



A Review On The Antifungal Potential Of Guava Leaf Extract

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Abstract:

The Myrtaceae family includes the guava tree (Psidium guajava L.), a fascinating and traditional plant grown for its many nutritional and therapeutic uses. One of the main natural sources of many bioactive substances is plants. The guava plant has numerous therapeutic uses and is frequently used in nutritional supplements and traditional remedies. Regarding nutritional content, one typical guava fruit has a wide range of vital elements and a comparatively low calorie count; it is noteworthy that it has around four times the amount of vitamin C present in an orange. Specifically, when quercetin was the sole therapy administered to fluconazole-resistant Candida albicans, minimal cell death was seen. The United States Food and Drug Organisation has generally classed quercetin as GRAS (generally recognised as safe). Phenolic substances such as gallic acid, catechin, luteolin, and quercetin have shown antifungal activity against a variety of Candida species, including Candida tropicalis and Candida albicans. It can be used to treat a wide range of illnesses.

Keywords:

Tropical, Sub tropical, Guava leaf, quercetin.

Introduction:



The guava tree (*Psidium guajava* L.), which belongs to the Myrtaceae family, is a remarkable and traditional plant cultivated for its wide-ranging medicinal and nutritional benefits. Plants serve as a primary natural source of numerous bioactive compounds [1]. In addition to being used as a dietary supplement, guava is significant in folk medicine, with various components of the plant exhibiting a range of therapeutic properties. Celebrated for its dual function as both a food and a remedy, guava has a rich historical background, originating in tropical regions. The leaves of the guava plant are particularly rich in bioactive compounds, including polyphenolic substances such as quercetin, various flavonoids, ferulic acid, caffeic acid, and gallic acids.

These compounds demonstrate strong antioxidant effects and possess stimulant activities [2]. Several characteristics, such as color, shape, venation, tip structure, roughness, texture, size, and edge morphology, are important in identifying leaf phenotypes. The leaves serve as a fungi and bacteria of static agent [3]. The plant is commonly referred to as “Guava” in English, “guayabo” in Spanish, “goyave” or “goyavier” in French, “guyaba” or “goeajaab” in Dutch, “goiaba” and “goaibeira” in Portuguese, and “jambubatu” in Malaya. It comprises approximately 133 genera and over 3,800 species. The species *Psidium guajava*, along with its various parts, has a long-standing history of medicinal value [7]. *Psidium guajava* is a sizable dicotyledonous shrub or petite evergreen tree, classified within the Myrtaceae family and indigenous to tropical regions of America. It is a widely recognized species known for its edible fruits. Nearly all its components have a historical context of therapeutic use.

This plant is capable of achieving full growth across a diverse array of soil types [4]. Guava leaves are characterized by their greenish hue, simplicity, and the absence of stipules, featuring short petioles, an entire margin, an ovate or acuminate tip, and a base that ranges from rounded to sub-acuminate. Additionally, the venation of these leaves is either pinnate or reticulate, with dimensions typically measuring 10 to 12 centimeters in length and 5 to 7 centimeters in width [8].

In terms of nutritional value, a single common guava fruit possesses a broad profile of essential nutrients with a relatively low calorie count; notably, it contains approximately four times the vitamin C found in an orange [6]. Extensive research in pharmacology has been conducted to highlight the medicinal benefits of extracts derived from guava leaves, demonstrating their efficacy as valuable therapeutic agents utilized by healthcare professionals, including doctors and pharmacists. The World Health Organization (WHO) also emphasizes that plants represent an optimal source for the development of various medications and pharmaceutical products. These natural substances are extensively employed by individuals due to their effective results [10].

The fruit is consumed in its natural state and is also processed into a variety of value-added products, including juice, jelly, jam, fruit butter, nectars, and syrups. Due to its delicate skin, guava is susceptible to bruising, necessitates low-temperature storage, and is at risk of microbial spoilage, which affects its shelf life as a fresh fruit [5]. Nonetheless, due to improper transportation, handling, and processing methods, the waste generated from fruit amounts to approximately 20-25% of the total guava yield.

This loss can be mitigated by transforming the fruit into various value-added products such as juice, jam, jelly, wine, and toffee. Jellies are particularly appealing to consumers because of their vibrant colors, smooth textures, pleasant flavors, and sweet taste. Typically, jelly is made by boiling a clear fruit extract with sugar, citric acid, additives, and pectin to achieve a semi-solid consistency. Additionally, aqueous extraction has been conducted to isolate the bioactive compounds from guava leaves, with their characterization completed through mass spectroscopy. Jellies containing and not containing guava extract were prepared in accordance with standard protocols, and subsequent proximate, texture, and organoleptic analyses were performed to fulfill the study's purposes [9].

It is widely grown all over the tropics and sub- tropics including India viz madhya pradesh, Wrisa, west bengal, Maharashtra, uttar pradesh, Bihar , Andhra pradesh, Tamil Nadu, Kamataka, rajasthan, Kerala, ,and many more states [11].

Antifungal activity:

Antifungal agents are substances that specifically prevent fungal infections by going after the disease-causing organisms. Stated differently, an antifungal agent is any material that treats mycoses by acting specifically against fungal diseases. The primary groups of these agents include polyenes, azoles, and allylamines, which are largely characterised by their chemical structures and modes of action [12, 13]. Numerous plants have been attained throughout the last several years. In light of this, the current study was conducted to assess the antifungal efficacy of locally accessible plant extracts of zingiber officinale, trachyspermum captivum, moringa oleifera, and Eugenia caryophyllata against *Fusarium solani*, which causes guava wilt [14].

Quercetin exhibits antifungal qualities against a variety of harmful fungus. Studies show that it inhibits the growth of dermatophytes, *Aspergillus* species, *Candida* species, and *Cryptococcus neoformans*, among others. Quercetin works against fungi by causing oxidative stress and compromising the integrity of their cell membranes, which eventually leads to cell death. In particular, little cell death was seen when quercetin was the only treatment given to fluconazole-resistant *Candida albicans*. On the other hand, fluconazole-resistant *Candida albicans* treated with a combination of quercetin and fluconazole showed a substantial increase in cell death [15, 16].

A potentially fatal illness that affects people with impaired immune systems. Numerous anatomical locations have been found to be impacted by *Candida albicans*, and its intricate pathogenic process has been investigated [17]. Quercetin exhibits antifungal properties against a variety of pathogenic fungi and has a bitter taste. The United States Food and Drug Organisation has generally classified quercetin as GRAS (generally accepted as safe) [19, 16]. Gallic acid, catechin, luteolin, and quercetin are among the phenolic compounds that have demonstrated antifungal efficacy against many species of *Candida*, including *Candida albicans* and *Candida tropicalis* [18].

Conclusion:

This study showed that the guava plant is valuable for health and also helpful for treating many more diseases. This demonstrated the strong antioxidant effect possessed the stimulant activity. Guava leaves serves the funga and bacteria to static agent. Guava leaves present the main constituents of quercetin to show the effectiveness against fungal infection.

They previously studied fluconazole-resistant *Candida albicans* treated with a combination of quercetin and fluconazole, which showed a substantial increase in cell death. They studied various actions of guava leaf in different diseases, such as antifungal, antioxidant, antibacterial, antiviral, and antidiabetic. Quercetin exhibits antifungal properties against a variety of pathogenic fungi and has a bitter taste. It is in high demand for guava plants. It is well known that Peru has a natural occurrence of crude plants.

Studied quercetin is among the phenolic compounds that have demonstrated antifungal efficacy against many species of *Candida*, including *Candida albicans* and *Candida tropicalis*.

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