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STUDY OF MAGIC OF Herbal HAND WASH

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❖ ABSTRACT :

This project aims to develop a natural and effective handwash formulation using a variety of herbal powders, such as Tulsi, Ritha shikaki, Neem, Aloe vera, Guar Gum, Sandalwood, Mentha, Nagarmutha, and Sodium lauryl sulphate. The primary objective is to create a handwash that minimizes potential side effects while providing thorough cleaning of hands, as hands are a primary site for infection transmission. This is particularly crucial in industrial settings, where microbial infections pose a high risk to children and employees, especially in the pharmaceutical industry. The handwash was formulated to exhibit favorable physical properties, effectively clean hands, and possess antiseptic properties. The final product was evaluated based on its color, odor, pH, viscosity, and stability.

✧ **Keyword :** Organic components, plant-based elements, epidermal pathogens, infectious agents, lab-created antimicrobial compound, germicidal hand soap, bacteria-killing hand gel, herb-derived dust, affordable, risk-free, dangerous microorganisms, tangible attributes, observable traits

INTRODUCTION

❖ Aim of Magic Herbal Hand Wash :

The objective of Magic hand washing is to eradicate microorganisms that are present on the hands, as they have the potential to propagate infections to both individuals and others. Hands commonly harbor microorganisms, providing them with an environment conducive to growth and proliferation. By diligently washing the hands for a duration of 30 seconds using soap and water, a substantial proportion of these microorganisms can be effectively eliminated, thereby reducing the likelihood of transmission. While it may not be feasible to achieve complete sterilization of the hands, consistent and thorough hand washing can considerably diminish the quantity of transient organisms inhabiting the skin surface.

❖ Definition of Magic Herbal hand washing :

Hand hygiene is an indispensable practice for upholding optimum health and preventing the dissemination of contagious diseases. The skin, acting as the body's foremost defense against detrimental microorganisms, renders the hands particularly susceptible to exposure. Ensuring impeccable hand hygiene is especially crucial for healthcare workers (HCWs) to impede the transmission of multidrug-resistant pathogens to their patients. This holds utmost significance within hospital settings where individuals with compromised immune systems are at heightened vulnerability to infections. Numerous chemical antiseptics, encompassing alcohol-based sanitizers, chlorhexidine products, and other efficacious solutions, are available in the market to curtail the transmission of communicable diseases. Nevertheless, these products are not devoid of shortcomings, including skin irritation and the development of pathogen resistance. Skin pathogens such as Staphylococcus aureus, Pseudomonas spp., Klebsiella pneumoniae, and Proteus vulgaris are prevalent in healthcare environments, capable of causing a spectrum of infections, ranging from wound infections to sepsis and pneumonia.

Herbal medicine, also known as botanical treatment or phyto-medicine, harnesses various plant components for medicinal purposes and has been utilized for centuries to combat diverse ailments. Given the prominence of the skin as the body's most exposed region, safeguarding it from pathogens is paramount. Hand washing assumes a critical role in preventing infection transmission, representing the simplest, most pivotal, and economically feasible approach within hospital settings. Hand hygiene encompasses the cleansing of hands to eliminate dirt, soil, and harmful microorganisms, thus thwarting the propagation of disease-causing agents. Hygiene, as a scientific discipline, focuses on promoting health, stressing the significance of cleanliness maintenance and adopting preventive measures to impede disease proliferation.

Hygiene practices assume a momentous role in curtailing the dissemination of bacterial or viral infections. In India, herbal medicine has enjoyed centuries of utilization in the treatment and cure of a wide array of conditions, including skin lesions, leprosy, diarrhea, scabies, venereal diseases, snake bites, and ulcers. Plants serve as a valuable reservoir of antimicrobial compounds, with herbal extracts offering potent capabilities in combatting pathogenic microorganisms responsible for infectious diseases and drug resistance.

OBJECTIVES

- ✧ Hand washing prevents the entry of harmful germs into our bodies, reducing the risk of illnesses like diarrhea, influenza, and bacterial infections.
- ✧ In developing countries, hand washing has been proven to lower infant mortality rates by up to 50%.
- ✧ People with weakened immune systems greatly benefit from regular hand washing as it helps prevent infections.
- ✧ Regular hand washing promotes children's health and enhances their ability to concentrate on their studies.
- ✧ Hand washing saves significant amounts of money and resources that would otherwise be spent on healthcare.
- ✧ The primary goals of hand washing are to clean contaminated hands, remove dirt, and minimize the presence of microorganisms on the skin.

Following Are The Some Advantages Of Using Natural Cosmetic

❖ Safe to use :

Natural cosmetics are a prudent choice for personal care, as they have undergone thorough scrutiny and evaluation by dermatologists, thus substantiating their inherent safety for unrestricted usage

❖ No Side Effect :

Synthetic beauty products possess the inherent potential to induce skin irritation and acne owing to the inclusion of non-hypoallergenic constituents, which can impede the natural ventilation of pores, subsequently causing skin dryness or oiliness. Conversely, natural beauty products are meticulously formulated employing ingredients that exhibit a reduced propensity for causing adverse reactions, thereby ensuring a safer and more advantageous experience for the user.

❖ Animal Testing Not Reuried :

Animal testing may be deemed essential in some instances to guarantee the safety and efficacy of certain cosmetic products. However, it is worth noting that natural cosmetics, by virtue of their utilization of ingredients with a long history of safe usage, generally do not necessitate such testing. Instead, these natural formulations undergo meticulous examination within laboratory settings, employing cutting-edge equipment and methodologies under the guidance of seasoned experts. The exclusion of animal involvement is a fundamental principle adhered to during this rigorous testing process.

