



# FORMULATION AND EVALUATION OF SPICES INFUSED HERBAL TEA – AN OVERVIEW

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## ABSTRACT:

Herbs are plants valued for their medicinal, aromatic and flavourful properties. Typically used in the preparation of traditional medicines, as fragrance, cooking, herbs encompass a diverse group of plant species. Herbal tea is basically a mixture of different types of medicinal plant parts which have potent medicinal value in it. The aim of present review is to exemplify ingredients used in the formulation of herbal tea. It is a preparation which have the ability to boost up the immunity, relieve stress, keeps active without any tiredness and anxiety. The medicinal values of herbal tea (mixture of herbs) have maximum therapeutic benefits and suitable for consumption. The action of herbal tea is slow but it shows therapeutic effect for long time period.

**KEY WORDS:**Herbal Tea,Antioxidant,ImmunityBooster,Antibiotic,Antibacterial

## INTRODUCTION:

The medicinal plants find applications in pharmaceutical,cosmetic,agricultural and food industry. The use of medicinal herbs for curing disease has been documented in the history of all civilizations. Plants play a crucial role in medicineproviding various compounds with therapeutic properties. For instance, aspirin originates from willow bark, while the antimalarial drug quinine is derived from the bark of the cinchona tree. Many modern medicines including antibiotics and pain relivers trace their roots to plant compounds. Additionally, plants contribute to traditional medicine offering remedies for a wide range of ailments.

Spices and herbs have played an important role in civilization and in the history of nations. A food herb is generally defined as the leaf of a plant when used in cooking but any other part of plant often dried can be used as a spice. Spices can be the buds (cloves), bark (cinnamon), roots (ginger), berries (pepper corns), aromatic seeds (cumin) and even the stigma of a flower (saffron).

Tea is the most generally consumed beverage after water. It has cooling, slightly bitter and astringent flavour that many people enjoy [1]. Herbal tea is basically a mixture of medicinal herb which is obtained from different types of plants which have medicinal value. The medicinal values of herbal tea will have the affinity to relief from many diseases such as immunity booster, hypertension, diabetes, glowing skin. It will lead to a healthy life of human beings.

Herbal tea is very easy to make and taken very easily with warm water. It will make the body hydrated and increase metabolism [2]. Herbal tea can be prepared by using either single herb beverage or mixed drug beverage. Single herb beverage can be made with help of only one herb. Whereas mixed herb beverage can be prepared using different types of herbs or more than one herb which have more medicinal benefits than single herb beverage [3].

Examples are **Single herb tea**

**GINGER TEA:** In this rhizome of ginger is taken and they are dried under shade and then crushed to a fine powder with the help of mixer or grinder and packed [4].

**CARDAMOM TEA:** In this seed of cardamom is taken and properly dried under shade and make them into fine powder and then sieved and is packed [5].

**Mixed herb tea (examples)**

**CINNAMON & BLACK PEPPER TEA:** In this both the drugs are taken separately and they are dried under shade and then powdered separately and then mixed properly in accurate quantity then packed properly [6].

**CARDAMON & GINGER TEA:** In this both the drugs are separately taken and they are dried under shade and then powder separately and then mixed properly in an accurate quantity then packed properly [7].

## **HERBAL TEA**

The term herbal tea is really a misnomer, as herbal teas does not contain any tea leaves. The tea leaves are harvested from the tea plant will contain caffeine [8]. Herbal teas do not contain caffeine because it is made up of various flowers, herbs, rhizomes, spices and dried fruits which are naturally caffeine free. Herbal tea is a mixture of different herbs which have medicinal values to cure or relief from many diseases like hypertension, diabetes, immunity booster and stimulant.

## INGREDIENTS AND THEIR DESCRIPTION:

### CINNAMON:

Cinnamon is the spice obtained from the inner bark of several tree species from the genus CINNAMOMUM, which has good nutritive value. Cinnamon is used mainly as an aromatic condiment and flavouring additive in a wide variety of cuisines, sweet and savoury dishes, breakfast, cereals etc.



**Fig.1- Cinnamon Bark**

**Botanical Name:** *Cinnamomum verum* (Also known as *Cinnamomum zeylanicum*)

**Synonyms:** *Cinnamomum aromaticum*, *Cinnamomum cassia*

**Family:** Lauraceae

### Morphological Characteristics:

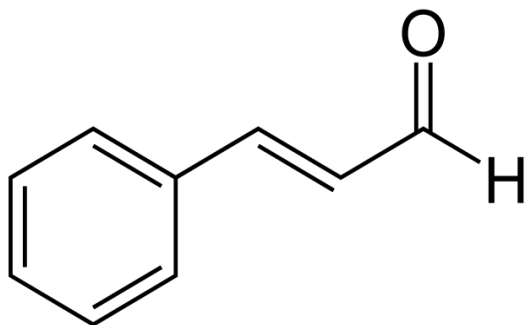
- **Tree:** Evergreen, reaching heights of 10-15 meters
- **Leaves:** Oval-shaped, leathery with a reddish tint when young
- **Bark:** Smooth, light brown, with characteristic vertical striations
- **Flowers:** Small, greenish, arranged in panicles

