
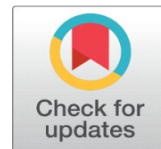


# ANTIBACTERIAL AND PHYTOCHEMICAL STUDIES OF PSIDIUM GUAJAVA LEAF EXTRACT

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## ABSTRACT

The pharmacological studies of the hydro-methanolic leaves extract of *Psidium guajava* was undertaken using Disk diffusion method. The secondary metabolites such as alkaloids, phenols, saponins, and tannins were present in *Psidium guajava* extract in phytochemical screening, it also showed antibacterial activities. The study is important because different part of *Psidium guajava* is used for treatment of various ailments in traditional medicine.

**Keywords:** Antibacterial, Photochemical, *Psidium Guajava*

**Received** 16 October 2021  
**Accepted** 16 November 2021  
**Published** 30 November 2021

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**DOI**  
[10.29121/granthaalayah.v9.i11.2021.4297](https://doi.org/10.29121/granthaalayah.v9.i11.2021.4297)

**Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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## 1. INTRODUCTION

The roots, bark, and leaves extract of Guava or *Psidium guajava* are used to treat various ailments in folk medicine. Morton (1987). The fruits of *Psidium guajava* contain vitamin C, vitamin A, iron, calcium and phosphorus Iwu (1993). It has 5 times richer in vitamin C than oranges Conway (2001). Manganese, phosphoric, oxalic and malic acids are also present in the fruit of Guava Nadkarni and Nadkarni (1999). The guava extract was reported antimicrobial activity against different bacteria strains Iwu (1993), Gnan and Demello (1999), Pranee (1999). The leaves have antiseptic properties Hernandez (1971), anti-inflammatory and analgesic activities Muruganandan et al. (2000). The ripe fruit is mildly laxative and the unripe fruit is indigestible Conway (2001). It is the remedy for diarrhea in folk medicine Wei et al. (2000).

## 2. MATERIALS AND METHODS

### 2.1. EXTRACTION PROCESS

#### Procedure

The *Psidium guajava* leaves were collected from the local area of Satna, cleaned and dried for few days in shade. Then powder was made with the help of grinder. 50 gms of leaves powder was taken in a separating funnel and added 50% methanol, then mixed it gently. After every 24 hours extract was collected in a beaker till the solvent appeared colorless. The final extract was pooled together and powder was made at 40°C in water bath. The total weight of dried powder was weighed. The desired amount of powder was dissolved in double distilled water before the final administration. Phytochemical screening was undertaken as per method reported by Agrawal, RC, 2021

## 2.2. ANTIBACTERIAL ACTIVITY

### Microorganisms used

The test organisms were obtained from the Department of Research, PBCRI Satna (M.P.). Antibacterial screening was undertaken at different concentration of 50% methanolic extract of *Psidium guajava* leaves the paper disc having the same diameter absorbed the concentration of extract as per method described by Kirby-Bauer (Disc diffusion method). The detail method is described in our published paper [Agrawal \(2021\)](#)

## 3. RESULTS

### 1) Phytochemical screening

**Table 1** Phytochemical present in the hydromethanolic extract of *Psidium guajava* extract

S.No.	Test	Results
1.	Test for Carbohydrates and reducing sugars	-
2	Test for Phenolic compound's	+
3	Test for Tannins	+
4	Test for Proteins	-
5	Test for Saponins	+
6	Test for Alkaloids	+

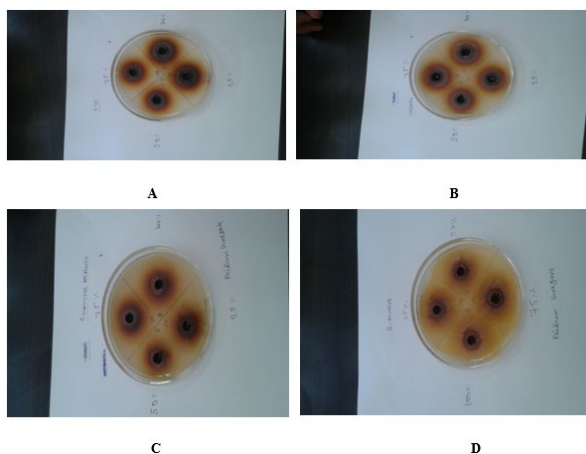
+ indicate present, - indicate absent.

