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Research Article

Formulation of Immune Booster Ficus Carica Tea Pack

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ABSTRACT

Ficus carica (anjeer), known for its rich nutritional and medicinal properties, is increasingly recognized for its immune-boosting and antioxidant benefits. This research focuses on developing an immune booster tea from dried fig leaves and fruit, combined with herbs like ginger, cinnamon, and lemon oil. The formulation aims to create a functional, caffeine-free beverage to enhance immunity, support digestion, and promote overall wellness. By employing drying techniques to preserve bioactive compounds and optimizing the blend for taste and health benefits, the study demonstrates the potential of anjeer-based teas in meeting the growing demand for natural, health-focused products. This study offers a promising avenue for functional beverage development using traditional knowledge and modern processing methods.

INTRODUCTION

Anjeer (Ficus carica), commonly known as fig, is a nutrient-rich fruit with numerous health benefits. It is packed with antioxidants, vitamins (A, B, C, and K), minerals (calcium, potassium, magnesium, and iron), and dietary fiber. Traditionally used in herbal medicine, anjeer is known for its immune-boosting, anti-inflammatory, and digestive properties. Formulating an anjeer tea pack involves selecting high-quality fig leaves or dried fruit, combining them with complementary herbal ingredients, and optimizing the blend for taste and health benefits.Anjeer—better known worldwide as the common fig—is the sweet, pear-shaped, seed-filled syconium produced by Ficus carica, a deciduous tree in the mulberry family (Moraceae). Thought to be one of the first fruit trees domesticated by humans, it originated in the arid Middle East and spread throughout the Mediterranean thousands of years ago [2]. Today it is cultivated commercially in warm, semi-arid regions on every inhabited continent, with Türkiye, Egypt, Algeria, and Morocco among the top producers [3]. This tea can help strengthen immunity, support digestion, and promote overall

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well-being. The final product should be carefully processed, packaged, and stored to maintain its nutritional value and aroma. Herbal teas have been widely consumed for their health benefits, and *Ficus carica* (commonly known as anjeer or fig) is an excellent ingredient for formulating an immune-boosting tea. Anjeer is rich in antioxidants, vitamins, and minerals that support immunity, digestion, and overall well-being. Both fig leaves and dried fruits contain bioactive compounds like flavonoids, polyphenols, and dietary fiber, which contribute to their therapeutic properties. The formulation of an anjeer tea pack involves selecting high-quality ingredients, optimizing the blend for taste and health benefits, and ensuring proper packaging to maintain freshness. This herbal tea can serve as a natural remedy for boosting immunity, improving digestion, and promoting heart health. The increasing demand for functional beverages makes anjeer tea a promising product in the herbal tea market. In traditional medicine, anjeer has been used for its anti-inflammatory, antimicrobial, and antioxidant properties. Both fig fruit and leaves are beneficial in strengthening the immune system, improving digestion, and supporting respiratory health. When formulated into an herbal tea, anjeer combines well with other medicinal herbs such as tulsi, ginger, cinnamon, and turmeric to create a potent immune-boosting blend. Herbal medicine has been widely used for centuries to enhance immunity and promote overall health. Nutritionally, fresh anjeer is about 80 % water, but when sun-dried its sugars concentrate, giving the chewy, honeyed flavour most South Asians associate with the name. Per 100 g of dried fruit it provides roughly 250–270 kcal, 9–10 g of dietary fibre, and useful amounts of calcium, potassium, and iron [1]. Traditional Ayurvedic and Unani texts describe anjeer as a gentle laxative and a tonic for the respiratory and reproductive systems; modern clinical studies largely attribute these effects to its soluble fibre and phenolic antioxidants [1].*Ficus carica*, commonly known as anjeer or fig, is a valuable medicinal plant known for its rich nutritional and therapeutic properties. It contains essential vitamins (A, B-complex, C, and K), minerals (iron, calcium, potassium, and magnesium), antioxidants (polyphenols and flavonoids), and dietary fiber, which contribute to immune system support.The preparation of an anjeer-based immune booster tea pack involves selecting high-quality dried fig leaves or fruit, blending them with complementary herbs, and ensuring proper processing and packaging. This herbal tea offers a natural, caffeine-free, and effective way to enhance immunity while promoting overall well-being. *Ficus carica* (fig), known for its potent nutritional and therapeutic properties, serves as a key ingredient in formulating an immune booster tea pack. This herbal blend leverages the bioactive compounds found in fig—such as antioxidants, vitamins, and minerals—to support overall health and enhance the body's natural defenses. Anjeer" is the Hindi term for figs (Ficus carica), and tea formulations using fig (or fig-leaf) extracts have been explored both as functional beverages and for their potential health benefits. One well-documented formulation comes from studies using fig leaf tea. Although "anjeer tea" can be made from either the dried fruit or the leaves, many research-focused formulations use the leaves because they contain a range of bioactive polyphenols (such as rutin, quercetin derivatives, and 8-hydroxycoumarin) with antioxidant and anti-inflammatory properties.Botanically, what we eat is not a true fruit but an "inside-out" inflorescence (syconium) whose tiny flowers line the inner walls; the gritty texture comes from hundreds of tiny true fruits (achenes). Most commercial cultivars are "common figs" that set seedless, parthenocarpic syconia without the specialised pollinating wasp—allowing reliable

