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An Analysis of Health Benefits of Guava

Deepti Mathpal [1], and Gulshan Rathore [2]

[1, 2] Assistant Professor, School of Medical and Allied Sciences, Sanskriti University, Mathura, Uttar Pradesh

Correspondence should be addressed to Deepti Mathpal; khyati.smas@sanskriti.edu.in

ABSTRACT: Guava is a tropical fruit native to South America. It belongs to the Myrtaceae family and is a well-liked plant. In contrast to other fruits, guava is untreated with chemicals, making it a healthier option. It has long been used as a homoeopathic herb to treat a variety of ailments throughout the globe. Oleanolic acid, tannins, quercetin, ursolic acid, triterpenes, pentacyclic triterpenoid, saponins, carotenoids, amritoside, guajanoic acid, lectins, leucocyanidin, beta-sitosterol and uvaol are among the active components. Guava contains antibacterial, anti-malarial, anti-diarrheal, anti-inflammatory, anti-cancer, anti-hyperglycemic, and antioxidant properties, among others. Several studies have revealed that guava contains a number of pharmacological active components that are responsible for a variety of biochemical activities, including antidiabetic, antimicrobial, antidiarrheal, anti-oxidant, anti-pyretic, cardioactive, hepatoprotective, immunomodulatory, spasmolytic, and contractile effects, which are discussed further in the review. This article discusses about pharmacological activities and how they may be used to treat a variety of illnesses and diseases.

KEYWORDS: Fruit, Guava, Health, Myrtaceae, Vitamin.

I. INTRODUCTION

Guava pulp (lyophilized) has been shown to have hypoglycaemic effects in diabetic rats, perhaps owing to its antioxidant properties. Kim et al. showed that a compound found in guava leaves promotes free radical scavenging and antioxidant capabilities. Oh et al. found that guava plant extracts exhibited hypoglycemic effects in a diabetic patient with severe diabetes. Guava fruit is high in vitamin A, vitamin C, and antioxidants such as carotene and lycopene, which protect the skin from wrinkles. Because of its beneficial effects on dyslipidaemia, lycopene has been linked to the prevention of cardiovascular disease. Lycopene is a strong antioxidant that aids the body in eliminating damaging free radicals, which may lead to cancer if left unchecked. Guava's antioxidant properties have been linked to anti-cancer effects in both solid and hematological cancers. The sodium and potassium levels in the body are maintained by the guava fruit, which helps people with hypertension control their blood pressure. Manganese is found in its fruit, which aids in the absorption of other important minerals from food. Guavas reduce triglycerides and cholesterol (LDL), two factors that contribute to the progression of heart disease [1].

This miraculous fruit helps to raise healthy cholesterol levels (HDL). Apart from being a natural skin toner, it has many anti-aging effects. Guava's iron content aids in the promotion of fertility. Guava potassium also helps to maintain appropriate blood pressure levels. The potassium content of a banana and a guava is almost same. Shigella (diarrhoea-causing bacteria), Staphylococcus, Bacillus, E. coli, Pseudomonas, and Clostridium all exhibited significant antibacterial activity in guava fruits. Salmonella E. coli (diarrhoea-causing bacterium) is bound by lectin content, which prevents it from adhering to the gut wall and preventing infection. Guava consumption in diarrhoea, gastroenteritis, and dysentery has been linked to the fruit's antimicrobial properties. The effects of a phytodrug (QG-5) derived from guava leaf extract showed a reduction in stomach ache, which was attributed to the antispasmodic effect of the quercetin concentration in the leaf extract. Guava has hypotensive and hypoglycemic properties, lending pharmacological support to the plant's suggested ethnomedical uses in the management of type 2 diabetes and the control of adult-onset hypertension in African cultures [2].

Many vital nutrients have been bestowed to Guava (Psidium guajava) by nature. Guava is believed to have been first grown for commercial purposes in South Africa and then introduced to India by the Portuguese. Guava is a fruit that is extremely prevalent in Asian nations, although it is more popular in Western countries due to its therapeutic qualities. It is a tiny tree of the Myrtaceae family. The tree may be grown in any soil that has a tropical or subtropical environment. As of now, India is the world's biggest producer of guava, followed by China. Depending on the species, guava fruits are typically 4 to 12 centimetres (1.6 to 4.7 in) long, round or oval. The fruit is initially green in color, but as it ripens, it becomes yellow. Apple guava is the most widely available guava on the market [3].

Guava leaves, in addition to the fruit, have potential health advantages, including cancer prevention, blood pressure regulation, diarrhoea treatment, and gastrointestinal issues relief, to name a few. It also aids in weight loss, skin tonicity, and the treatment of coughs, colds, constipation, dysentery, and scurvy .Apple guava, cherry guava, and strawberry guava are all popular guava varieties throughout the globe. Usually consumed raw in ripened or semi-ripened form, or in the form of juices.