### 2) Antibacterial Activitys

*Psidium guajava* exhibited antibacterial activity against *S.aureus*, *Klebsellia*, *Ps auregosa* and *E. coli* at the extract of leaves of at the different concentration

**Tables 2** Studies of Antibacterial Activity of *Psidium Guajava*

Name of microorganisms	% Concentration of Extract / [zone of inhibition(mm)]			
	25	50	75	100
<i>S.aureus</i>	12	11	15	10
<i>Klebsellia</i>	15	12	13	17
<i>Ps.auregiosa</i>	11	10	13	11
<i>E. Coli</i>	10	8	9	10



**Figure 1** showed A, B, C and D showed the zone of inhibitions

#### 4. DISCUSSION AND CONCLUSION

Recent scientific research has established the presence of many active compounds in this plant that are known to possess specific pharmacological properties. Present study showed that *Psidium guajava* leaves extract caused antimicrobial activity against gram positive and gram-negative bacteria. These results support the findings of Egharevba et al. (2010) and Biwas et al. (2013) which also reported the antibacterial effect of guava leaves extracts and found that they inhibited the growth of *S. aureus*. However, the ethanolic extract showed stronger inhibition than the aqueous extract against the organisms. Phenols, saponins, Tannins and Alkaloids were present in the 50 % methanolic extract of *Psidium* extract. *Psidium Guajava* may be used for development of modern drugs for various ailments.

#### ACKNOWLEDGEMENTS

The author is thankful to Ms. Shikhaq dahiya, Dissertation student for carrying out some part of the work.

#### REFERENCES

- Agrawal, R.C. (2021) Pharmacological studies of *Mangifera indica* leaves extract. *World journal biology, Pharmacy and health sciences*. 7 (3), 73-79. Retrieved from <https://doi.org/10.30574/wjbphs.2021.7.3.0100>
- Biwas, B., Rogers, K., McLaughlin, F., Daniels, D. and Yadav, A. (2013). Antimicrobial Activities of Leaf Extracts of Guava (*Psidium guajava* L.) on Two Gram-Negative and Gram-Positive Bacteria. *International Journal of Microbiology*, 1-7. Retrieved from <https://doi.org/10.1155/2013/746165>
- Conway, Peter: (2001) *Tree Medicine - a comprehensive guide to the healing power of over 170 trees*. Judy Piatkus (Publishers) Ltd. Retrieved from [https://doi.org/10.1016/S0962-4562\(02\)00076-0](https://doi.org/10.1016/S0962-4562(02)00076-0)
- Egharevba, H. O., Iliya, I., Ibekwe, N., Abdullahi, M. S., Okwute, S. K. and Okogun, J. I. (2010). Broad Spectrum Antimicrobial Activity of *Psidium guajava* Linn. Leaf. *Nature and Science* 8(12), 43-50
- Gnan, S. O., Demello, M. T. (1999) Inhibition of *Staphylococcus aureus* by aqueous *Goiaba* extracts. *Journal of Ethnopharmacology*. 68, 1/3, 103-108. Retrieved from [https://doi.org/10.1016/S0378-8741\(99\)00048-3](https://doi.org/10.1016/S0378-8741(99)00048-3)
- Hernandez, Dolores F: (1971) *Plants of the Philippines*. M&L Licudine Enterprises. First Printing. 2nd. edition 1980. Printed in the Philippines. University of the Philippines: Chairman: Consuelo V. Asis. D.
- Iwu, Maurice M. : (1993) *Handbook of African Medicinal Plants*. CRC Press. ISBNNo.0-8493-4266-X.
- Morton, J. (1987). Guava. In: J.F. Morton. *Fruits of warm climates*. Julia F. Morton, Miami, FL. p. 356-363.
- Muruganandan, S.; Srinivasan, K.; Tandan, S. K.; Jawahar Lal; Suresh Chandra; Raviprakash, V.: (2000) Anti-inflammatory and analgesic activities of some medicinal plants. *Journal of Medicinal and Aromatic Plant Sciences*. 2001, 22/23, 4A/1A, p.56-58. Proceedings of the National Seminar on the Frontiers of Research and Development in Medicinal Plants, Lucknow, India, 16-18 September.

- Nadkarni, K.M., Nadkarni, A.K.: (1999) Indian Materia Medica - with Ayurvedic, Unani-Tibbi, Siddha, Allopathic, Homeopathic, Naturopathic and Home remedies. Vol.1. Popular Prakashan Private Ltd., Bombay, India. ISBN No. 81-7154-142-9.
- Pranee Jaiarj, Paranee Khoohaswan, Yuwadee Wongkrajang, Penchom Peungvicha, Potjane Suriyawong, Saraya, M. L. S., Orawan Ruangsomboon.: (1999) Anticough and antimicrobial activities of Psidium guajava Linn. leaf extract. Journal of Ethnopharmacology,67,2,203-212. Retrieved from [https://doi.org/10.1016/S0378-8741\(99\)00022-7](https://doi.org/10.1016/S0378-8741(99)00022-7)
- Wei L, Li Z, Chen B.: (2000) Clinical study on treatment of infantile rotaviral enteritis with Psidium guajava L. Zhongguo Zhong Xi Yi Jie He Za Zhi. Dec;20(12):893-5