



THE REVIEW ON STUDY OF GINGER

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Abstract- The subterranean stems or rhizomes of *Zingiber officinale*, a tropical perennial herb in the family Zingiberaceae, are used to make spice ginger. The chemical composition of the ginger plant before discussing cultivation, variety, and output. We go into detail on the various ginger rhizome products, including fresh ginger, preserved ginger, dry ginger, ginger powder, ginger oil, ginger oleoresin, and ginger paste. Before the chapter is finished, a look at quality requirements, organic ginger, and some biotechnology studies are taken. The primary applications and functional qualities of ginger are then described, including culinary and medicinal (both traditional and modern) purposes.

❖ INTRODUCTION:-

For thousands of years, ginger—also known as the "Root" or Rhizome—of the plant *Zingiber officinale* has been used as a spice and herbal remedy. Its use in Asian, Indian, and Arabic herbal traditions dates back a long time. For more than 2,000 years, ginger has been used in China, for instance, to alleviate nausea, diarrhoea, and stomach discomfort as well as to aid with digestion.

Ginger is a native of Asia and has been used there as a seasoning for food for at least 4,400 years. It has been used to alleviate the symptoms of the common cold, the flu, headaches, and painful menstrual cycles.

A thick, twisted, beige underground stem is ginger. The stem rises about 12 inches above the ground, bearing white or yellowish-green blooms and long, narrow, ribbed, green leaves.

Additionally, ginger has been used to treat cardiac ailments, arthritis, colic, and diarrhoea.



In India, ginger is sold in its whole in raw or dried form, and to the same amount, it is utilised to extract oil and oleoresin. On a modest scale, ginger

can be appropriately dehydrated in growing centres in rural Mizoram, Meghalaya, Nagaland, and Pradesh, Arunachal. Mizoram ginger, on the other hand, has less fibre and is more popular in the market. The *Zingiber officinalis* plant's underground branches or rhizomes are used to make dry ginger. It also goes by the name unbleached ginger. This is standard procedure. However, mechanical dehydration boosts output while improving quality and hygienic conditions. This product is adaptable and can be manufactured across the nation. The outer skin is often peeled off and dried in the sun for approximately a week to prepare it.

❖ **Forms of ginger:-**

shapes of ginger Three distinct types of ginger are typically available: -

- Green, fresh ginger root

- Ginger preserved in brine or syrup
- Ginger spice, dried.

Despite the fact that fresh roots can be shipped abroad, fresh ginger is typically only consumed in the region where it is grown. Rhizomes can be eaten as a fresh vegetable at any stage of development. Only immature rhizomes are used to produce preserved ginger. bottled ginger. Exports are where most preserved ginger goes. Hong Kong, The two countries that produce the most preserved ginger worldwide are China and Australia. Making preserved ginger is difficult because it demands careful attention to detail. Ginger stems should only be utilised when they are the youngest and most sensitive. The well-established Chinese and Australian manufacturers make it challenging to compete, thus processors are discouraged from producing this item. The mature rhiz is what is used to make dried ginger spice. ome of dried ginger. The flavour and perfume of the rhizome get considerably greater as it gets older. Large bits of dried ginger are frequently shipped and processed into spices in the final destination. Ginger that has been dried may be pulverised and used both as a spice and to make ginger oil and ginger oleoresin. In order to make dried ginger, there are crucial pre- and post-harvest procedures that need be followed. the growing of ginger the growing of ginger Although ginger is a perennial plant, it is typically

planted as an annual for spice harvesting. It needs a warm, humid environment with 150–300 cm of annual precipitation or extensive irrigation. From virtually sea level to an elevation of 1500 metres above sea level, the plant may be grown.. It does well on sandy or clay loam soil with plenty of humus and adequate drainage. Ginger may be integrated as an intercrop in coconut, coffee, and orange plantations and does best in partial shade. During the monsoon rains in April and May, planting is done. When the tops have died back, ginger is harvested by pulling out the rhizomes. In different nations, dried ginger is harvested and processed in different ways.

