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# "Unlocking the Potential of Terminalia Chebula: Development and Assessment of Herbal Soap"

***Shraddha Kharake[1], Anita Khade[2], Sourabh Londhe[3], Vaibhav Lasure[4]***

Dr.Kolpe Institute Of Pharmacy, Kolpewadi Kopargaon, Maharashtra - 423601

**ABSTRACT:-**

In India, the foundation of codified traditional systems like Ayurveda has always been ethnomedicine, an ancient therapeutic method that is customarily used by folk and various tribal populations. Because of its remarkable healing abilities and broad range of biological activity, Terminalia chebula Retz. (Combretaceae) is known as the "**King of Medicines"** in Tibet and is consistently placed first in the Ayurvedic materia medica. Since ancient times, the fruit of Terminalia chebula Retz. Has been used to treat a variety of illnesses and conditions. Fruit pulp extract's photochemical study reveals that while carbs and steroids are lacking, protein, amino acids, glycosides, flavonoids, vitamins, alkaloids, tannin, and phenolic compounds are present and carbohydrates , steroids are absent. Against several bacterial species, Terminalia chebula shown antibacterial activity. In herbal soap formulation use of Terminalia chebula fruits. In Ayurvedic tradition, Terminalia chebula is celebrated for its robust antioxidant, antibacterial, and dermal regenerative qualities, rendering it an ideal foundation for cleansing and therapeutic skin formulations. The combination with aloe Vera's calming effects, alum's antimicrobial properties, castor oil's hydrating capabilities, and natural abrasives such as rice flour and honey wax creates a comprehensive approach to dermal wellness, addressing conditions including acne, lackluster appearance, and skin inflammation. Given the growing consumer preference for herbal, sulfate-free, and non-chemical skincare alternatives, this soap formulation demonstrates significant market viability.

**KEYWORDS:-** Myrobalan, Terminalia chebula retz. ,haritaki , T. Chebula .

## INTRODUCTION:-

Everywhere in the world, viruses have been a serious concern. The latest pandemic has seen the highest rates of mortality and morbidity, placing a great deal of strain on the healthcare system. Good health, also known as rasayana pharmaceutical and Myrobalan, refers to a better condition of nourishment, which supports youthfulness and heightened immunity. Restores the body's balance and offers protection from infection. Because they influence the immune system and improve the body's reaction to illness, they also have healing and rejuvenating properties. The lack of appropriate medication and the insufficiency of effective immunizations drive people to look for alternative natural remedies based on traditional knowledge or ethnomedicine. Because of its remarkable healing abilities and broad range of biological activity, Terminalia chebula Retz. (Combretaceae) is known as the "**King of Medicines**" in Tibet . In India, the foundation of codified traditional systems like Ayurveda has always been ethnomedicine, an ancient therapeutic method that is customarily used by folk and various tribal populations. Many significant modern medications are being found and created using the expertise of ethnomedicine, and contemporary scientists have been appreciating ethnomedicine. This herbal cure is a cutting-edge substitute for contemporary medicine [1] . Over 80% of the population relies on conventional remedies for their primary healthcare requirements, per a World Health Organization research [2]. Seven different types of Haritaki fruits—Vijaya, Rohini, Putana, Amrita, Abhaya, Jivanti, and Chetaki—have been described in Ayurveda[3]. All of the Ayurvedic classics, the Nighantus, and publications on the materia medica of Ayurveda provide information about this medicinal plant. Tibetan literature and other floras of medicinal plants also highlight the plant's specifics. It can be found all over India up to 1500 meters above sea level[4] .

**Ratha, K.K. and Joshi, G.C. (2013) .,**

Haritaki (Terminalia chebula Retz., Family: Combretaceae) is found across India, up to 1500 meters above sea level, and has significant medicinal benefits. Even though Terminalia chebula Retz is the only botanical source of Haritaki, Ayurvedic texts and other medical literature detail the several types' uses, origins, distinguishing characteristics, and medicinal applications. A thorough analysis of the many Haritaki variants has been conducted in the current study.

