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Dosage Forms Based On Tulsi .

Ruturaj Ranjeet Pawar¹ , Guidance Teacher :Mrs. Ulka Mote²

Late Laxmibai phadtare college of pharmacy Kalmb -Walchandnagar.
Pune,Maharashtra,India 413114

ABSTRACT :

This review paper provides a comprehensive analysis of Tulsi's application in various dosage forms, exploring the formulation principles, therapeutic uses, and practical directions for administration.

The paper is organized to separately address each dosage form, including traditional preparations, modern oral formulations, and advanced delivery systems. We discuss the rationale behind formulating Tulsi into different forms, considering factors such as bioavailability, stability, patient compliance, and specific therapeutic targets.

Furthermore, we provide representative formulation examples and highlight the synergistic effects of Tulsi with other excipients and active ingredients.

The review aims to serve as a valuable resource for researchers, pharmacists, and healthcare practitioners interested in the development and utilization of Tulsi - based

Keyword : Tulsi formulations, Types , formula , use , direction to use.

INTRODUCTION :

Ocimum sanctum L., commonly known as Tulsi or Holy Basil, is a revered plant in Ayurvedic and traditional medicine systems. Its therapeutic properties are widely attributed to its rich phytochemical profile, which includes eugenol, rosmarinic acid, ursolic acid, and various flavonoids.

In Hinduism, Tulsi is revered as the "Queen of Herbs" and is considered a manifestation of the goddess Lakshmi, often found in the courtyards of homes and temples. Its spiritual significance is matched by its profound therapeutic value, as documented in ancient Ayurvedic texts like the Charaka Samhita and Sushruta Samhita,

Where it is hailed as a potent adaptogen, immunomodulator, and Rasayana (rejuvenator).

Key phytochemicals include

- **Eugenol:** A major component of Tulsi essential oil, eugenol is a phenolic compound known for its potent antimicrobial, anti-inflammatory, and analgesic properties. It contributes significantly to Tulsi's efficacy in treating respiratory infections and pain.
- **Ursolic Acid:** A triterpenoid acid found in high concentrations, ursolic acid is a well-studied compound with anti-inflammatory, anti-cancer, and hepatoprotective (liver-protecting) effects.
- **Rosmarinic Acid:** A phenolic compound that acts as a powerful antioxidant, scavenging free radicals and protecting against oxidative stress. It also exhibits anti-allergic and anti-Inflammatory properties, making it beneficial for a range of chronic diseases.
- **Flavonoids:** Tulsi contains various flavonoids, such as orientin and vicenin, which possess strong antioxidant and radioprotective properties, helping to protect cells from damage caused by radiation and environmental toxins.

TYPES OF FORMULATION

• Traditional Dosage Forms

This section explores the time-honored methods of using Tulsi, often prepared at home or in traditional pharmacies. These forms are valued for their simplicity and the direct use of the whole plant or its parts.

1. Tulsi Fresh Leaves (Swasa/Swarasa)

Formula: Fresh leaves of *Ocimum sanctum*.

Preparation: The fresh leaves are crushed or ground to extract their juice (swarasa). This juice can be consumed directly or mixed with honey, ginger juice, or water.

Uses: Traditionally used for respiratory ailments like cough, cold, and asthma. It is also a popular remedy for fever, digestive issues, and as an immune booster.

Direction to Use: 1-2 teaspoons of fresh Tulsi leaf juice, taken 2-3 times a day. It is often recommended to consume on an empty stomach for maximum absorption.

2. Tulsi Herbal Tea (Phanta)

Formula: Dried Tulsi leaves or a blend of dried leaves, flowers, and stems.

Preparation: A decoction (phanta) is prepared by boiling dried Tulsi leaves in water. Other herbs like ginger, cardamom, or black pepper are often added to enhance flavor and therapeutic effect.

Uses: A common daily beverage for stress reduction, general wellness, and as a preventive measure against common infections.