crops in orchards from California to Maharashtra [2]. Figs—locally known in India as anjeer—are the mature, syconium-type fruit of Ficus carica L., a small deciduous tree belonging to the Moraceae family. Cultivated for more than 5,000 years along the Mediterranean Basin and later across Asia, figs have transitioned from a fresh or dried snack to a multifunctional functional-food ingredient. Their sweet, honeyed pulp, edible seeds, and rich phytochemical profile make them an emerging candidate for novel nutraceutical beverages such as anjeer tea. Below is a brief, research-oriented overview to situate figs within the context of developing a fig-infused tea product.

1.Historical and Cultural Context

Figs (Ficus carica L.), known as anjeer across the Indian sub-continent, have been intertwined with human civilisation for at least five millennia. Archaeobotanical evidence from the Jordan Valley pinpoints fig domestication to c. 9400 BCE, predating cereal cultivation [1]. From Mesopotamia, figs travelled westward with Phoenician traders and eastward along the Persian Royal Road, eventually naturalising in the arid pockets of the Indian Deccan by the late first millennium BCE [2]. Ayurvedic treatises such as the Charaka Samhita prescribe anjeer decoctions (kashaya) for "vata-pitta shamana" (pacifying wind-fire imbalance) and as a mild Vadodara (detoxifier) [3]. The concept of fig-based tisane is therefore not novel; medieval Unani scholars described māʾ al-tin (fig water) as a demulcent. Contemporary wellness trends, however, have catalysed the re-emergence of anjeer tea—either as a stand-alone infusion or blended with Camellia sinensis leaves—to meet consumer demand for plant-based functional beverages [4].

2.Botanical and Agronomic Background

F. carica thrives in semi-arid, subtropical climates, tolerating temperatures from –7 °C (dormant) up to ~45 °C (growing). The fruit forms from an inverted inflorescence (syconium) that houses hundreds of tiny true flowers lining its inner cavity. India (notably Maharashtra and Karnataka), Turkey, Egypt, and Morocco are leading producers, with average yields of 8–12 t ha^{-1} for open-field cultivation. Genotypes such as 'Poona Fig', 'Deanna', and 'Conadria' are favored for Indian agro-conditions and dried-fruit traits—critical for tea-pack applications where low residual moisture (<18 % w/w) prolongs shelf life. [9].

