

## Zinziber officinale- A Survey on Phytochemistry and Pharmacological Aspects

Rakesh Ranjan<sup>1\*</sup>, Jitendra Jena<sup>2</sup>, Jyoti Yadav<sup>3</sup> and Manoj Kumar Sarangi<sup>4</sup>

<sup>1,2,3</sup>Pharmacy College Azamgarh, Itaura, Chandeshwar, Azamgarh, Uttar Pradesh.

<sup>4</sup>Sardar Bhagwan Singh PG Institute of Biomedical Sciences and Research, Balawala, Dehradun, India.

### ABSTRACT

The study involved photochemistry and pharmacological aspects of *Zinziber officinale* (Family: Zingiberaceae). *Z. officinale* is a traditional spice, herbaceous perennial plant with tuber like rhizome. Ginger is chemically enriches by phenolic compounds, sesquiterpenes and volatile oil. Ginger extract contains gingerols and shagaols. It is used in nausea due to motion sickness. Currently, it showed anti-platelet activity inhibiting platelet aggregation induced by ADP, immuno-modulation and *in vitro* antineoplastic activity. Other activities like antipyretic cardiovascular effects, antioxidants and antispasmodic activities were also found.

Recently, it is used in combination for improved medicinal effects with other drugs like *Centella asiatica* in poor circulation and *Myristica fragrans* for common cold and asthma. This comprehensive account on phytochemistry and pharmacological aspects is used to reveals it's potential therapeutic effects.

**Keywords:** Ginger, phenolic compounds, antipyretic.

### INTRODUCTION

The common cooking ginger is an herbaceous perennial with upright stems and narrow medium green leaves arranged in two ranks on each stem. The plant gets about 4 ft (1.2 m) tall with leaves about 3/4 in (1.9 cm) wide and 7 (17.8 cm) long. Ginger grows from an aromatic tuberlike rhizome (underground stem) which is warty and branched. The inflorescence grows on a separate stem from the foliage stem, and forms a dense spike, to 3 in (7.6 cm) tall. The bracts are green with translucent margins and the small flowers are yellow green with purple lips and cream colored blotches. Most gingers in cultivation are sterile cultivars grown for the edible rhizome, and the flower is rarely seen.

There is a cultivar of *Zingiber officinale* known as 'Sunti', which comes from Java and is similar to the common cooking ginger, but forms smaller rhizomes. It is used in the same way as common ginger but is said to have better medicinal qualities.

Ginger is an herb. The rhizome (underground stem) is used as a spice and also as a medicine. It can be used fresh, dried or juice.

Ginger is commonly used to treat various types of "stomach problems," including motion sickness, morning sickness, colic, upset stomach, gas, diarrhea, nausea caused by cancer treatment, nausea and vomiting after surgery, as well as loss of appetite.

Other uses

- Include treating upper respiratory tract infections, cough, and bronchitis.
- Fresh ginger is used for treating acute bacterial dysentery, baldness, malaria, poisonous snake bites, rheumatism, migraine headache, and toothaches.
- Dried ginger is used for chest pain, low back pain, and stomach pain.
- Some people pour the fresh juice on their skin to treat burns. The oil made from

ginger is sometimes applied to the skin to relieve pain.

- In foods and beverages, ginger is used as a flavoring agent.
- In manufacturing, ginger is used as for fragrance in soaps and cosmetics.
- One of the chemicals in ginger is also used as an ingredient in laxative, anti-gas, and antacid medications.

We all have memories of mom's home remedy, something she gave us whenever we complained of a minor upset, a sniffling nose, stomach upset or the like. For my siblings and me that wasn't chicken soup, it was ginger ale. Ginger ale served two purposes, both curative and placebo. Curative, in that few foods or spices, of which ginger is best known, are as well documented as medicinal plants as they are as food. The placebo effect grew from my child mind which associated ginger with ginger snap cookies. I thought I was getting cured with medicine of which cookies were made!

Ginger, consists of the fresh or dried roots of *Zingiber officinale*. In 1807, the English botanist William Roscoe (1753-1831) gave the plant the name *Zingiber officinale*. The ginger family is a tropical group especially abundant in Indo-Malaysia, consisting of more 1275 plant species in 48 genera. The genus *Zingiber* includes about 100 species of aromatic herbs from East Asia and tropical Australia. The name of the genus, *Zingiber*, derives from a Sanskrit word denoting "horn-shaped," in reference to the protrusions on the rhizome.

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. A club-like spike of yellowish, purple-lipped flowers have showy greenish yellow bracts beneath. Unfortunately, ginger rarely flowers in cultivation.

The ginger of commerce consists of the thick scaly rhizomes (underground stems) of the plant. They branch with thick thumb-like protrusions, thus individual divisions of the rhizome are known as "hands." Ginger, both

fresh and dried, has become increasingly popular in the United States in recent years. During the 1990s, on average, the U.S. imported more than 4,000 metric tons of ginger per year. Major world producers include Fiji, India, Jamaica, Nigeria, Sierra Leone, and China. American imports come from China, several Caribbean Islands, Africa, Central America, Brazil, and Australia. Ginger is now commercially cultivated in nearly every tropical and subtropical country in the world with arable land for export crops. Although most ginger is imported, the best fresh ginger this writer has ever sampled was organic ginger grown in Hawaii.

