

Review for the Phytochemical Constituents Present in Psidium Guajava L. and Psidium Guajava

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Abstract: There are three different varieties of guava, ripe apple guavas (*Psidium guajava*), lemon guava (*Psidium littorale* var. *littorale*) and strawberry guava (*Psidium littorale* var. *cattleianum*). The chemical constituents present in the leaves of *Psidium guajava* and *Psidium guajava* L were found out using different solvents. The leaf extract has also shown to have tranquilizing effect on intestinal smooth muscle, inhibit chemical processes found in diarrhea and aid in the re-absorption of water in intestines. A recent study has suggested that the anti diarrheal activity is happening through the inhibition of intracellular calcium release. The effective use of guava in diarrhea, dysentery and gastroenteritis can also be related to guava's documented antibacterial properties^{1,2}.

Keywords: *Psidium Guajava Leaf, Psidium Littorale Leaves, Screening Test*

I. INTRODUCTION

Guava is very common in Asian countries but it is increasingly available in the western world, particularly as more of its health benefits are revealed. It is somewhat a round or pear-shaped second fruit and is light green, yellow, or maroon in colour on the outside when ripe. Guava also has white or maroon flesh and lots of small hard seeds are enveloped in very soft, sweet pulp. It is eaten raw (ripe or semi-ripe) or in the form of jams and jellies.

A. Taxonomic classification:

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Myrtales

Family: Myrtaceae

Genus: *Psidium*

Species: *Psidium guajava*

The leaves of guava contain an essential oil rich in cineol, tannins, triterpenes, flavonoids, resin, eugenol, malic acid, fat, cellulose, chlorophyll, mineral salts, and number of other fixed substances.

The bark of the plant contains tannins (12-30%) and calcium oxalate crystals, while the seeds contain glycine rich proteins, starch and phenolic and flavonoids compounds^{3,4}. The roots are also rich in tannins⁵. The plant also contains leukocyanidins, sterols and gallic acid in the roots⁶.

Leaves are ground in to a paste, applied on wounds and ulcer. Leaves are also chewed to relieve toothache⁷. In China, the leaves are used as antiseptic for treatment of diarrhoea⁸.

It was also proofed that the bark extract showed significantly higher antioxidant activity in scavenging of DPPH, superoxide and Nitric oxide free radicals.

The leaf and bark extracts are used in vitro antimicrobial activity mostly associated with flavonoids, such as morin glycosides, quercetin, and quercetin glycosides^{9,10,11}.

This study was aimed at bringing awareness of chemical compounds present in the leaf of *psidium gaujava* and *psidium littorale* and the screening test was tabulated and also it was having many more compounds that were highlighted for further application.

Psidium guajava leaf extract at 250mg/ml and 200mg/ml concentrations completely inhibited virus growth in embryonated eggs as revealed by the survival of embryos of the inoculated eggs.

The Phyto derivatives of *Psidium guajava* are used as an remedy for dental caries. Dental caries is also known as tooth decay or a cavity, a disease where bacterial processes change carbohydrate like sugar in food left on teeth to acid that demineralises hard tooth structure (enamel, dentin, and cementer)¹².

Some authors have found the essential oil of *Psidium guajava* *Littorale*. Leaves were predominated by sesquiterpenes. In Tunisia, Khadhri et.al (2014) reported that veridiflorol (36.4%) and trans-caryophyllene (5.9%) were the major constituents of *P.guajava* L.leaf oil¹³.

In India, numerous medicinal plants are used for the treatment of liver disorders. One of the plants used traditionally is guava plant, *Psidium guajava* Linn. (Myrtaceae).

II. MATERIALS AND METHODS

Extraction Methods Used on Guava.

The leaf samples were washed in tap water, dried and placed into a blender to be ground into powder. Four solvents were arranged in increasing polarity; n-hexane (>95%), methanol (>95%), ethanol (>99.5%), and boiling distilled water were used for the maceration extraction procedure. The leaf powder was added to each of the solvents to make 20% concentration. The mixtures were made in sterile 125mL Erlenmeyer flask wrapped in aluminium foil to avoid evaporation and exposure to light for 3 days at room temperature. The flasks were placed on a platform shaker at 70rpm. After 3 days of soaking in solvent, the mixtures were transferred to 50mL tubes and centrifuged for 10min at 4,000 rpm at 25°C. The supernatant was collected and stored at 4°C until use¹⁴.

Phytochemical screening of leaf extract of *Psidium guajava* Linn

Extracts	Phenols and tannins	Saponins	Terpenoids	Flavonoids	Glycosides
n-Hexane	-	-	-	-	-
Methanol	+	-	+	+	+
Ethanol	+	-	+	+	+
Distilled Water	+	+	+	+	+

(+) Presence of constituent (positive),

(-) Absence of constituent(negative)¹⁴

Preparation of Plant Extract of *Psidium guajava*

The leaves of *Psidium guajava* were sorted to eliminate any dead matter and other unwanted particles after which they were air-dried for 2 weeks and pulverized before the commencement of the extraction. The extraction was carried out as described by Njar et al.(1993) and Raji (1995).The pulverized leaves weighing 245g was exhaustively extracted

with distilled water by means of cold extraction and extract evaporated in vacuo. The leaf extract was then concentrated in vacuo using a rotary evaporator at 40°C. The solvent remaining in the extract was finally removed by placing the extract in porcelain dishes in temperature-controlled oven to give a residue weighing 9.55g .The resulting extract was reconstituted in 9.55ml of sterile distilled water to give a final concentration of 1000mg/ml¹⁵.

Phytochemical screening of leaf extract of *Psidium guajava*

Extracts	Steroids and terpenoids	Flavonoids	Carbohydrates	Phenolic compounds	Saponins	Tannins
Acetone	+	+	+	+	+	+
Chloroform	-	-	-	-	+	-
Ethanol	+	+	+	-	-	-

(+)Presence of constituent (Positive), (-) Absence of constituent (negative)¹⁵

RESULT AND DISCUSSION

The screening test reveals the possibility of chemical constituents in both *Psidium guajava* L. and *Psidium guajava*. Different solvents were used to do the analysis. The leaves of *Psidium guajava* L. has many chemical constituent than the *Psidium guajava* leaves extract. In common for both the leaves' extract ethanol is used, in that also the presence of chemical constituents is high in *Psidium guajava* L.

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