- Temperature range 15–35 °C; chilling not required.
- Optimum rainfall – needs dry spell at ripening; heavy monsoon can crack fruit.
- Soil: deep, well-drained loams, pH 6.0–7.5.
- Major cultivars in India: 'Poona Fig' (Maharashtra),'Dinkar',' Conadria', 'Excel', 'Deanna', emerging tissue-culture selections.
- Ideal planting geometry (5 × 5 m square and 2.5 × 2.5 m high-density).
- Fertigation schedules, pruning cycles (twice yearly tip-pruning to promote breba & main crops).

2.1 Botany and Primary Production

2.2 Taxonomy and Morphology

Belonging to the Moraceae family, F. carica is a gynodioecious species producing unique inflorescence structures termed syconia—hollow, urn-like receptacles lined internally with hundreds of minute unisexual flowers [5]. Commercial cultivars are broadly categorised into Common,

Smyrna, San Pedro, and Caprifig types based on pollination requirements.

2.3 Global and Indian Production Statistics

According to FAOSTAT (2023), global fig output reached 1.34 million t year-¹, with Türkiye (303 kt), Egypt (269 kt), and Morocco (161 kt) leading [6]. India contributes a modest 20 kt year-¹, yet commands premium prices for its 'Poona Fig' and 'Dinkar' cultivars prized for drying quality [7]. The semi-arid tracts of Maharashtra, Karnataka, and Uttar Pradesh provide optimal growing degree days (GDD 2400–2800) and low post-monsoon humidity conducive to sun-drying.

3. Nutritional and Phytochemical Profile Relevant to Tea Applications

Dried anjeer (moisture ≈ 18 %) contains 48–55 % invert sugars, 9–11 % dietary fibre, and a mineral spectrum dominated by K^+, Ca^{2+}, and Mg^{2+} [8]. Phytochemical mapping via HPLC-DAD has identified over 30 phenolics, with chlorogenic acid (42–75 mg·100 g^{-1}), rutin (18–31 mg·100 g^{-1}), and cyanidin-3-O-rutinoside (6–18 mg·100 g^{-1}) as major constituents [9]. The total antioxidant capacity typically ranges 3.5–5.5 mmol·TE per 100 g d.w., exceeding most dried fruits [10]. For infusion formats, these compounds leach efficiently at 90–95 °C within a 5-min steep, delivering ~120–150 mg GAE·serving^{-1} of polyphenols [11]. High levels of quercetin-3-rutinoside, chlorogenic acid, and anthocyanins (in darker cultivars) underpin figs' radical-scavenging ability, making them attractive for formulating a caffeine-alternative or antioxidant-boosted herbal tea.

3.1.Polyphenols

Both tea (especially green and black tea) and anjeer are rich in polyphenols, which are antioxidants.

Common types found in both:

Catechins (like EGCG in tea, also present in small amounts in anjeer) Flavonoids (quercetin, kaempferol)

3.2. Tannins

Found in both tea and anjeer. These contribute to the bitter taste and also have antioxidant and antimicrobial properties.

3.3. **Caffeic acid**

A type of phenolic acid present in both. It has anti-inflammatory and antioxidant effects

3.4. Chlorogenic acid

Found in tea and in dried figs, known for its role in glucose metabolism and antioxidant activity.

3.5. Minerals

Both contain potassium, magnesium, and calcium, though in different concentrations.

4. Applications of Anjeer (Ficus carica)

4.1 Nutritional and Culinary Uses:

Anjeer, commonly known as the dried form of Ficus carica (fig), is a popular edible fruit both in fresh and dried form. It is sweet, soft, and chewy, with crunchy seeds, making it a versatile ingredient in:

- Snacks and desserts: Used in energy bars, jams, cookies, and traditional sweets.
- Salads and cereals: Adds natural sweetness and texture.

- Cooking: In Middle Eastern and Mediterranean cuisines, figs are added to savory dishes, stews, and meat recipes.
- Health drinks: Figs are soaked in water or milk and consumed for their nutritional benefits.

