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AN OVERVIEW OF GINGER: A REVIEW

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ABSTRACT

This abstract discusses the health benefits of ginger, including its potential to relieve nausea, reduce osteoarthritis pain, lower blood sugar, reduce menstrual pain, and help prevent cancer. The background of the study is that ginger has been used in traditional and alternative medicine settings for its medicinal properties. The research problem is to explore the potential health benefits of ginger and its impact on various health conditions. The aim is to investigate the effects of ginger on nausea, osteoarthritis pain, blood sugar levels, menstrual pain, and cancer prevention. The methodology involves a review of relevant studies and research findings on the health benefits of ginger. Participants in the studies include pregnant women, individuals with osteoarthritis, diabetes, and those at normal risk for colon cancer. The context of the research is the use of ginger in traditional medicine and its incorporation into various food and medicinal products in different cultures. The results indicate that ginger has potential health benefits, including relieving nausea, reducing osteoarthritis pain, lowering blood sugar, reducing menstrual pain, and possibly helping to prevent cancer. The implications of the findings suggest that ginger can be used as a natural remedy for various health conditions and may have implications for the development of new therapies.

keywords: ginger, health benefits, nausea, osteoarthritis, blood sugar, menstrual pain, cancer prevention.

INTRODUCTION

Ginger (Zingiber officinale Roscoe) has long been farmed. Ginger is thought to be indigenous to Southeast Asia and southern China.India and Asia. Japan brought it to the Mediterranean in the first century, followed by England

in the eleventh century, America in 1585, and Japan again in the third century [1]. Nowadays, it is extensively grown throughout the world's tropical and subtropical climates, primarily in Asia and Africa. With a yield of 10,000 kg per hectare on average and a total production of over 200,000 tons, ginger is harvested over 21,000 hectares worldwide. The major uses of ginger in food preparation are as a spice and flavoring. Ginger's distinctive flavor and scent are caused by volatile oils, the main pungent constituents of which are zingerone, shogaols, and gingerols. Many investigations have been conducted in an attempt to understand the miracle that is this plant. The history of ginger cultivation, its medicinal properties, its current production and cultivation methods, varieties, and breeding will all be covered in the book. Historically, it has been used to treat nausea, vomiting, rheumatism, baldness, respiratory diseases and bleeding disorders.

PROPERTIES OF GINGER

1. Potency: spicy
2. Taste: bitter
3. Properties: light, adhesive and thick

Benefits

India, China and the Japanese people are used ginger as food and all the people used ginger as medical substances. Colds, cough, vomiting, dizziness, hypertension, impaired vision problems, such as the ginger is used as drug. Indian Ayurvedic treatment for digestion, fever and stomach diseases, ginger is used heavily in the production of medicines.

Chin called the dry ginger and pepper, along tipple tea helps to removing mucus in the body for a long time and helps to protect health. Aromatic and medicinal oil extracted from the ginger, helps in preparation of ginger beer, ginger wine. Ginger powder used in the spices products. Foreign countries, ginger used for making Biscuits, Cakes, soup and pickle.

BIOCHEMISTRY OF GINGER

BIOCHEMISTRY OF GINGER Ginger standards have been well documented in USP (United State Pharmacopoeia) and National formulary. The chemistry of ginger is well documented with the respect to the oleoresin and volatile oil. There is stringent criteria for the usage of medical grade (should contain 1.5% or more volatile oil). The studies have identified more than 400 different compounds in ginger and major constituents are as follows:

1. Carbohydrates- about 70%

2. Lipid- about 8% which includes free fatty acids.

3. Volatile oils- about 3% consist mainly of the sesquiterpenes, beta-bisabolene

4. In addition, raw fibres, vitamins and minerals are also present in ginger.

HEALTH BENEFITS

Ginger is a potential herb used worldwide for its immense phytotherapeutic properties. In Ayurveda it is known as Mahaaushdi which means use of this herb improves body functions and helps to eliminates toxins from the body (Nadkarni, 1976). Modern scientific research has revealed that ginger possesses numerous therapeutic properties including antibiotic, antimicrobial, and antioxidant effects, an ability to inhibit the formation of inflammatory compounds, and direct anti-inflammatory effects. Besides this, ginger is also effective against some kinds of cancers, stimulates blood circulation, controls blood pressure and hypertension, helps in lowering cholesterol, and is associated with combating heart problems.

THERAPEUTIC PROPERTIES OF GINGER

Cardiovascular effects

Large number of studies showed that the important constituents of ginger namely gingerol and shogaol classes of compounds might have many therapeutic effects including anti-inflammatory, antioxidant, and hypocholesterolemic effects.