Guava and its leaves may provide health advantages, according to this research [4].

A. Benefits and uses of Guava

a. Laxatives

Guava, both the fruits and the leaves, contain a significant quantity of dietary fiber, which is the foundation for constipation therapy. The fiber and roughage content of the newer tender leaves is especially high, which is important for the prevention and treatment of constipation and hemorrhoids. It is estimated that 100 grams of guava fruit provides 36 grams of dietary fibers [5]. Apart from that, Guava seeds are effective laxatives that aid in the relief of chronic constipation and colon cleaning. The fruit is one of the greatest sources of dietary fiber and Vitamin C, which is very high in comparison to other fruits, and just one guava provides approximately 12% of the daily required fiber consumption, making it highly helpful for digestive health.

b. Problems Associated With Oral Cavity

Periodontitis is caused mostly by dental plaque, which, if left untreated, progresses to gingivitis and periodontitis6. Aggregatibacter actinomyce temcomitans, Porphyromonas gingivalis, Fusobacterium nucleatum, and Prevotella intermedia are some of the frequent pathogens that cause periodontitis [6]. Guava has a high content of quercetin, which has been proven to have amazing antibacterial action against infections like these [7]. In sensitive bacteria, the potential mechanism of Quercetin in periodontitis is cell membrane rupture and inactivation of essential protein by creating irreversible complexes with the protein [8]. Guava extract works against oral plagues without disrupting the homeostatis of the oral cavity. It also inhibits germs from adhering to the mouth cavity, preventing the plague from spreading further [9]. Gum bleeding is the second most frequent issue related with the buccal cavity (scurvy). Guava has a high vitamin C concentration, with some reports claiming that it has four times the vitamin C of an orange, making it an excellent option for curing scurvy. Because of its astringent properties, it may also be used to treat toothaches and ulcers. To obtain immediate relief from toothache, eat the leaves immediately [10]. Because of the folate level in guava leaves, it may also be used to treat bad breath. As a result, guava is a great treatment for issues involving the mouth.

c. Anti-diabetic

Guava leaves are peeled and consumed on an empty stomach in China to combat diabetes. Guava fruits and leaves have the ability to decrease blood sugar levels when eaten without the skin, according to a research performed by the Medicinal Research Laboratory in Allahabad on mice. Several authors have investigated the effects of Psidium guajava leaves on intestinal glycosidases in relation to postprandial hyperglycemia, indicating a breakthrough in the treatment of diabetes (type II). Furthermore, the high fiber content of guava delays the absorption of glucose from the stomach, preventing a rapid increase in blood sugar levels after a meal. People who drank guava tea after eating white rices had significantly lower blood glucose levels than those who drank plain water as a control. Guava (both the fruit and the leaves) also seems to decrease fasting glucose. People with Type 2 diabetes who drank guava leaf decoction with every meal for three months had lower fasting blood glucose levels than before the trial, according to a research.

d. Guava Leaves for Colds and Coughs

Guava leaves have been proven to be helpful in the treatment of colds and coughs. Guava is high in ascorbic acid and iron, which helps to decrease lungs congestion and mucus production while also keeping the respiratory system clear of pathogens. According to reports, the components in Guava work like a miracle in the treatment of influenza. Fruit, especially raw fruit, or a decoction prepared from delicate young leaves, may help relieve colds and coughs. It works by dissolving mucus polymers, easing cough and lowering mucus production. It also keeps the respiratory system, throat, and lungs free of germs and suppresses existing microbial activity thanks to its astringent qualities. Guava has a high quantity of vitamin C, which has been shown to be helpful in curing colds and coughs caused by germs or viruses. In many Indian communities, roasted ripe guava is utilized as a home treatment for severe instances of cough, cold, and congestion. Another study found that a hydro extract of Psidium guajava leaves substantially reduced the coughing frequency caused by capsaicin aerosol after 15 minutes of treatment as compared to a control group.

e. Antibacterial

Guava extracts have antibacterial properties against Gram-positive and Gram-negative microorganisms. The effects of an aqueous combination and a water-soluble methanol extract from guava leaves and bark against multidrug-resistant Vibrio cholera were evaluated in vitro and shown to have significant antibacterial activity. They came to the conclusion that this plant has the ability to reduce cholera outbreaks. Villagers typically shun market medications in the treatment of illnesses in children, preferring alternative treatments such as chewed and ingested guava leaves (young and sensitive ones). Guava extract has been proven to be effective against E. coli, a bacteria that is resistant to the majority of current antibiotics on the market. Guava leaves extract has a lot of action against intestinal bacteria like Vibrio cholera, which is the causative organism causing cholera, thus it may be utilized in areas where the drugs of choice are hard to come by. The antimicrobial activity of essential oils and methanol, hexane, and ethyl acetate extracts from guava leaves was investigated, with the extracts being tested against Staphylococcus aureus, Salmonella spp., and Escherichia coli bacteria. The extract had the highest impact against Staphylococcus aureus of all the bacteria examined, and the methanolic extract had the greatest suppression of bacterial growth.