#### Classification

**Kingdom:** plantae

**Division:** angiosperma

**Class:** Monocotyledoneae

**Order:** Scitaminaea

**Family:** Zingiberaceae

**Genus:** Zingiber

**Species:** Officinale

**Habitat:** South east asia and throughout india.

**Product offered:** Rhizomes, Oil

**Vernacular name**

**Latin Name:** Zanthoxylum alatum

**English Name:** Toothache Tree

**Sanskrit /Indian Names:**

Tejpal, Tumburu

#### Botanical source

Dried rhizomes of zingiber offiinale Roscoe belonging to family zingiberaceae.

**Ginger** is a perennial plant in the family Zingiberaceae - its rhizome is commonly used as a cooking spice throughout the world. The ginger plant has a long history of cultivation known to originate in China and then spread to India, Southeast Asia, West Africa, and the Caribbean.

#### Cultivation and collection:

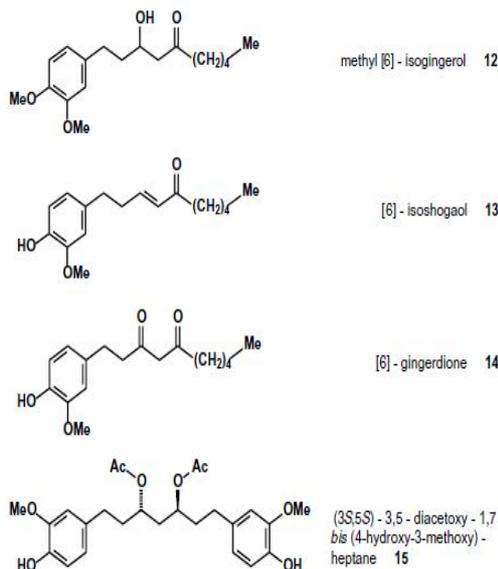
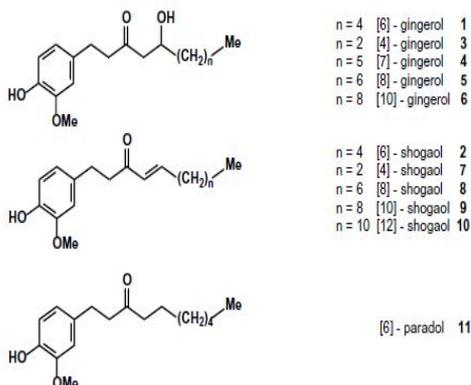
Ginger is grown in all seasons throughout the year. Most of the cultivars are sterile i.e flowers are rarely seen and is mainly grown for the rizome. The plant prefer rich, well-

drained, sandy loam or clay soil and plenty of indirect sunlight and water. Generally ginger prefers shade, but it will tolerate full sun if adequate water is provided. Soil should be well draining and heavily manured with compost or dried leaf a few weeks before planting.

The plant is always propagated by portions of rhizomes known as seed rhizome or setts. Cut large rhizome into sections, making sure that each has some good buds or eyes cropping out. Before planting, wash the rhizome pieces in running water and plant these pieces on the ground about an inch below the surface of the soil. Water sparingly until the new growth sprouts occur. It will grow well in containers also.

The time from planting to maturity will vary with the climatic conditions. Plants should be allowed to grow for at least three to four months before the rhizomes are harvested. Ginger is harvested by digging out rhizomes when the tops have died down. The rhizomes are lifted from the earth, cleared of all adhering matter by washing, and then sun-dried to help preserve them. The rhizome reaches mature size 6-9 months after planting and the leaves dry down naturally. If left undisturbed, the rhizomes will sprout new buds and the plant will repeat the growth cycle.

**Important constituents**



**Identification test**

The pungency of ginger powder, which is due to gingerol, is destroyed by boiling with 2% potassium hydroxide for 10 minutes.

**Uses**

Ginger has been used for stomach upset, motion sickness, nausea, and vomiting. Ginger root is widely used around the world as a spice or food additive. Ginger is fried and eaten plain, and used in curry pastes and other sauces in India; it is grilled and used to flavor fish and meats or for making ginger tea in Indonesia; it is boiled or fried in Chinese cookery; used to baste chicken or eaten as pickled ginger (beni shoga) and served with sushi in Japan; and used in Jamaica to make Jamaican jerk paste.

**CONCLUSION**

There is need for creating awareness among the people about the therapeutic values of ginger and its various phytochemical constituent. The consumers demand for herbal drugs may encourage ginger cultivation and production and would help to formulate new drugs and carry out several research works for curing various diseases.



**Fig. 1: Ginger Rhizome**

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