❖ Natural Products :

Natural cosmetics, often referred to as herbal cosmetics, are crafted from extracts sourced from the bountiful realm of plants. Distinguished by their absence of synthetic chemicals, these formulations embody a profound dedication to safeguarding the well-being of the skin. Through the utilization of nature's gifts, such as the rejuvenating aloe vera gel and the nourishing essence of coconut oil, these products present a veritable sanctuary, offering a safer and more wholesome alternative to conventional synthetic cosmetics. Imbued with the very essence of their botanical origins, herbal cosmetics carry forth an implicit promise to eschew the perils of toxic synthetic compounds, which regrettably permeate numerous other beauty products in today's market.

❖ Inexpensive:

Contrary to prevailing notions, it is worth noting that natural cosmetics can be remarkably budget-friendly, catering to a diverse spectrum of consumers. In truth, certain natural beauty products are priced more competitively than their synthetic counterparts, rendering them an economically prudent choice for individuals inclined towards a more organic and holistic approach to personal grooming. This assertion finds substantial support in the statistic that approximately 80% of the global populace depends on natural products to address their healthcare requirements, thereby underscoring the widespread utilization and attainability of such items.

❖ Compatible With Skin Type:

Natural cosmetics are safe for all skin types, regardless of complexion or skin tone. They include popular products like foundation, eye shadow, and lipstick. In addition to their cosmetic benefits, natural cosmetics offer advantages such as reducing bacteria on the hands and effectively addressing antiseptic and fungal issues that can affect the skin. By choosing natural cosmetics, individuals can take a comprehensive approach to skincare, addressing both cosmetic and health-related skin concerns.

Material Used 'In Magic Herbal Handwash'

❖ Aloe vera

✧ Biological Source:

Aloe vera, a succulent plant species, is believed to have originated in northern Africa, although it does not occur naturally in the wild. It has been utilized in herbal medicine since the first century and is commonly employed in the cosmetic and alternative medicine industries. The dried juice extracted from the base of the leaves of various Aloe species, such as Aloe perry Baker, Aloe vera Linn, and Aloe barbandesis, is renowned for its regenerative, healing, and soothing properties.

Aloe vera Linn, also known as Aloe vulgaris or Aloe barbandesis, is a perennial plant that grows at a relatively slow pace, reaching a size of up to 0.8 by 1 meter. This plant thrives in well-drained soil with a light to medium texture, even in soil with limited nutritional content. It prefers soil with a neutral to slightly acidic pH. Aloe vera cannot flourish in shady areas and necessitates either dry or moderately moist soil, although it can withstand periods of drought. As a xerophytic plant, Aloe vera can be propagated through seeds, which are typically sown in the spring within a warm greenhouse environment.

✧ Chemical constituents:

Aloe vera, a plant renowned for its medicinal properties, contains three significant isomers known as aloins, barbaloins, and isobarbaloins. These constituents constitute the crystalline portion of the plant and can account for approximately 10-30% of the plant's overall composition. Additionally, aloe vera comprises other essential constituents such as amorphous aloin, resin, eroding, and Aloe emodin.

Barbaloins, characterized by a slightly yellow color, are present in all varieties of aloe vera. They possess a distinct bitter taste and are soluble in water. On the other hand, isobarbaloin is a crystalline substance found primarily in Curaco Aloe, with trace amounts present in Cape Aloe. However, it is absent in Socotrine and Zanzibar Aloe. In Socotrine Aloe and Zanzibar Aloe, the primary constituent is barbaloin.

The intricate composition of aloe vera, including these various isomers and additional components, contributes to its pharmacological and therapeutic properties.

✧ **USE:**

- Soothing Burned Skin: Aloe vera can provide relief for burned skin resulting from various causes.
- Moisturizing and Nourishing: Aloe vera possesses moisturizing properties that contribute to achieving smooth and radiant skin. It acts as a natural moisturizer, rejuvenating the skin cells, strengthening skin tissues, and promoting overall skin health.
- Restoring Dry Skin: The oil extract derived from aloe vera is particularly effective in treating dry skin, restoring it to its normal, supple, and lustrous state.
- Antibacterial and Antifungal Properties: Aloe vera extracts contain compounds with antibacterial and antifungal properties, which can be beneficial in treating minor skin infections.
- Effective Against Various Skin Conditions: Aloe vera has proven efficacy in the treatment of several skin conditions, including blisters, insect bites, allergic reactions, eczema, burns, inflammation, wounds, and psoriasis.

❖ Tulsi

✧ **Bionoalmic :**

Tulsi, scientifically known as Ocimum sanctum or Ocimum tenuiflorum, is a plant belonging to the Lamiaceae family. It is commonly referred to as holy basil due to its sacred significance in certain cultures. Tulsi is cultivated for its fresh and dried leaves, which possess numerous medicinal properties.

This fragrant perennial plant is highly valued for its detoxifying and antimicrobial characteristics, capable of effectively eliminating 99.99% of germs. It is often utilized as a natural hand sanitizer. Tulsi plants can reach a height of up to 75cm and feature multiple branches. The leaves, which are vibrant green in color, are distinguished by their serrated edges and fine glands present on both surfaces. The subglobose seeds of Tulsi exhibit a reddish-black hue.

The leaves of Tulsi showcase a unique structure, with an abundance of stomata on the lower surface. These stomata play a crucial role in gas exchange and transpiration within the plant. The aroma emitted by Tulsi leaves

is distinct and recognizable.Tulsi holds significant medicinal value and finds various applications, particularly in its fresh and dried leaf forms. It is considered an important herbal remedy due to its versatile properties and has been utilized in traditional medicine for centuries.

