INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

OPEN ACCESS

**Research Paper**

# Formulation and Evaluation of Herbal Antidiarrheal Syrup

**Dr. Dheeraj Chechare***

*PRES's College of Pharmacy (D &B.Pharm) Chincholi- Mohu, Sinnar, Nashik.*

ARTICLE INFO

Published: 04 Apr 2026
Keywords:
Guava, Antidiarrheal, Soxhlet apparatus, Escherichia coli
DOI:
10.5281/zenodo.19415272

## ABSTRACT

The well-known tropical tree Psidium guajava, or guava, is widely farmed for its fruit. Guava has a lengthy history of use in medicine in many nations. In addition to improving locomotor coordination, this plant is used to treat diarrhea, dysentery, gastroenteritis, hypertension, diabetes, dental cavities, and discomfort. Its leaf's extract is being used as a medicine in cough, diarrhea, and oral ulcers and in some swollen gums wound. It's fruit is rich in vitamins A, C, iron, phosphorus and calcium and minerals. It contains high content of organic and inorganic compounds like secondary metabolites e.g. antioxidants, polyphenols, antiviral compounds, anti-inflammatory compounds. There are relaxation effects when terpenes, caryophyllene oxide, and p-selinene are present. Numerous substances found in guava leaves have bacteriostatic and fungistatic properties. Guava possesses radioprotective properties and a high concentration of vital antioxidants. Guava leaves' most potent antioxidant, quercetin, is what gives them their spasmolytic properties. Its ethyl acetate extract can prevent the growth of thymus and germ infection. Guava has anti-inflammatory, anti-viral, anti-plaque, and anti-mutagenic properties. In addition to having antinociceptive properties, guava extract reduces inflammation and serum production associated with liver injury. Guava ethanolic extract can be used to treat male infertility by increasing both the amount and quality of sperm. A number of common intestinal illnesses, including Salmonella, Shigella, Escherichia coli, Aeromonas, Staphylococcus aureus, and Candida, were tested for in guava leaves, or Psidium guajava. The alcoholic and aqueous extracts of Psidium guajava leaves were made using the Soxhlet apparatus. The extracts' antibacterial activity was assessed on Mueller Hinton Agar using the punch well technique. Significant inhibitory effects against the isolates under test were observed. Significant efficacy was demonstrated by ethanolic extract against Vibrio, Shigella, Salmonella, and Aeromonas species. The aqueous extract showed significant efficiency against candida and Escherichia coli.

***Corresponding Author:** Dr. Dheeraj Chechare
**Address:** *Seth Vishambhar Nath Institute of Pharmacy, Barabanki.*
**Email** ✉: nilesh737997@gmail.com

**Relevant conflicts of interest/financial disclosures**: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## INTRODUCTION

The condition known as diarrhea is characterized by increased stool volume or fluidity, increased frequency of bowel movements, and, most often, cramping. According to the most recent data, the condition affects roughly 3–5 billion people annually and causes 5–6 million fatalities in children under the age of five. For underdeveloped nations like India, diarrhea has been a serious problem because of inadequate and compromised cleanliness, a lack of safe drinking water, and malnutrition (Thapar and Sanderson, 2004; Palla et al., 2015; Prasad et al., 2017). Shigella species, Vibrio cholera, and pathogenic Escherichia coli are thought to be the most frequent causes of human diarrhea, accounting for 14–17% of cases in developing nations. Although antibiotics have been shown to be useful in treating a number of infectious disorders, including diarrhea, their improper, erratic, and ongoing usage may result in the emergence of resistant bacteria, which would reduce the effectiveness of treatment regimens. As a result, people are turning to medicinal plants to meet their fundamental medical needs and fight off a variety of illnesses (Barbour et al., 2004; Parmar et al., 2019). Native to the Caribbean and Central and South America, the plant Psidium guajava L. (Myrtaceae), also known as guava, is grown for food and medicine all throughout the world's tropical and subtropical regions (Piña-Vázquez et al., 2017; Machado et al., 2018). The herb has been used historically all throughout the world as an antiamoebic and antispasmodic to treat diarrhea, dysentery, gastroenteritis, stomachaches, indigestion, inflammation, ulcers, and more (Gutiérrez et al., 2008; Tetali et al., 2009; Birdi et al., 2010; Koriem et al., 201 9.