**Bulbul, M.R.H. et al.,**

Terminalia chebula Retz, often referred to as "Haritaki/Myrobalan," has long been used in traditional medicine. Numerous traditional medical disciplines, including Unani, Tibb, Ayurveda, and Siddha, have made substantial use of it to treat human maladies like bleeding, digestive, liver tonic, carminative, dysentery, analgesic, anthelmintic, antibacterial, and skin conditions. Using a variety of internet databases, research on the pharmacological effects of T. Chebula and its phytoconstituents published between January 1996 and December 2021 was examined. The biological characteristics of T. Chebula, such as its antioxidative, antiproliferative, antimicrobial, proapoptotic, anti-diabetic, anti-aging, hepatoprotective, anti-inflammatory, and antiepileptic effects, were discovered by a number of laboratory techniques over the aforementioned period. Additionally, it helps with the metabolism of fats and carbohydrates and inhibits endothelial dysfunction and atherogenesis. Various T. Chebula components.

**Akhtar, M.S. et al.,**

One of the most significant parasitic disease groups on the Indo-Pakistan peninsula, helminthiasis causes significant losses in animal productivity. Animal helminths can be treated with a broad range of anthelmintics. However, one of the challenges that animal health care specialists have long encountered is the development of helminth resistance to routinely used anthelmintics. Thus, one area of scientific interest is the utilisation of the anthelmintic potential of plants native to the Indo-Pak peninsula. This study examines the application of a few native herbs as animal anthelmintics.

**Mukherjee, A. And Banerjee, M. (2019)**.,

Taking rasayana, also known as positive health therapy, can improve a person's immune to ward against illness, cure it, and stop it from happening again. These are nutritional supplements, immunostimulants, and rejuvenators with potent antioxidant activity; they influence the immune system and improve the body's reaction to illness. We avoid diseases while we are in good health. The purpose of this page is to emphasise T. Chebula's ethnopharmacological, pharmacological, and immunomodulatory properties, as well as how it might treat viral disorders and promote good health.

**Shamsi Saad Shamsi2,3*et.al.,**

Numerous methods have been used recently in natural skin care, with herbal therapies becoming more popular because of their alleged effectiveness and lack of negative side effects. Acne-causing bacteria like Propionibacterium acnes and Terminalia chebula, a medicinal plant with a long history of traditional medicinal properties, find herbal soaps particularly appealing due to their antimicrobial, anti-inflammatory, and antioxidant qualities. On the other hand, little is known about its cytotoxicity to human skin cells and its ability to combat germs that cause acne.

**Ms, S. And Patel, M. et,al.,**

Using a natural herbal soap can be an excellent alternative to the majority of commercial soaps, which contain chemicals that can be detrimental to the skin. To provide the best skin care solution for your skin, several natural soap producers also employ herbal remedies and aromatherapy. Herbal soaps, which are made entirely of natural components and uncommon herbs, have been shown to offer significant skin benefits. It is well known that the saponification process produces soap. Glycerol and fatty acid salt are the products of the procedure, which involves the triglyceride reacting with a strong potassium or sodium hydroxide.

**Das, S. et.al.,**

Plant-based components and botanical extracts are used to make herbal soaps, also referred to as natural soaps. Because they are composed of natural components, they provide the skin with a number of benefits. Among the advantages are their natural scent, antioxidant content, moisturising and nourishing qualities, and environmental friendliness. Herbal formulation and evaluation, including the determination of organoleptic and physicochemical parameters, constitute the basis for the manufacture of the extract of the herbal soap. Measurements and observations were made of the pH, total fatty matter, alcohol insoluble matter, foam height, foam retention, and moisture content. It was found to be brown in colour, silky in texture, and aromatic in scent.

**Kumar Ratha, K. et al.,**

Rice flour (Oryza Sativa) and coffee beans (Coffea SP) are the natural ingredients. This study's goals are to ascertain the best way to make a natural face mask using rice flour and coffee beans, as well as to evaluate the physical characteristics of the finished product. The examination of the face mask preparation using the mixture of rice flour and coffee bean powder in Formula I reveals that the powder is brown, slightly gritty, and scented. According to the study's findings, Formula I, which consists of 70% coffee bean powder and 30% rice flour.

