
**FORMULATION AND EVALUTION ON ANTIBACTERIAL ACTIVITY
OF TULSI EXTRACT**

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DOI: <https://doi-doi.org/101555/ijarp.5176>**ABSTRACT**

A herbal soap was formulated using the leaf extract of Tulsi, and Neem, Alovera, Turmeric powder. Ayurvedic cosmetic are also known as the herbal cosmetic the natural content in the herbs does not have any side effect on the human body most herbal supplement are based on several botanical ingredients with long histories of traditional or folk medicine usage. Numerous chemical toxins microorganism present in the atmosphere may cause chemical infection and damage to skin cosmetic alone are not sufficient to take care of skin and body parts.

Tulsi is broad spectrum antibacterial activity, tulsi has proved to be highly effective in protecting our body from various infections and disease of the liver, skin, kidney, etc. Herbal soap of tulsi preparation is medicine or drugs it contain Antibacterial and Antifungal agent.

Soap properties have been used to treat various skin disorders. Species of streptococcus and staphylococcus aureus are the most common types of fungus that cause skin infections [2]. This wonder herb is used to test acne, skin infections , lighten dark spots , pimples and improve skin texture. The leaves of the Tulsi plant are believed to possess healing properties and are often used in Ayurvedic medicine to treat various ailments and illnesses.

Well known for its anti- acne benefits, tulsi can help reduce, heal and fade appearance of acne, pimples and blemishes on the skin.

KEYWORDS:- Tulsi, Neem, Alovera, Turmeric, Rosé Water, Cleanser Base, Lavendar Basic Oil.

INTRODUCTION

Medicinal plants have been widely used since ancient times for the treatment and prevention of various diseases because of their therapeutic properties. In recent years, there has been growing interest in plant-based antimicrobial agents due to the increasing resistance of microorganisms to synthetic antibiotics. Herbal medicines are considered safer, economical, and easily available alternatives to conventional drugs.

Among various medicinal plants, Tulsi, also known as Holy Basil, occupies an important place in traditional systems of medicine such as Ayurveda. Tulsi is well known for its antimicrobial, anti-inflammatory, antioxidant, and immunomodulatory activities. The plant contains several bioactive compounds such as eugenol, ursolic acid, flavonoids, tannins, and essential oils, which are responsible for its medicinal properties.

The formulation of herbal extracts into suitable dosage forms has become an important area of pharmaceutical research. Tulsi extract can be formulated into preparations such as gels, creams, ointments, or solutions for therapeutic applications. Evaluation of antibacterial activity helps determine the effectiveness of the formulated product against pathogenic bacteria.

The present study focuses on the formulation and evaluation of the antibacterial activity of Tulsi extract. The aim is to prepare a suitable herbal formulation containing Tulsi extract and to investigate its antibacterial potential against selected bacterial strains using standard microbiological methods. This study may contribute to the development of effective herbal antimicrobial agents with fewer side effects and reduced chances of microbial resistance.

Tulsi, commonly known as Holy Basil, is one of the most important medicinal plants used in traditional Indian systems of medicine such as Ayurveda. Tulsi is known as the “Queen of Herbs” because of its wide range of therapeutic properties. The plant contains several bioactive compounds such as eugenol, ursolic acid, rosmarinic acid, flavonoids, tannins, and saponins, which are responsible for its medicinal activities.

Tulsi possesses many pharmacological properties including: Antibacterial activity

Antifungal activity

Anti-inflammatory activity Antioxidant activity Antiseptic property

Skin protective action

The antibacterial activity of Tulsi soap can be evaluated against microorganisms such as:

Staphylococcus aureus Escherichia coli

The formulation and evaluation of antibacterial Tulsi extract soap therefore represents an important approach in the development of herbal cosmetic products that are economical,

effective, safe, and environmentally friendly. Such herbal soaps are useful for daily skin care and help maintain proper hygiene while reducing the harmful effects associated with synthetic chemical-based soaps.