Its antitrypanosoma, antileishmania, cytotoxic, antimalarial, antidiarrheal, and antiparasitic properties have been documented in pharmacological investigations (de Souza et al., 2017; Machado et al., 2018). According to phytochemical analyses, the main active ingredients include quercetin, quercetin-3-O-arabinoside, gallic acid, rutin, morin, morin-3-O-lyxoside, and morin-3-O arabinoside.

### Herbal Syrup

A concentrated decoction, honey, sugar, and occasionally alcohol are combined to create herbal syrup. Cough syrup is just one of many illnesses that can be treated with herbal plants and medicines. Funnel, lemon grass, jeera, clove, and psidium guavaja are all present in herbal hand syrup.

### Benefits of herbal syrup:

No side effect.
Low cost.
Easily available.
No harmless.
Herbs grow in common place.

### Mechanism of Action:

In many cultures, guava, or Psidium guajava, has long been used as a remedy for diarrhea. Several factors are believed to be involved in Psidium guajava's mode of action in diarrhea:

1.Antimicrobial activity: Antimicrobial substances found in guava leaves include flavonoids, tannins, and essential oils. These substances aid in preventing the development of bacteria, viruses, and other pathogens that might be responsible for the diarrhea.

2.Anti-inflammatory effects: Extracts from guava leaves have anti-inflammatory qualities that may help lessen intestinal inflammation brought on by irritations or infections. The symptoms of diarrhea may be lessened by doing this.

3.Astringent qualities: Guava leaves' high tannin content has astringent qualities that might cause the intestinal mucosa to constrict. By lowering the

amount of water and electrolyte secreted into the intestines, this helps prevent fluid loss and regulates the frequency and intensity of diarrhea.
4.Antioxidant effects: Rich in vitamin C and other antioxidants, guava can help shield the intestinal lining from oxidative stress, promoting the digestive tract's recovery and halting additional damage during diarrhea
5.Gut motility reduction: Guava leaf extracts may slow down gut motility, which would provide the intestines more time to absorb electrolytes and water. This would lessen the watery stool that is typical of diarrhea.

**Drug Profile:**

**1) Psidium guajava**

Biological Name: Pisidium guajava L.
Synonyms: Guajava pyrifera, Myrtus guajava

**Table : 01: Information of Psidium guajava**

| Kingdom | Plantae |
|---|---|
| Order | Myrtales |
| Family | Myrtaceae |
| Clade | Myrtales |
| Genus | Myrtales |
| Species | Psidium guajava |

**2) Fennel**

Biological Name: Foeniculum vulgare
Synonyms: Saunf,Sweet fennel, Florence fennel.

**Table : 02: Information of Fennel**

| Kingdom | Plantae |
|---|---|
| Order | Apiales |
| Family | Apiaceae |
| Clade | Tracheophytes |
| Genus | Foeniculum |
| Species | F.Vulgare |

**3) Clove**

Biological Name: S. Aromaticum.
Synonyms : Caryophyllum, Clove flower, Clove bud.

**Table : 03: Information of Clove**

| Kingdom | Plantae |
|---|---|
| Order | Myrtales |
| Family | Myrtaceae |
| Clade | Roslds |
| Genus | Syzygium |
| Species | S. Aromaticum |

**4) Lemon Grass**

Biological Name : C.Citratus.
Synonyms : Cochin grass, Malabar grass.

**Table : 04: Information of Lemon Grass**

| Kingdom | Plantae |
|---|---|
| Order | Poales |
| Family | Poaceae |
| Clade | Diaphoretickes |
| Genus | Cymbopogon |
| Species | C. Citratus |

**5) Jerra**

Biological Name : Cuminum cyminum
Synonyms : Ajaji, Jiraka, Jira, Sadajira, Jiru.

**Table : 05: Information of Jerra**

| Kingdom | Plantae |
|---|---|
| Order | Apiales |
| Family | Apiaceae |
| Clade | Angiosperms |
| Genus | Cuminum |
| Species | Cuminum cyminum |

**Plant Overview:**

**Psidium guajava** [1-6]

Guava, also known as Psidium guajava (P. guajava), is a tropical fruit that is widely grown around the world, including in South America, Egypt, India, Indonesia, Syria, Pakistan, and Bangladesh. It is a compact tree or evergreen shrub that is a member of the Myrtaceae family.

