectal cancer cells, suggests research presented at the Frontiers in Cancer Prevention Research, a major meeting of cancer experts that took place in Phoenix, AZ, October 26-30, 2003. In this study, researchers from the University of Minnesota's Hormel Institute fed mice specially bred to lack an immune system a half milligram of (6)-gingerol three times a week before and after injecting human colorectal cancer cells into their flanks. Control mice received no (6)-gingerol. Tumors first appeared 15 days after the mice were injected, but only 4 tumors were found in the group of -gingerol-treated mice compared to 13 in the control mice, plus the tumors in the -gingerol group were smaller on average. Even by day 38, one mouse in the (6)-gingerol group still had no measurable tumors.

Ginger Induces Cell Death in Ovarian Cancer Cells

Lab experiments presented at the 97th Annual Meeting of the American Association for Cancer, by Dr Rebecca Lui and her colleagues from the University of Michigan, showed that gingerols, the active phytonutrients in ginger, kill ovarian cancer cells by inducing apoptosis (programmed cell death) and autophagocytosis (self-digestion). Conventional chemotherapeutic agents also suppress these inflammatory markers, but may cause cancer cells to become resistant to the action of the drugs. Liu and her colleagues believe that ginger may be of special benefit for ovarian cancer patients because cancer cells exposed to ginger do not become resistant to its cancer-destroying effects.

Anti-emetic Activity:

Early animal studies had demonstrated the anti-emetic property of fresh ginger (Mowrey, D.B, *et al*), but it was the clinical work of Mowrey and Clayson which generated a wider interest in this use of ginger. They compared the effects of 1.88g of dried powdered ginger, 100mg dimenhydrinate (Dramamine) and placebo on the symptoms of motion sickness in 36 healthy subjects who reported very high susceptibility to motion sickness. Motion sickness was induced by placing the blind folded subject in a tilted rotating chair (Qian, D.S, *et al*, 1992). Ginger was found to be superior to dimenhydrinate and placebo in preventing the gastrointestinal symptoms of motion sickness and the authors postulated a local effect in the gastrointestinal tract for ginger. This was particularly likely since it was given as a powder only 25 minutes before the test. The gingerols and shogaols were subsequently identified as the main anti-emetic compounds in ginger.

Antiplatelet Activity:

Srivastava and co-workers found that aqueous extract of ginger inhibited platelet aggregation induced by ADP, epinephrine, collagen and arachidonic acid in vitro (Srivastava, K.C., 1984). Ginger acted by inhibiting thromboxane synthesis¹²⁻¹³. It also inhibited prostacyclin synthesis in rat aorta. The antiplatelet action of 6-gingerol was also mainly due to the inhibition of thromboxane formation.

Conclusion

Ginger is a promising plant material with numerous biological properties. Ginger rhizome, which is valued for its flavor, is the most cultivated spice in the world today. Oleoresin found in ginger is an active ingredient. Ginger, which has great importance as a medicine, occupies a vital position in Ayurveda and ancient Chinese medicine systems. Ginger can be easily processed and used in many recipes as home-made medicine for treating cough, cold, nausea, vomiting, etc. It was also frequently employed to disguise the taste of medicines. Ginger is on the FDA's "generally recognized as safe" list, though it does interact with some medications. Pharmacological and clinical studies have demonstrated the anti-emetic, anti-ulcer, anti-inflammatory, antioxidant, etc. properties of ginger. Now science is catching up and researchers around the world are finding that ginger works wonders in the treatment of various types of cancers and other fatal life-threatening diseases.

References

1. Guruprasad, V.S., "Ginger Chemistry, technology and Quality Evaluation (part 1). Crit Rev Food Sci Nutr 17:1, [1982].
2. Kannan, K. and Nair, K.P.V., 'Zingiber officinale in Kerala', Madras Agricultural
3. Hosoki, T. and Sagawa, Y., 'Clonal Propagation of Ginger (Zingiber officinale Rosc) through tissue culture', Hort. Sci, 12, [1977], pp 451-452.
4. Hoque, M.I., Perveen, S. and Sarkar, H.R., 'In vitro Propagation of Ginger (Zingiber officinale Rosc)', Plant Tissue Cult. 9, [1977], pp 45-51
5. Bhat, S.R., Chandel, K.P.S. and Kacka, A., 'In Vitro Propagation of Rhizomes in ginger Zingiber officinale Rosc', Indian J. Exp Biol. 32, [1994], pp 523-536.
6. O'Hara, M., Keifer, D., Farrel, K. and Kemper, K., 'A Review of 12 commonly used medicinal herbs', Archives. Fam. Med. (7), [1998], pp 523-536
7. Schauenberg P & Paris F, *Guide to Medicinal Plants*, Keats Publishing, New Canaan CT, 1977

8. Indian Medicinal Plants, A Compendium of 500 species, Part V, by Orient Longman Publications, 1997, p. 431.
9. *British Herbal Pharmacopoeia*, B.H.M.A., 1983, 239-240
10. Chang, H.M *et al*, "Pharmacology and Applications of Chinese Materia Medica." *World Scientific*, Singapore, 1987
11. Mowrey, D.B, *et al*, "Motion Sickness, Ginger, and Psychophysics" *Lancet*, 1982, 1(8273); 655-657
12. Yamahara, J, *et al*, "Cholagogic Effect of Ginger and its Active Constituents", *Journal of Ethnopharmacology*, 1985, 13(2); 217-225
13. Srivastava, K.C, "Effects of Aqueous Extracts of Onion, Garlic and Ginger on Platelet Aggregation and Metabolism of Arachidonic Acid in the Blood Vascular System; In vitro Study", *Prostaglandins Leukotrienes and Medicine*, 1984, 13(2); 227-235
14. Farnsworth, N.R, *et al*, Bunyaphrathasara, N, eds *Thai Medicinal Plants. Medicinal Plant Information Centre*, Bangkok, 1992.
15. Sharma, J.N, *et al*, "Suppressive Effects of Eugenol and Ginger Oil on Arthritic Rats", *Pharmacology*, 1984, 49(5), 314-318.
16. Qian, D.S, *et al*, "Pharmacologic Studies of Antimotion Sickness Actions of Ginger", *Chung-kuochung hsii chieh ho tsa chih*, 1992, 12(2); 70, 95-98