Ginger enhances blood circulation throughout the body by stimulation of the heart muscle and by diluting circulating blood. This enhances cellular metabolism and helps to relief cramp and tension (Gong et al., 1989; Pecoraro et al., 1998; Frisch et al., 1995; Yamahara et al., 1989; Ernst and Pittler, 2000; Chaiyakunapruk et al., 2006).

Hypotensive effect

There are many studies which prove hypotensive effect of ginger when it was given at 0.3-3 mg/kg. It helps to reduce atrial blood pressure by blocking calcium channel or by acting on muscarinic receptor (Ernst and Pittler, 2004; Portoni et al., 2003; Ozgoli and Goli, 2009; Vutyavanich et al., 2001).

Anti-hypercholesteraemic effect

Ginger extracts interfers with cholesterol biosynthesis leading to decreasing cholesterol levels. Ginger extracts have antilipidemic effects, by reducing thermogenesis and high lipids levels. It also helps to increase serum HDL-

cholesterol (Ernst and Pittler, 2004; Portoni et al., 2003; Ozgoli and Goli, 2009; Vutyavanich et al., 2001; AlAwwadi, 2010; 2013).

Gastrointestinal effect of ginger

Ginger is very useful in the treatment of several gastrointestinal diseases including peptic and duodenal ulcer. Ulcer is generally caused due to imbalance between defensive and offensive factors like acid, pepsin and Helicobacter pylori; and in this case, ginger is useful due to its anti-inflammatory properties. Ginger acts and protects gastric mucosa against several ulcerogenic agents. Ginger is also very useful in cases of ulcerogenesis due to its antioxidant activities (Lumb, 1994; Gull et al., 2012; Dugasani et al., 2010; Halvorsen et al., 2002).

Antiemetic effect of ginger

Ginger shows strong antiemetic property by enhancing intestinal motility and inhibiting serotonin receptors. It stimulates peripheral anti-cholinergic and ant-histaminic receptors and antagonises 5- hydroxytreptamine receptors in the GIT (Lumb, 1994; Gull et al., 2012; Dugasani et al., 2010; Halvorsen et al., 2002).

Ginger anti-nausea effect due to chemotherapy

Chemotherapy is known to cause severe nausea and vomiting. It has been proved that ginger is effective in preventing nausea and vomiting caused by chemotherapy. Gingerols the key ingredients responsible for the activity have shown pharmacological effect. It is also used to treat nausea after surgery and same has been proved in several randomised clinical trials. This effect is seen due to its action on the 5-HT3 receptor (Ajith et al., 2007; Krim et al., 2013; Waggas, 2009; Sabina et al., 2011; Ahmed et al., 2008).

Morning sickness

FDA classifies ginger as safe for the treatment of morning sickness and it is widely used during early pregnancy. It reduces symptoms of morning sickness if same is taken in the recommended amount. The German Commission and Europe does not consider it as safe due to lack of published data (El-Sharaky et al., 2009; Nasri et al., 2013; Ajith et al., 2008 ; El-Abhar et al., 2008; Kyung et al., 2006).

Hematologic (platelets) effects of ginger

Scientific evidence is still pending; however it was found that ginger is having anti-thrombotic and strong antiinflammatory effect due to increased fibrinolytic activity when same has been taken at about 5 g. It was found that Gingerols and Paradol have good anti-platelet and COX-I inhibitor properties (Mehdizadeh et al., 2012; Jagetia et al., 2004; Jagetia et al., 2003). The effect of the ginger is different if it is consumed dry or fresh.

Regulation of blood glucose and lipid levels

Ginger is very effective in lowering blood glucose level when same has been taken in dried form. It also decreases cholesterol and triglyceride level. Long term usage helps to increase high-density lipoprotein cholesterol concentrations (Duke and Ayensu, 1985; Afzal et al., 2011; Kim et al., 2007; Li et al., 2012).

Rheumatologic effect of ginger

Ginger exerts its anti-inflammatory effects by the mechanisms which explain the role of inhibition of preinflammatory factor like prostaglandin and leukotriene biosynthesis which can decline pain associated with rheumatoid and osteoarthritis. It is having proven history of treatment of rheumatic conditions (Duke and Ayensu, 1985; Avato et al., 2000; Afzal et al., 2011; Ha et al., 2012).

Headache

Ginger is used for the treatment of headache and having Al-Awwadi 113 good effect on reducing symptoms of pain. This effect is due to reduction in prostaglandin synthesis. It also has been reported that ginger suppresses leukotriene biosynthesis by inhibiting 5- lipoxyganse (Ernst and Pittler, 2004; Nasri et al., 2013; Tjendraputra et al., 2001).