❖ **CHEMICAL CONSTITUENTS :-**

Phenols	Volatile oils	
	Sesquiterpenes	Others
Gingerols and shogaols	bisabolene, zingiberene, zingiberol, sesquiphellandrene, curcurnene	6-dehydrogingerdione, galanolactone, gingesulfonic acid, zingerone, geraniol, neral, monoacyldigalactosylglycerols, gingerglycolipids

Depending on the variety, region, and climatic circumstances, ginger contains, on a dry matter basis, around 50% carbohydrates, 9% protein and free amino acids, 6-8% fatty acids and triglycerides, 3-6% ash, and 3-6% crude fibre (Leung, 1984, Tang, 1992). Some African ginger types provide 5.98 and 3.72 grammes of protein and fat per 100 grammes. Ginger contains both soluble and insoluble fibres. Potassium, magnesium, copper, manganese, and silicon are important micronutrients that are found in ginger in good amounts. Manganese and potassium support the development of disease resistance and guard the lining of the heart, blood vessels, and urinary tract. Silicon aids in the absorption of calcium and supports healthy skin, hair, teeth, and nails. The ginger rhizome also contains trace levels of the vitamins A and E, as well as certain B-vitamins and Vitamin C.

❖ **USES OF GINGER:-**

Since very early times, ginger has been utilised for a variety of reasons. It has been used as medication for a long time. It has long been used as a home cure as well as a common cooking herb, condiment,

and spice. The ginger root can be used medicinally to relieve nausea brought on by motion sickness or other types of sickness. Additionally, ginger extract has long been utilised to reduce inflammation in conventional medical procedures. Today, Ginger is frequently used by herbalists to treat conditions including arthritis, pneumonia, and ulcerative colitis that are characterised by inflammation. To sum up, ginger oil is used to treat a variety of conditions including bruises, carbuncles, nausea, hangovers, travel sickness, seasickness, colds and flu, catarrh, congestion, coughs, sinusitis, sores on the skin, sore throats, diarrhoea, colic, cramps, chills, and fever. In addition, ginger oil is used in cooking, as a flavouring for cakes, cookies, and other baked goods, and it also serves as the primary flavouring in ginger ale, a sweet, fizzy non-alcoholic beverage. Chemicals in ginger may help with nausea relief and inflammation reduction. The molecules are thought to largely control nausea in the stomach and intestines, but they may also do so in the neurological system and brain.. Ginger is used as a flavouring in both food and drink. Ginger is used in manufacturing as a scent in soaps and cosmetics. One of the compounds found in ginger is also a component of antacid, laxative, and anti-gas drugs. Spice is made from ginger.

- Green Ginger is a common ingredient in culinary recipes.
- It is employed in the creation of Ginger oil and oleoresin, the production of soft drinks and alcoholic beverages, the production of processed foods, and the preservation of ginger.
- Use of ginger for motion sickness. Some research, although not all, indicate that ginger may be more effective than a placebo in easing some motion sickness symptoms. In a study involving 80 novice sailors who were prone to motion sickness, those who took ginger powder had less nausea and had fewer cold sweats than those who took a placebo. However, ginger did not make them feel less queasy. A research involving healthy participants came to the same conclusion.

➤ **Pregnancy nausea and vomiting:-**

Short-term usage of 1g of ginger daily, according to human research, may help pregnant women who are experiencing nausea and vomiting (no longer than 4

days). According to several studies, ginger relieves morning sickness more effectively than a placebo.

Thirty pregnant women with severe vomiting participated in a tiny trial, and those who took 1 gramme of ginger daily for four days experienced less nausea and vomiting than those who took a placebo. In a bigger research with 70 pregnant women who had nausea and vomiting, those who received a same quantity of ginger reported feeling less queasy and vomited less frequently than those who received a placebo. Before eating ginger, pregnant women should consult their doctors and should not take more than 1g each day.

➤ **Osteoarthritis :-**

For generations, ginger has been used in traditional medicine to lessen inflammation. And there is some proof that ginger may lessen osteoarthritis pain.