Direction to Use: Infuse 1-2 teaspoons of dried Tulsi leaves in a cup of hot water for 5-10 minutes. Strain and drink. Can be consumed multiple times a day.

Brands for Reference: Organic India, Octavius, The Tea Trove, Vahdam Teas.



• Oral Dosage Forms

The development of modern oral dosage forms addresses the need for standardized, stable, and convenient products.

1. Tulsi Capsules/Tablets

Formula:

Tulsi Extract (Standardized): 100-500 mg (e.g., 2.5% ursolic acid)

Excipients: Microcrystalline cellulose (filler), Magnesium stearate (lubricant), Silicon dioxide (anti-caking agent).

Shell: Hard gelatin or HPMC (for vegetarian capsules).

Preparation: The standardized Tulsi extract is mixed with the excipients and then encapsulated or compressed into tablets. The standardization ensures a consistent dosage of active compounds.

Uses: Used as an adaptogen for stress management, a general health supplement, and for immune system support. Capsules and tablets are ideal for precise dosing.

Direction to Use: 1-2 capsules or tablets, taken once or twice daily with water, preferably after a meal to minimize gastrointestinal irritation.

Brands for Reference: Dabur Tulsi Tablets, Himalaya Wellness Tulsi Tablets, Organic India Tulsi Capsules, Zandu Tulsi Capsules.



2. Tulsi Syrups/Liquid Formulations

Formula:

Tulsi Hydro-alcoholic Extract: 5-15% w/v

Vehicle: Sucrose solution or a mixture of sorbitol and glycerin.

Preservatives: Sodium benzoate, Methylparaben.

Flavoring Agents: Natural flavors.

Preparation: The Tulsi extract is dissolved in a base of water and a co-solvent (like ethanol). Sweeteners, preservatives, and flavoring agents are then added to create a stable, palatable syrup.

Uses: Syrups are particularly suitable for children and individuals who have difficulty swallowing tablets. They are commonly used for cough, cold, and as a general tonic.

Direction to Use: 5-10 ml, 2-3 times a day, or as directed by a healthcare professional.

Brands for Reference: Dabur Honitus Tulsi Cough Syrup, Himalaya Koflet-SF Cough Syrup (contains Tulsi), Zandu Tulsi Syrup.



3. Tulsi Chewable Tablets

Formula:

Tulsi Dry Extract: 100-200 mg

Bulking Agents: Mannitol, Sorbitol,

Xylitol (for a sugar-free formulation) Binders: Microcrystalline cellulose,

Maltodextrin

Disintegrants: Croscopovidone,

Croscarmellose sodium

Flavors and Sweeteners: Sucralose,

Peppermint oil, fruit flavors

Lubricant: Magnesium stearate

Preparation: Tulsi extract and other powdered ingredients are blended and then granulated, often using a wet granulation technique to improve flowability. The granules are then compressed into chewable tablets with a single or multi-punch tablet machine. The selection of excipients ensures a pleasant taste and a soft texture that breaks down easily in the mouth.

USES: Ideal for individuals who have difficulty swallowing conventional tablets. Chewable tablets are particularly popular for pediatric and geriatric patients. They are commonly used for immune support, cough, and cold symptoms. Direction to Use: Chew one tablet thoroughly before swallowing, 1-2 times daily or as needed. No water is required.

Brands for Reference: Charak Pharma's 'Gufic' range, Zandu, and some formulations from Patanjali may offer chewable tablets containing Tulsi.



4 . Tulsi Effervescent Granules/Tablets

Formula:

Tulsi Dry Extract: 50-150 mg

Acid Source: Citric acid, Tartaric acid

Alkali Source: Sodium bicarbonate,

Sodium carbonate

Sweeteners and Flavors: Aspartame,

Sucralose, Lemon/Lime flavor

Binders: Polyethylene glycol (PEG)

Preparation: The active ingredient, Tulsi extract, is mixed with the acidic and alkaline components. The effervescent mixture is then granulated, often in a low-humidity environment to prevent a premature reaction. The granules can be packaged as-is or compressed into effervescent tablets. Upon contact with water, the acid-base reaction releases carbon dioxide, creating a fizzing sensation.

