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FORMULATION AND EVALUATION HERBAL SOAP FORM FICUS RELIGIOSA

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ABSTRACT
Ficus religosa, sometimes referred to as peepal, is a member of the Moraceae family. Studies have been conducted on phenolic components, hydrocarbons, aliphatic alcohols, volatile components, phytosterols, amino acids, furanocoumanins, and a few other secondary metabolite types in Ficus religiososa. The agar well diffusion technique was used to assess the antimicrobial activity of plant extracts. The researcher will be asked to isolate novel medicinal chemicals from various regions of Ficus religiosa in order to discover novel medications. Similar to Ayurveda, Siddha, Unani, and homeopathy, it is a prominent indigenous medical system. Traditional medicine uses a variety of parts, including stem bark, root bark, aerial roots, vegetative buds, leaves, fruits, and latex, to treat diabetes, vomiting, burns, gynecological disorders, diarrhea, nervous disorders, and as a tonic and astringent. In India, medicinal plants have been the main source of treatment because they contain a variety of complex chemical substances with varying compositions. Following the formulation's completion, it was assessed for physicochemical characteristics such as color, odor, pH, spreadability, extrudability, consistency, solubility, and washability. Additionally, the formulation was assessed for stability at different temperatures, demonstrating no change in irritancy or spreadability. The majority of commercial soaps contain chemicals and synthetic components that can be unpleasant or harmful to the skin. Human skin requires specialized therapy for healing, enhanced skin tone, and the look of radiant health. Another potential approach is to use natural herbal soaps. Our study's objective was to create herbal hygienic soap using an antibacterial ingredient and the cold process technology. Herbal soap was prepared using Aloe vera, Lemon oil, neem, Ethanol, Rosemery water, Rosewater, Glycerin, Steric acid, Soft Paraffin. Ficus religiosa (Active ingredient), and NaOH (lye) and different extracts were included into basic saponification reaction. The saponification, soluble matter, antimicrobial testing using different concentration of soap solution comparing with standard. The herbal soaps has satisfactory antimicrobial results as compared to antibiotic. Moreover, oils used are added to treat various skin infection and for daily usage.

KEYWORDS: Ficus religiosa, herbal soap, Antimicrobial Activity.

INTRODUCTION

It has long been known that medicinal plants are an important source of bioactive substances for both conventional and contemporary medical uses. Ficus religiosa L. (Peepal), a member of the Moraceae family, is one of the most significant ethnomedical plants on the Indian subcontinent. The plant's leaves are especially notable because of their rich phytochemical composition and variety of biological activities, even though the plant's bark, fruits, latex, and roots have all been used in traditional therapeutic techniques. A Modern medicine aims to create medications that are more effective and have fewer negative effects Pharmaceutical plants continue to be an important source of novel pharmaceutical compounds. These flora have complicated chemicals that contribute to their therapeutic qualities, referred to as secondary plant metabolites Medicinal plants have long been a reliable source of treatments for a wide range of illnesses background. In thepast, more than 30% of plant species have been utilized therapeutically, and more than 75% of people use plant extracts for medical purposes globally.

Discovery of Soap

The Discovery and Art of Soap Making Up to 1660. Soap, defined as the substance produced by the action of a base on fats and oils, has played an essential role in civilization's history, yet its discovery was unintentional, and its utility was only gradually recognized. As a result, following Liebig and others' lead and attempting to analyze prior civilizations based on their knowledge or lack thereof of soap is just impossible. If this were not the case, the Fanti of West Africa and the Gauls of the first century A.D., who appear to have found soap independently, would have advanced further in civilization than the Egyptians or the Greeks, both of whom were unaware of soap. Both the Egyptians and the Greeks were familiar with therapeutic remedies that contained alkalis, tallow, and various vegetable oils, among other components. The Papyrus Ebers describes the use of similar ointments to treat herpes and to remove fat around the eyes25. Many different types of lead plasters were also known. Again, the Berlin Papyrus instructs on preparing an ointment using natron and tallow27, while Hippocrates utilized oil and soda combinations as purgatives26. According to early writings, the Assyrians employed a mixture of castor oil and alkali as a head wash.27 In addition to this knowledge, the production of alkaline lyes from plant ashes was well known to practically all nations from very early times; nonetheless, their usage in the making of soap appears to have occurred at least not until the Christian era.

