



CODEN [USA]: IAJ PBB

ISSN : 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**

SJIF Impact Factor: 7.187

<https://doi.org/10.5281/zenodo.7544240>Available online at: <http://www.iajps.com>

Research Article

**CHARACTERIZATION EVALUATION AND IN VITRO  
ANTIOXIDANT TESTING OF PSIDIUM GUAJAVA (STEM)**Ramkishan Kushvaha, Dr. Vivekanand Katare\*<sup>1</sup>, Mr. Shriram Sen<sup>1</sup>, Dr. Prabhat Kumar Jain<sup>2</sup><sup>1</sup>Vivekanand College of Pharmacy, Bhopal (M.P.), <sup>2</sup>Scan Research Laboratories, Bhopal (M.P.)**Article Received:** December 2022    **Accepted:** December 2022    **Published:** January 2023**Abstract:**

*Herbal therapy, an oldest kind of medicare known to humans and involves the use of entire plant or plant part, for the treatment of various debilitating diseases or to support good health. Natural herbs were extensively used for the treatment and prevention of various ailments since ancient times. Guava (Psidium guajava Linn.) Family Myrtaceae is important plant used traditionally for medicinal purpose. Psidium guajava, is an important food crop and medicinal plant in tropical and subtropical countries is widely used like food and in folk medicine around of the world. The pharmacological actions and the medicinal uses of aqueous extracts of guava leaves in folk medicine include the treatment of various types of gastrointestinal disturbances such as vomiting, diarrhea, inhibition of the peristaltic reflex, gastroenteritis, spasmolytic activity, dysentery, abdominal distention, flatulence and gastric pain. This study focuses on Characterization evaluation and in vitro antioxidant testing of Psidium guajava Stem. The results showed percentage yield of methanolic extract of Psidium guajava as 13.6%. The results of the phytochemical test indicated the presence of phenols, Diterpenes, proteins and amino acids, flavonoids, and carbohydrates. The TLC Profile results indicated the presence of flavonoids, a bioactive molecule with a variety of pharmacological actions. The DPPH method for determining antioxidant potential was performed. The IC50 value obtained for methanolic extract of Psidium guajava was 65.31%. From above obtained results it can be concluded that the stem of Psidium guajava have potent antioxidant potential.*

**Keywords:** *Psidium guajava, Anti-oxidant, TLC, IC50***Corresponding author:****Vivekanand Katare,**

Vivekanand College of Pharmacy, Bhopal (M.P.)

QR code



Please cite this article in press Vivekanand Katare et al, *Characterization Evaluation And In Vitro Antioxidant Testing Of Psidium Guajava (Stem)*., Indo Am. J. P. Sci, 2023; 10(01).

**INTRODUCTION:**

Since ancient times natural herbs were extensively used for the treatment and prevention of various ailments and in past few decades, due to an extensive research in traditional system of medicine various herbal medicines have been developed for the prevention and treatment of diseases, which are environmentally, organically safe and inexpensive. Indian sub-continent has a good capability to tackle the task of meeting the worldwide demand for such products due to its rich wealth in case of herbal medicine. Historically, Indian people conventionally played a vital role in the development and management of these biological sources (Namjooyan *et al.*, 2014).

Herbal therapy, an oldest kind of medicare known to humans and involves the use of entire plant or plant part, for the treatment of various debilitating diseases or to support good health. Natural herbs were extensively used for the treatment and prevention of various ailments since ancient times. Based on pros and cons in this field leads to the generation of new herbal remedies which are beneficial for health, with no or minimal side effects. The collected rich knowledge about natural products has progressively developed into various systems including traditional Indian medicine, European medicine, Japanese Kampo, traditional Chinese medicine, or traditional Arabic and Islamic medicine and folk medicines (Payyappallimana, 2010).

Guava (*Psidium guajava* Linn.) Family Myrtaceae is important plant used traditionally for medicinal purpose. *Psidium guajava*, is an important food crop and medicinal plant in tropical and subtropical countries is widely used like food and in folk medicine around of the world. A survey of the literature shows *P. guajava* is mainly known for its antispasmodic and antimicrobial properties in the treatment of diarrhoea and dysentery. It has also been used extensively as a hypo-glycaemic agent (Thaipong *et al.*, 2006).

