REVIEW ARTICLE ISSN: 3139-8448 (print) & 3108-3218 (online)

BTS International Advanced Pharmaceutical Sciences Journal

Vol 01 | Issue 10 | October 2026 Journal homepage: www.btsempire.com

MANUSCRIPT ID: BTS1026008

Guava Oil: A Comprehensive Review of Pharmacognosy and Phytochemistry

Dr. Narendra Kumar Reddy Kolli, D Suresh babu, P. Nissy Praharsh.

Vikas group of Institutions, NTR District, Vijayawada, Andhrapradesh, India.

Corresponding Author Mail Id: drnkrkolli@gmail.com

Received: 26 September 2026 | **Revised & Accepted:** 24 October 2026

Keywords: Guava oil, Psidium guajava, Anti-inflammatory activity, Anti-cancer.

Abstract:

Essential oils have remained a popular herbal remedy for various chronic diseases since ages. But most of these products lack sufficient clinical evidence for therapeutic value. One such valuable variety of medicinal plants is Guava (Psidium guajava). This plant has found to have various applications in the treatment of different ailments such as, dysentery, gastroenteritis, high blood pressure, diabetes, tooth decay and pain relief. Alongside producing benefits for improving coordination and mobility. The medicinal properties of this plant are largely derived from its leaf extract, which is used for treating cough, oral ulcers and swollen gums. Additionally, the fruit of the plant is packed with essential nutrients like vitamins A and C, iron, phosphorus and calcium, as well as many other organic and inorganic compounds, including antioxidants, polyphenols, antiviral compounds and anti-inflammatory compounds. The phenolic components in guava are effective in fighting against cancer cells and preventing premature aging of the skin. Relaxation effects are produced by certain components like terpenes, caryophyllene oxide and p-selinene. Guava leaves contain multiple compounds that act as inhibitors of fungal and bacterial growth. This plant is also rich in antioxidants like quercetin, providing it with radio-protective abilities, to relieve muscle spasms. The extract of guava also demonstrates pain-relieving activity and is effective in reducing inflammation and promoting the production of serum in cases of liver damage. However, there is a need for detailed research to separate and characterize the precise antimicrobial elements and to delve into other potential medicinal impacts. As a result, once the crucial oil components are isolated, they can be employed as a curative solution for combatting contagious illnesses and many other advantages of this plant.

Introduction

Psidium guajava L., commonly referred to as guava, is a tropical American plant belonging to the. It is now grown across various tropical regions and has adapted to local environments. Within indigenous medicinal practices, different parts of the guava plant are utilized to treat a range of human ailments including wounds, ulcers, bowel issues and cholera.

Pharmacological studies have demonstrated that the bark, seeds, peels, pulp, fruit and leaves of the guava plant possess antibacterial, fruit crops cultivated in these areas.The plant of Guava has been valued since ancient times for its medicinal properties. Additionally, research in pharmacology has revealed that this plant possesses greater potential beyond being a mere source of fruit. Its abundant nutritional and phytochemical composition endow it with advantageous properties against various chronic illnesses. Utilizing

© BTS Pharma Empire All Rights Reserved

BTS International Advanced Pharmaceutical Sciences Journal
Vol 01 | Issue 10 | October 2026 Journal homepage: www.btsempire.com
MANUSCRIPT ID: BTS1026008

P. guajava contributes to the decrease in chronic disease risk and treatment. It is also economically significant for fruit-producing nations. Notably, this plant is safe for consumption, as indicated by non-toxicity and lack of mutagenicity in vivo tests, along with minimal potential for drug interactions. Presently, they have gained significant popularity for their potential in treating microbial diseases and for their beneficial properties, including anti-cancer, antioxidant and anti-inflammatory effects.
Furthermore, it's fruit by-products (seeds and skin) exhibit potential for future applications in the food and cosmetic sectors.They are extracted from plants using methods such as hydro distillation, steam distillation, hydro diffusion, or solvent extraction. These techniques separate the essential oils from the plant material, allowing them to be collected and used for various purposes. anti-inflammatory, antipyretic, spasmolytic and central nervous system depressant properties. This tropical plant, belonging to the, is extensively found in the Nepalese Terai, inner Terai and mountainous regions. It is highly esteemed for its medicinal qualities, economic viability and is one of the predominant. Guava oil is derived from the plant's leaves. These compounds contribute towards medicinal properties, making them suitable for various therapeutic applications. These include treating conditions such as diabetes, hyper tension respiratory diseases, obesity, reducing fever, promoting wound healing, relieving pain and exhibiting anti-inflammatory effects. The presence of phenols, terpenes, terpenoids, quercetin, glycosides, acetic acid, protocatechuic acid, citric acid, glutamic acid, malonic acid, cis-aconitic acid, trans-aconitic acid, epicatechin, asparagine and xanthine in guava leaves also grants it excellent antioxidant properties [1].