### Microscopic Characteristics:

- **Trichomes:** Presence of glandular and non-glandular trichomes on the leaf surfaces
- **Stomata:** Stomata mainly on the lower leaf surface
- **Vascular bundles:** Well-developed vascular bundles in the stem

## Chemical Constituents:

- **Cinnamaldehyde:** Primary component responsible for the characteristic aroma.



**Fig. 1(a) Chemical structure of cinnamaldehyde**

- **Eugenol:** Contributes to the flavour and possesses antimicrobial properties
- **Cinnamic Acid:** Provides health benefits and is used in the synthesis of other compounds
- **Coumarin:** Present in trace amounts and may have anticoagulant properties

## Uses:

- **Culinary:** Flavouring agent in both sweet and savoury dishes
- **Medicinal:** Traditionally used for its anti-inflammatory and digestive properties
- **Aromatherapy:** Essential oil extracted for aroma therapeutic purposes
- **Preservative:** Antimicrobial properties make it useful in food preservation
- **Traditional Medicine:** Employed in various cultures for its potential health benefits

## **CLOVE:**

The term Clove is derived from the French word “Clove” and the English word ‘clout’ both meaning ‘nail’. The clove is one of the important tree spice crops grown in India. The clove of commerce is the fully grown but unopened aromatic dried flower bud of an ever-green tree *syzygium aromaticum*. They behold sharp, biting flavours and strong aroma.



**Fig. 2: Clove Buds**

**Botanical Name:** *Syzygium aromaticum*

**Synonyms:** *Eugenia caryophyllata*

**Family:** Myrtaceae

**Morphological Characteristics:**

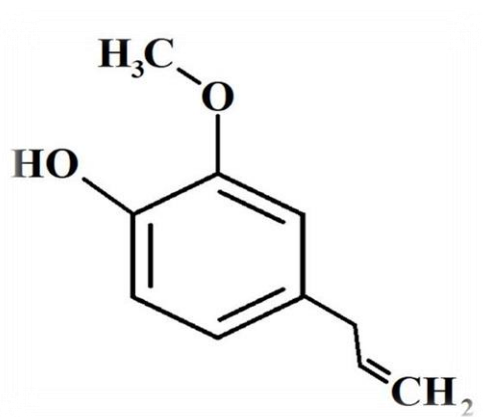
- **Plant type:** Ever green tree
- **Leaves:** Oval, pointed and aromatic
- **Flowers:** Small numerous with a reddish blue
- **Buds:** Pink and aromatic, developing into cloves

**Microscopic Characteristics:**

- **Trichomes:** Present on the leaves and stems
- **Stomata:** Small pores on the leaf surface
- **Vascular Bundles:** Arranged in a characteristic pattern

## Chemical Constituents:

- **Eugenol:** Main aromatic compound



**Fig. 2 (a): Chemical Structure of Eugenol**

- **Acetyl eugenol:** Found in smaller amounts
- **Caryophyllene:** Contributes on the spice's aroma

## Uses:

- **Culinary:** Used in the cooking and baking as a flavouring agent
- **Medicinal:** Known for its analgesic and antiseptic properties
- **Dental care:** Found in toothpaste and mouth washers
- **Aromatherapy:** Clove oil used as essential oil for a warm fragrance
- **Traditional medicine:** Used in various cultures for its potential health benefits

## **CARDAMOM:**

Cardamom is a valuable spice that is obtained from the seeds of a perennial plant (*Elettaria cardamomum*). In this fruit part is used in herbal tea and other herbal formulations. Cardamoms are used as flavouring and cooking spices in both food and drink and as a medicine. Cardamom is known as queen of species. The seeds whole or in powdered form are regarded as one of the most valuable spices, often employed in the preparation of curry powder, pickles, sausages, cakes and confectionery.