Guava has a wide range of phytochemical elements and substances with antioxidative qualities, including polysaccharides, essential oils, minerals, vitamins, enzymes, triterpenoid acid alkaloids, steroids, glycosides, tannins, flavonoids, and saponins. These components are essential in giving the plant many health benefits, such as its anti-inflammatory, anti-oxidant, and perhaps anticancer properties. Guava is known for being a notable source of minerals and phytochemical antioxidants, including ascorbic acid, carotenoids, dietary fiber that is high in antioxidants, and polyphenolics.

**Fennel (Foeniculum vulgare)[7-8]**

A fragrant perennial herb with golden blossoms is fennel. Despite its Mediterranean origins, it is now commonplace all throughout the world.An anise-flavored spice that is frequently used in cooking is dried fennel seeds. But even though they look and taste alike, fennel and anise are not the same. The dried, ripe seeds and oil of fennel are used to make medicine. Among other digestive problems, fennel is used to treat heartburn, intestinal gas, bloating, appetite loss, and colic in infants. Cholera, coughs, bronchitis, upper respiratory tract infections, backaches, bedwetting, and vision problems are also treated with it. Snake bites are treated with a fennel powder poultice. Food and drink items use fennel oil as a flavoring.

**Clove (Syzygium aromaticum)[8-10]**

Clove, or Syzygium aromaticum, is a native Indonesian tree. In addition to being a common spice, dried flower buds from this plant are utilized in Chinese and Ayurvedic medicine. Clove oils are mixed with dried flower buds, leaves, and stems to manufacture medication. Clove oil contains eugenol, which may help prevent infections and lessen discomfort. Clove is also a common ingredient in cigarettes. There isn't enough trustworthy scientific evidence to support the widespread usage of clove to treat a variety of conditions, including hangovers, indigestion, toothaches, and dental plaque.

**Lemon Grass (Cymbopogon Citratus)[15-17]** One plant that is a member of the grass family is lemongrass. Cymbopogon citratus, one of the more than 100 species of lemongrass, is frequently used in both food and medicinal. Chemicals found in lemongrass leaves and essential oil may help stop some germs and yeast from growing. Chemicals in lemongrass can also lessen swelling and pain. Although there isn't any solid scientific proof to back up its efficacy, people use lemongrass to treat a variety of ailments, including thrush, gingivitis, excessive cholesterol, dandruff, and stomachaches. Lemongrass should not be confused with other herbs and compounds that share the same name, such as citronella, oil, and lemon eucalyptus.

**Cuminum cyminum[18-21]**

Compounds found in cumin seeds can also aid in lowering intestinal inflammation, which may lessen the symptoms of diseases like Irritable Bowel Syndrome (IBS). Additionally, cumin seeds may have anti-cancer effects. Cumin seeds and their extracts have been proved in numerous trials to prevent the growth of stomach, liver, and colon cancer cells. Cumin seeds are believed to have an anticancer impact because of their high antioxidant content, which can help shield cells from damage brought on by free radicals.

**Experimental Studies:**

Methodology & Materials Required:

Psidium guajava
Fennel (Foeniculum vulgare)
Clove (Syzygium aromaticum):
Lemon Grass (Cymbopogon citratus):
Cuminum Cyminum
Sucrose
Methyl paraben

**Method of Extraction Processs**

**Extraction of Psidium guajava:**

50g of Psidium guajava precatorius leaves were placed in a reflex condenser with 100 ml of water for two hours after being collected from various locations and cleaned with sterile water. Use filter paper to filter the solution once it has cooled.

**Extraction of Lemon grass:**

First, a fresh Cymbopogon citratus was gathered and properly cleaned with tap water. For one hour, 30g of leaves per leaf were put in a separate reflex condenser with 50ml of water. Use filter paper to fiter the solution after cooling it.

**Extraction of Clove and Fennel:**

Put five to seven grams of each herbal component in a beaker.
The herbs were mixed with 50 milliliters of water.
For one hour, the substance was slowly cooked in a water bath.
Bring to a boil until the volume is one-fourth of what it was before.
After cooling, the liquid was filtered.

**Method of Preperation of Anti-Dairrheal Syrup:**

Psidium guajav leaf extract was combined with clove, fennel, and cumin to create the finished cough syrup.
Add methyl paraben and propylparaben as preservatives and lemongrass extract as a flavoring.
Herbal hand syrup was made, and the solution's clarity was visually inspected to assess its solubility.