2. Medicinal Uses in Traditional Systems:

Anjeer has a long-standing place in Ayurveda, Unani, and Traditional Chinese Medicine **(TCM)**. Its medicinal applications include:

1. **Respiratory relief**: Used for soothing sore throats, coughs, and bronchitis.
2. **Blood purification**: Believed to help in detoxifying blood and improving skin conditions.
3. **Sexual health**: Traditionally considered an aphrodisiac and used to address reproductive issues.
4. **Digestive Health:**

High in dietary fiber; helps relieve constipation and supports gut health.

5. Heart Health:

   Contains potassium and antioxidants that help regulate blood pressure and reduce cholesterol.

6. Bone Health:

   Rich in calcium and magnesium, supporting bone density.

7. Diabetes Management:

   Anjeer has a low glycemic index and may help regulate blood sugar in moderation.

8. Weight Management:

The fiber content helps with satiety, making it a good option for weight control.

3. Modern Health Applications: Scientific studies support several health-promoting properties of figs:

- **Antioxidant activity**: Rich in polyphenols, flavonoids, and carotenoids which help combat oxidative stress .
- **Antidiabetic potential**: Some studies suggest fig leaf extracts may improve insulin sensitivity and help regulate blood sugar levels.
- **Cardiovascular health**: Potassium, magnesium, and fiber in figs may help control blood pressure and cholesterol levels.
- **Anti-inflammatory and antimicrobial effects**: Leaf and fruit extracts exhibit potential against bacterial infections and inflammation.

4.Cosmetic and Skincare Uses: Due to its antioxidant and moisturizing properties, fig extracts are increasingly used in skincare products for:

- Hydration.
- Anti-aging.
- Skin soothing and glow-enhancing treatments.

5. Agricultural and Environmental Applications:

- **Fodder**: Leaves and fruit are sometimes used as fodder for livestock.
- **Soil conservation**: The fig tree's robust root system helps prevent soil erosion.

- **Agroforestry**: Its ability to thrive in poor soils makes it a suitable candidate for arid-zone agroforestry systems.

MATERIALS AND EQUIPMENT'S

The following materials of Pharma grade or the best possible Laboratory Reagent (LR) were used as supplied by the manufacturer. The double distilled water was used in all experiments.

Table no.9 List of material used

Sr. No	Materials used	Category	Grade	Suppliers of Material
1	Dried Figs(powder)	Herbal & Natural Products	Pharma grade	Indo Pharma
2	Dried fig leaves	ApI	Pharma grade	Indo Pharma
3	Ginger	Herbal & Natural Products	LR	Indo Pharma
4	Cinnamon	Herbal & Natural Products	LR	Indo Pharma
5	Lemon oil	Aromatherapy Products	LR	Indo Pharma
6	Starch	Binder	LR	Indo Pharma
7	Honey	Sweetener & Soothing Agent	LR	Indo Pharma

METHOD & EVALUATION:

Preparation of Ingredients

The first step in preparing dried fig leaf powder is the careful selection of mature, healthy leaves. Leaves should be free from pests, diseases, and mechanical damage. Typically, leaves are harvested during the dry season when they are fully mature.After collection, leaves should be thoroughly washed to remove dust, dirt, and any pesticide residues. This can be achieved by rinsing the leaves under running tap water followed by soaking in a solution of water and a mild disinfectant, such as potassium permanganate or sodium hypochlorite, for about 10–15 minutes. Subsequently, the leaves should be rinsed again with clean water to remove any traces of the disinfectant.The drying process is crucial to preserve the bioactive constituents of fig leaves. Two common methods are

Shade Drying: Leaves are spread out in a well-ventilated, shaded area, away from direct sunlight. This method helps in retaining sensitive compounds like phenolics and flavonoids. Studies have shown that shade-dried fig leaves have higher antioxidant and anti-inflammatory activities compared to oven-dried leaves.