Herbal Soap

Herbal soap preparation is a medicine that contains antibacterial, anti-aging, anti-oxidant, and anti-septic characteristics. It mostly uses plant parts such as seeds, rhizomes, nuts, and pulps to treat an injury or disease or to improve health. Herbs are the most commonly used natural items to cure practically all ailments and skin problems due to their great medicinal value, low cost, availability, and compatibility. The herbs used were chandana, nagkeshara, padmak, khus, yashtimadhu, manjistha, sariva, payasya, seta (sweta durva) and lata (shyama durva). These ayurvedic herbs are used to purify blood and eliminate vitiated doshas like (vata, pitta, kapha) from the body as they are mainly responsible for skin disorders and other diseases. The herbs mentioned in khushthagna mahakashaya effective in skin disorders, include khadira, abhaya, amalaki, haridra, bhallataka, saptaparna, karavira, vidanga and jati.

Advantages of herbal soap

Natural components

Herbal soaps are prepared with natural plant-based ingredients including essential oils, herbs, and botanical extracts, which are gentler on the skin and less prone to cause irritation or allergies.

Moisturizing properties

Many herbal soaps include moisturizing components such as shea butter or coconut oil, which help keep the skin hydrated and supple.

Aromatherapy benefits

Herbal soaps frequently contain essential oils with aromatherapeutic characteristics, which can aid in relaxation, stress alleviation, and overall well-being.

Disadvantages of herbal soap

Limited availability

Herbal soaps may not be as readily available as conventional soaps in supermarkets or drugstores, requiring consumers to seek out specialty stores or online retailers.

Cost

Herbal soaps can be more expensive than regular soaps due to the use of high-quality natural ingredients.

Shorter shelf life

Because herbal soaps are made with natural ingredients and lack preservatives, they may have a shorter shelf life compared to commercially produced soaps.

AIM

To formulate and evaluate herbal soap containing *Ficus religiosa* and other natural ingredients for effective cleansing, antimicrobial activity, and skin protection with minimum side effects.

OBJECTIVES

1. To prepare herbal soap using natural herbal ingredients such as *Ficus religiosa*, neem, reetha, sandalwood, and lemon oil.
2. To develop a skin-friendly and eco-friendly herbal soap by using the cold process method.
3. To evaluate the physicochemical properties of the formulated herbal soap such as pH, colour, odour,

foam height, foam retention, moisture content, and wetting time.
4. To study the antimicrobial activity of herbal soap against common skin microorganisms.
5. To assess the skin irritation and safety profile of the prepared herbal soap.
6. To improve cleansing efficiency, moisturizing effect, and skin nourishment using herbal ingredients.
7. To prepare a natural alternative to synthetic chemical-based soaps for daily skin care use.
8. To study the therapeutic benefits of herbal ingredients in maintaining healthy skin and preventing skin infections.

LITERATURE REVIEW

1. Tiwari et al. (2024) formulated and evaluated herbal soap containing *Ficus religiosa*, neem, lemon oil, sandalwood, and shikakai using the cold process method. The prepared soap showed satisfactory antimicrobial activity, acceptable pH, good foaming ability, and skin compatibility. The study concluded that herbal soap can be used as a safer alternative to chemical-based soaps for daily skin care.
2. Charde et al. evaluated the antioxidant activity of ethanolic leaf extract of *Ficus religiosa* using DPPH radical scavenging assay. The extract demonstrated significant free radical scavenging activity due to the presence of flavonoids and phenolic compounds. The study suggested that *Ficus religiosa* may help protect skin from oxidative stress and premature aging.
3. Viswanathan et al. investigated the anti-inflammatory activity of aqueous bark extract of *Ficus religiosa* using carrageenan-induced paw edema in rats. The extract significantly reduced inflammation compared with the standard drug phenylbutazone, indicating its potential usefulness in treating inflammatory skin disorders.
4. Roy et al. studied the wound healing activity of hydroalcoholic leaf extract of *Ficus religiosa* using excision and incision wound models in rats. Ointments containing 5% and 10% extract accelerated wound contraction and epithelialization, showing promising healing activity.
5. Murti et al. evaluated the wound healing effect of ethanolic root extract of *Ficus religiosa*. The extract-treated groups showed faster tissue regeneration and improved healing compared with control groups, supporting its traditional use in skin treatment.
6. Studies on neem (*Azadirachta indica*) revealed strong antibacterial and antifungal activities against various skin pathogens including *Staphylococcus aureus* and *Candida albicans*. Neem extracts were found effective in reducing acne, itching, and skin inflammation due to the presence of nimbin, azadirachtin, and flavonoids.