**Vera, A. (no date) E.M. Mbaawuaga et.al.,**

Aloe vera extract, which functions as an antibacterial ingredient, to obtain samples of liquid soap for hand washing. A commercial hand-washing liquid soap sample (Astonish) that contained triclosan (0.1 %w/w) as an antibacterial ingredient was used to compare these results. Like the commercial liquid soap solution, the liquid soap solutions demonstrated exceptional foaming, wetting, and cleaning properties. Furthermore, the growth of the fungus A. Flavus was prevented by the liquid soap solutions, which also provided an average zone of inhibition between S. Aureus and P. Aeruginosa. The commercial liquid soap solution, which provided an average inhibition zone of mm 9.0 0.1 for both bacteria and also prevented the growth of the fungus, compares favorably (p ? 0.05) with these results.

**Mendake et.al.,**

Using coconut oil, beeswax, NaOH (lye), glycerine, neem, aloe vera, turmeric, tulsi, sandalwood powder, orange peel powder, multani mitti, reetha, honey, and vitamin E capsules, the study aims to make and assess polyherbal soap. Following the preparation of the herbal formulation, the physical parameters, pH, foam height, foam retention time, moisture content, alcohol insoluble matter, etc. Were evaluated. Numerous studies have demonstrated the antibacterial, anti-inflammatory, antifungal, and other properties of these herbal plant extracts. The results for the herbal soap show that these soaps are inexpensive, practical, produce natural foam when applied, cause no skin irritation, and have few or no negative side effects.

***MARKETED PREPARATION OF TERMINALIA CHEBULA :-***

1. Haritaki gandhraj premium beauty soap
2. Ayurdaanta Herbs powder
3. TRUE BOTANICALS Renew CHEBULA EXTREME CREAM
4. Seoul ceuticals Activated Chebula Serum
5. Himalaya – Organic triphala Caplets
6. Haritaki Tea
7. Haritaki plus – Hair dye
8. Krishna's Herbal & Ayurveda – Harad natural laxative powder
9. Shepherdes MYROBALAN (terminalia chebula) Natural Dye Extract
10. ORGANIC INDIA TRIPHALA Digestion & Colon Cleanse Capsule

## PLANT PROFILE:-

**A. Terminalia chebula :-**

**1. VERNACULAR NAMES:-**

- Sanskrit: Abhaya, Kayastha, shiva, Pathya
- Asamese: Shilikha
- Bengali: Haritaki
- English: Myrobalan
- Gujrati: Hirdo, Himaja, Pulo-harda
- Kannada: Alalekai
- Kashmiri: Halela
- Malayalam: Katukka
- Marathi: Hirda, Haritaki, Harda, Hireda
- Oriya: Harida
- Punjabi: Halela, Harar
- Tamil: Kadukkai
- Telugu: Karakkaya
- Hindi: Harre, Harad, Harar[5] .
- Combodia : Sa mao tchet
- Filipino : Chebulic myrobalan
- French : myrobalan noir
- Malay : manja puteri (unripe fruit)
- Thai : samo thai (central)
- Vietnamese : chieu lieu xanh [6].

2. TAXONOMY OF TERMINALIA CHEBULA :-

| Kingdom | **Plantae-Plants** |
|---|---|
| Sub-kingdom | Tracheobionta-Vascular plants |
| Super division | Spermatophyta-seed |
| Plants Division | Magnoliophyta – Fowering plants |
| Class | Magnoliopsidadicotyledons |
| Subclass | Rosidae |
| Order | Myrtales |
| Family | Combretaceae-Indian almond family |
| Genus | Terminalia L-tropical almond |
| Species | T. chebula |

**Table,1:Taxonomy of Terminalia chebula**

**3. Synonyms with definition:-**

- ✓ Haritaki — born in the abode of Hara (Lord Shiva) on Himalayas
- ✓ Vijaya- victorious or conquers all the diseases
- ✓ Rohini— heals the wounds and ulcers
- ✓ Amrita — nectar,
- ✓ Shakla sreshta — the best of all
- ✓ Abhya — not fearful of any diseases
- ✓ Airytha — cures all diseases
- ✓ Pramatha-eradicates the disease from the source