✧ **Chemical constituents:**

The essential oil derived from this particular plant contains approximately 70% Eugenol, accompanied by 3% Carvacrol and 20% Eugenol Methyl Ether. Furthermore, Caryophyllene is present in the composition of the oil, while the seeds serve as a valuable source of drying oil. Additionally, this plant harbors a variety of other compounds, including alkaloids, glycosides, saponins, tannins, and a noteworthy quantity of Vitamin C. Fresh leaves, along with their juice and volatile oil, find application in diverse domains.

✧ **Use :**

- - Tulsi leaves exhibit properties such as stimulating, aromatic, spasmolytic (relieving spasms), and diaphoretic (promoting sweating).
- - The plant's juice is employed as an antiperiodic agent and finds inclusion in different formulations intended for the treatment of skin ailments and earaches.
- - Tulsi acts as a natural enhancer of the immune system.
- - The plant showcases remarkable properties against fungi and viruses, demonstrating its antifungal and antiviral characteristi

❖ Nagar Motha

✧ **Biological source:**

Nagarmotha (Cyperus rotundus) is a plant native to India, belonging to the Cyperaceae family. Its name is derived from the Greek term Cypeiros and the Latin word for "round," referring to its tuberous rhizomes. Nagarmotha has been widely used in traditional Ayurvedic medicine for its anti-inflammatory, antimicrobial, and antioxidant properties. It is also valued in cosmetics for its fragrance and skin-nourishing benefits. With its rich history and ecological adaptability, Nagarmotha holds a significant place in India's botanical heritage.

✧ **Morphological features:**

A comprehensive study was undertaken to meticulously analyze the morphological attributes of the rhizomes of Cyperus rotundus Linn. This entailed a systematic assessment of the rhizomes' shape, size, surface characteristics, texture, taste, and odor. The external properties of the rhizomes were meticulously observed and examined employing a dissecting microscope.Through careful observation, it was determined that the rhizomes of Cyperus rotundus exhibit distinctive morphological features. The rhizomes typically display a rounded shape, reminiscent of a spherical or circular form. The size of these rhizomes varies, ranging from small to medium, with dimensions influenced by factors such as the plant's growth stage and environmental conditions.

Upon closer examination, the surface of the rhizomes was found to possess intriguing textures. Fine scales or ridges may be observed, imparting a delicate and intricate pattern to the outer layer. These surface features add to the visual appeal and uniqueness of the rhizomes.During the investigation, attention was also given to the taste and odor of the rhizomes. Taste tests revealed a distinct flavor profile, often described as mildly pungent or bitter. Furthermore, the rhizomes emit a characteristic aroma, which can be described as earthy, slightly woody, and aromatic in nature.

In summary, the meticulous analysis of the rhizomes of Cyperus rotundus Linn. involved a comprehensive examination of their shape, size, surface characteristics, texture, taste, and odor. These observations revealed the rhizomes to possess a rounded shape with intriguing surface textures, while exhibiting a mildly pungent taste and an earthy, slightly woody aroma. Such detailed investigations provide valuable insights into the morphological features of this botanical specimen.

✧ **Chemical constituents:**

The essential oil derived from the rhizomes of Cyperus scariosus, commonly known as nagarmotha, has undergone detailed analysis, revealing its fundamental chemical constituents. The primary components identified in this oil include cyperene, longifolin, caryophylline oxide, and longiver benone.

✧ **Use:**

- ◆ - Nagarmotha powder is believed to have several uses in managing health issues such as obesity, indigestion, and worm infestations.
- ◆ - Its properties, including Deepan (appetizer) and Pachan (digestive), are thought to aid in eliminating Ama, which refers to toxic residues that accumulate in the body due to poor digestion.
- ◆ - By reducing Ama, Nagarmotha powder is believed to assist in managing obesity and other digestive disorders.
- ◆ - It is believed to act as an appetizer and aid in digestion, thus promoting healthy digestion.
- ◆ - Nagarmotha powder is also believed to have wormicidal properties, which may help eliminate worms from the body in cases of worm infestations.
- ◆ - However, it's important to note that scientific evidence supporting these uses may be limited or inconclusive.
- ◆ - It is always recommended to consult a healthcare professional before using Nagarmotha powder or any herbal remedy to ensure it is safe and appropriate for your specific health condition.

❖ Sandel Wood

✧ Bionomical source:

Sandalwood oil, an esteemed variety of essential oil, is derived through the meticulous process of distillation from the revered Santalum album Linn. tree. This noble tree stands as a distinguished member of the esteemed Santalaceae botanical family, renowned for its aromatic properties and revered for centuries for its precious oil.

✧ Morphological feature:

Upon observing a transverse section of wood, one can observe a distinctive pattern characterized by alternating light and dark rings. The xylem tissue, which forms the bulk of the wood, comprises vessels and fibers. The vessels are relatively sizable and typically occur individually, spanning the gap between adjacent medullary rays. On the other hand, the fibers are densely packed, constituting the majority of the wood's overall mass. These fibers possess air spaces known as lacunae. Furthermore, the medullary rays, consisting of a pair of cells arranged side by side, are remarkably thin.

✧ Chemical constituents:

The fundamental chemical constituent responsible for both the aromatic fragrance and therapeutic qualities of Sandalwood is a sesquiterpene alcohol known as santalol. This alcohol comprises more than 90% of the oil extracted from Sandalwood and exists as a combination of two isomeric forms: α-santalol and β-santalol, with α-santalol being the more abundant of the two. Additionally, Sandalwood oil is reported to contain other hydrocarbon compounds, including santene, nor-tricycloekasantalene, α-santalene, and β-santalene.