Furthermore, studies have shown that they inhibit cell growth in cancer cell lines, including breast cancer (MCF-7 and MDA-MB-231), prostate cancer (PC-3, DU 145 and LNCaP), cervical cancer (HeLa), colon cancer (COLO320DM) and nasopharyngeal cancer. However, many studies suggest that the varying ratios of its constituents are influenced by genetic factors and environmental conditions such as climate and soil characteristics that can trigger alterations in the plant's secondary metabolic processes [2].

Botanical source and Chemical Composition

Pharmacognosy of Guava Oil:

Iron, calcium, phosphorus and vitamin C are all present in guava fruit. Compared to an orange, it has higher vitamin C. The fruit contains flavonoids, quercetin, saponin and oleanolic acid. Guava have main components viz; ascorbic acid and citric acid which are crucial for its anti-mutagenic effect. Fruits are rich in volatile oil pleasant aroma is attributed to carbonyl chemicals. A total of 41 hydrocarbons, 25 esters, 13 alcohols and 9 aromatic compounds are present in guava. Essential oil found in leaves are α-pinene, -limonene, β –pinene, isopropyl alcohol, menthol, acetate, caryophyllene and β-bisabolene. The guava leaves also contain oleanolic acid. Also, mono- and sesquiterpenes make up most of the chemical composition. The essential oil has been associated with a variety of chromatographic patterns, demonstrating chemotype diversity. Even when they are present in very small concentrations (ppm), chemical tests of essential oils disclose the accessible components, both quantitatively and qualitatively. These oils may contain a variety of chemicals and identifying them could help with finding differences between genotypes, chemotypes and potential chemical markers [3].

© BTS Pharma Empire All Rights Reserved

BTS International Advanced Pharmaceutical Sciences Journal
Vol 01 | Issue 10 | October 2026 Journal homepage: www.btsempire.com
MANUSCRIPT ID: BTS1026008

Essential Oil Composition:

Methods of Extraction Guava oil has been avidly extracted using multiple methods including Soxhlet extraction, low pressure solvent extraction, ultrasound extraction, hydro distillation, supercritical fluid extraction, cold press. As various parts of this plant has been utilised to extract oil, each of the aforementioned method is specific to the phytoconstituents and the parts.

Different characterization Techniques:

To characterize and screen the phytoconstituents of guava oil, methods like Gas Chromatography, High-Performance Liquid Chromatography, Mass Spectrometry, Fourier Transform Infrared Spectroscopy, Nuclear Magnetic Resonance Spectroscopy, Differential Scanning Calorimetry, Rheology and Sensory Evaluation have been widely utilized as described in Table 1. Every method used is specific with respect to its utility in comprehending the class of constituents.

Medicinal properties of Psidium guajava (guava) oil:

Several therapeutic uses for the management of infantile rotaviral enteritis, diarrhoea and diabetes as shown in the [33,34] is often by crushing the leaves and applying the extract on wounds, boils, skin and soft tissue infected sites are some of the ethnomedical uses. The root-bark, bark and stem are astringent, whereas the fruit is diuretic, while leaves are astringent. Locally, a decoction of the leaves is quite beneficial for vertigo and aching disturbances. P. guajava leaf is a therapeutic used as an

Industrial and Commercial Application of Guava Oil:

Essential oils are essentially the most volatile part of a plant that has been physically removed and possesses the scent and other distinctive qualities of that plant. Essential oils have long been used to treat a variety of conditions, including obesity, diabetes mellitus, bronchitis, convulsions, epilepsy, wound pain and asthma attacks. In addition to eugenol, cineole and fat, the essential oil from guava leaves also contains tannins, flavonoids, triterpenes, malic acid and resin. Guava leaves are suitable for a variety of therapeutic purposes, including the treatment of rheumatoid arthritis, pain management, wound healing and fever reduction Along with the biological as well as medicinal uses of guava oil, it also has following industrial and commercial applications [4].

Guava Oil: A powerful skincare ingredient:Harmful free radicles are which are responsible for causing skin dame and premature ageing are inhibited by vitamins present in this oil. However, it also has nearly as much potassium, a crucial electrolyte, as a banana. Guava is a natural source of vitamin C, vitamin E and other bioactive antioxidants such as rutin, quercetin, gallic acid, catechin, chlorogenic acid, beta-carotene and lycopene. This makes it an appealing alternative to prevent and cure oxidative stressor damage that may otherwise result in dark spots, fine lines and wrinkles, as well as uneven skin texture. Collagen production is increased. This results in firmer, more elastic skin. Lycopene, a natural antioxidant, is abundant in guava vegetable oil, which offers significant anti-aging. Additionally, it nourishes and restructures the skin because of its composition in polyunsaturated fatty acids. Guava vegetable oil, which is extremely high in the omega-6 fatty acid linoleic acid, is fantastic for retaining moisture in the skin and maintaining its elasticity. Therefore, it would be beneficial to nourish the dry, dull skin and hair. Additionally, the oil's

© BTS Pharma Empire All Rights Reserved

BTS International Advanced Pharmaceutical Sciences Journal
Vol 01 | Issue 10 | October 2026 Journal homepage: www.btsempire.com
MANUSCRIPT ID: BTS1026008

carotenoid content enables skin protection. Vitamins C and A, which revitalize the skin and hair, are abundant in it as well. It is important not to confuse the vegetable oil extracted from the fruit's seeds with the guava tree's essential oil [5].