Antimicrobial

Due to phenolic compounds, ginger has shown excellent antimicrobial properties and effective in controlling virus, bacteria, fungal disease. In many countries, ginger is used to preserve food (Ernst and Pittler, 2004; Liao et al., 2012; Chen et al., 2009).

Antibacterial

Ginger has shown good antimicrobial effect against both Gram positive and negative bacteria; however, severally, this effect is reduced due to heating (Jagetia et al., 2004; Ha et al., 2012; Tjendraputra et al., 2001; Kubra et al., 2013).

Antifungal

Gingerols and Gingerdiol are the main anti-fungal principles and extract of ginger powder is effective against several antifungal diseases (Ernst and Pittler, 2004; Ramkissoon et al., 2012; Mallikarjuna et al., 2008; Nasri et al., 2013).

Antiparasitic action

Ginger acts as anti-parasitic; study shows the in vivo potential of methanolic extract of Zingiber officinale in the treatment of trypanosomiasis (Halvorsen et al., 2002; Jagetia et al., 2003; Kubra et al., 2013; Duarte, 2016; Kumar et al., 2015; Choi et al., 2013; Saraswat, 2010; Pushpanathan, 2008)

Antineoplastic

Ginger is a powerful antineoplastic agent. In several studies, extracts of ginger suppress cell proliferation and act against resistance of cancerous cells (Barnes et al., 2002; Newall et al. 1996; Ernst and Pittler, 2000; Nasri et al., 2013; Kumar et al., 2015; Saraswat, 2010).

Antioxidant

Ginger is having powerful antioxidant activity due to its oil which has protective effect on DNA damage. They have demonstrated this effect in many cell culture (Chaiyakunapruk et al., 2006; Ramkissoon et al., 2012; Kabuto et al., 2005; Mahmoud et al., 2012; AlAwwadi,2010; 2013).

Menstrual cramps (dysmennorhea)

The powerful anti-inflammatory action on prostaglandin synthesis help in menstrual cramps (Halvorsen et al., 2002; Mallikarjuna et al., 2008; Mahmoud et al., 2012; Kubra et al., 2013).

Facts on ginger

Ginger can be traced back to 5000 years in India and China, where it was used as ayurvedic medicine.

1. Many culinary recipes list ginger as an herb, while others classify it as a spice. Some people refer to dried ginger powder as a spice, while others refer to the fresh root as an herb.
2. Ginger is a tropical plant that originated between India and Malaysia. It is now grown extensively in India, Jamaica, Sierra Leone, Nepal, Thailand, Nigeria, Malaysia, Southern China, and Japan.
3. The five major ginger producing countries are -:
   - China – 396.60 thousand tons
   - India – 385.33 thousand tons
   - Nepal – 210.79 thousand tons
   - Thailand- 172.68 thousand tons
4. India continues to be the world's largest ginger consumer, accounting for 43 percent of total world volume.
5. The Indian State of Assam is the number 1 state in the country for producing most of the ginger with about 167.39 metric tonnes and constituting 17.5 % of India's total output of this crop.
6. Ginger comes in an amazing variety of shapes and sizes. There are Nearly 1,600 species of ginger grown worldwide.

7. Ginger, Turmeric, Tavaksira, and Cardamom belong to the family Zingiberaceae. This family consists of 56 genera and more than 1,300 species.
8. Ginger takes 210-240 days to reach full maturity after planting. Ginger harvesting for vegetable uses begins after 180 days, depending on demand. The matured rhizomes are picked at full maturity, i.e., when the leaves turn yellow and begin to dry.
9. It contains gingerol, which is a powerful anti-inflammatory and has other medicinal properties too.
10. The crop thrives best in warm and Humid Climates.
11. Ginger plants can grow to about 2 to 3 feet tall.
12. A well-managed crop yields 15 to 20 tonnes of ginger rhizomes per hectare.
13. Ginger has numerous health benefits, some of which are -:
    - It helps Digestion by Speeding up the digestion process.
    - Improves Immunity
    - Aids In Weight Loss
    - Improves Skin health by increasing blood circulation
    - Improves Heart Health as it acts as a blood thinner.
    - Improves Brain Function
    - It helps in regulating blood sugar

Side effect of ginger

Short-Term Effects

Heartburn, upset stomach, and diarrhea.

Long-Term Effects

May lead to miscarriage and may excessively lower blood sugar levels.

Drug Interactions

It may interact with blood thinners, immunosuppressant drugs, and anti-diabetic medications

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