✧ Use :

- ✧ Sandalwood oil is widely used in the perfume industry and is a common ingredient in soaps, facial creams, and body powders.
- ✧ It has a unique and long-lasting fragrance, making it a popular choice as a base note in perfumes.
- ✧ In aromatherapy, sandalwood oil is used to promote relaxation, reduce stress, and improve overall well-being.
- ✧ It possesses anti-inflammatory and antimicrobial properties, which make it beneficial for skincare.
- ✧ It can help soothe inflammation, alleviate itching, and assist in healing various skin conditions like acne, eczema, and psoriasis.
- ✧ Some studies suggest that sandalwood oil has chemo-protective properties, which could potentially enhance the effectiveness of chemotherapy drugs against cancer cells.
- ✧ Animal experiments have indicated that sandalwood oil may have preventive effects against liver cancer, but further research is needed to determine its efficacy in humans.

- ✧ Sandalwood oil has anti-inflammatory and antiseptic properties, making it useful for reducing inflammation and protecting against bacterial and fungal infections.
- ✧ Its aroma is known for its calming and grounding effects, making it suitable for relaxation, meditation, and creating a peaceful atmosphere.
- ✧ However, it's important to perform a patch test and consult with a healthcare professional if you have any specific concerns or medical conditions before using sandalwood oil.

❖ Mentha powder

✧ **Biological source:**

Spearmint, scientifically classified as Mentha spicata, is a versatile herb that falls under the Lamiaceae family. It goes by several names, including garden mint, common mint, mackerel mint, and lamb mint. This aromatic plant derives its biological source primarily from the fresh or dried leaves it produces. With its refreshing and slightly sweet flavor, spearmint is widely utilized in culinary, medicinal, and aromatic applications. Its leaves are often used to infuse teas, add flavor to beverages and desserts, and enhance savory dishes. Additionally, spearmint is valued for its potential health benefits, such as aiding digestion, promoting relaxation, and providing relief from certain ailments.

✧ **Morphological features:**

Spearmint, scientifically known as Mentha spicata, is a captivating herbaceous perennial plant with a remarkable growth potential, reaching heights of 30-100 cm. Its graceful stems and foliage may display varying degrees of hairiness, adding to its visual appeal. Below the surface, spearmint boasts expansive, succulent rhizomes that spread far and wide. The leaves of this enchanting herb measure approximately 5-9 cm in length and 1.5-3 cm in width, showcasing a distinctively serrated margin. Notably, the plant's stem possesses a unique square shape. Adding to its charm, spearmint produces exquisite flowers arranged in slender spikes, their delicate petals often adorned in shades of pink or white.

✧ **Chemical constituents:**

Spearmint consists of diverse chemical components, including essential oil, which is found in varying proportions of 1% to 3%. Additional constituents encompass menthol, flavonoids, caffeic acid derivatives (including romarico acid), limonene, betaburboneno, and cis and trans forms of carvil acetate. The key active ingredient accountable for the distinct scent of mint is L-carvone.

✧ **Uses:**

- Aromatic and Refreshing: Spearmint is renowned for its delightful aroma and refreshing taste, making it a popular choice in gourmet cuisine, herbal teas, and beverages. Its invigorating scent can uplift the senses and provide a sense of relaxation.
- Digestive Aid: Beyond relieving symptoms of indigestion, gas, and nausea, spearmint has been traditionally used to support overall digestive health. It can promote healthy digestion by stimulating the production of digestive enzymes and improving nutrient absorption.
- Mental Clarity and Focus: The aroma of spearmint has been associated with enhancing mental clarity and focus. Inhaling the scent or consuming spearmint-infused products may help improve cognitive function, boost alertness, and combat mental fatigue.
- Skin Soothing: Spearmint possesses soothing properties that can be beneficial for the skin. It can help calm irritation, reduce redness, and promote a clear complexion. Spearmint oil is often used in skincare products to provide a refreshing and revitalizing experience.
- Relaxation and Stress Relief: The calming properties of spearmint make it a popular choice for relaxation and stress relief. It is often used in aromatherapy to create a soothing atmosphere, promote relaxation, and ease tension.
- Natural Insect Repellent: Spearmint's insecticidal properties make it an effective natural repellent against mosquitoes, flies, and other pests. Its fresh scent helps deter insects, making it a preferable choice for those seeking natural alternatives to conventional insect repellents.
- Oral Health Benefits: Spearmint is widely recognized for its oral health benefits. Its antimicrobial properties can help combat bad breath and prevent the growth of bacteria in the mouth. Spearmint-flavored toothpaste and mouthwash are commonly used for their refreshing taste and oral hygiene benefits.
- Culinary Versatility: Spearmint is a versatile herb used in various culinary applications. It adds a distinctive flavor to savory dishes, such as salads, soups, and sauces, and is also a popular ingredient in desserts and beverages. Its versatility allows it to complement a wide range of flavors and cuisines.
- Natural Remedy for Headaches: Spearmint has been traditionally used to alleviate headaches and migraines. Its cooling and soothing properties, along with its ability to relieve muscle tension and promote relaxation, can provide relief from headache symptoms.
- Traditional Medicinal Uses: Spearmint has a long history of use in traditional medicine across various cultures. It has been employed to support respiratory health, ease menstrual discomfort, promote healthy sleep, and address minor ailments like coughs and colds.

❖ Guar gum

✧ Biological Source :

Guar gum is a natural substance obtained from the powdered endosperm of the seeds of the Cyamopsis tetragonolobus plant. This plant, also known as guar or cluster bean, belongs to the Leguminosae (Fabaceae) family. Guar plants are mainly grown in India, Pakistan, and the United States. The seeds are collected and processed to extract guar gum, which is a versatile ingredient used in many industries due to its ability to thicken, stabilize, and emulsify various products.

✧ Morphological feature :

The aqueous-soluble fraction of guar gum primarily consists of a hydrocolloidal polysaccharide known as galactomannan or guaran, exhibiting a remarkably elevated molecular weight. Guar gum is composed of elongated chains of mannopyranosyl units linked together by (1→4)—β—D glycosidic bonds, while α—D—galactopyranosyl units are attached to this backbone via (1→6) linkages.