METHODS OF PREPARATION:-

Ingredients	Quantity	role
Tulsi extract	4.8ml	Antibacterial
Neem extract	3.2ml	Antibacterial
Turmeric powder	0.8gm	Antifungal
Glycerine soap base	64gm	Soap base
Honey	1.6ml	Antibacterial
Rose water	1.2ml	Cooling agent
Lavender oil	1.2ml	Perfume agent
Aloe vera extract	3.6ml	Anti-aging

METHODS

Collection and extraction

- The leaves of the tulsi is collected from the fresh plant and is wash properly and dry.
- Then tulsi leaves were crushed in mortar pestle(kharal),and crushed leaves were squeezed through the filtered in the filter paper, and collect the tulsi extract.
- Neem leave also used same method.
- The alovera gel extract proper, and this extract filtered through the smooth cloth, and collect the alovera extract.
- Turmeric is the grinding in mortal pestle, and this turmeric extract passed through the sieve's, and collect the fine turmeric powder.
- The crude extract was complete to use.
- This extraction is best for the soap result.

PROCEDURES

- Give of tulsi extract in a beaker then this beaker may be add Of neem extract, alovera extract, turmeric powder, rose water and honey then all are mix 2 to 3 min.
- The small pieces of the prepared basic glycerine soap were put into a porcelain dish and melted on a water bath At a temperature below 60°C.
- After melt base add mix all ingredient in the melt soap and mix it them finally heat Stop and add lavender essential oil.
- The preparation solution will be give in small, small container for the shape of the soap. Final soap is ready and it packing in the paper.



INGREDIENTS OF DETAILS

1. TULSI



Tulsi is known as the “Queen of Herbs” because of its many health benefits. Its leaves are used to treat cough, cold, fever, stress, and digestive problems. Tulsi has antibacterial, antiviral, and anti-inflammatory properties, which make it a powerful natural remedy.

Tulsi also helps improve environmental health by purifying the air and increasing oxygen levels.

Botanical Name: *Ocimum tenuiflorum*, *Ocimum sanctum* · Synonyms: Holy Basil, Sacred Basil
Kingdom: Plantae · Clade: Tracheophytes · Order: Lamiales · Family: Lamiaceae · Genus: *Ocimum* · Species: *O. tenuiflorum*.

2. NEEM



Neem is a fast growing tree that usually reaches a height of 15-20 m, and under very favorable conditions up to approximately 30-35 m. As a rule it is an evergreen tree, but under

extreme circumstances, such as extended dry periods, it may shed most of nearly all of its leaves. The branches spread widely. The fairly dense crown is roundish or oval and may reach a diameter 15-20 m in old free standing specimens. The trunk is relatively short, straight and may reach a girth of 1.5-3.5 m. The bark is hard fissured or scaly and whitish-gray to reddish-brown. The sap wood is grayish-white and the heart wood reddish.

1. Synonym – Arishth .
2. Family – Mellaceae.
3. Chemical constituents – Nimbin , Nimbinene.
4. Use – Anti – bacterial Use :-

Neem preparations are reportedly efficacious against a variety of skin diseases, septic sores, and infected burns. The leaves, applied in the form of poultices or decoctions, are also recommended for boils, ulcers, and eczema. The oil is used for skin diseases such as scrofula, indolent ulcers, and ringworm.

3. ALOE VERA



Aloe is a succulent plant widely used in alternative medicine. There are at least 420 different plant species of Aloe. Aloe vera specifically refers to the *Aloe barbadensis* Miller plant, which is the most common form used in Aloe-based products.

Synonym - Ghrith kumari. Family- Liliaceae.

Chemical constituents – lignin, vitamin, enzymes, minerals. Use – Anti-Aging

4. TURMERIC



Turmeric has been put to use as a foodstuff, cosmetic, and medicine. It is widely used as a spice in South Asian and Middle Eastern cooking. It lends curry its distinctive yellow color and flavor.

1. Synonym- Haldi.
2. Family- Zingiberaceae.
3. Chemical constituents- Curmin , DimethoxyCurmin.
4. Use- antibacterial.

Uses Inflammation. Degenerative eye conditions. Metabolic syndrome. Arthritis. Hyperlipidemia cholesterol in the blood.

5. ROSE WATER



Rose water has been used as a vehicle for other medicines and as an eye lotion. Triple or stronger rose water is water saturated with volatile oil of rose petals. It is a by product in the

distillation of oil of roses. The finest rose water is obtained by 'distillation of the fresh petals.

1. Synonym – Attarrose.
2. Family – Rosaceae.
3. Chemical constituents – Citronellol, linalool.
4. Use – Flavouring agent.

Uses:- prevent wounds such as burns and cuts becoming infected.