Uses: This form offers rapid dissolution and absorption, as the effervescence helps to break down the active ingredients. It is a palatable way to consume herbs, especially for those who dislike the taste of traditional remedies. It's often used for quick relief of symptoms like indigestion, cough, and to provide a refreshing, immunityboosting drink.

Direction to Use: Drop one effervescent tablet or a spoonful of granules into a glass of water (150-200 ml). Wait for it to dissolve completely and drink. Consume once or twice daily.

Brands for Reference: Brands like Fast&Up and other nutraceutical companies that offer vitamin C or immunity-boosting tablets may have similar effervescent formulations with Tulsi.

5. Tulsi Oral Drops

Formula:

Tulsi Essential Oil or Standardized

Extract: 1-5%

Vehicle: Propylene glycol, Glycerin,

Ethanol (in specific ratios)

Preservative: Sodium benzoate

Preparation: The Tulsi extract is dissolved in a solvent mixture to create a stable, concentrated liquid. The formulation is designed for easy dosing using a dropper.

Uses: This is a highly concentrated form, allowing for small doses to be mixed with water or other beverages. It is a convenient and versatile option for daily use as an immune supplement and a general wellness tonic.

Direction to Use: Add 1-2 drops to a glass of lukewarm water, tea, or any other beverage. Drink 2-3 times a day.

Brands for Reference: Upakarma Ayurveda, Baidyanath, and Patanjali are well-known for their “Tulsi Drops” or “Tulsi Ark” products.



6. Tulsi Oral Sprays

Formula:

Tulsi Extract (Aqueous): 1-5%

Solubilizer: Polysorbate 80

Humectant: Glycerin

Preservatives: Potassium sorbate,

Sodium benzoate

Flavoring Agents: Menthol, Peppermint oil

Preparation: Tulsi extract is dissolved in an aqueous base with a solubilizer to ensure a uniform solution. A pump spray mechanism is used to deliver a fine mist into the mouth or throat.

Uses: Oral sprays offer a fast-acting, localized effect, particularly for sore throats, coughs, and bad breath. The fine mist coats the oral and pharyngeal mucosa, providing immediate relief and antimicrobial action. It is a convenient and portable dosage form.

Direction to Use: Spray 1-2 times directly into the throat or mouth as needed.

Brands for Reference: While dedicated Tulsi oral sprays are less common, some throat and cough sprays from brands like Dabur and Himalaya may contain Tulsi as a key ingredient for its soothing properties.

• Advanced Delivery Systems

This section explores novel and targeted delivery systems for enhanced Bioavailability and therapeutic efficacy

1. Tulsi Nanoparticles/Nanoemulsions

Formula:

Active Ingredient: Tulsi essential oil or purified extracts.

Carrier: Lipid-based or polymeric nanoparticles (e.g., PLGA).

Surfactants: Tween 80, Lecithin.

Co-surfactants: Propylene glycol.

Preparation: Tulsi oil or extract is encapsulated within a nanoscale carrier using techniques like high-pressure homogenization or solvent evaporation.

This creates a stable nanoemulsion or nanoparticle suspension.

Uses: This advanced form is under research for improved bioavailability of lipophilic compounds and targeted delivery to specific tissues. Potential applications include enhanced anti-cancer and antiinflammatory therapy.

Direction to Use: Primarily in a research and clinical setting. Directions for use would be highly specific to the targeted application and administered under strict medical supervision.

Brands for Reference: (Note: This is a research-intensive area. Commercial products are not yet widely available under these specific names, but brands like Upakarma Ayurveda offer “Tulsi Drops” which are a concentrated form, a step towards more advanced liquid Formulations.)