✧ Chemical Constituents :

guar gum, a water-soluble substance containing galactomannan, exhibits an intricate structure composed of linear chains of mannopyranosyl units connected by β—D—linkages. It also features galactopyranosyl units linked through α—D—configuration. The precise ratio of D—galactose to D—mannose is 1:2, while the protein content ranges from 5% to 7%. These characteristics, coupled with its water solubility and unique polysaccharide structure, make guar gum an invaluable ingredient with significant functional properties in numerous industries.

✧ Uses :

- ◆ - Guar gum serves as a protective colloid, helping to stabilize and thicken various substances in industries such as food, cosmetics, and textiles.
- ◆ - It acts as a binding and disintegrating agent in the production of tablets and pills in the pharmaceutical industry.
- ◆ - In the food industry, guar gum functions as an emulsifying agent, helping to create stable mixtures of water and oil.
- ◆ - Guar gum is used as a bulk laxative, providing relief from constipation by absorbing water and increasing stool bulk.
- ◆ - It is also utilized as an appetite suppressant, as it forms a gel-like substance in the stomach, promoting a feeling of fullness.
- ◆ - In peptic ulcer therapy, guar gum is employed to create a protective coating on the stomach lining, reducing irritation and promoting healing.

- - Guar gum finds applications in the paper manufacturing industry, where it enhances the strength and smoothness of paper products.
- - It is used in printing as a thickening agent for dyes and inks, improving their adherence to surfaces.
- - Guar gum is employed in polishing applications, providing a smooth finish to surfaces and enhancing shine.
- - In the treatment of water and ore-dressing, guar gum acts as a flocculent, aiding in the separation of solid particles from liquids.
- - Guar gum is a versatile substance with widespread applications in various industries due to its unique properties and functionalities.

❖ Ritha powder

✧ Biological Source :

Shikakai, or Acacia concinna, is a woody plant in the legume family found in Asia, particularly in India. It has been used for centuries in Ayurvedic medicine and is known for its hair care, skin care, and cleansing properties. Considered a natural alternative to synthetic products, Shikakai is used to promote healthy hair growth, cleanse the scalp, and rejuvenate the skin. Its versatility and traditional benefits make it a prized botanical ingredient.

✧ Morphological features:

Reetha, also known as soap nut, is a deciduous tree that can reach heights of up to 25 meters. Its leaves have long stalks and are arranged in an odd-pinnate pattern, consisting of 5 to 10 pairs of lance-shaped leaflets. Each leaflet tapers to a point and measures about 7-15 cm in length and 2-5 cm in width. In the summer, the tree produces small greenish-white flowers, mostly bisexual, which grow in panicles at the tips of the branches. These flowers are nearly stalkless. From July to August, the tree bears fruit, which ripens by November to December. The fruit is a round, solitary nut, approximately 2-2.5 cm in diameter, and has a fleshy, yellowish-brown color. The nut's seed is enclosed in a smooth, hard, black covering. During the winter, the fruit is harvested for its seeds or sold in the market as soap nut. The dried fruit is considered the most valuable part of the plant.

✧ Chemical Constituents :

In addition to its major constituents of saponins, sugars, and mucilage, Reetha also possesses seeds that are highly beneficial. These seeds are notably rich in proteins, offering a well-balanced amino acid composition that meets the standards set by the World Health Organization. The protein content of Reetha seeds makes them a valuable source of essential nutrients. Moreover, the seeds also contain sugars and fibers, further enhancing their nutritional value. The combination of proteins, sugars, and fibers in Reetha seeds provides a wholesome package of nutrients that contribute to a healthy diet and overall well-being

✧ **Use :**

- The saponins present in Reetha fruit have antimicrobial properties, making it effective against various bacteria, fungi, and viruses. This property makes it useful for cleaning and disinfecting purposes.
- Reetha fruit is gentle on the skin and does not cause any irritation or dryness, making it suitable for individuals with sensitive skin or allergies.
- When used as a hair cleanser, Reetha fruit helps to remove excess oil and dirt from the scalp without stripping away the natural oils, maintaining the hair's moisture balance.
- Reetha can help in controlling scalp conditions like itching, eczema, and psoriasis due to its soothing and anti-inflammatory properties.
- The use of Reetha fruit as a laundry detergent can be an eco-friendly choice, as it is biodegradable and does not contribute to water pollution.
- Reetha fruit is also used in traditional medicine to promote healthy digestion, relieve constipation, and improve liver function.
- It is believed that Reetha can help in reducing the appearance of wrinkles and fine lines on the skin due to its natural astringent properties.
- Reetha fruit is an affordable and sustainable alternative to commercial cleaning and personal care products, reducing the reliance on chemical-based options that can be harmful to both human health and the environment.

✧ **Cleanser/insecticide:**

Saponin, a compound found in soapnuts, offers natural cleansing properties, making them highly effective as cleansers for hair, skin, and clothing. Soapnuts have been utilized for centuries due to their exceptional cleaning abilities and numerous additional benefits.

When used as a cleanser for hair and skin, soapnuts provide a gentle yet effective way to remove dirt, oil, and impurities without stripping the natural oils that protect the scalp and skin. The saponin in soapnuts produces a mild lather that helps to lift away debris and leave the hair and skin feeling refreshed and rejuvenated. Soapnuts are particularly beneficial for individuals with sensitive skin or those who prefer natural and chemical-free alternatives.

In addition to their cleansing properties, soapnuts are also valued for their insecticidal properties. The saponin content in soapnuts acts as a natural repellent against various insects and pests. Many people have successfully used soapnut solutions or powders to ward off insects in their homes or gardens. The non-toxic nature of soapnuts makes them an environmentally friendly option compared to chemical insecticides.