**Fig. 3: Cardamom Seeds**

**Botanical Name:** *Elettariacardamomum*

**Synonyms:** Amomum cardomomum, Cardomomum, Elettaria repens

**Family:** Zingiberaceae

**Morphological Characteristics:**

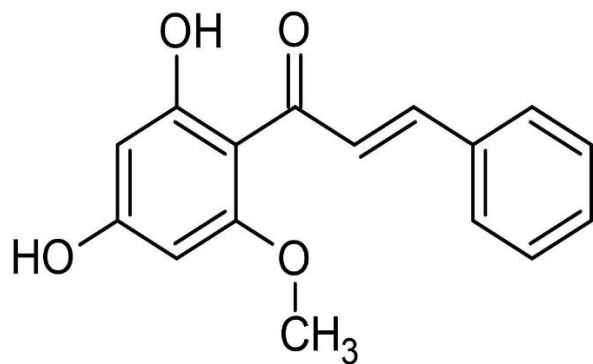
- **Plants:** Perennial, herbaceous plants
- **Leaves:** Alternate, lance -shaped and long
- **Fruits:** Capsules containing small, aromatic seeds
- **Flowers:** Small, yellowish with a tubular structure

**Microscopic Characteristics:**

- **Seeds:** Cotton oil, cells and starch grains
- **Pollen:** Spherical, with distinctive apertures

**Chemical Constituents:**

- **Essential oil:** Mainly composed of cineole, terpinol acetate and linalool
- **Cardamonin:** A bioactive compound with antioxidant properties



**Fig. 3 (a): Chemical Structure of Cardamomin**

- **Flavonoids:** Including quercetin and kaempferol

### Uses:

- **Culinary:** Widely used as spice in cooking and baking
- **Medicinal:** Traditional remedy for digestive issues and respiratory problems
- **Perfumery:** The aromatic seeds contribute to fragrances
- **Ayurveda:** Utilized in traditional Indian medicine for various health benefits

### **BLACK PEPPER:**

Black pepper, derived from the *piper nigrum* plant, is one of the most popular spice products in oriental countries. Largely used as flavouring agent in food and tea. The principal bioactive constituent of black pepper is piperine which increase the bioavailability of many phytochemicals present in food items. Black pepper extract shows good antioxidant activity.





**Fig:4: Black Pepper Seeds**

**Botanical Name:** *Piper Nigrum*

**Synonyms:** Piper album, piper indicum and piper officinarum

**Family:** Piperaceae

**Morphological characteristics:**

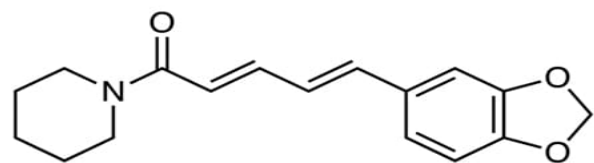
- **Plant type:** Climbing perennial vine
- **Leaves:** Dark green, alternate, heart shaped
- **Flowers:** Small, white to greenish spikes
- **Fruits:** Berries that turn from green to red and finally black when ripe

**Microscopic Characteristics:**

- **Trichomes:** Present on the epidermis, multicellular
- **Stomata:** Present on the lower leaf surface
- **Vascular tissues:** Consist of Xylem and Phloem bundles

## Chemical constituents:

- **Pipeline:** Responsible for the pungent taste



**Fig .4 (a): Chemical Struture Of Piperine**

- **Essential Oils:** Including compounds like limonene, pinene and beta – caryophyllene
- **Alkaloids:** Piperidine alkaloids contribute to the characteristic flavour

## Uses:

- **Culinary:** Widely used as a spice for flavouring various dishes
- **Medicinal:** Traditionally used for digestive and respiratory ailments
- **Aromatic:** Essential oil extracted for fragrance and aromatherapy

## FRESH GINGER:

Ginger is one of the earliest known oriental spices and is being cultivated in India for both as fresh vegetable and as dried spice. Ginger is obtained from the Rhizomes of *Zingiber officinale*. Ginger has been used traditionally for varied human ailments, to aid digestion and to treat stomach upset, diarrhoea and nausea.



**Fig. 5: Fresh Ginger Rhizome**

**Botanical name:** *Zingiber officinale*

**Synonyms:** Amomum zingiber zingiberaceae

**Family:** Zingiberaceae

### Morphological Characteristics:

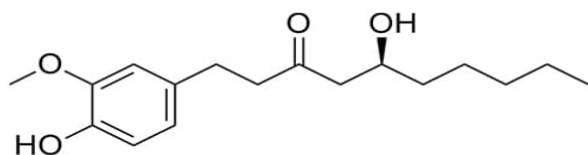
- **Plant:** Herbaceous perennial
- **Stem:** Pseudo stem with leafy shoots
- **Leaves:** Alternately arranged, lanceolate, green
- **Inflorescence:** Cone-like spikes with yellowish-green flowers

### Microscopic Characteristics:

- **Rhizome Cells:** Contain starch grains, oil cells, and secretory cells
- **Trichomes:** Simple multicellular hairs on the epidermis

## Chemical Constituents:

- **Gingerol:** Main bioactive compound responsible for the pungent taste



**Fig.5 (a): Chemical Structure of Gingerol**

- **shogaol:** Formed from gingerol during drying or cooking.
- **Zingiberene:** Aromatic compound contributing to the fragrance

### Uses:

- **Culinary:** Commonly used as a spice and flavouring agent
- **Medicinal:** Traditional remedy for digestive issues, anti-inflammatory properties
- **Cosmetic:** In skincare products for its antioxidant benefits

## **DRY GINGER:**

When it comes to the dried form of ginger, it is popularly known as “saunth” or “south” in Hindi and often used in powder. It is essentially fresh ginger that has been dehydrated and ground into a fine powder. This process significantly alters its flavour and makes dry ginger a concentrated spice.



