Asian Journal of Multidimensional Research
ISSN: 2278-4853 Vol. 11, Issue 11, November 2022 SJIF 2022 = 8.179
A peer reviewed journal

CHEMICAL COMPOSITION OF GINGER (ZINGIBER OFFICINAIE) PLANT

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DOI: 10.5958/2278-4853.2022.00295.6

ABSTRACT

The chemical constituents of ginger are very complex, with over 400 compounds identified to date. The chemical constituents of ginger vary depending on several factors, including geographic origin, harvesting process, and storage conditions.

KEYWORDS: *cineole, bisabolene, borneol, citral, linalool, shogaol, oleoresin, resin, farnesene, limonene, geranial, turmeric.*

INTRODUCTION

The roots are adventitious in origin, forming a fibrous root system. A modified underground shoot-rhizome is often taken as a root, from which green above-ground shoots and adventitious roots extend. Rhizome-primary structure: integumentary tissue-cork; central-axial cylinder-ring of vascular fibrous bundles (closed collateral), parenchyma with numerous vascular fibrous bundles (closed collateral) and cells with essential oil (yellow-green) [1].

The stem is erect, rounded, and not pubescent. Internodes more than 1 cm, elongated. The leaves are alternate, simple, entire, lanceolate, entire, with a pointed apex, have a leaf sheath [2]. The base of the leaf is heart-shaped. The flowers are zygomorphic, located on short peduncles, collected in spike-shaped inflorescences. The green calyx consists of five sepals, fused. The corolla is divided into three petals of purple-brown or yellow-orange flowers. Androecium is polyfraternal, one stamen is fertile, and the rest are barren. The gynoecium consists of three fused carpels. The fruit is a three-leaved capsule [3].

The chemical constituents of ginger are very complex, with over 400 compounds identified to date [4]. The chemical constituents of ginger vary depending on several factors, including geographic origin, harvesting process, and storage conditions. The content of essential oil in dry rhizomes is 1-3%, its main components are α- and β-zingiberenes (zingiberenes; sesquiterpenes (a group of organic compounds of the terpene class - up to 70%), camphene, cineole, bisabolene, borneol, citral, linalool, shogaol, oleoresin, resin, farnesene, limonene, geranial, turmeric.Ginger

also contains vitamins C, B1, B2 and essential amino acids [5].The burning taste is due to the substance gingerol.6-gingerol is the most abundant gingerol in ginger, there are also 8-, 10- and 12-gingerols Ginger contains compounds related to gingerol or shogaol, such as 1-dehydrogingerdione, 6-gingerdione and 10-gingerdione, as well as gingerdiols and diarylheptanoids.The content of essential oil in dry rhizomes is 1.5-3%, mainly its component is zingiberene (zingiberene)-sesquiterpenes (a group of organic compounds of the terpene class) - up to 70%, there are also camphene, cineole, bisabolene, borneol, citral, linalool [6]. In addition, ginger contains vitamins C, B1, B2 and essential amino acids. The burning taste is due to the substance gingerol [7].

Ginger (Zingiber officinaie) contains water, a large amount of useful minerals (magnesium, phosphorus, calcium, sodium, iron, zinc, potassium, chromium, manganese, silicon), vitamins (A, B1, B2, B3, C, E, K), fatty acids (oleic, caprylic, linoleic), proteins, including amino acids (leucine, valine, isoleucine, threonine, lysine, methionine, phenylalanine, tryptophan), asparagine, glutamic acid, as well as fats, carbohydrates (sugars) [8]. The basis of the burning taste of ginger is a special resinous substance gingerol. All parts of the plant and even the seeds contain an aromatic essential oil, the main components of which are α- and β-zingiberenes, which give it a special aroma. It is not surprising that with such a rich composition, ginger has a lot of useful properties [9].

Ginger (Zingiber Officinaie) - Calorie Content and Chemical Composition

The nutritional value calories	Content (per 100 grams)
Squirrels	80 kcal
Fats	1.8 gr
Carbohydrates	0.8 gr
Water	17.8 gr
Cellulose	78.9 gr
Squirrels	2 gr

Vitamin Content

vitamins	chemical name	Content in 100 grams	Percent Daily Need
Vitamin A	retinol equivalent	0 mcg	0%
Vitamin B1	thiamine	0.02 mg	1%
Vitamin B2	riboflavin	0.03 mg	2%
Vitamin C	vitamin C	5 mg	7%
Vitamin E	tocopherol	0.3 mg	3%
Vitamin B3 (PP)	niacin	0.7 mg	4%
Vitamin B4	choline	28.8 mg	6%
Vitamin B5	pantothenic acid	0.2 mg	4%

Vitamin B6	**pyridoxine**	**0.16 mg**	**8%**
Vitamin B9	**folic acid**	**11 mg**	**3%**
Vitamin K	**phylloquinone**	**0.1 mg**	**0%**

Mineral Content

Minerals	**Content in 100 grams**	**Percent Daily Need**
Potassium	**415 mg**	**17%**
Calcium	**16 mg**	**2%**
Magnesium	**43 mg**	**11%**
Phosphorus	**34 mg**	**3%**
Sodium	**13 mg**	**1%**
Iron	**0.6 mg**	**4%**
Zinc	**0.34 mg**	**3%**
Selenium	**0.7 mcg**	**1%**
Copper	**226 mcg**	**23%**
Manganese	**0.23 mg**	**0**

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