Fig. No. 7 Ficus Carica leaves drying process

Tray Drying: Drying Ficus carica (fig) leaves and fruits in a tray dryer helps preserve their nutritional and medicinal properties. Fig leaves should be dried at 40–50°C for 4–8 hours, with air velocity of 1–2 m/s and low humidity (10–20%). Leaves should be washed, spread in a single layer, and are ready when brittle and crumbly.Fig fruits, due to higher moisture, require 55–65°C for 12–24 hours with 1.5–2.5 m/s airflow and 15–30% humidity. Sliced or halved figs should be laid cut-side up and

are done when leathery and pliable. Leaves are placed in an oven set at a low temperature (40–50°C) for several hours. While this method is faster, it may lead to the degradation of some heat-sensitive compounds. The drying process should continue until the leaves become crisp and brittle, indicating that all moisture has been removed

Formulation of Powder Using Mortar & Pestle

To prepare the Immune Booster Ficus carica tea powder, first grind each ingredient (dried figs, fig leaves, ginger, cinnamon, and lemon peel) using a mortar and pestle until they turn into a fine powder. Then, combine the ground ingredients in a large mixing bowl or mixer, adding starch as a binder and lemon oil or honey (for Batch C) as needed. Blend the mixture until uniform. After mixing, sift the powder to ensure even consistency. Finally, package the powder into tea bags or airtight sachets, label the product with ingredient information, and store it in a cool, dry place.

Fig no.9 Mortar & Pestle

Preparation of Powder Blend of Drug and Excipients

Ficus carica, commonly known as the fig, is a well-known plant whose leaves and fruits have long been used for their nutritional and medicinal benefits. To formulate a tea or any other product using fig leaves and fruits, it's essential to conduct a pre-compression assessment of their powder to ensure that it has the proper flowability, uniformity, and physical properties for processing. Here's a breakdown of the pre-compression assessment for Anjeer (Ficus carica) Leaves and Fruits Powder**.**To prepare the powder blend for the immune booster Ficus carica tea pack, first, accurately weigh the ingredients for each batch, including dried figs, fig leaves, ginger, cinnamon, lemon peel, starch, and optionally honey and lemon oil. Next, grind all dry ingredients into a fine powder to ensure uniformity and sieve them to remove coarse particles. The ground powders are then mixed in a tumble mixer or V-blender for 10-15 minutes, with honey and lemon oil added at the final stage if included. Once the blend is uniform, it is packaged into tea bags or airtight containers, ensuring the correct weight per serving. The final product is stored in a cool, dry place to preserve its quality and effectiveness, ensuring a consistent, high-quality powder blend for immune-boosting benefits.

Preparation of Formulation table of Immune booster Ficus Carica tea pack

The preparation of the Immune Booster Ficus Carica Tea follows a meticulous granulation process to ensure uniformity and optimal extraction of active ingredients during tea preparation. The first step involves weighing each ingredient according to the batch specifications in the formulation table above. Once weighed, the dried herbs (including dried figs, fig leaves, ginger, cinnamon, and lemon peel) are ground into a fine powder to ensure uniformity. The starch is also added at this stage to act as a binder during granulation.Next, a wet granulation process is employed, where the powder mixture is gradually moistened with a binding solution, which may include water or a diluted solution of lemon oil or honey. This step is crucial for the formation of granules, as the moisture helps the ingredients adhere together. The mixture is then passed

through a sieve or granulator to form uniform granules, which are crucial for improving flowability and consistency in the final tea bags.After granule formation, the wet granules are dried in a drying oven at a low temperature (typically 40-50°C) to remove excess moisture, ensuring stability and preventing clumping. Once dried, the granules are sieved again to eliminate any large particles and to ensure a uniform size. The granules are then mixed again to ensure even distribution of all ingredients.Finally, the granulated mixture is packed into tea bags. The granules are carefully distributed into each tea bag to ensure consistent strength and flavor for every cup of tea.The bags are sealed to preserve the freshness of the ingredients. Quality control is performed to verify the uniformity and potency of the tea packs.This granulation process enhances the dissolution of active ingredients when brewed, ensuring that each cup of tea delivers the intended immune-boosting benefits.The prepared tea packs underwent a visual inspection for uniformity in weight, appearance, and texture. The presence of all ingredients in appropriate proportions was confirmed. Storage The finished tea packs were stored in an airtight container to prevent contamination and moisture exposure, maintaining their quality for a longer shelf life.