f. Anticancer Activity

Lycopene, an antioxidant rich in Guava, plays an important function in cancer prevention and treatment. Breast cancer and prostate cancer react the best of all. When guavas are dissected, the red flesh contains more lycopene than the other kinds. Lycopene works by scavenging free radicals while also preventing the

production of new ones. Many studies have shown that an aqueous extract of guava blossoming leaves has anti-prostate cancer activity in a cell line model, suggesting that it may be a potential anti-androgen-sensitive prostate cancer agent. Guava also has a high content of carotene, which has been linked to the prevention of lung and oral malignancies.

g. Antihypertensive and Hypolipidemic

It also includes potassium, which aids in blood vessel relaxation and, as a result, blood pressure management. The increased potassium and fiber content of guava fruit has been shown to result in substantial reductions in blood pressure and blood lipids when consumed on a regular basis. Furthermore, Guava has a high concentration of pectin, which lowers blood lipids by delaying meal absorption, lowering the risk of cardiovascular disease19. Gallic acid, catechins, epicatechins, rutin, naringenin, and kaempferol in the leaves, according to several writers, are responsible for inhibiting the enzyme pancreatic cholesterol esterase, resulting in reduced cholesterol in the blood. Catechins are useful as a hypercholesterolemia preventative treatment [20]. Quercetin has been linked to a lower risk of death from heart disease and a lower risk of stroke in people with hypertension and hyperlipedimiea. Guava has a modest amount of potassium, which helps to enhance heart health and prevent strokes by regulating high blood pressure and reducing cholesterol.

h. Gastrointestinal Issues

The flavonoid and quercetin content of guava leaves has been shown to protect against a variety of illnesses that originate in the gastrointestinal system. The leaves of Psidium guajava are an example of a plant that is widely used as a folk remedy for a variety of gastrointestinal problems. The alkalinity of fruits and leaves prevents harmful bacteria that cause gastroenteritis from growing. Guava is useful in the treatment of diarrhea because it inhibits microbial development, releases extra mucus from the gut, and therefore aids in the binding of loose stools. Guava contains numerous important vitamins and minerals, including carotenoids, vitamin C, and potassium, all of which help to prevent GIT issues. Chewing guava leaves on an empty stomach may help to eliminate excess mucus formation in the large intestine. Drinking guava leaf tea in moderation helps to keep stool consistency. Because of its high concentration of quercetin and flavonoids, guava leaf extract is used to treat gastrointestinal problems.

i. Antidiarrheal

It has been discovered that boiling 6-10 fresh tender guava leaves in a saucepan of warm water and drinking it on an empty stomach while still warm is extremely helpful in reducing diarrhea. P. guajava leaves, according to the researchers, exhibit a wide range antibacterial action (antigiardial and antirotaviral activity) that may be utilized to successfully treat diarrhea of pathogenic origin. The presence of significant flavonoids concentration in guava leaves may be linked to the antidiarrheal action. Guava barks are also used to cure diarrhea in children due to their astringent properties. Tea prepared from guava leaves or extract in a cup of hot water may aid with bowel movement. In 2008, the Journal of Smooth Muscle Research published an article in which researchers investigated the effects of guava leaves on rat peristalsis and discovered that the extract of guava leaves could delay the onset of castor oil-induced diarrhea, reduce the frequency of defecation, and reduce the severity of diarrhea in rats.

j. Antacid and ulcer-protective properties

Guava tea is still produced in most communities today by boiling 10-15 young Guava leaves in 3-4 cups of water and then drinking the warm mixture to get rid of acidity. In vitro, the methanolic extract had the best antacid and ulcer healing properties of all the extract solvents. The flavonoids and saponins contained in the Guava fruit and leaves have been shown to be helpful in reducing acidity and consequent stomach ulcers. The ulcer index of ethanol-induced ulcer in the stomach of Wister rats was significantly reduced by methanolic extract of Psidium guajava leaves at dosages of 500 and 1000 mg/kg body weight.