Fumigant Activity of the Psidium guajava:

Providing enough food for the world's population is one of the most difficult challenges due to the ongoing growth of population. Following are the ways to complete.

(i) expand the agricultural area.

(ii) maximize the output of the existing fields. One of the biggest challenges to cultivated crops. Is insect pests, which has a significant negative impact on global productivity. Fumigant Activity of the Psidium guajava Providing enough food for the world's population is one of the most difficult challenges due to the ongoing growth of population. Following are the ways to complete

(iii) expand the agricultural area

(iv) maximize the output of the existing fields. One of the biggest challenges to cultivated crops is insect pests, which has a significant negative impact on global productivity.

Guava Leaves Extract as the Corrosion Inhibitor:

Further investigation reveals the most effective metal corrosion inhibitor, thanks to the nature's rich organic source of corrosion inhibitors. According to a qualitative analysis using FeCl3 and which produced white precipitates that showed the presence of tannins forming a film layer on the surfaces of the materials, guava leaves are one of the sources currently under discussion as a corrosion inhibitor in corrosive media. Guava leaf extracts added to a NaOH solution increase anodic and cathodic polarization resistance, which lowers corrosion density. The higher value of anodic suggests that the extract from guava leaves has a significant impact on anodic reaction. Additionally, a phytochemical analysis of the extracts of guava leaves shows that they contain active secondary metabolite components, including tannins, terpenoids and flavonoids. Because of this, it can regulate the rate of iron corrosion in seawater as a water [6].

Synergistic Effect of Guava oil

Rapid urbanisation and industrialization have frequently caused water's microbiological quality to decline. The drinking water has been poisoned, even in metropolitan areas. Some of the most common inhabitants of water are Escherichia coli and it pathotypes. The major cause of infectious diarrhoea and other gastrointestinal disorders among them is Enterotoxigenic Escherichia coli (ETEC). The pathogen possesses virulent and antibiotic-resistant genes that account for its virulence and resistance. The persistence of such ETEC strains is frequently linked to disease outbreaks. The drug-resistance profile of ETEC, isolated from drinking water, is the subject of the current study. Chemically created zinc oxide nanoparticles were tested for antibacterial efficacy against drug-resistant types of bacteria. Guava leaf extracts were employed and their synergistic investigation with Zinc Oxide nanoparticles was conducted, to boost the antibacterial activity of nanoparticles. Zn O-NPs were created by means of a chemical reduction process. Comparing synthetic Zn O-NPs to traditional antibiotics, they exhibit improved antibacterial activities. Additionally, the synergistic effects of Zn O-NPs against ETEC were investigated using guava leaf extract and were successful [7].

© BTS Pharma Empire All Rights Reserved

BTS International Advanced Pharmaceutical Sciences Journal
Vol 01 | Issue 10 | October 2026 Journal homepage: www.btsempire.com
MANUSCRIPT ID: BTS1026008

Safety and Toxicity of Guava Oil Toxic Study Guava Seed Oil (GSO):

The primary mouse hepatocytes and PBMC were shown to be unaffected by GSO at up to 24 and 48 hr, when their cell viability was greater than 80%. All mice given GSO (10 mg/kg, orally) survived the whole duration of the trial and during the observation period of 14 days after treatment, they exhibited no significant aberrant clinical indications or side effects, according to the results of an acute toxicity test. The animals that were slaughtered at termination had no abnormalities, according to a macroscopic assessment. The findings imply that GSO had an oral LD50 larger than 10 mg/kg and was therefore practically harmless to animals. Acute injection of the GSO n-hexane extract was not hazardous to mouse hepatocytes, human PBMC, or experimental rats and included a variety of lipophilic chemicals (LA as the main component, tocopherols and tocotrienols), as well as polar phenolic compounds. The sub chronic toxicity study's findings demonstrated that levels of biomarkers and indicators of kidney and liver function did not alter significantly as a result of the GSO treatment [8].