The pharmacological actions and the medicinal uses of aqueous extracts of guava leaves in folk medicine include the treatment of various types of gastrointestinal disturbances such as vomiting, diarrhea, inhibition of the peristaltic reflex, gastroenteritis, spasmolytic activity, dysentery, abdominal distention, flatulence and gastric pain. These extracts have also been indicated to cause disturbances of the central nervous system: insomnia, convulsions and epilepsy. Bronchitis, asthma attacks, cough, pulmonary diseases could be also treated with guava teas and could also be useful as anti-

inflammatory and hemostatic agent. Moreover, aqueous extracts of guava leaves were described to be effective against a number of microbial strains and anti-rotavirus activity. The classical approach in the search of new lead molecules for management of various diseases. Thorough screening of literature available on *Psidium guajava* depicted the fact that it is a popular remedy among the various ethnic groups, vaidhyas, hakims and Ayurvedic practitioners for cure of ailments. It is needed to explore this plant very thoroughly and researchers are exploring the therapeutic potential of this plant (Koo and Mohamed, 2001; Mittal *et al.*, 2010).

This study focuses on Characterization evaluation and in vitro antioxidant testing of *Psidium guajava* Stem.

**MATERIAL AND METHODS:****Collection of plant materials:**

The Stem of *Psidium guajava* were collected from Indrapuri Garden, Bhopal in the period of September 2022.

**METHODS:****Extraction:**

Collected plant drugs namely *Psidium guajava* (Stem) were cleaned properly and washed with distilled water to remove any kind of dust particles. Cleaned and dried plant drugs were converted into moderately coarse powder in hand grinder. Powdered plant drugs were weighed (140 gm) and packed in (1 liter) air tight glass Bottle. The plant drugs were subjected to extraction by Methanol as solvent for about 24 hrs. The liquid extracts were collected in a tarred conical flask. The solvent removed from the extract by evaporation method using hot plate. The extracts obtained with each solvent were weighed to a constant weight and percentage w/w basis was calculated (Kokate, 1994).

**Phytochemical Analysis:**

Preliminary phytochemical screening means to investigate the plant material in terms of its active constituents. In order to detect the various constituents present in the Methanolic extract of *Psidium guajava*, were subjected to the phytochemical tests as per standard methods (Harborne, 1973).

**Thin layer chromatography:**

TLC was produced with the aim of identifying the individual substances in a mixture and also testing for purity or for separation of mixtures. The mobile phase was made up of Toluene: Ethyl acetate: Formic acid in ratio of 5:4:1. The separation of solutes is carried out a layer of adsorbent that is adhered to a flat surface of inert materials like a glass plate or a polyester film. Traditionally, analytical TLC has

found application in the detection and monitoring of compounds through a separation process. The height of the solvent front and center of spots were measured in the form of  $R_f$  value. The  $R_f$  value indicates the position the position at which a substance was located in the chromatogram (Sherma and Fried,2003).

#### Antioxidant Activity:

DPPH free radical scavenging assay DPPH scavenging activity was measured by modified method. DPPH scavenging activity was measured by the spectrophotometer. Stock solution (6 mg in 100ml methanol) was prepared such that 1.5 ml of it in 1.5 ml of methanol gave an initial absorbance. Decrease in the absorbance in presence of sample extract at different concentration (10- 100  $\mu\text{g/ml}$ ) was noted after 15 minutes. 1.5 ml of DPPH solution was taken and volume made till 3 ml with methanol, absorbance was taken immediately at 517 nm for control reading. 1.5 ml of DPPH and 1.5 ml of the test sample of different concentration were put in a series of

volumetric flasks and final volume was adjusted to 3 ml with methanol. Three test samples were taken and each processed similarly. Finally, the mean was taken. Absorbance at zero time was taken for each concentration. Final decrease in absorbance was noted of DPPH with the sample at different concentration after 15 minutes at 517 nm. The percentage inhibition of free radical DPPH was also calculated (Olufunmiso and Afolayan, 2011).

#### RESULTS AND DISCUSSION:

The percentage yield of methanolic extract of *Psidium guajava* was found to be 13.6%. The results of the phytochemical test indicated the presence of phenols, Diterpenes, proteins and amino acids, flavonoids, and carbohydrates. The TLC Profile results indicated the presence of flavonoids, a bioactive molecule with a variety of pharmacological actions The DPPH method for determining antioxidant potential was performed. The IC50 value obtained for methanolic extract of *Psidium guajava* was 65.31%.