➤ **Other Uses :-**

According to preliminary research, ginger may help decrease cholesterol and prevent blood clots. That can aid in the treatment of heart disease, a condition in which blood arteries might clog, resulting in a heart attack or stroke. According to other research, ginger may assist type 2 diabetics better regulate their blood sugar. If ginger is safe and beneficial for treating diabetes and heart disease, more study is required.

❖ **PRECAUTIONS WHILE TAKE :-**

• **PEDIATRIC (Childrens) :-**

- NEVER feed ginger to a youngster under the age of two.
- Children older than two years old can consume ginger to relieve headaches, nausea, and stomach cramps. Find the proper dose by consulting your doctor.

• **Adult :-**

- Generally speaking, DO NOT consume more than 4 g of ginger day, from all sources. Women who are pregnant shouldn't consume more than 1 g each day.
- For nausea, gas, or indigestion: Some studies have used 1 g of ginger daily, in divided

doses. Ask your doctor to help you find the right dose for you.

- One trial utilised 250 mg, four times per day, for arthritic pain.
- Some studies have utilised 650 mg to 1 g of antacids per day for vomiting brought on by pregnancy. NEVER take ginger without first consulting your doctor.
- A tried-and-true method for boosting the body and healing sickness is the usage of herbs. Herbs, however, might cause adverse reactions and combine with other drugs, vitamins, and herbal products. Due to these factors, using herbs should be done so under the guidance of a medical professional who has training in botanical medicine..
- It is rare to have side effects from ginger. In high doses it may cause mild heartburn, diarrhea, and irritation of the mouth. You may be able to avoid some of the mild stomach side effects, such as belching, heartburn, or stomach upset, by taking ginger supplements in capsules or taking ginger with meals.
- Before consuming ginger, those who have gallstones should see their physicians. Before undergoing surgery or being put under anaesthesia, be careful to inform your doctor if you're taking ginger. Pregnant or breastfeeding women, people with heart conditions, and people with diabetes should not take ginger without talking to their doctors.
- If you have a bleeding issue or are using any blood-thinning drugs, such as aspirin, DO NOT take ginger.

❖ INTERACTIONS OF GINGER:-

Both prescription and over-the-counter medications and ginger may interact. You shouldn't use ginger if you take any of the following medications without first seeing your doctor.

▪ **Blood-thinning medications:-**

Ginger may make bleeding more likely. If you use blood thinners such aspirin, warfarin (Coumadin), or clopidogrel (Plavix), consult your doctor before eating ginger.

▪ **Diabetes medications:-**

Blood sugar may be lowered with ginger. That might increase the chance of hypoglycemia, or low blood sugar.

▪ **High blood pressure Medication :-**

The blood pressure-lowering effects of ginger may increase the risk of low blood pressure or irregular heartbeat.

❖ **PROPERTIES OF GINGER:-**

• **.Antibacterial:-**

Both gram-positive and gram-negative bacteria, such as Clostridium, Listeria, and Enterococcus, are resistant to the antibacterial effects of ginger extracts. Fresh ginger oil was inactive against Bacillus subtilis, whereas dry ginger oil was more active against Pseudomonas aeruginosa and weaker against Bacillus subtilis.

• **Antioxidant:-**

Ginger protects catalase, a vital antioxidant needed to convert potentially toxic hydrogen peroxide in cells to glutathione peroxidase, while sparing SOD (superoxide dismutase). SOD also reacts with hydrogen peroxide and supports the preservation of cell membrane integrity. Antioxidant capabilities are included in ginger's active ingredients. Zingerone is a strong free radical scavenger due to its chemical makeup. The molecule's hydroxyl groups are in charge of scavenging peroxynitrite, a potent pro-oxidant linked to a number of pathophysiological and neurodegenerative processes.

• **Cancer :-**

Because of their ability to inhibit cyclooxygenase and lipoxygenase activities, induce apoptosis, and have antitumorogenic effects, ginger components are classified as chemopreventive dietary agents. Ginger blocks 5-LO enzymes, which are the only source of nutrition for prostate cancer cells. In the absence of the 5-LO enzyme, prostate cancer cells expire in one to two hours. Leukemic, skin, kidney, lung, and pancreatic cancer cells are all killed off by ginger. Some compounds in ginger, including 6 gingerol and 6 paradol as well as other elements including shogaols and zingerone, are thought to have anticancer characteristics. As a result, it can be used safely for cancer therapy.