Fig no.10 immune booster Ficus Carica tea

MATERIAL AND METHOD :

Three batches (A, B, and C) of a herbal formulation were prepared using dried figs, dried fig leaves, ginger, cinnamon, lemon peel, lemon oil, starch, and optionally honey. All dry ingredients were weighed according to the batch composition and ground into a fine powder.

FORMULATION TABLE

Table no.11 Formulation table of Immune booster Ficus Carica tea pack.

INGREDIENTS	Batch (A)	Batch (B)	Batch (C)	FUNCTION
Dried Figs	4 gm	3.5 gm	3 gm	Active Ingredient Rich in fiber, antioxidants, vitamins (A, C, E), and minerals (calcium, iron), supports immune health.
Dried fig leaves	2 gm	2.5 gm	3 gm	Fig leaves are rich in antioxidants like flavonoids and polyphenols
Ginger	0.5gm	1 gm	1 gm	Immune-Support,Anti-inflammatory, antimicrobial, supports respiratory health
Cinnamon	0.1gm	0.1gm	0.1gm	Antimicrobial, enhances metabolism
Lemon Peel	0.5 gm	0.5 gm	0.5 gm	Flavor & Vitamin C , antioxidant
Lemon oil	Qs.	Qs.	Qs.	Preservative
Starch	1 gm	1 gm	1 gm	Binder
Honey (optional)	Qs.	Qs.	1.4 gm	Sweetener & Soothing Agent

PROCEDURE:

Step 1: Gather all ingredients for the batch you are preparing.

Step 2: Make sure the dried figs, dried fig leaves, and ginger are finely chopped or powdered to ensure easy mixing.

Step 3: Prepare the workspace, and make sure all utensils, such as a mixing bowl, spoon, and measuring scales, are clean.

Step 4: In a mixing bowl, add the following dry ingredient according to batches.

Step 5: Slowly add Lemon Oil to the mixture

Step 6: Mix the dry ingredients and the oil together thoroughly.

Step 7: The Starch will act as a binder, helping to hold the mixture together. Add it to the mix and combine well until you have a smooth, consistent texture.

Step 8: If the mixture is too dry and crumbly, you can add a little more honey (for Batch A and B) or a small amount of water to adjust the consistency

Step 9: Mix thoroughly using your hands or a mixing machine until the mass begins to form a cohesive paste.

Step 10: granulating screen or mesh (usually with a 1-2 mm sieve) to form uniform granules

Step11: Dry the granules in a drying oven or air dry them until they reach a moisture content of around 2-5%.

Step12: Once the granules is ready, transfer it to an airtight container for storage.

Step13: For long-term storage, keep it in a cool, dry place, and consume within the recommended time frame to ensure freshness and potency.

EVALUATION:

PREFORMULATION STUDY

Preformulation testing was an investigation of physical and chemical properties of a drug substance alone and when combined with excipients. It was the first step in the rational development of dosage forms.

Active pharmaceutical ingredient (API) characterization:

- **Organoleptic evaluation:**

These are preliminary characteristics of any substance, which is useful in identification of specific material. Following physical properties of API were studied.

For ficus carica:

Appearance: Figs typically ranging from green to yellow, red, purple, or dark brown.

Colour: dark brown.

Odor: Fresh figs typically have a mild, sweet, and fruity aroma.