HERBAL INGREDIENTS USED IN HERBAL SOAP

1. Ficus religiosa

Ficus religiosa belongs to the family Moraceae and is commonly known as Peepal tree. Different parts of the plant are traditionally used for wound healing, skin diseases, inflammation, and microbial infections. The plant contains tannins, flavonoids, steroids, terpenoids, glycosides, and phenolic compounds. These constituents possess antimicrobial and antioxidant activities which help in acne control, skin protection, and wound healing.

Figure No. 1: Ficus religiosa.

2. Neem (*Azadirachta indica*)

Neem is well known for its antibacterial, antifungal, and anti-inflammatory properties. Neem leaves contain nimbin, azadirachtin, quercetin, and flavonoids that help reduce acne, itching, eczema, and skin infections. Neem also helps in controlling excess oil secretion and improves skin texture.

Figure No. 2: Neem.

3. Reetha (*Sapindus mukorossi*)
Reetha contains natural saponins which produce foam and act as cleansing agents. It removes dirt and excess oil gently without damaging the natural moisture of skin. Reetha also possesses antimicrobial and anti-inflammatory properties.

Figure No. 3: Reetha.

4. Sandalwood (*Santalum album*)
Sandalwood oil contains α-santalol and β-santalol which provide cooling, soothing, and anti-inflammatory effects. It helps in reducing acne, pigmentation, scars, wrinkles, and skin irritation.

Figure No. 4: Sandalwood.

5. Lemon Oil (*Citrus limon*)
Lemon oil contains citric acid, limonene, and flavonoids that show antioxidant and antibacterial activities. It acts as a natural fragrance agent and helps in skin brightening and acne control.

Figure No. 5: Lemon Oil.

6. Glycerin
Glycerin is a natural moisturizing agent that helps maintain skin hydration and softness. It prevents excessive dryness caused by cleansing action.