**Table**

**No 6: Formulation of Herbal Syrup**

| Sr. No. | Ingredients | F1 | F2 | Uses |
|---|---|---|---|---|
| 1 | Psidium guajava | 15 ml | 25 ml | API Antimicrobial activity |
| 2 | Fennel (Foeniculum vulgare) | 2 ml | 2 ml | Flavouring agent |
| 3 | Clove (Syzygium aromaticum): | 3 ml | 3 ml | Anti oxidant |
| 4 | Lemon Grass (Cymbopogon citratus | 4ml | 4ml | Flavoring agent |
| 5 | Cuminum Cyminum | 4ml | 4ml | Carminative |
| 6 | Methyl paraben | 2ml | 2ml | Preservative |
| 7 | Sucrose | 10ml | 10ml | Base |

**Evaluation Test:**

**1) Colour**
5 ml of prepered syrup was taken in a watch glass Watch glass set against a white background in white tube light.The colour was observed with naked eye.

**2) Odour examination:**

ml of prepared syrup was taken and sniffed separately.The time interval between 2 sniffs was 2 minutes to nullify the previous effect.

**3) Taste examination**
A pinch of the final syrup was taken and the taste buds of the tongue were examined

**4) Determination of pH**

5 ml of prepared syrup taken in a 100 ml measuring bottle.
Sonicate for 10 minutes. – Measure pH

**5) Determination of viscosity**

The viscosity of each preparation was determined with an Ostwald U-tube viscometer.

**6) Determination of density**

Use density bottle. Density is calculated as a substances mass per the volume it occupies

## RESULTS & DISCUSSION:

| Sr. No | Evaluation parameters. | Formulation 1 | Formulation 2 |
|---|---|---|---|
| 1 | Colour | Brownish | Brownish |
| 2 | Odour | Pleasant | Pleasant |
| 3 | Taste | Sweet | Sweet |
| 4 | pH | 6.1 | 6.4 |
| 5 | Viscocity | 1.08 cp | 0.99 |
| 6 | Density | 1.05 gm | 1.07 |

## CONCLUSION

The following succinctly describes the findings of the investigation into the creation and assessment of Psidium guajava herbal antidiarrheal syrup:
Antidiarrheal Efficacy: The herbal syrup made from Psidium guajava showed strong antidiarrheal efficacy, lowering the frequency and length of diarrhea. This implies that the syrup can work well as a herbal remedy for diarrhea.
Phytochemical Analysis: It was discovered that the Psidium guajava syrup included vital bioactive substances with antibacterial, anti- inflammatory, and antidiarrheal qualities, including tannins, flavonoids, and alkaloids. The reported therapeutic benefits are probably caused by these substances.
Safety Profile: The syrup's fitness for human usage was demonstrated by the formulation's safety during evaluation, which revealed no significant negative effects. The syrup's promise as a safe herbal medicine was supported by the fact that its toxicity was negligible at the tested doses.efficiently due to its good stability under various storage circumstances. Furthermore, the individuals responded favorably to the syrup, with no notable problems with palatability or flavor being mentioned.

In summary, the Psidium guajava antidiarrheal syrup showed great promise as a natural remedy for diarrhea and was discovered to be a stable, safe, and effective composition. To determine its long-term advantages and validate its therapeutic efficacy in human beings, more clinical research is advised.

## REFERENCES

1. Adamu H. M., Abayeh O. J., Agho M. O., Abdullahi A. L., Uba A., Dukku H. U., et al. (2005). An ethnobotanical survey of Bauchi State herbal plants and their antimicrobial activity. J. Ethnopharmacol. 99, 1–4. 10.1016/j.jep.2004.12.025 - DOI – PubMed.
2. Afzal M., Iqbal R., Mahmood Z., Zeshan B., Wattoo J. (2019). Study of GC-MS and HPLC characterized metabolic compounds in guava (Psidium guajava L.) leaves. Pak. J. Agric. Sci. 56, 709–713. 10.21162/PAKJAS/19.7131.
3. Ahs J. W., Tao W., Löfgren J., Forsberg B. C. (2010). Diarrheal diseases in low-and middle-income countries: incidence, prevention and management. Open Infect. Dis. J. 4, 113–124. 10.2174/1874279301004010113 - DOI