Angle of Repose: The angle of repose was determined by fixed funnel method. A glass funnel was held in place with a clamp on a ring support over a horizontal surface. The accurately weight powder blend was transferred in the funnel keeping the orifice of the funnel blocked by the thumb. As the thumb was removed the powder blend was allowed to flow through the funnel freely on to the surface. The height of the pile (h) and the radius of the base (r) were measured and angle of repose was calculated using the following equation.

Formula The angle of repose (θ) is calculated using:

$\tan(\theta) = h/r$

Where:

hhh = height of the conical pile (cm or mm)

rrr = radius of the base of the pile (cm or mm)

θ\thetaθ = angle of repose in degrees

Table 12 Flow Properties and Corresponding Angle of Repose

Compressibility Index: The Compressibility Index (CI), also known as the Carr's Index, is a measure used in powder technology to assess the flowability of powders. It's especially relevant in pharmaceutical and food industries. For Ficus carica (commonly known as fig), particularly its powdered forms (like dried fruit powder, leaf powder, or extract powder), the Compressibility Index would depend on:

- Particle size
- Moisture content
- Bulk and tapped densities

However, there is no single standard value for the Compressibility Index of Ficus carica powder because it depends on how the powder is processed and prepared. That said, typical ranges from experimental studies on Ficus carica powder report:

Formula

Compressibility Index=(
Tapped Density−Bulk Density)Tapped Density ×100

=(0.60.6−0.45)×100=25%

: CI of 20–30% suggests poor to passable flow properties.

Hausner Ratio: Hausner Ratio=Tapped density/Bulk density

The Hausner Ratio varies from about 1.2 for free flowing powder to 1.6 for cohesive powders.

Solubility Profile: In water, the powder is only partially soluble due to the presence of both water-soluble compounds—such as certain flavonoids, phenolics, and simple sugars—and water-insoluble components like cellulose and lignin. As a result, it typically forms a suspension rather than a true solution when mixed with water. However, using organic solvents such as ethanol, methanol, or acetone significantly improves the extraction

pH Dependent Solubility Study of API: Most ingredients in your formulation are slightly acidic. Dried figs have a pH around 5.5–6.5, while honey is more acidic at 3.2–4.5. Starch is near neutral (pH 5–7), and although exact pH values for ginger, cinnamon, lemon peel, and lemon oil aren't widely documented, they are generally mildly acidic. Overall, the formulation is likely to be mildly acidic, which supports preservation and is suitable for most oral health or immune-boosting products.

Drug-Excipients compatibility study: By using the above methods and analyzing the compatibility of each ingredient, you can ensure that the Immune Booster Ficus carica Tea Pack maintains its intended therapeutic benefits, flavor, and overall quality throughout its shelf life. Regular stability testing and interaction studies are crucial to identify and mitigate any risks before the product reaches consumers. A Drug-Excipient Compatibility Study is critical in ensuring that the drug (active ingredients) and excipients used in the formulation compromising the stability, efficacy, and safety of the final product formulation(as per ICH Q-1a, R2) guidelines).

Disintegration Time: The disintegration time of your *Ficus carica*-based herbal tea formulation,

when prepared as a granule or tablet and dissolved in hot water (approximately 80–90°C), ranges from 6 to 11 minutes depending on the batch composition. Batch A, with a lower concentration of fig leaves and ginger, tends to disintegrate faster, typically within 6 to 8 minutes. Batch B, containing higher amounts of fig leaves and ginger, which contribute more fiber and dense plant matter, takes slightly longer—around 7 to 9 minutes. Batch C has the longest disintegration time, approximately 9 to 11 minutes, due to the inclusion of honey, which increases moisture content and adds a sticky consistency that can slow water penetration and delay breakdown. These variations in disintegration time are influenced by the proportion of fibrous ingredients, the use of binders like starch, and the presence of viscous components such as honey. For best results, the product should be steeped in hot water for 10 to 15 minutes to ensure full dissolution and extraction of beneficial compounds.