- ✓ Amogh — always beneficial
- ✓ Kayastha — sustains the body
- ✓ Pratpathya — extremely whole some
- ✓ Divya — divine in nature
- ✓ Prananda — offering life
- ✓ Jiva, Jivanti, Jivanika – life promoting
- ✓ Putana- sanctifying
- ✓ Shreyasi — conferring prosperity
- ✓ Chetaki— increasing vitality
- ✓ Balyi — gives strength
- ✓ Jivya priya — liked by all
- ✓ Bhisak priya —loved by physicians
- ✓ Pachani — digestive

**4. Useful parts :-**

i. Fruits (Immature and mature)
ii. Bark
iii. Gum
iv. Leaves
v. Galls [7].

**5. Pharmacognosy:-**

When seeds are examined under a powder microscope, trichomes and endosperms with polygonal cellulosic cells and xylem with lignified cells with oil globules, aleurone grains, and calcium oxalate crystals are visible[8].

**6. Phytochemical analysis:-**

Fruit pulp extract's phytochemical study reveals that while carbs and steroids are lacking, protein, amino acids, glycosides, flavonoids, vitamins, alkaloids, tannin, and phenolic compounds are present and carbohydrates , steroids are absent[9].

**7. Ecology:-**

➢ **Natural habitat:-**

Terminalia chebula can be found sporadically in mixed deciduous and teak forests, as well as in rather dry types of woods.

➢ **Limits of biophysics :-**

***Elevation***: up to 1500 (-2000) meters

***Type of soil:*** The species can be found on a range of soil types, including clayey and shaded ones.

➢ **Botanic Description:-**

Terminalia chebula is a medium- to big deciduous tree that can grow up to 30 meters tall. It has a broad, roundish crown and widely dispersed branches. The elliptic, oblong leaves have a sharp tip, a cordate base, full margins, glabrous upper surface, and a yellowish pubescence underneath. The monoecious blooms are carried in terminal spikes or short panicles and have a strong, disagreeable odour. They are dull white to yellow in colour. The fruits have a single angle stone and are glabrous, yellow to orange-brown, ellipsoid to ovoid drupes. Terminalia chebula can be found on dry slopes up to 900 meters above sea level in the Indian subcontinent's deciduous woodlands[10].

| Sr.no | Species Name | Feature | Use | Place of origin |
|---|---|---|---|---|
| **1.** | Vijaya | Oval | All the diseases | Vindhya |
| **2.** | Rohini | Circular | In wounds and ulcers | Pakisthanka |
| **3.** | Putana | Little, Very hard | As a dressing | Sindha |
| **4.** | Thick | Outer layer | For purification purpose | Champa Bhagalpur |
| **5.** | Abhaya | Having 5 lines | For eye disorders | Champa Bhagalpur |
| **6.** | Jivanti | Golden colour | For all diseases | Saurastra Gujrat |
| **7.** | Chetaki (white) | Having 3 lines | For purgation | Saurastra Gujrat |
| **8.** | Chetaki (Black) | Having 3 lines | For purgation | Himachal |

***Table,2: Botanical description according to place of origin[10].***

**8. Biological and Pharmacological activities of Terminalia chebula:-**

**1. Antibacterial action:-**

Against several bacterial species, Terminalia chebula shown antibacterial activity[11] . According to one team of researchers, it effectively suppresses Helicobactor pyroli's (H. pyroli) urease activity [12]. There have also been reports of Terminalia chebula's antibacterial effectiveness against human pathogenic bacteria that are both Gram positive and Gram negative [13] . Methicillin-resistant Staphylococcus aureus was susceptible to the antibacterial effects of gallic acid and its ethyl ester, which were extracted from an ethanolic extract of Terminalia chebula [14].