**Fig.6: Dried Ginger Rhizome**

**Botanical Name:** *Zingiberofficinale*

**Synonyms:** Ammomum zingiber, zingiberaceae

**Family:** Zingiberaceae

### Morphological Characteristics:

- **Plant:** Herbaceous perennial
- **Rhizome:** Thick, knobby, aromatic Rhizomes
- **Leaves:** Narrow, lance -shaped, green arising from the rhizome
- **Inflorescence:** Cone -like spike with small yellow -green flowers

### Microscopic Characteristics:

- **Rhizome Cells:** Parenchymatous cells, starch grains, oil cells
- **Trichomes:** Unicellular, conical, glandular trichomes
- **Vascular Tissues:** Xylem vessels, Phloem fibres

### Chemical Constituents:

- **Gingerol:** Responsible for the characteristic pungency
- **Shogaol:** Formed from gingerol during drying or processing
- **Zingiberene:** A sesquiterpene responsible for the aroma.

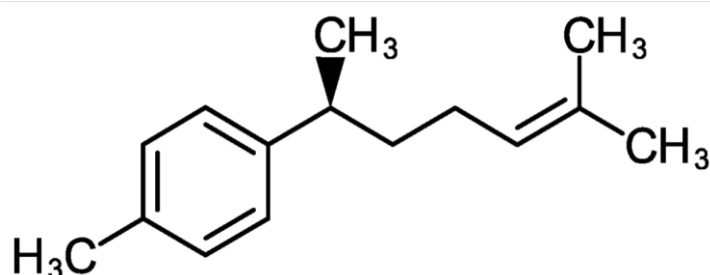


Fig.6 (a): Chemical Structure of Zingiberene

## Uses:

- **Culinary:**Used as a spice in various cuisines
- **Medicinal:**Known for anti-inflammatory and digestive properties
- **Traditional Medicine:** Used for treating colds,nausea and digestive issues
- **Aromatherapy:** Essential oil extracted for therapeutic purposes
- **Flavouring:**Commonly used in beverages and confectionery.

## **EVALUATIONPARAMETERS**

**AshValue-** In this sample was taken and weighed accurately and put into muffle furnace and the reading was checked according to their time and temperature and weight of residue was also calculated accordingly.It indicates the mineral content of the herbal material after complete combustion. It helps to assess the inorganic impurities in the herbal tea.

**ExtractiveValue:**Take an accurately weighed amount of sample and macerated with a hundred cubic centimetres of chloroform water during a closed flask for twenty-four hours, shakefor six hours and permitting standing for eighteen hours. Filter the extract and avoid the loss of solvent.Twenty-five cubic centimetres of the filtrate was taken and gaseous to status during a tarred vessel at 105°C,to a constant weight and weighed the proportion of soluble extractive was calculated [9]. It measures the quantity of soluble constituents extracted from the herbal material. It provides insights into the potential medicinal or flavour components present.

**FlowRate:** Flow rate is obtained because of the flow property of a substance. First sample was taken and weighed accurately and allowed to flow in the funnel and slat area unit for different fundamental quantity[10]. It measures how quickly the herbal tea powder flows through a specific apparatus. This parameter is essential for understanding the powder`s ease of handling during processing and packaging.

**Loss On Drying:** Loss on drying is the loss of weight expressed as % w/w resulting from water and volatile matter can be driven off under specified conditions. Weigh about 2 gm of the air-dried crude drug in a dried and tarred flat weighing dish. Dry in a hot air oven at 100-105°C . Cool in desiccators over phosphorous pentoxide for specific period of time. The loss in weight is recorded as moisture. Repeat the process till constant weight is obtained [11]. It indicates the percentage of weight lost due to the removal of moisture during drying. It helps to determine the initial moisture content and the efficiency of the drying process

## **CONCLUSION:**

From the above study. It is studied that herb and spice which are used in the making of herbal beverage are very useful and can be used to treat multiple diseases and also used in making of all other formulation of herbal medicine,side effects of herb are also studied which help in studying of herbal interactions in making the product free from anybad interactions and also prevent drug -drug interaction. Basically,any tea can be prepared by using tea leaves which contains caffeine. This herbal beverage is free from caffeine. The formulations of this product arealso easier and in this evaluation parameter of herbal beverage are also studies which help in testing the storage and degradation of herb.

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