**Table: 1 Extractive values obtained from *Psidium guajava***

S.N.	Solvent	% Yield
1.	Methanol	13.6%

#### Phytochemical screening of *Psidium guajava*

**Table: 2 Preliminary phytochemical screening of *Psidium guajava***

S.N.	Phytoconstituents	Test Name	Methanolic Extract
1	Alkaloids	Wagner's Test	-(ve)
2	Carbohydrates	Fehling's Test	+(ve)
3	Flavonoids	Lead acetate	+(ve)
		Alkaline reagent test	+(ve)
4	Proteins & Amino acids	Precipitation test	+(ve)
5	Phenols	Ferric chloride test	+(ve)
6	Diterpenes	Copper acetate test	+(ve)
7	Saponins	Foam test	-(ve)

#### Results of TLC profile

##### Visible light:

**Table 3:  $R_f$  value of various sports**

Sport	$R_f$ value(cm)
1.	0.62
2.	0.78
3.	0.92
Standard	0.46

## Short UV

Table 4: Rf value of various sports

Sport	Rf value(cm)
1.	0.56
2.	0.68
3.	0.82
4.	0.92
Standard	0.46

## Long UV:

Table 5: Rf value of various sports

Sport	Rf value(cm)
1.	0.42
2.	0.62
3.	0.72
4.	0.86
Standard	0.46

Table 6: % Inhibition of Methanolic extract of *Psidium guajava*

S. No.	Concentration (µg/ml)	Methanolic extract ( <i>Psidium guajava</i> )		
		Absorbance	% Inhibition	IC 50
1	10	0.289	12.95181	65.31
2	20	0.274	17.46988	
3	40	0.220	33.73494	
4	60	0.169	49.09639	
5	80	0.116	65.06024	
6	100	0.108	67.46988	

**CONCLUSION:**

The results of the phytochemical test indicated the presence of phenols, Diterpenes, proteins and amino acids, flavonoids, and carbohydrates. *Psidium guajava* extract was discovered to be devoid of alkaloids and saponins. The TLC Profile results indicated the presence of flavonoids, a bioactive molecule with a variety of pharmacological actions. This plant *Psidium guajava* was also subjected to in vitro antioxidant activity, which demonstrated the existence of antioxidants needed to combat free radicals. In order to treat many diseases and ailments, this plant portion can be used.

**REFERENCES:**

- Namjooyan F, Ghanavati R, Majdinasab N, Jokari S, Janbozorgi M. Uses of complementary and alternative medicine in multiple sclerosis. *J Tradit Complement Med.* 2014;4(3):145-52. doi: 10.4103/2225-4110.136543, PMID 25161918.
- Payyappallimana U. Role of traditional medicine in primary health care: An overview of perspectives and challenging; 2010
- Thaipong K, Boonprakob U, Crosby K, Cisneros-Zevallos L, Byrne DH: Comparison of ABTS, DPPH, FRAP, and ORAC assays for estimating antioxidant activity from guava fruit extracts. *J Food Compos Anal* 2006; 19: 669–675.
- Koo MH, Mohamed S: Flavonoid (myricetin, quercetin, kaempferol, luteolin and apigenin) content of edible tropical plants. *J Agric Food Chem* 2001; 49: 3106–3112.
- Mittal P, Gupta V, Kaur G, Garg AK, Singh A. Phytochemistry and pharmacological activities of *Psidium guajava*. *IJPSR.* 2010;1(9):9-19.
- Kokate CK. *Practical Pharmacognosy.* 4th edition. Delhi: Vallabh Prakashan; 1994.
- Harborne JB. *Phytochemical methods.* London: Chapman and Hall; 1973
- Sherma, J., & Fried, B. (Eds.). (2003). *Handbook of thin-layer chromatography.* CRC press.
- Olufunmiso OO, Afolayan AJ, Phenolic content and antioxidant property of the bark extract of *Ziziphus mucronata* willd. Subsp. *mucronata* willd, *BMC Complement Alter Med* 2011; 11:130