**2. Anti-fungal activity:-**

Terminalia chebula's aqueous extract has antifungal properties against certain yeasts and dermatophytes [15,16] .

**INGREDIENTS PROFILE :-**

**B. Aloevera:-**

The well-known succulent plant aloevera is frequently used to soothe and moisturize the skin. Aloe vera is added to natural soap in this study to examine the samples' cytotoxicity and antibacterial qualities [17].

| Kingdom | **Plantae** |
|---|---|
| Phylum | Anthophyta |
| Class | Monocotyledoneae |
| Order | Asparagales |
| Family | Asphodelaceae |
| Genus | Aloe |

***Table,3: Taxonomy of aloevera[18] .***

C. **Alum:-**

Infections of the skin and soft tissues are common. The two most prevalent fungal infections of the skin are candidiasis and Aspergillosis. Alum from Yemen is a naturally occurring mineral that has antibacterial and antifungal qualities [19] .

D. **Castor oil:-**

- **Name in biology**: Ricinus communis
- **Chemical composition:** Triglycerides, including 80% ricinoleic acid, isoricinoleic acid, linoleic acid, stearic acid, and isostearic acid
- **Category:** antimicrobial and anti-aging
- **Appearance:** Nearly colorless or pale yellow [20].

**E. Rose oil:-**

Rose essential oil is widely used in the fragrance and cosmetics sectors and has been shown to have important pharmacological qualities, including cytotoxic, antioxidant, and antibacterial effects. Indeed, it is anticipated that the demand for premium rose oil would increase significantly in the future on a global scale[21] .

**F. Rose water:-**

- **Using steam distillation**, the biological nomenclature is Rosa × damascena's sepals and petals.
- **Components:** Sepals and Petals
- **Chemicals** -geraniol (4.43%), citronellol (5.72%), and phenethyl alcohol (81.27%).
- **Uses:** Reduces skin redness, soothes skin irritation includes antioxidants, heals burns, wounds, and scars [22] .

**G. Borax:-**

Borax used in herbal soap formulation. The major uses of borax are as a preservatives , as a buffering agent, it can also aid to keep the soap's pH stable. According to research, it may work well to keep soap's moisture level constant over time.

**H. Honey wax :-**

Honeybees (Apis mellifera) use blossom nectar to make honey, a concentrated natural product. It has more than 200 molecules with a variety of biological or pharmacological actions, from hypoglycemic to anti-hypertensive, anti-inflammatory, antibacterial, and antioxidant properties. Because of its distinct physicochemical characteristics and abundance of bioactive chemicals [23] .

**I. Rice flour:-**

Half of the world's population, including nearly all of East and South East Asia, consumes rice flour, a cereal grain that is produced 95% of the time by humans.

- **Synonyms :** Meal of rice , Rice vermicelli
- **Biological source :** Is thoroughly ground organic rice. In contrast, rice starch is often created by steeping rice in lye. It's a great substitute for wheat flour, which some people may find to be problematic for their digestive systems.
- **Chemical components:** Includes lipid, rice, starch, ash, and protein.
- **Medical properties:** It contains natural anti-inflammatory and gluten-free qualities, improves the health of the neurological system, prevents constipation, lowers the risk of cancer, prevents obesity, and improves skin health. It is also a wonderful source of energy. It is also a fantastic source of protein, which lowers blood pressure and blood sugar and promotes heart health.
- **Refreshes and brightens the skin:** By eliminating dead skin cells, it makes the skin's texture brighter. Brightens and revitalizes the skin. It eliminates dead skin cells, brightening the texture of the skin.
- **Purification:** Rice flour was gathered, allowed to dry at room temperature, and then manually ground into a powder using a mortar and pestle. To obtain material particles of the right size, these powders go through sieve sixty [24].

## MATERIAL & METHODS:-

❖ **Plant collection-**

The herbal soap is prepared by collecting & using Specific plant materials as well as other ingredients of formulation.