6. HONEY



Honey, Sweet, viscous liquid food, dark golden in colour, produced in the honey sacs of various bees from the nectar of flowers. Flavour and colour are determined by the flowers from which the nectar is gathered. Some of the most commercially desirable honeys are produced from clover by the domestic Honeybee

Synonym – Madhu. Family – Apidae.

Chemical constituent – Dextrose, Laevulose. Anti –aging.

Uses:-

Honey contains nutrients beneficial to health. . Raw honey is rich in antioxidants. .

Using honey to replace table sugar helps improve diabetes. . The antioxidants in honey help lower blood pressure.

7. GLYCERIN



Glycerin soap base is a transparent or semi-transparent soap base used for making handmade soaps. It contains glycerin, a natural humectant that attracts moisture from the air and helps keep the skin soft and hydrated. Glycerin soap is gentle on the skin and is widely used for preparing herbal, medicated, and cosmetic soaps.

Uses Herbal soaps Cosmetic soaps Antibacterial soaps Moisturizing soaps Medicated soaps
USES

Uses of Tulsi Extract Soap Tulsi extract soap is a herbal soap made from Tulsi (Holy Basil) plant extract. It is widely used in skincare because Tulsi contains natural antibacterial, antifungal, anti-inflammatory, and antioxidant properties.

1. Helps in Treating Acne and Pimples: Tulsi soap helps remove excess oil, dirt, and bacteria from the skin. Its antibacterial action may help reduce acne-causing germs and prevent pimples.
2. Maintains Skin Hygiene: Tulsi extract soap is commonly used for daily bathing and hand washing because it helps cleanse the skin and remove impurities, sweat, and dust.
3. Prevents Skin Infections: The antifungal and antimicrobial properties of Tulsi may help protect the skin from minor fungal infections, itching, and rashes.
4. Reduces Skin Inflammation: Tulsi contains anti-inflammatory compounds that help soothe irritated skin, redness, and swelling. It may be useful for sensitive or inflamed skin.
5. Controls Excess Oil: Tulsi soap helps control oily skin by removing excess sebum from the skin surface. This keeps the skin fresh and less greasy.
6. Helps in Skin Detoxification: Tulsi soap removes toxins, dirt, and pollutants from the skin and helps keep pores clean. This gives a refreshed and clean feeling after bathing.

7. Improves Skin Glow:Regular use of Tulsi soap may help improve skin texture and complexion by keeping the skin clean and healthy. Some users notice smoother and brighter skin.
8. Provides Antioxidant Protection:Tulsi contains antioxidant such as flavonoids and eugenol that help protect the skin from free radical damage and early signs of aging.
9. Useful for All Skin Types: Many Tulsi soaps are gentle and suitable for oily, normal, and sensitive skin when used regularly.
10. Gives Refreshing FragranceTulsi soap provides a natural herbal fragrance that gives freshness and a cooling effect after bathing.

- Medicinal Uses of Tulsi Extract Soap
- Used as an antibacterial cleansing soap
- Help sin mild fungal infections
- Helps reduce itching and irritation
- Useful in managing body odor caused by bacteria
- May help in minor cuts and skin allergies due to its antimicrobial action
- Cosmetic Uses of Tulsi Extract Soap

Daily face and body cleansing Acne control

Oil control

Skin brightening

Maintaining soft and healthy skin

Precautions

People with very dry or highly sensitive skin may experience dryness after excessive use.

Stop using if irritation or allergy develops. Avoid contact with eyes.

Some antibacterial soaps may not always work better than regular soap and excessive use can sometimes dry the skin.

ADVANTAGES

1. Antibacterial Action:Tulsi (HolyBasil) contains natural compounds like eugenol that help kill or control bacteria on the skin.It helps reduce skin infections, pimples, acne, and body odor.
2. Prevents Acne and Pimples:The antibacterial and anti-inflammatory properties of tulsi help clear clogged pores and reduce acne-causing bacteria.