4. Alam N. H., Ashraf H. (2003). Treatment of infectious diarrhea in children. Pediatr-Drugs 5, 151–165. 10.2165/00128072-200305030-00002 - DOI
5. Alaoui Amine S., Melloul M., El Alaoui M. A., Boulahyaoui H., Loutfi C., Touil N., et al. (2020). Evidence for zoonotic transmission of species A rotavirus from goat and cattle in nomadic herds in Morocco, 2012–2014. Virus Genes 56, 582–593. 10.1007/s11262-020-01778-w – DOI.
6. Agrawal, S. (2001) Seed spices – an introduction. In: Agrawal, S., Sastry, E.V.D. and Sharma, R.K. (eds) Seed Spices – Production, Quality, Export. Pointer Publishers, Jaipur, India, pp. 1–18.
7. Akgül, A. (1986) Studies on the essential oils from Turkish fennel seeds. In: Brunke, J.E. (ed.) Progress in Essential Oil Research. W. de Gruyter and Co., New York, pp. 487–489.
8. Johnson, A.; Gowtham, J.; Janakiraman, N.; Malar, T.R.J.J.; Rocha, J.E.; Coutinho, H.D.M. Phytochemical profile of Asplenium aethiopicum (Burm. f.) Becherer using HPTLC. Separations 2020, 7, 8.
9. Fontanals, N.; Marcé, R.M.; Borull, F. Materials for solid-phase extraction of organic compounds. Separations 2019, 6, 56.
10. Salvatore, M.M.; Ciaravolo, M.; Cirino, P.; Toscano, A.; Salvatore, F.; Fallo, M.; Naviglio, D.; Andolfi, A. Fatty acids from Paracentrotus lividus sea urchin shells obtained via rapid solid liquid dynamix extraction (RSLDE). Separations 2019, 6, 50.
11. Akgül, A. and Bayrak, A. (1988) Comparative volatile oil composition of various parts from Turkish bitter fennel (Foeniculum vulgare var. vulgare). Food Chemistry 30(4), 319–323.
12. Anon. (1991) Clean Spices: A Guide Book for Shippers of Products to the U.S. Spice Trade. ASTA, Washington, DC, pp. 4.
13. Arctander, S. (1960) Perfume and Flavour Materials of Natural Origin. Mrs. G. Arctander, 6665 Valley View Boulevard, Las Vegas, Nevada.
14. Batiha G.E.S., Beshbishy A.A., Tayebwa D.S., Shaheen M.H., Yokoyama N., Igarashi I. Inhibitory effects of Uncaria tomentosa bark, Myrtus communis roots, Origanum vulgare leaves and Cuminum cyminum seeds extracts against the growth of Babesia and Theileria in vitro. Jap. J. Vet. Parasitol. 2018;17:1–13.
15. Weiss EA. Essential oil crops. Wallingford, UK: CAB International; 1997. pp. 59–137. Kumar S, Dwivedi S, Kukreja AK, Sharma JR, Bagchi GD, editors. Cymbopogon: The Aromatic Grass Monograph. Lucknow, India: Central Institute of Medicinal and Aromatic Plants; 2000.
16. Filipoy A. Medicinal plants of the Pilaga of Central Chaco. J Ethnopharmacol. 1994;44:181–93.
17. Leite JR, Seabra ML, Maluf E, Assolant K, Suchecki D, Tufik S, et al. Pharmacology of lemongrass (Cymbopogon citratus Stapf).Assessment of eventual toxic, hypnotic and anxiolytic effects on humans. J Ethnopharmacol. 1986;17:75–83.
18. Fernando C, Ramon A, Halley P. Effect of plants used in Mexico to treat gastrointestinal disorders on charcoal gum acacia induced hyperperistalsis in rats. J Ethnopharmacol. 2010;128:49–51. doi:10.1016/j.jep.2009.12.022.
19. Farthing M, Lindberg G, Dite P, Khalif I, Salazar-Lindo E, Ramakrishna BS, et al. World Gastroenterology Organisation Practice Guidelines: Acute diarrhea. 2008:1–29.
20. Venkatesan N, Thiyagarajan V, Narayanan S, Arul A, Raja S, Vijaya Kumar SG, et al. Antidiarrhoeal potential of Asparagus

racemosus wild root extracts in laboratory animals. J Pharmacol Pharm Sci. 2005;8:39–45.

21. Gutierrez RM, Mitchell S, Solis RV. Psidium guajava: A review of its traditional uses, phytochemistry and pharmacology. J Ethnopharmacol. 2008;117:1–27.

HOW TO CITE: Dr. Dheeraj Chechare, Formulation and Evaluation of Herbal Antidiarrheal Syrup, Int. J. of Pharm. Sci., 2026, Vol 4, Issue 4, 704-711 https://doi.org/10.5281/zenodo.19415272