- **Collection of Terminalia chebula:-**
  The fruit of Terminalia chebula (Myrobalan) were collected from Kalsubai Harishchandragad Abhyaranya A/P. Bhandardara , after that the fruits were shade dried & coarsely powder by using mortar & pestle.
- **Collection of Aloevera:-**
  The leaf of aloe barbadensis (aloevera) were collected from the botanical garden of Dr.Kolpe Institute Of Pharmacy College Kolpewadi.
- **Collection of Alum:-**
  The alum is purchased from general store.
- **Collection of Castor oil**
  The castor oil is purchased from medical store.
- **Collection of Rose water:-**
  The rose water is purchased from medical store.
- **Collection of Rose oil ,Borax:-**
  The rose oil, Rose water & borax were collected from the laboratory of Dr. Kolpe Institute of Pharmacy College Kolpewadi.
- **Honey wax:-**
  The honey comb is collected by local area to prepared honey wax.
- **Collection of Rice flour:-**
  The rice flour is purchased from general store.

❖ **Authentication of plant –**

The herbarium was prepared of Terminalia chebula ( Myrobalan) & Authentication of plant is obtained from S.S.G.M.(Shri Sadguru Gangagir Maharaj Science, Gautam Arts and Sanjeevani Commerce college, Kopargaon) college Of Kopargaon ,from botany department.

❖ **Drying & grinding –**

Drying of the Myrobalan (Terminalia chebula) fruits in shed to dried ,then grinds into mortar & pestle to form a coarse powder.

❖ **Extraction:-**

The Terminalia chebula was extracted with water. By using heating mentle apparatus. For about 2 hrs. With occasional agitation. After extraction completed filter the solution & weighed it.

**Preparation of Terminalia chebula extract:**

- ✓ Fresh Terminalia chebula fruits are collected and shed dried for about 15 days.
- ✓ The dried fruits are grinded by using mortar & pestle to form a coarse powder.
- ✓ Take 300 ml of water into cleaned & sterilized beaker.
- ✓ Add 50 gm of Terminalia chebula's coarse powder into it.
- ✓ Mix the above samples uniformly.
- ✓ Put the solution beaker into heating mentle apparatus for about 2 hrs set temperature as 70°c .
- ✓ Occasional agitation allowed.
- ✓ After extraction process solution to be filter.
- ✓ Then weighed the filtrate & cover with aluminium foil.

**FORMULATION OF HERBAL SOAP:-**

Formulation of herbal soap as follows:

| INGREDIENTS | QUANTITY (%) |
|---|---|
| **Terminalia chebula** | 2 gm |
| **Aloevera** | 4 gm |
| **Alum** | 1.6 gm |
| **Castor oil** | 0.2 |
| **Rose oil** | 1.5 ml |
| **Rose water** | 3 ml |
| **Borax** | 0.5 gm |

| | |
|---|---|
| **Honey wax** | 34.8 gm |
| **Rice flour** | 2.4 gm |

***Table,4: Ingredients used in herbal soap***

**PROCESS :-**

1) Take a Honey wax as a base of herbal soap into beaker.
2) Using a water bath, raise and maintain the temperature to heat the soap base.
3) A soap base will transform into a liquid after being heated.
4) Add the ingredients listed in the formulation table after that.
5) Boil the mixture using water bath.
6) Continually stirred to combine the components for the herbal soap as described above.
7) In a soap mold, this mixture is poured.
8) Let it to cool to room temperature.
9) After that unmold the soap.
10) Soap is formed.

**Activity of ingredients:-**

| Sr.no. | Ingredients | Activity |
|---|---|---|
| **1.** | Terminalia chebula | Antibacterial |
| **2.** | Aloevera | Moisturizer |
| **3.** | Alum | Antibacterial<br>Antifungal |
| **4.** | Castor oil | Anti-aging<br>Antimicrobial |
| **5.** | Rose oil | Antioxidant |
| **6.** | Rose water | Anti-scar<br>Hydrating |
| **7.** | Borax | Preservative<br>pH stabilizer |
| **8.** | Honey wax | Antioxidant<br>Anti-inflammatory |
| **9.** | Rice flour | Exfoliating<br>Brightening activity |