Gingerol is a powerful anti-tumor agent in leukaemia cells, inhibits the development of pancreatic cells, and is helpful in preventing constipation-related cancer.

❖ **Storage OF GINGER :-**

Store dried rhizomes, slices, and splits in a cold environment (10–15 °C). The flavour components start to degrade at higher temperatures (23–26°C), and ginger starts to lose part of its flavour and scent. The storage space has to be dry and out of direct sunlight. The rhizomes should be shielded from pests and insects while being stored. To shield the rhizomes against the cigarette beetle, natural insecticides such the leaves of *Glycosmis pentaphylla* or *Azadirachta indica* can be applied (*Lasioderma serricome*). The storage space must be pest-free, dry, cold, and clean. To keep bugs and vermin out of the space, mosquito netting has to be installed on the windows. Foods with strong aromas, detergents, and paints shouldn't be kept in the same space.

❖ PACKING OF GINGER :-

Rhizomes in bulk can be sent in lined corrugated cardboard boxes, timber boxes, or jute sacks. Packaging for dry slices or powder uses multi-wall laminated bags. Due to film permeability, certain laminates are superior than others. The material used for packing needs to be air- and moisture-tight. The bags may be sealed using machines. The product's name, brand name (if appropriate), manufacturer information (name and address), date of manufacture, expiration date, weight of the contents, added ingredients (if appropriate), and any

other details that the country of origin and of import may require must all be included on the label.

❖ CONCLUSION :-

Ginger is a rhizomatous plant grown throughout South-eastern Asia and China and in parts of Japan, Austria, Latin America, Jamaica, and Africa. Ginger has been used as a spice and medicine in the Indian subcontinent since ancient times. Its medicinal values have been known for centuries.. The most common condiment, flavouring, and garnishing ingredient is it. The plant treats dyspepsia and colic and acts as a stimulant and carminative. It is used to treat cardiac disorders since it is known to have blood-thinning and cholesterol-lowering qualities. The main phenolic compounds and essential oils function as strong antioxidants and have the ability to scavenge free radicals. The presence of substances like thymol, eugenol, 1, 8-cineole, and pinenes, linalool, and terpineol contributes to the antibacterial characteristics. One effective natural cold cure is ginger tea. The plant can also be used to treat diabetes, pneumonia, rheumatism, diarrhoea, and motion sickness. It treats nausea brought by chemotherapy, morning sickness, and motion sickness. All things considered, ginger is a versatile plant with amazing phytotherapeutic and medicinal capabilities. On our planet, it would be challenging to locate a region or country that has not profited from this magnificent fragrant herb.

❖ REFERENCES:-

- i.El-Baroty GS, Abd El-Baky HH (2008). Evaluation of the Egyptian Moldavian Balm's essential oil on a chemical and biological level. *Journal of Essential Oil Therapy*, 2: 76–81.
- ii.El Baz, FK, HH Abd El-Baky, GS El-Baroty (2009). Marine algae serves as a natural preserving component. *Int. J. Food Sci. Technol.*, 44: 1688–1695 Ulvalactucal
- iii.Adewunmi, CO, Oguntimein, BO, Furu, P.(1990). Molluscicidal and antischistosomal activities of *Zingiber officinale*. *Plant Medica*. 56: 374- 376.
- iv.Ahmed RS, Seth V & Banerjee BD (2000) Influence of dietary ginger (*Zingiber officinale* Rosc.) on antioxidant defense system in rat: comparison with ascorbic acid. *Indian J ExpBiol* 38, 604–606.
- v.Ajay M, Gilanui AH, Mustafa MR. 2003.Effect of flavonoids on vascular smooth muscles of the isolated rat thoracic aorta.*Life Sci*. 74: 603-612 Ajith TA, Nivitha V, Usha S. (2007).