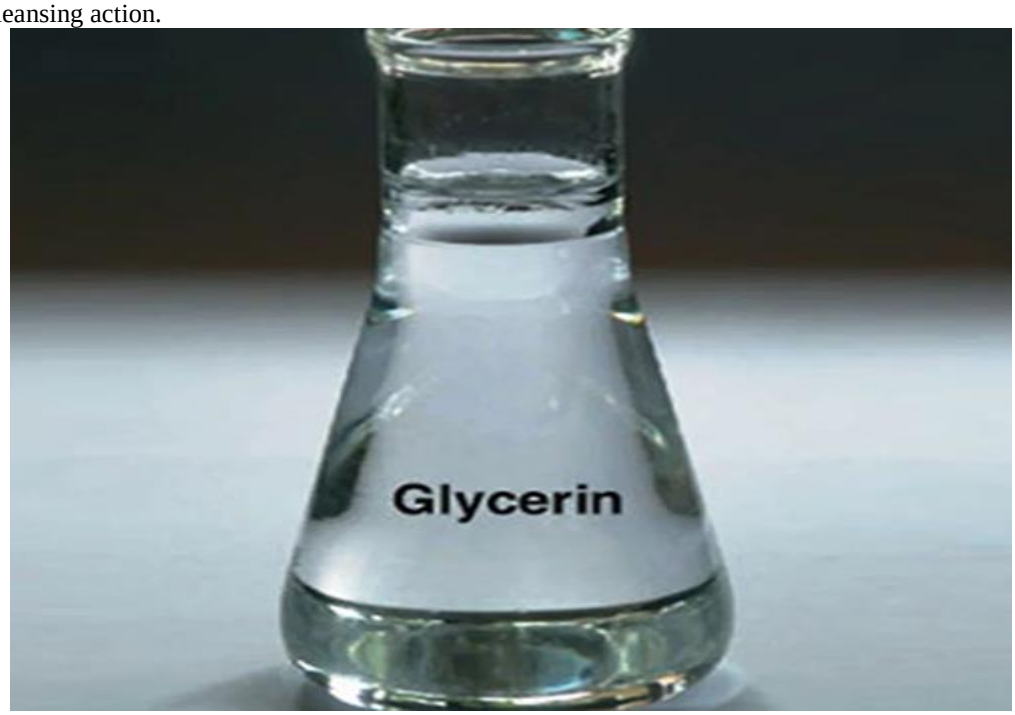

Figure No. 6: Glycerin.

METHOD OF PREPARATION OF HERBAL SOAP
The herbal soap is generally prepared using the cold process method. In this method, oils such as coconut oil are mixed with sodium hydroxide solution to prepare the soap base through saponification reaction. Herbal ingredients including *Ficus religiosa* extract, neem powder, sandalwood powder, reetha powder, lemon oil, glycerin, stearic acid, and soft paraffin are then incorporated into the soap base with continuous stirring. The prepared mixture is poured into soap molds and

allowed to solidify. After cooling and drying, the herbal soap is removed from molds and packed properly.

The cold process method is preferred because it preserves the active phytoconstituents and therapeutic activity of herbal ingredients.

EVALUATION PARAMETERS OF HERBAL SOAP

1. pH

The pH of herbal soap should be within a skin-friendly range to avoid irritation and dryness.

2. Foam Height and Foam Retention

These parameters determine the cleansing ability and foaming characteristics of soap.

3. Moisture Content

Proper moisture content ensures stability and prevents cracking of soap.

4. Wetting Time

It measures the time required for the soap solution to wet the surface effectively.

5. Skin Irritation Test

The formulated soap is applied on skin to check redness, itching, or irritation.

6. Antimicrobial Activity

The soap is tested against microorganisms such as *Staphylococcus aureus* and fungal species to evaluate antimicrobial effectiveness.

7. Organoleptic Properties

Colour, odor, texture, and appearance are observed for consumer acceptability.

CONCLUSION

Herbal soaps formulated with *Ficus religiosa* and other medicinal plants provide an effective and safer alternative to synthetic soaps. The presence of natural phytochemicals offers antimicrobial, antioxidant, anti-inflammatory, and moisturizing activities that improve overall skin health. Herbal ingredients such as neem, sandalwood, reetha, and lemon oil enhance cleansing efficiency and therapeutic value of the soap. Evaluation studies indicate that herbal soaps possess acceptable physicochemical properties, good foaming ability, skin compatibility, and significant antimicrobial action against common skin pathogens. The increasing demand for natural cosmetic products has further highlighted the importance of herbal soap formulations in modern skincare. Thus, herbal soaps can be considered beneficial, economical, and environmentally friendly products for daily skin care applications. The investigation of herbal soap was done and it was concluded that the prepared herbal soap shows the best results. Hence, present research shown that the herbal soap possess less / minimal or no side effects and showing a satisfactory results. The various types of herbal ingredients were used in the formulation of herbal soap that contains herbal ingredients such as, Ficus religiosa, neem powder, shikakai powder, chandan powder, apricot extract, etc for skin care or maintain the healthy skin. The herbal soap was evaluated to the various parameters such as, organoleptic parameter, pH test, foaming ability and foaming height test, skin irritation, dirt dispersion test, wetting time test and dissolving test. The effect of different herbal ingredients in the formulation was investigated. The evaluated parameters wre exactly similar to standard parameters. On the basis of evaluation studies the formulations provide excellent foaming property and skin irritation and other parameters was determined by using prepared herbal soap, hence it proven that this herbal soap does not produce any side effects or irritation after applying on the skin. The herbal soap was prepared by using cold process method.

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