***Table,5: Activity of ingredients used in herbal soap***

## EVALUATION PARAMETERS OF HERBAL DRUG & HERBAL SOAP FORMULATION:-

1. **Flavonoid test:-**
   a. **Lead acetate test-**
   Taken Terminalia chebula extract+10% lead acetate it gives yellowish ppt = flavonoids present.
2. **Alkaloids test:-**
   a. **Wagner test -**
   Taken Terminalia chebula extract + wagner's reagent it gives reddish brown ppt = Alkaloids present.
   b. **Dragendroff's test –**
   Taken Terminalia chebula extract + dragendroff's reagent it gives orange red ppt= Alkaloids present.
   c. **Hager test-**
   Taken Terminalia chebula extract + Hager's reagent it gives yellowish ppt = Alkaloids present.
   d. **Mayer's test-**
   Taken Terminalia chebula extract + Mayer's reagent it gives yellowish ppt = Alkaloids present.
3. **Tannin's test:-**

**a. Ferric chloride test-**

Taken Terminalia chebula extract + $FeCl_3$ it gives black ppt = Tannin's present.

**4. Chromatographic evaluation:-**

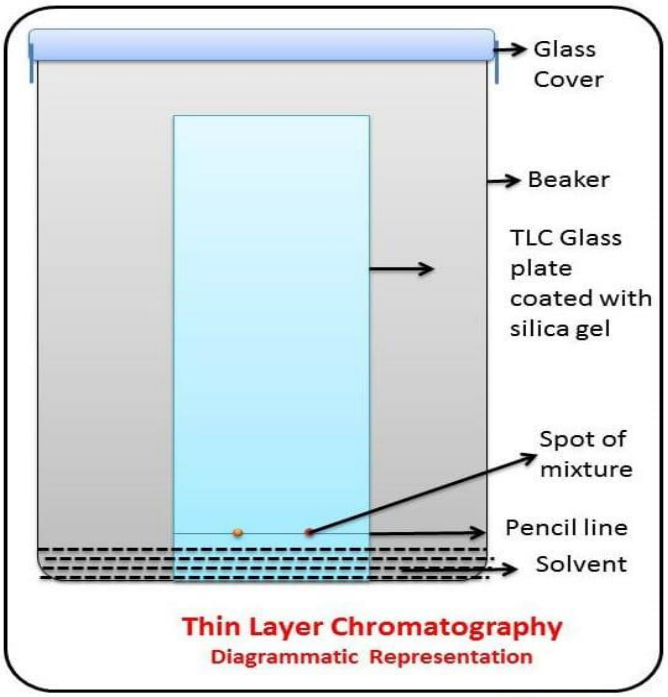
I. **Thin layer chromatography:** TLC is reliant on the separation process. Idea. The relative affinities of the chemicals for the two phases determine the separation. Over the surface of the stationary phase, the chemicals in the mobile phase migrate. The compounds with a higher affinity for the stationary phase move more slowly than the other compounds, which move more quickly. Consequently, the mixture has been separated. When the separation process is finished, the different parts of the mixture show up on the plates as spots at different levels.

- Appropriate detection procedures identify their nature and character.

***Fig,34: Diagrammatic representation of TLC***

- **Need of TLC :**

a) Characterize the extract in terms of the quantity of distinct phytoconstituents.




b) To create a technique for separating phytoconstituents chemical ingredients.

- **Preparation of sample:-**

| Stationary phase | **Silica gel – G** |
|---|---|
| Mobile phase | Acetone: Methanol: Water (6:3:1) |
| Saturation time | 10 mins |
| Spraying reagent | Ferric chloride reagent |
| Observation | Compound moved upward & shows band. |

***Table,6:Preparation of TLC sample***

**5. Colour :-**

A white background was utilized to visualize the herbal soap in order to determine its color and the compositions' clarity. Obtaining colour of soap is "dark brown".

**6. Odour:-**

We employed two distinct techniques to assess the odour of the mixtures. The sample was heated on a hot plate in the first technique. The second technique entails three to five individuals, including both men and women, directly breathing a sample.