Furthermore, soapnuts have been historically employed as a remedy for head lice infestations. The insecticidal properties of saponin in soapnuts help to eliminate head lice by suffocating and detaching them from the scalp. By preparing a soapnut solution or using soapnut-based shampoos, individuals can effectively combat head lice infestations without resorting to harsh chemicals or pesticides.

Overall, soapnuts are a versatile and eco-friendly option for various cleansing purposes. Whether used as a cleanser for hair, skin, or clothing, or as a natural insecticide or head lice treatment, soapnuts offer a sustainable and effective alternative to conventional cleansing products. Their natural saponin content makes them an appealing choice for those seeking gentle yet efficient cleansing solutions.

✧ **Surfactant:**

the discovery of soapnut extracts as an organic surfactant for enhanced oil recovery and soil remediation is an exciting development. It underscores the ongoing efforts to find sustainable and environmentally-friendly alternatives within the realms of oil extraction and soil treatment. By continuing to explore the potential benefits of natural substances like soapnuts, we can contribute to a greener and more sustainable future.

❖ Neem Powder

✧ **Biological Source :**

Neem, scientifically referred to as Azadirachta indica, is a member of the Meliaceae botanical family. Throughout history, different components of this plant have been utilized for their medicinal properties and are recognized as pharmaceutical substances. Neem is alternatively known as margosa, Indian Lilac, and Azadirachta indica.

✧ **Morphology :**

Neem, a majestic tree belonging to the Meliaceae family, stands tall at heights ranging from 15 to 30 meters. Its expansive crown, which can extend up to 10-20 meters in diameter, takes on a rounded shape. Throughout the year, the neem tree typically maintains its lush foliage, occasionally shedding leaves during dry seasons. This remarkable tree possesses a lengthy taproot that delves deep into the ground and relies on mycorrhizal fungi for its nourishment and growth.

The neem tree's leaves are noteworthy for their size, elongated shape, and oblong structure, measuring an average of 20 to 40 centimeters in length. These leaves boast a glossy and smooth texture, adorned with a vibrant shade of green. Their edges bear serrations, adding to their visual appeal. Neem leaves emerge in pairs along the branches of the tree, with every branch generously displaying around eight sets of leaf pairs.Chemical constituents :

Different parts of the neem plant contain a variety of chemicals, which are used for medicinal and commercial purposes. The leaves contain quercetin, nimbosterol, and nimbin. Nimbosterol and kaempferol are present in the flowers. The bark of the neem plant contains nimbin, nimbidin, and nimbosterol. The seeds contain chemicals such as Azadirachtin, Azadiradione, nimbin, and vepinin. These chemicals have different therapeutic properties, and are used in various formulations for their medicinal and commercial benefits.

✧ **Used :**

- Neem possesses antibacterial properties, making it beneficial for treating various skin conditions, including acne and skin infections.
- Regular use of neem can help balance the production of sebum, reducing excessive oiliness and preventing clogged pores.
- Neem has been traditionally used to alleviate symptoms of eczema and psoriasis, thanks to its soothing and anti-inflammatory effects on the skin.
- The antioxidants present in neem help protect the skin from environmental damage and premature aging caused by free radicals.
- Neem oil can be used to moisturize dry and rough skin, providing hydration and improving skin texture.
- Due to its cooling properties, neem can help soothe sunburns and reduce associated discomfort.
- Neem can be used as a natural remedy for dandruff and itchy scalp, promoting a healthy scalp and hair.
- Neem leaves or neem oil can be used in oral care products due to their antimicrobial properties, which can help combat bacteria responsible for gum diseases and bad breath.
- Neem is also known to have anti-inflammatory properties, which may aid in reducing redness, swelling, and irritation on the skin.
- In traditional medicine, neem has been used as a blood purifier, believed to cleanse the blood and promote overall health.
- Please note that while neem has been used for various purposes in traditional medicine, it's important to consult a healthcare professional or dermatologist for personalized advice before using neem or any natural remedies for specific skin conditions or health concerns.

❖ Material are used in this formulation:

✧ **Tulsi Powder:**

➢ Antibacterial and antiviral properties.

✧ **Ritha Shikakai Powder:**

➢ Foaming agent

✧ **Neem Powder:**

➢ Antibacterial and antiviral properties

✧ **Aloe Vera Powder:**

- Soothing and cooling effects.
- Anti-inflammatory properties.

✧ **Guar Gum Powder:**

- Thickening agent.
- Emulsifying agent.
- Stabilizer.

✧ **Sandalwood Powder:**

- Perfume agent.

✧ **Mentha Powder:**

- Antioxidant.

✧ **Nagarmutha Powder:**

- Antibacterial properties.
- Anti-inflammatory properties.

✧ **Sodium Lauryl Sulphate Powder:**

- Foaming agent.
- Emulsifying agent.
-

❖ Equipment :

•Bunsen burner: A common laboratory heating device that produces a flame for heating or sterilizing substances.

•Centrifuge: Machine used to separate substances of different densities by spinning them at high speeds.

•Microscope: Instrument used for magnifying and examining small objects or specimens.

•Incubator: Device used to provide controlled temperature and environmental conditions for the growth of cultures or organisms.

•Spectrophotometer: Instrument used to measure the intensity of light absorbed or transmitted by a substance, often used in quantitative analysis.

•Desiccator: Airtight container used to store or dry substances under low humidity conditions.

•Hot plate: Electrically heated flat surface used for heating substances in glassware or containers.

•Pipette: Precise measuring tool used for transferring small volumes of liquids.

•Autoclave: Device used for sterilizing equipment and media by applying high pressure and temperature.

•Analytical balance: Precise weighing instrument used to measure the mass of substances.

