

International Journal of Pharmacy and Natural Medicines

ISSN: 2321-6743 | <https://doi.org/10.30904/j.ijpnm.2026.4988>

Development Herbal Tea Blend with Medicinal Spices

D. Radhika*, K. Trisha, K. Manisha, K. Navya, J. Johny

Samskruti College of Pharmacy, Kondapur, Ghatkesar, Medchal, Hyderabad-501301, Telangana, India

*Corresponding E-mail: pav0920@gmail.com

Received: 14-03- 2026 | Revised: 31-03- 2026 | Accepted: 23-04- 2026 | Published: 25-05-2026

ABSTRACT

Herbal teas are widely consumed functional beverages prepared using medicinal herbs and spices possessing therapeutic properties. The present study was aimed at the formulation and evaluation of spices-infused herbal tea using medicinal ingredients such as cinnamon, clove, cardamom, black pepper, fresh ginger, and dry ginger. These medicinal spices are rich in bioactive phytoconstituents including polyphenols, flavonoids, alkaloids, terpenoids, and essential oils, which exhibit antioxidant, antimicrobial, anti-inflammatory, digestive, and immunomodulatory activities. The increasing prevalence of lifestyle-related disorders and growing awareness regarding natural healthcare have increased the demand for herbal beverages with health-promoting benefits. The crude drugs were collected from the local market, dried, powdered, and sieved to obtain fine powder. Two formulations were prepared: powdered herbal tea and honey-infused herbal tea shots. Organoleptic evaluation parameters such as colour, odour, taste, texture, and shape were assessed. Flow rate analysis and preliminary physicochemical evaluations were also performed to determine the quality and handling properties of the formulation. The herbal tea formulations exhibited pleasant aroma, acceptable taste, and desirable physical characteristics. Formulation-I showed a spicy taste with powder texture, whereas Formulation-II exhibited sweet taste with smooth and spherical characteristics due to the addition of honey binder. The formulations demonstrated promising potential as natural antioxidant and health-promoting beverages. The study concluded that spices-infused herbal tea can serve as a beneficial caffeine-free functional beverage with potential applications in preventive healthcare and nutraceutical industries.

Keywords

Herbal tea,
Medicinal spices,
Cinnamon,
Ginger,
Antioxidant activity

Introduction

Medicinal plants have played an important role in human healthcare systems since ancient times. Herbal medicines obtained from natural sources are widely used for the prevention and treatment of various diseases because of their therapeutic efficacy, affordability, easy availability, and fewer side effects compared to synthetic drugs (1). According to the World Health Organization (WHO), a major portion of the global population depends on traditional herbal medicines for primary healthcare needs [1].

Medicinal plants contain several biologically active compounds such as alkaloids, flavonoids, tannins, terpenoids, glycosides, phenolic compounds, and volatile oils that contribute to their pharmacological activities. Herbs and spices have been extensively utilized not only as flavouring agents in foods but also as therapeutic agents for treating several disorders [2]. Spices are aromatic plant substances obtained from bark, roots, rhizomes, buds, seeds, berries, fruits, or flowers. Common medicinal spices include cinnamon, clove, cardamom, black pepper, and ginger. These spices possess antioxidant, antimicrobial, anti-inflammatory, digestive stimulant, hepatoprotective, cardioprotective, and immunomodulatory properties [4]. Tea is one of the most widely consumed beverages after water because of its refreshing taste and

stimulating properties [5]. Conventional tea prepared from *Camellia sinensis* contains caffeine and polyphenols, whereas herbal tea is prepared using medicinal herbs, spices, roots, flowers, fruits, and seeds without tea leaves. Herbal teas are generally caffeine-free and are mainly consumed for their medicinal and therapeutic benefits [6]. Herbal tea formulations may be prepared using a single herb or multiple herbs and spices to produce synergistic therapeutic effects.

The increasing prevalence of lifestyle disorders such as obesity, diabetes mellitus, hypertension, cardiovascular diseases, stress, and weakened immunity has increased the demand for natural functional beverages [3]. Herbal tea blends enriched with medicinal spices are considered important functional beverages because they provide additional physiological benefits beyond basic nutrition. Herbal teas rich in antioxidants help neutralize free radicals and reduce oxidative stress associated with aging and chronic diseases [7].

Cinnamon (*Cinnamomum verum*) contains cinnamaldehyde and eugenol responsible for its antioxidant, antimicrobial, anti-inflammatory, and antidiabetic activities (8). Clove (*Syzygium aromaticum*) contains eugenol, which exhibits antiseptic, analgesic, antioxidant, and antimicrobial properties [9].

Cardamom (*Elettaria cardamomum*) possesses aromatic oils such as cineole and linalool responsible for digestive and flavouring properties [10]. Black pepper (*Piper nigrum*) contains piperine, which enhances digestion and improves bioavailability of phytoconstituents [11]. Ginger (*Zingiber officinale*) contains gingerol and shogaol with antioxidant, anti-inflammatory, antiemetic, and digestive stimulant activities [12].