**7. Appearance :-**

Evaluation of organoleptic properties of herbal soap ,such as shape and clarity , was carried out by sensory and visual examination.

8. **Consistency :-**

The Visually investigation of soap then it shows solid consistency in nature .

9. **Sensitivity test :-**
   After applying the prepared herbal soap on skin surface , it was left in the sun for forty-five minutes. Any sensitivity not occurred in that area. Herbal soap shows non sensitive in nature.
10. **pH:-**
    pH of herbal soap was evaluated by using pH meter.
11. **Skin irritation test:-**
    Apply small amount of the soap to patch of skin about 15 minutes then observed the skin irritation occurred or not . After the test any irritation not occurred in skin surface.
12. **Foam height:-**
    Twenty-five ml of distilled water were used to dissolve a two-gram sample of soap. Next, transfer it to a 100 ml measuring cylinder and fill it with water to reach 50 ml. The foam height was measured above the aqueous volume, which was measured up to 50 ml . They display a foam height about 7 cm.

## RESULT & DISCUSSION:-

To assess its colour, consistency, odour, and look, herbal soap was taken. It was discovered that the herbal soap had a smooth, brown texture.

- **Physical parameters for Terminalia chebula** –

| Parameters | Observation |
|---|---|
| **Lead acetate test** | Flavonoids present |
| **Wagner's test** | Alkaloids present |
| **Dragendroff's test** | Alkaloids present |
| **Hager's test** | Alkaloids present |
| **Mayer's test** | Alkaloids present |
| **Ferric chloride test** | Tannin's present |

***Table,7:Physical parameters for Terminalia chebula***

- **Chromatographic evaluation of Terminalia chebula –**

| Parameter | Standard (Rf)value | Observation |
|---|---|---|
| **TLC** | 0.5-0.89 | **0.41** |

***Table,8:Chromatographic evaluation of Terminalia chebula***

- **Physical parameters for herbal soap from Terminalia chebula fruits –**

| Parameters | Observation |
|---|---|
| **Colour** | Dark brown |
| **Odour** | Characteristics |
| **Appearance** | Smooth texture |
| **Consistency** | Solid |
| **Sensitivity test** | Non sensitive |

| | |
|---|---|
| **pH** | 8 |
| **Skin irritation test** | No rashes, No irritation |
| **Foam height** | 7cm |

***Table,9:Physical parameters for herbal soap from Terminalia chebula fruits***

## DISCUSSION –

The formulated herbal soap had a smooth in texture, a characteristic odour & dark brown in colour. The herbal soap's pH was checked & found to be 8 which is optimal range. Consistency was found to be solid in nature. The ideal foam height that soap should create in between 1.3-22 cm , however the foam height was found to be 7 cm. After measuring the sensitivity test on hand any sensitive reaction not occurred that is soap is non sensitive. Then skin irritation test also evaluated, any rashes not occurred in tested area of hand ,it shows no irritation of soap to skin surface.

## CONCLUSION:-

The present work involved the formation of herbal soap from Terminalia chebula fruits by using honey wax as a base. The development of a soap incorporating Terminalia chebula (Haritaki) alongside aloe vera, alum, castor oil, rose oil, rose water, borax, honey wax, and rice flour represents a comprehensive and integrative dermatological formulation. Terminalia chebula is recognized for its antimicrobial, antioxidant, and regenerative attributes, rendering it particularly efficacious in enhancing cutaneous health, diminishing acne manifestations, and decelerating aging indicators. Through synergistic combination with calming and moisturizing components such as aloe vera, rose water, and honey wax, complemented by the purifying and exfoliative qualities of rice flour and alum, this soap provides multifaceted dermatological advantages-effectively cleansing, nourishing, repairing, and safeguarding the skin through natural mechanisms.

The growing demand for skincare product' free of chemicals and herbs is met by this combination, which also supports conventional and sustainable wellness methods. Borax's moderate antibacterial properties and castor oil's moisturizing properties further improve its usefulness. This soap appeals to customers looking for natural, multipurpose skincare products with Ayurvedic roots and has great promise in both the therapeutic and cosmetic markets.

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