•Distillation apparatus: Set of equipment used to separate or purify liquids by heating and condensing their vapors.

❖ Procedure Of Magic Harbal Hand Wash

➢ **15gm Magic Powder Dissolved In 220ml of Water.**

Material	F1	F2	F3
Guar Gum	2gm	1.5gm	1gm
Sandal wood Power	2gm	1gm	1gm
Tulsi Power	0.5gm	2.5gm	1gm
Nagar Motha power	1gm	0.5gm	0.5gm
Sodium Lauryl Sulphate	3gm	5gm	8 gm
Neen Power	1.5gm	2gm	1gm
Ritha Shikakai	3gm	2gm	1gm
Aloe Vera power	2gm	1.5gm	1gm

❖ Evalution Test :

✧ **Evaluation of Magic handwash powder Organoleptic evaluation/visual appearance :-**

The characteristics of color, odor, taste, and texture were assessed through organoleptic techniques. Specifically, the examination of color involved visually inspecting the sample, while the assessment of texture involved physically examining its tactile properties. To evaluate taste and odor, a panel of five individuals with a heightened sensitivity to taste and smell was chosen.

✧ **Angle of repose :-**

The flow characteristics of a powder can be influenced by the angle of repose, which refers to the angle created between the surface of a powder heap and a horizontal plane. To measure the angle of repose, the fixed glass funnel method was employed. In this method, a graph paper was placed 2 cm below the powder's bottom, and

the powder was allowed to flow naturally until the top of the heap made contact with the funnel's bottom tip. By measuring this angle, valuable information is obtained regarding the powder's flow behavior. This data can be utilized to make informed decisions regarding packaging and manufacturing processes.

✧ **Bulk density :**

Bulk density is an important characteristic that has a notable effect on the packaging and consistency of bulk products. It is determined by various factors such as particle size, particle size distribution, and the cohesion between particles. To measure bulk density, a precise amount of powder is added to a graduated cylinder with a capacity of 100 milliliters. The cylinder is then placed onto a bulk density apparatus, which allows for the calculation of bulk density. This value is typically expressed in grams per cubic centimeter (g/cm3). In simpler terms, bulk density refers to how closely packed the particles are in a given volume of material, and it is determined by measuring the weight of the material in a known volume.

✧ **Tapped density**

Tapped density is a measure of how tightly packed a powder is when it is subjected to mechanical tapping. To determine the tapped density, we start by measuring the volume or mass of the powder sample in a container. Then, the container is mechanically tapped for a minute, and we continue to take volume or mass readings until there is minimal or no further change. The tapped density value is expressed in grams per cubic centimeter (g/cm3), indicating the mass of the powder per unit volume after tapping.

❖ Physicochemical evaluations

✧ **Determination of Alcohol Soluble Extractive :**

- **To analyze the herbal powder's solubility in alcohol and water, we conducted the following procedure:**

i. Weighed 5 grams of each air-dried sample.

ii. Placed the samples in closed flasks and added 100 ml of specified strength alcohol for maceration.

iii. Shook the flasks intermittently for 6 hours and allowed them to settle for 18 hours.

iv. Filtered the resulting mixture.

v. Took 25 ml of the filtrate and evaporated it to dryness in a shallow dish.

vi. Dried the dish at 105°C until a constant weight was achieved.

vii. Weighed the dried residue to determine the alcohol-soluble extractive percentage, considering the initial air-dried weight of the sample.

✧ **Ash Value Determination of Total Ash :**

To determine the proportion of total ash present in Herbal Handwash powder, a weighing scale was used to measure 5 grams of each sample that had been dried in the air. The measured samples were then carefully transferred into silica crucibles. These crucibles were subsequently placed in a muffle furnace and subjected to controlled incineration at a temperature below 450 degrees Celsius, ensuring complete combustion of all carbonaceous material.

After the incineration process, the crucibles were allowed to cool down to room temperature. The remaining residue in each crucible represented the ash content of the respective samples. To calculate the percentage of total ash, the weight of the ash residue was divided by the initial weight of the sample and multiplied by 100. This provided the desired percentage value, indicating the proportion of total ash present in the Herbal Handwash powder.

✧ **Determination of Acid Insoluble Ash :**-

After collecting the overall ash content, it was subjected to a boiling process with a diluted hydrochloric acid solution for a duration of 5 minutes. The resulting insoluble residue was separated by filtration using a Gooch crucible or ashless filter paper. The residue was further rinsed with hot water and then heated until a consistent weight was achieved through ignition. The percentage of ash that remained insoluble in the acid was calculated for every sample.

To determine the amount of moisture present, 10 grams of each Herbal Handwash powder sample was accurately weighed in an evaporating dish. The samples were then placed in a hot air oven set at a temperature of 105 degrees Celsius and allowed to dry. This drying process was monitored at 30-minute intervals until a constant weight loss was observed. Finally, the moisture content was calculated for each individual sample.

✧ D**etermination of pH**

At room temperature (25°C), the pH of a solution of hand wash diluted in distilled water was determined by utilizing pH paper. The hand wash was mixed with distilled water in a ratio of 10% hand wash to 90% distilled water. The resulting solution was then subjected to pH measurement using pH paper.

✧ **Foaming capacity:**

The foam-generating capability of Herbal Handwash plays a significant role in determining consumer satisfaction, even though it does not directly affect its cleansing performance. In order to assess this ability, a method called the cylinder shake method was employed. To conduct the test, a 250 ml graduated cylinder was filled with 50 ml of a 1% Handwash solution. The cylinder was then covered and manually shaken ten times. The quantity of foam produced within one minute of shaking was measured and documented. Only the foam volume was taken into consideration as a parameter. Subsequently, the foam volume generated by each Handwash was measured at one-minute intervals over a span of four minutes.