The incorporation of these medicinal spices into herbal tea formulations improves both therapeutic efficacy and organoleptic properties such as flavour, aroma, and taste. Herbal tea formulations may therefore serve as economical, convenient, and acceptable natural beverages that promote immunity, digestion, metabolism, and overall wellness. Hence, the present study was undertaken to formulate and evaluate spices-infused herbal tea using selected medicinal spices with potential health benefits.

Materials and Methods

Materials: The medicinal plants and spices selected for the present study were chosen based on their antioxidant, antimicrobial, anti-inflammatory, antidiabetic, anti-obesity, and immunomodulatory properties. The crude drugs used in the formulation included cinnamon, clove, cardamom, black pepper, dry ginger, and fresh ginger. All ingredients were procured from the local market and authenticated based on their morphological characteristics.

Method of Preparation

The collected crude drugs were cleaned, shade dried, and converted into fine powder using a grinder or crusher. The powdered materials were passed through a sieve apparatus to obtain uniform particle size. Based on literature reports, two formulations were prepared.



Fig.1: Ingredients for herbal tea

Table.1: Formulation-I: Powdered Herbal Tea

S.No	Ingredient	Quantity
1	Cinnamon	50 gm
2	Clove	12.5 gm
3	Cardamom	15 gm
4	Black pepper	12.5 gm
5	Dry ginger	q.s
Total Quantity		90 gm

Table.2: Formulation-II: Honey Infused Herbal Tea Shots

Sl. No	Ingredient	Quantity
1	Cinnamon	50 gm
2	Clove	12.5 gm
3	Cardamom	15 gm
4	Black pepper	12.5 gm
5	Dry ginger	10 gm
6	Honey	q.s
Total Quantity		100 gm

The prepared formulations were subjected to organoleptic evaluation, preliminary physicochemical analysis. Parameters such as color, odour, taste, texture, and shape were evaluated. Flow rate analysis was also performed to determine powder handling characteristics. Ash value, extractive value, and loss on drying were considered for further evaluation studies.

Results and Discussion



Table.3: Organoleptic Evaluation

Evaluation Parameter	Formulation-I	Formulation-II
Color	Brown	Dark Brown
Odour	Pleasant	Pleasant
Taste	Spicy	Sweet
Texture	Powder	Smooth
Shape	Amorphous	Spherical

The organoleptic evaluation indicated that both formulations possessed acceptable sensory characteristics. Formulation-I exhibited a spicy taste due to the presence of black pepper, ginger, cinnamon, and clove. Formulation-II showed improved taste and texture because of honey incorporation. Pleasant aroma was observed in both formulations due to the volatile oils present in cardamom, cinnamon, and clove.

Table.4: Organoleptic Evaluation

Quantity	Sample Taken	Filtrate
1	10 ml	5 ml
2	20 ml	10 ml
3	30 ml	15 ml
4	40 ml	20 ml
5	50 ml	25 ml

The flow rate analysis indicated satisfactory flow properties of the herbal tea powder. Proper flow ability is essential for handling, processing, packaging, and storage of powdered formulations. Additional evaluations such as ash value, extractive value, and loss on drying may further help in determining formulation quality and stability. The results suggested that the prepared herbal tea formulations possess promising potential as functional beverages with antioxidant and health-promoting properties.

Discussion

The present study focused on the formulation and evaluation of spices-infused herbal tea using medicinal spices such as cinnamon, clove, cardamom, black pepper, fresh ginger, and dry ginger. Herbal tea formulations were prepared using powdered crude drugs and honey infusion methods. The selected medicinal spices possess antioxidant, antimicrobial, anti-inflammatory, digestive, and immunomodulatory activities that may contribute to overall health promotion. The prepared herbal tea formulations exhibited desirable organoleptic properties such as pleasant aroma, acceptable taste, and suitable texture.

Formulation-I possessed spicy flavour with powder texture, whereas Formulation-II showed improved palatability and smooth texture due to honey incorporation. Flow rate analysis indicated satisfactory handling properties of the formulations.

Conclusion

The study demonstrated that herbal tea prepared using medicinal spices can serve as a natural caffeine-free functional beverage with potential health benefits. The synergistic action of phytoconstituents present in cinnamon, clove, cardamom, black pepper, and ginger may help improve immunity, digestion, metabolism, and antioxidant defence mechanisms. Therefore, the developed herbal tea formulation may serve as a safe, economical, and beneficial alternative to conventional caffeinated beverages. Further phytochemical, antioxidant, microbial, and stability studies are required to scientifically validate the therapeutic efficacy of the formulation.

Acknowledgment

The authors thank the, Samskruti College of Pharmacy, Hyderabad, T.G, India, for technical assistance and support.

Conflict of Interests

The authors declare no conflict of interest

Ethics Approval: Not applicable

Funding

This study received no specific funding from public, commercial, or not for profit funding agencies.

AI Tool Declaration

The authors declare that no AI and related tools are used to write the scientific content of this manuscript.

Data Availability

Data will be available on request

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