3. Reduces Skin Inflammation: Tulsi soap helps soothe redness, irritation, itching, and skin rashes because of its anti-inflammatory activity.
4. Natural Antioxidant Effect: Tulsi is rich in antioxidants that protect the skin from damage caused by free radicals, pollution, and sunlight. It helps maintain healthy skin.
5. Helps in Wound Healing: Tulsi supports faster healing of minor cuts, wounds, and skin infections due to its antimicrobial properties.
6. Controls Excess Oil: Tulsi soap helps remove extra oil and dirt from the skin, making it useful for oily and acne-prone skin.
7. Maintains Skin Freshness: The herbal aroma and cleansing action of tulsi provide a refreshing feeling and help reduce bad body odor.
8. Suitable for Daily Use: Herbal tulsi soaps are generally mild and contain fewer harsh chemicals, making them safer for regular bathing.
9. Anti fungal Properties: Tulsi may help protect against fungal infections like itching and ringworm due to its antifungal activity.
10. Improves Skin Appearance: Regular use may help improve skin tone, maintain softness, and give a healthy glow to the skin.

DISADVANTAGES

1. May Cause Skin Dryness: Frequent use of antibacterial soap can remove natural oils from the skin, leading to dryness and roughness.
2. Possible Skin Irritation: Some people may experience itching, redness, burning sensation, or irritation due to sensitivity to tulsi or other soap ingredients.
3. Allergic Reactions: Individuals allergic to herbal products may develop rashes or skin allergies after using tulsi soap.
4. Strong Herbal Smell: The natural odor of tulsi may not be liked by everyone.
5. Not Suitable for Very Sensitive Skin: People with highly sensitive skin or skin disorders like eczema may experience discomfort after use.
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6. Limited Shelf Life: Herbal soaps containing natural extracts may have a shorter shelf life compared to commercial chemical soaps.
7. May Not Kill All Germs: Tulsi soap has antibacterial properties, but it may not be as strong as medicated antibacterial soaps against certain microorganisms.
8. Can Cause Excessive Oil Removal: Continuous use may remove too much oil from the

skin, causing irritation or flaky skin.

9. Variation in Quality: The effectiveness of tulsi soap depends on the quality and concentration of tulsi extract used during preparation.
10. Possible Color or Fragrance Changes: Natural ingredients in herbal soaps may change color, smell, or texture overtime.

EVALUATION PARAMETERS

Evaluation parameters are used to determine the quality, effectiveness, stability, and safety of tulsi extract soap. These tests help ensure that the soap is suitable for skin use and has good antibacterial activity.

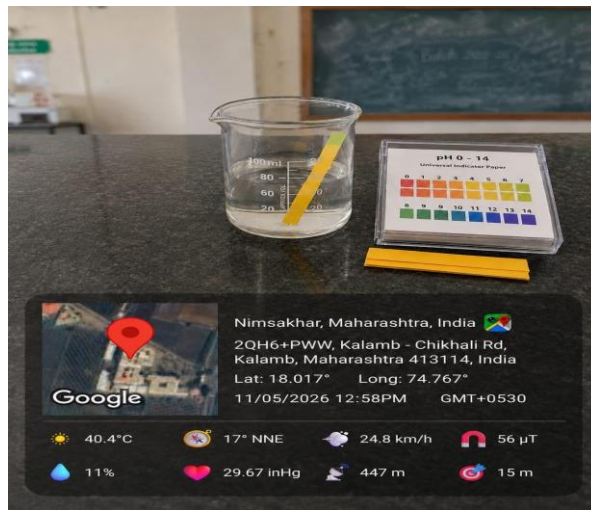
- Organoleptic Evaluation: Organoleptic evaluation such as colour and clarity was done by sensory and visual inspection.
- Colour – Brownish Odour – Aromatic Appearance – Good Shape – Ovals
- PH: The pH was determined by using pH paper, the pH was found to be neutral in nature.

Foam Retention: In the 100 ml of measuring cylinder transfer the Prepared the 25 ml of the 1% soap solution. Then the cylinder was shaken 10 times. The volume of foam retention was recorded. Alcohol insoluble matter: 5gm of the material were placed in a conical flask. This was mixed with 50ml of 70% ethanol and vigorously shaken to dissolve the material entirely. 20ml of warm ethanol and filter paper were added to the solution before it was filtered. Dried it for 1 hour at 105°C. It was noted how much dried paper weighed [16].