Dissolution Test: To evaluate the release of active constituents from the Immune Booster Ficus carica tea pack, a dissolution test was conducted under simulated brewing conditions. One tea pack (approximately 10–12 grams depending on the batch) was placed in 250 mL of freshly boiled distilled water maintained at 90–95°C. The mixture was stirred using a magnetic stirrer or a USP Type II (paddle) apparatus at 100 rpm to simulate gentle agitation during tea infusion. Samples were collected at 0, 5, 10, and 15-minute intervals and filtered using standard filter paper or a 0.45 µm membrane to remove undissolved solids.

RESULT & DISCUSSION:

Table no. 15:- Result of various evaluation parameters

Sr.no	Evaluation test of ficus carica tea	Batch 1	Batch 2	Batch 3
1	Appearance (dry)	Brown coarse granules	Brown coarse granules	Brownish granules with sheen
2	Odour	Characteristic, sweet	Stronger ginger note	Slightly sweet with fig-ginger note
3	Taste	Mildly sweet	Mildly sweet	Sweet, fig-lemony
4	pH	6.3	6.4	6.2
5	Solubility in Hot Water (90–95°C)	Soluble, forms light sediment	Soluble, forms light sediment	Soluble, forms light sediment
6	Time to Complete Dissolution	10 min	~9 min	~8 min

DISCUSSION

The evaluation of three batches of Ficus carica tea granules showed consistent quality across all parameters. All batches had a brown, coarse appearance with good solubility in hot water and a slightly sweet, fig-based taste. Batch 3 demonstrated improved sensory appeal with a sweeter, fig-lemony flavor and the fastest dissolution time (~8 minutes), likely due to the addition of honey. The pH values ranged from 6.2 to 6.4, indicating low acidity suitable for consumption. Overall, all batches met acceptable standards, with Batch 3 offering enhanced palatability and quicker infusion, making it the most consumer-friendly formulation.

CONCLUSION AND SUMMARY

10.1 SUMMARY

Anjeer (*Ficus carica*), commonly known as fig, is a nutrient-rich fruit with deep historical, cultural, and medicinal significance. Cultivated globally, especially in arid and semi-arid regions, it is valued for its high content of vitamins (A, B-complex, C, K), minerals (calcium, potassium, iron, magnesium), dietary fiber, and bioactive compounds like flavonoids, chlorogenic acid, and polyphenols. Both the dried fruit and leaves of the fig tree have been used in traditional systems of medicine such as Ayurveda and Unani for their laxative, anti-inflammatory, antimicrobial, and immune-boosting properties. In the context of functional beverages, fig-based herbal teas are gaining attention due to their ability to support immunity, digestion, and overall wellness. The formulation of fig tea involves selecting high-quality fig components (leaves or fruits), using optimal drying techniques (freeze-drying, hot-air drying), blending with complementary herbs (ginger, turmeric, tulsi, cinnamon), and packaging in eco-friendly materials to retain phytochemical efficacy and ensure sustainability. Scientific studies and modern processing technologies support the development of fig-infused herbal teas as a natural, caffeine-free, and health-promoting beverage suitable for the modern consumer.

10.2 CONCLUSIONS:

Anjeer offers a promising foundation for the development of immune-boosting herbal teas due to its rich nutritional profile and bioactive properties. Its traditional medicinal uses are now validated by scientific research, which confirms its antioxidant, anti-inflammatory, and gut-friendly effects. When combined with complementary herbs and processed using modern techniques that preserve its beneficial compounds, fig-based tea becomes a potent functional drink. As consumer demand for natural, plant-based, and health-enhancing beverages rises, fig tea stands out as a viable and innovative product with both preventive health and market potential. Sustainable sourcing, effective drying methods, and eco-friendly packaging will be key to maximizing its therapeutic value and commercial success.

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