k. Wound Healing

Guava leaves have been utilized widely won wounds throughout the history of humanity from time immemorial. Guava leaves were ground into a paste with a little water or oil and applied to the wound surface by ancient Indian and Chinese peoples. When a methanolic extract of guava leaves was administered twice daily to an experimental wound, tannins and flavonoids showed quicker healing. Many studies have shown that ointment produced from guava leaves may heal wounds far quicker than commercially available products. The leaves are cleaned, crushed, and extracted with oil. To aid absorption, the extract is given a carrier (usually melted candle wax). The final combination is then administered twice daily for four days straight to the wound.

l. Anti-Allergy

Studies on methanol and aqueous extracts of Psidium guajava leaves revealed effective suppression of histamine release from mast cells as well as blocking IL-10-mediated in vitro activation of T regulatory (Tr) cells from CD4+ splenocytes of C57BL/6 mice. By directly inhibiting Tr cell function, the extracts altered the Th1/Th2 balance to a Th1 dominant state. In mice, guava leaf extracts reduced the allergic response mediated by T cells.

II. LITERATURE REVIEW

Escalera Cruz D et al. discussed health benefits of guava in which they explained how Fruits, like food, are a good source of antioxidants and offer essential elements including water, carbs, minerals, and vitamins. The purpose of this page is to explain the therapeutic and nutritional characteristics of guava (Psidium guajava L), which is also known as perulera, guava, and jalocote. Guava is a tropical fruit that's high in antioxidants. It is recommended to include in the diet for nutrients and natural substances containing: high in vitamin C (strengthens the immune system and stimulates the production of white blood cells); low in calories and carbohydrates (ideal for losing weight and protecting the

cardiovascular system); diuretic properties due to potassium content; pectin fiber type facilitating digestion It promotes circulation, combats diabetes, and regulates blood glucose levels [7].

Harjoko A et al. discussed Guava in which they explained how The fruit guava (Psidium guajava L.) offers many health advantages. Guava has a significant market share in Indonesia and has economic value. This implies that the guava item has been widely consumed by society. This time, the sorting is still done manually, which has a number of flaws. Because of humans' negligence, this categorization produces findings that are less precise and inconsistent. In the marketing industry, the grading procedure is critical. Because all fruit quality was valued the same, improper grading may be costly to farmers [8].

Murphy A discussed Cultivation, antioxidant properties and health benefits of guava in which he explained how Guava (Psidium guajava L.), a native of southern Mexico and Central America, now grows across South America, Europe, Africa, and Asia. It is commonly grown in tropical and subtropical areas and is gaining popularity throughout the globe. The first chapter of this book examines the productive characteristics, quality, and health advantages of guava. The composition of guava by-products, which control the functional characteristics, is the subject of Chapter Two. Guava's chemical makeup, antioxidant activity, and culinary uses are discussed in Chapter Three. The fourth chapter provides an overview of the basic and applied elements of guava fruit aroma compound synthesis [9].

Sunkara R et al. discussed Effect of Drying Techniques on Antioxidant Capacity of Guava Fruit in which they explained how Consumption of fruits and vegetables on a regular basis has been linked to a lower risk of chronic illnesses. The tropical fruit guava (Psidium guajava Linn.) is high in antioxidants, vitamin C, and polyphenol chemicals. One of the most popular techniques for preserving and extending the shelf life of guava is drying. The goal of this research was to see how drying methods affected the antioxidant activity of guava fruit. Guava was dried using an air drier (45 degrees Celsius), a freeze dryer, and osmatic drying methods [10].

III. DISCUSSION

Guava (Psidium guajava), a popular fruit that is often served as a dessert, has been shown to be high in nutrients such as vitamins and minerals that are beneficial to human health. Traditional medicine has utilized parts of the guava tree (root, bark, leaves, and fruits) to cure a variety of ailments. Guava extracts have the potential to be effective antioxidants in the treatment of hepatic and malignant disorders. Guava contains vitamins that enhance the body's immunity. Other health advantages include the capacity to combat illnesses like scurvy and thyroid disorders, as well as being necessary for the brain and vision, as well as weight loss compensation. The current paper focuses mostly on the positive actions of guava, as well as the fruit's nutritional composition and health advantages.

IV. CONCLUSION

The widespread use of allopathic medicines for illness treatment and prevention has resulted in the fast emergence of drug resistance. One of the most common causes of medication treatment failure is drug resistance. Drug resistance is one of the most common problems encountered during antimicrobial treatment. Resistance to natural treatment or Ayurvedic therapy, on the other hand, is very uncommon, which has prompted many individuals to convert from allopathic to Ayurvedic medicine. However, extracting the active component from the crude natural chemical poses a significant difficulty for researchers, necessitating the development of a simpler technique. Natural therapy is not only safe and easy to get, but it is also cost effective in the treatment and prevention of illness. Even doctors and practitioners are searching for alternative treatments for different illnesses these days, therefore the development of traditional herbal medicine based on natural resources must be prioritized.

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