Future Prospects:

The group of scientists when performed experiments to evaluate the efficiency of guava oil and revealed that various parts of P. guajava contain abundant secondary metabolites, particularly phenolics, flavonoids, squalene and Vitamin E. This characteristic makes the plant a promising source of antioxidants for use in nutraceuticals and functional food products. Analysis of the plant's essential oil identified the presence of caryophyllene and its derivatives, highlighting potential as an anti-inflammatory agent. Another notable feature of P. guajava is its high content of meroterpenoids, primarily derived from phloroglucinol. These compounds are primarily produced by different fungi and possess immunosuppressive activity [9, 10].

Conclusion

Extensive research conducted over the past decade has yielded significant advancements in the discovery of pharmacological agents from natural sources. Natural products with specific activity and low toxicity have been identified as promising lead compounds. This comprehensive review highlights the strong evidence supporting the antidiarrheal, antimicrobial, antioxidant and various other beneficial activities of Psidium guajava L. The fruit and its juice are widely enjoyed for their delicious taste and nutritional benefits. The essential oil that exhibits the strongest antimicrobial properties has the potential to be employed as a natural substitute for antibiotics. This study presents a brief scientific overview of the selected essential oil. Additionally, further investigation is necessary to isolate and identify the specific antimicrobial compounds and explore additional pharmacological effects. Consequently, once the essential oil is isolated, it can be utilized as a medicinal remedy for the treatment of infectious diseases. However, further clinical and pharmacological studies are necessary to fully explore the untapped potential of this plant and gain a comprehensive understanding of its beneficial effects.

Acknowledgement

The authors are thankful to Bharati Vidyapeeth (Deemed University), Poona College of Pharmacy for the provision of infrastructure and facilities to conduct the research.

© BTS Pharma Empire All Rights Reserved

BTS International Advanced Pharmaceutical Sciences Journal
Vol 01 | Issue 10 | October 2026 Journal homepage: www.btsempire.com
MANUSCRIPT ID: BTS1026008

References

1. Gutierrez RMP, Mitchell S, Solis RV. Psidium guajava: a review of its traditional uses, phytochemistry and pharmacology. J Ethnopharmacol. 2008;117(1):1-27. doi:10.1016/j.jep.2008.01.025.
2. Kumar M, Tomar M, Amarowicz R, Saurabh V, Nair MS, Maheshwari C, et al. Guava (Psidium guajava L.) leaves: nutritional composition, phytochemical profile, and health-promoting bioactivities. Foods. 2021;10(4):752. doi:10.3390/foods10040752.
3. Wang L, Wu Y, Huang T, Shi K, Wu Z. Chemical compositions, antioxidant and antimicrobial activities of essential oils of Psidium guajava L. leaves from different geographic regions in China. Chem Biodivers. 2017;14(9):e1700114. doi:10.1002/cbdv.201700114.
4. Silva EAJ, Estevam EBB, Silva TS, Nicolella HD, Furtado RA, Alves CCF, et al. Antibacterial and antiproliferative activities of the fresh leaf essential oil of Psidium guajava L. (Myrtaceae). Braz J Biol. 2019;79(4):697-702. doi:10.1590/1519-6984.189089.
5. Chaturvedi T, Singh S, Nishad I, Kumar A, Tiwari N, Tandon S, et al. Chemical composition and antimicrobial activity of the essential oil of senescent leaves of guava (Psidium guajava L.). Nat Prod Res. 2021;35(8):1393-1397. doi:10.1080/14786419.2019.1648462.
6. Zhang X, Wang J, Zhu H, Wang J, Zhang H. Chemical composition, antibacterial, antioxidant and enzyme inhibitory activities of the essential oil from leaves of Psidium guajava L. Chem Biodivers. 2022;19(5):e202100951. doi:10.1002/cbdv.202100951.
7. Alam A, Jawaid T, Alsanad SM, Kamal M, Balaha MF. Composition, antibacterial efficacy, and anticancer activity of essential oil extracted from Psidium guajava (L.) leaves. Plants (Basel). 2023;12(2):246. doi:10.3390/plants12020246.
8. Narvaez-Cuenca CE, Inampues-Charfuelan ML, Hurtado-Benavides AM, Parada-Alfonso F, Vincken JP. The phenolic compounds, tocopherols, and phytosterols in the edible oil of guava (Psidium guava) seeds obtained by supercritical CO2 extraction. J Food Compos Anal. 2020;89:103467. doi:10.1016/j.jfca.2020.103467.
9. Huang J, Li C, Ma J, Xu K, Chen X, Jiang J, et al. Chemical constituents of Psidium guajava leaves and their antibacterial activity. Phytochemistry. 2021;186:112746. doi:10.1016/j.phytochem.2021.112746.
10. Chechani B, Roat P, Hada S, Yadav DK, Kumari N. Psidium guajava: an insight into ethnomedicinal uses, phytochemistry, and pharmacology. Comb Chem High Throughput Screen. 2024;27(1):2-39. doi:10.2174/1386207326666230426093315.

© BTS Pharma Empire All Rights Reserved