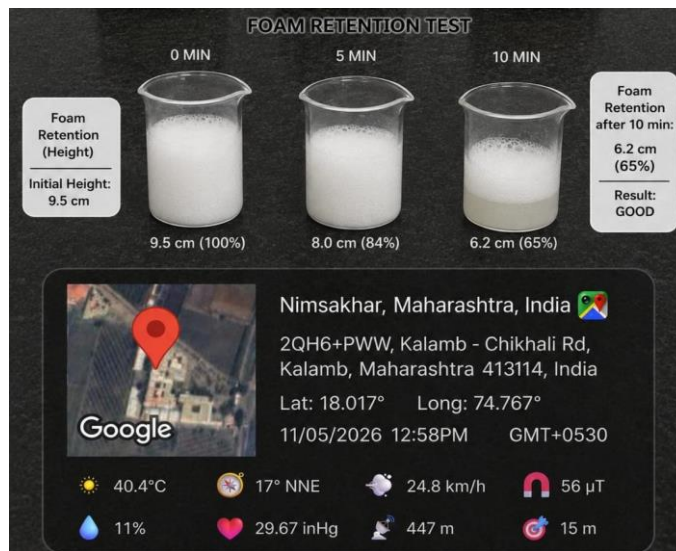
Dirt dispersion test: First, we prepare a 1% sample solution that was taken in a measuring cylinder and added two drops of ink in to the sample solution. The measuring cylinder was then shaken ten times while being covered by a hand. The ink is present concentrate in the foam is considered to be of low quality, investigate that. The remaining dirt particles are then found in the water section. The amount of ink found in the foam was notice.

Skin irritation test For the determination of irritancy test, Use the soap sample on clean skin to observe for signs of irritation, such as redness, burning, or itching and 24 hours, the situation was monitored.

PH :-



FOAM RETENTION TEST :-



DIRT DISPERSION TEST :-



RESULT

Parameters	Results
Formulation	Soap
Colour	Brownish
Shape	Ovals
Appearance	Good
Texture	Smooth
Odour	Aromatic
PH	7 (neutral)
Foam retention	19min
Foam height	3 cm
Alcohol insoluble matter	18.0
Skin irritation test	Non irritant
Dirt dispersion	Good dirt dispersion
Acceleration stability testing	No change in soap

DISCUSSION

The formulation of tulsi extract soap was carried out to prepare a herbal soap with good cleansing and antibacterial properties. Tulsi is widely used in herbal preparations because of its antimicrobial, antifungal, anti-inflammatory, and antioxidant activities. The incorporation of tulsi extract into soap helps improve skin protection and hygiene. In the formulation, ingredients such as soap base, tulsi extract, glycerin, fragrance, color, and distilled water were used. The soap base provides cleansing action, while glycerin acts as a moisturizer and prevents dryness of the skin.

Tulsi extract serves as the active antibacterial agent in the formulation. During preparation, the soap base was melted and mixed uniformly with tulsi extract and other ingredients. Proper mixing is important to ensure uniform distribution of the extract throughout the soap. The mixture was then poured into molds and allowed to cool and solidify.

The prepared tulsi soap showed good physical appearance, acceptable odor, and smooth texture. The herbal extract provided a natural greenish color and characteristic smell to the soap. The formulation produced satisfactory foam and cleansing action.

The antibacterial activity of the soap may be due to the presence of phytoconstituents in tulsi such as eugenol and flavonoids, which inhibit microbial growth. The soap also showed acceptable pH suitable for skin application.

The formulation of tulsi extract soap offers several advantages such as: Natural antibacterial effect Reduced use of synthetic chemicals Skin-friendly action Herbal and eco-friendly product However, stability and storage conditions should be properly maintained because herbal products may undergo changes over time.

Thus, the formulated tulsi extract soap can be considered an effective herbal soap with good cleansing, antibacterial, and skin-protective properties.

CONCLUSION

The formulation of tulsi extract soap was successfully prepared by using tulsi extract, glycerin soap base, fragrance, color, and other suitable ingredients. Tulsi possesses natural antibacterial, antifungal, and antioxidant properties, which make it useful for skin cleansing and protection against microorganisms.

The prepared soap showed good appearance, pleasant odor, proper hardness, and satisfactory foaming ability. The evaluation parameters such as pH, foam height, foam retention, moisture content, and skin irritation test were found to be within acceptable limits. The soap provided effective cleansing action without causing irritation to the skin. The study concludes that tulsi extract can be effectively incorporated into herbal soap formulation produce a natural and safe antibacterial soap. Herbal soaps containing tulsi extract may be beneficial for maintaining healthy skin, reducing microbial growth, and avoiding the side effects commonly associated with synthetic chemical soaps. Thus, tulsi extract soap can be considered a promising herbal cosmetic product with good therapeutic and commercial value.

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