2. Tulsi Lozenges/pastilles

Formula:

Tulsi Extract (Aqueous): 1-5% Base: Sugar (e.g., isomalt, sucrose) or sugar-free polyols (e.g., maltitol).

Binding Agents: Acacia gum, gelatin.

Flavoring Agents: Mint, lemon.

Preparation: Tulsi extract is incorporated into a heated sugar or polyol base, which is then poured into molds to solidify.

Uses: Designed for localized effect in the oral cavity and throat. They are effective for soothing a sore throat, relieving cough, and improving oral hygiene.

Direction to Use: Allow one lozenge to dissolve slowly in the mouth every 2-3 hours as needed.



Brands for Reference: Himalaya Koflet lozenges (contain Tulsi), Dabur Honitus lozenges (contain Tulsi).

• Topical and Transdermal Dosage Forms

Topical applications of Tulsi are used for localized therapeutic effects on the skin, leveraging its anti-inflammatory, antimicrobial, and antioxidant properties.

1. Tulsi Gels and Creams

Formula:

Tulsi Extract (Aqueous or Hydroalcoholic): 2-10%

Gelling Agent: Carbopol 940, HPMC

(Hydroxypropyl Methylcellulose) Emulsifying Agents (for creams): Cetyl alcohol, Stearic acid

Humectants: Glycerin, Propylene glycol .

Preservatives: Methylparaben, Propylparaben .

Preparation: For a gel, the gelling agent is dispersed in water, and the Tulsi extract is added along with other excipients. For a cream, an oil phase and a water phase are prepared separately and then mixed with the extract at a controlled temperature to form a stable emulsion.

Uses: Treatment of various skin conditions like acne, eczema, and fungal infections. It is also used in wound healing, reducing inflammation, and as an ingredient in anti-aging skincare products.

Direction to Use: Apply a thin layer to the affected area of the skin 2-3 times daily or as directed. Gently massage until absorbed.

Brands for Reference: Khadi Organique , Neem & Tulsi Face & Body Wash, , Everyuth Naturals Anti Acne Anti Marks Tulsi Turmeric Face Wash, Shahnaz Husain Tulsi Neem Face Wash.

2. Tulsi Ointments/Balms

Formula:

Tulsi Essential Oil or Oily Extract: 1-5% Ointment Base: Petrolatum, Paraffin wax, Lanolin, or a blend of natural waxes (e.g., beeswax).

Preparation: The Tulsi essential oil or extract is carefully mixed into a melted ointment base. The mixture is then stirred continuously until it cools and solidifies to ensure uniform distribution of the active ingredient.

Uses: Primarily for localized pain relief, muscular aches, and congestion. The volatile oils in Tulsi provide a counterirritant effect.

Direction to Use: Gently rub a small amount onto the chest, back, or temples for relief from cold, cough, or headache. Apply to sore muscles as needed.

Brands for Reference: Brands like Baidyanath and Patanjali may offer balms or rubs containing Tulsi.

• Specialized and Emerging Dosage Forms

These forms are less common but represent innovative approaches to drug delivery.

1. Tulsi Mouthwash/Gargle

Formula:

Tulsi Leaf Extract or Essential Oil: 0.5-

2%

Vehicle: Water or hydro-alcoholic solution

Surfactants: Polysorbate 80 Flavoring and Coloring Agents:

Peppermint oil, Menthol

Preparation: The Tulsi extract is dispersed in water or a water-alcohol mixture with the aid of a surfactant. Flavoring agents are added to improve palatability.

Uses: Used for oral hygiene to combat bad breath, and treat minor mouth infections and ulcers. Tulsi's antimicrobial properties are effective against oral pathogens.

Direction to Use: Gargle or rinse the mouth with a small amount for 30 seconds to a minute after brushing or as needed. Do not swallow.

Brands for Reference: Some dental and herbal brands may incorporate Tulsi into their mouthwash formulations, such as Dabur Red Toothpaste (which contains Tulsi extract).



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