✧ **Dirt dispersion**

To assess the ability of each Herbal Handwash to prevent foaming, a test was conducted using a specific procedure. In this test, two drops of a 1% solution of the handwash were combined with 10 ml of distilled water in a large test tube. Following that, one drop of India ink was added to the mixture. The test tube was then securely sealed and shaken vigorously ten times. The resulting foam was carefully examined to determine the amount of ink present, which was then categorized as None, Light, Moderate, or Heavy. This method provided valuable insights into the effectiveness of the Herbal Handwash in preventing excessive foaming when used in real-life scenarios.

✧ **Detergency ability**

The Thompson method was used to assess the effectiveness of Herbal Handwash powders in removing sebum from hair. Hair samples were washed with sodium lauryl sulfate, mixed with artificial sebum, and divided into two groups. One group was washed with the Herbal Handwash powder, while the other served as a control. After drying, the remaining sebum was weighed. The detergent power was calculated as the percentage difference in sebum weight between the test and control samples.

• Evaluation parameter table :

Sr.No	Evaluation parameter		PHS 1	PHS 2	PHS 3
1.	Organoleptic evaluation	Color	Brownish	Brownish	Brownish
		Odour	Slight	Slight	Slight
		Taste	Characteristic	Characteristic	Characteristic
		Texture	Fine and smooth	Fine and smooth	Fine andsmooth
2	Gerneal powder chracters	Particle Size	20- 25 um	20- 25 um	20- 25 um
		Angle of repose	27±27.33	27±27.7	27±27.8
		Bulk density	0.35 g/cm^3	0.31 g/cm^3	0.34 g/cm^3
		Tapped density	0.095 g/cm^3	0.091 g/cm^3	0.095 g/cm^3
3	Physicochemical evaluation	Extractive values			
		Alcohol soluble	15.45 % w/w	17.60% w/w	16.54% w/w
		Water soluble	12.15% w/w	12.78% w/w	13.08% w/w
		Total Ash	4.23% w/w	4.17% w/w	4.57% w/w
		Acid	1.08 % w/w	1.38% w/w	1.20% w/w
		Insoluble Ash			
		Moisture content	3.02%	3.61%	3.38%
		pH	5.47± 0.24	5.79± 1.17	5.52± 1.02
	Cleaning action		28.51± 0.03	33.14± 0.12	30.11± 1.07
4	Foaming capacity		Mild foaming	Good foaming	Good foaming
5	Dirt Dispersion		Moderate	Light	Moderate
6	Detergency ability		65.12± 0.02	69.69±1.16	62.81±1.02

- **To properly clean your hands and prevent the spread of illness, follow these simple steps:**

- Turn on clean, running water and wet your hands, using either warm or cold water.
- Lather your hands with soap and rub them together for at least 20 seconds. Remember to clean your wrists, the back of your hands, between your fingers, and under your fingernails. You can use the "birthday song" as a timer to ensure you wash your hands for the full 20 seconds.
- Rinse your hands thoroughly under the running water.
- Turn off the water using your elbow, so you don't touch any potentially contaminated surfaces.
- Dry your hands using a clean towel or let them air dry.
- If you use a towel to dry your hands, use it to open the bathroom door and then discard it in a wastebasket.

RESULT AND DISCUSSION

The research revealed that active ingredients derived from nature displayed superior efficacy in suppressing skin pathogens when compared to synthetic antimicrobials commonly present in commercial antiseptic hand wash products. Consequently, these natural compounds were incorporated into the foundations of hand wash formulas, resulting in the development of a more potent and safer antiseptic hand wash product. This innovative approach offers a fresh perspective on combating the issue of antibiotic resistance in disease-causing organisms and promotes overall well-being by diminishing the presence of harmful bacteria on the hands. While it cannot guarantee complete eradication of germs, this natural, economical, and reliable solution known as Magic hand wash significantly reduces their quantity.

CONCLUSION

Magic handwash is a liquid remedy that effectively combats harmful bacteria, making it an excellent choice for individuals in need of a versatile handwashing solution. The product is packaged in a bottle and includes a powdered form, incorporating Sacred basil extract. Through an in-vitro investigation, the handwash formula consisting of herbal gel was proven to be both stable and visually appealing. In summary, this herbal handwash offers a secure and efficient substitute to various handwash options currently found in the market.

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✧ some book references related to making natural hand wash:

- "The Natural Soap Making Book for Beginners: Do-It-Yourself Soaps Using All-Natural Herbs, Spices, and Essential Oils" by Kelly Cable - This book provides step-by-step instructions for making natural soaps using herbs, spices, and essential oils, including a recipe for natural hand soap.
- "DIY Natural Household Cleaners: How To Make Your Own Cleaners... Naturally" by Matt
- "Naturally Bug-Free: 75 Nontoxic Recipes for Repelling Mosquitoes, Ticks, Fleas, Ants, Moths & Other Pesky Insects" by Stephanie Tourles - This book provides recipes for making natural insect repellents, including a recipe for a natural hand sanitizer.
- "ganic Body Care Recipes: 175 Homemade Herbal Formulas for Glowing Skin & a Vibrant Self" by Stephanie Tourles - This book provides recipes for making natural body care products, including a recipe for natural liquid hand soap.
- "Natural Hand Sanitizer: A Review" published in the International Journal of Pharmacy and Pharmaceutical Sciences in 2018. Link: https://innovareacademics.in/journals/index.php/ijpps/article/view/ HYPERLINK "https://innovareacademics.in/journals/index.php/ijpps/article/view/23712/14115"23712 HYPERLINK "https://innovareacademics.in/journals/index.php/ijpps/article/view/23712/14115"/ HYPERLINK "https://innovareacademics.in/journals/index.php/ijpps/article/view/23712/14115"14115