- vi. Zingiber officinale Roscoe alone and in combination with alpha-tocopherol protect the kidney against cisplatin-induced acute renal failure. *Food Chem. Toxicol.* 45: 921–927.
- vii. Akhani SP, Vishwakarma SL, Goyal RK. (2004). Anti-diabetic activity of Zingiber officinale in Streptozotocin-induced type I diabetic rats.
- viii. Ali BH, Blunden G, Tanira MO, et al. (2008). Some phytochemical, pharmacological and toxicological properties of ginger (Zingiber officinale Roscoe): a review of recent research. *Food Chem Toxicol* 46, 409–420.
- ix. Ali A, Gilani, AH. (2007). Medicinal value of ginger with focus on its use in nausea and vomiting of pregnancy. *Int J food propert.* 10: 269-278.
- x. *Alternative Medical Review.* (2003) Volum 8, Number 3, 2003 Zingiber officinale. Monograph Anwar F, Ali M, Hussain AI, Shahid M (2009). Antioxidant and Artemisia sphaerocephala Krasch seed polysaccharide in alloxan-induced diabetic rats. *Swiss. Med. Wkly.*, 136: 529-532.
- xi. Bhagylakshmi A, Singh, NS. (1988). Meristem culture and micropropagation of variety of ginger (Zingiber officinale Rosc) with a high yield of oleoresin. *J Hort Sc.* 63: 321-329 Blumenthal M. (1998).
- xii. The complete German Commission E monographs: therapeutic guide to herbal medicines. Austin: American Botanical Council. Bode A. (2003). Ginger is an effective inhibitor of HCT116 human colorectal carcinoma in vivo. Paper presented at the Frontiers in Cancer Prevention.
- xiii. *British Pharmacopoeia* 2008, vol III: 2740.
- xiv. Chrubasik S, Pittler MH, Roufogalis BD. Zingiberis rhizome: A comprehensive review on the ginger effect and efficacy profiles. *Phytomedicine* 2005, 12: 684-701.
- xv. Dedov VN, Tran VH, Duke CC, Connor M, MacDonald JC, Mandadi S, Roufogalis BD. Gingerols: a novel class of vanilloid receptor (VR1) agonists. *Br J Pharmacol* 2002, 137: 793-798.
- xvi. El-Abhar HS, Hammad LNA, Gawad HAS. Modulating effect of ginger on rats with ulcerative colitis. *J Ethnopharmacol* 2008, 118: 367-372.
- xvii. Grzanna R, Lindmark L, Frondoza CG. Ginger – A herbal medicinal product with broad anti-inflammatory actions. *J Med Food* 2005; 8:125-32. Grøntved A, Hentzer E. Vertigo-reducing effect of ginger root. A controlled clinical study. *ORL* 1986, 48: 282-286.
- xviii. Jagetia G, Baliga M, Venkatesh P. Ginger (Zingiber officinale Rosc.), a dietary supplement, protects mice against radiation-induced lethality: mechanism of action. *Cancer Biother Radiopharm* 2004, 19: 422-435.
- xix. Krüth P, Brosi E, Fux R, Mörike K, Gleiter CH. Ginger-associated overanticoagulation by phenprocoumon. *Ann Pharmacother* 2004, 38: 257-260.
- xx. Lee E, Surh Y-J. Induction of apoptosis in HL-60 cells by pungent vanilloids, [6]-gingerol and [6]- paradol. *Cancer Lett* 1998, 134: 163-168.
- xxi. Mills SY, Bone K. *Principles and Practice of Phytotherapy.* Edinburgh, Churchill Livingstone 2000: 394-403.
- xxii. Nanthakomon T, Pongrojpraw D. The efficacy of ginger in prevention of postoperative nausea and vomiting after major gynecologic surgery. *J Med Assoc Thai* 2006, 89(Suppl 4): 130-136.
- xxiii. Nirmala K, Krishna TP, Polasa K. In vivo Antimutagenic potential of ginger in the formation and excretion of urinary mutagens in rats. *Int J Cancer Res* 2007, 3: 134-142.