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# FORMULATION AND EVALUATION OF POLYHERBAL CREAM

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## ABSTRACT

Cosmetic made from either natural or synthetic components are almost in regular use universally in many different forms for enhancing the beauty. Herbal medicines are sometimes referred to as Herbalism or botanical medicine. The herbal cosmetics defines as beauty products which possess desirable physiological activities such as healing, smoothing, appearance, enhancing and conditioning properties because of herbal ingredients. The herbal anti-inflammatory cream was prepared and evaluated with an aim to design and developed new formula for herbal multipurpode cream. Formulation was evaluated for various physicochemical parameters which includes appearance, type of emulsion, colour, odour, pH, texture, etc. Various drugs such as Azadirachta indica (Neem leaves), Occimum sanctum (Tulsi) are utilize to form the cream. Herbal cream was compared with various parameters like colour, odour, pH, Spreadability, Washability, Consistency and was found to be satisfied with all required characterization. This cream can be used as an effective anti-inflammatory activity.

**KEYWORDS:** Cosmetics, Herbal cream, Tulsi, Neem, Almond oil, Polyherbal.

## 1. INTRODUCTION

Herbal cosmetics are defined as beauty products containing herbal ingredients that have desired physiological activities such as healing, smoothing appearance, enhancing, and conditioning qualities. The use of herbs in cosmeceutical production has greatly risen in recent years in the personal care system, and there is a high demand for herbal cosmetics. Cosmetics are substances that are applied to the human body with the purpose of cleansing, beautifying, increasing attractiveness, and changing appearance without harming the body's structure or functions.Cream is described as semisolid emulsions that are either oil in water (o/w) or water

in oil (w/o), and are designed for external application.A skin cream's purpose is to protect the skin from various environmental conditions and weather while also providing a calming effect. Neem is an antifungal and anti-inflammatory herb that can also be used to treat scars, pigmentation, redness, and itching. Tulsi is used to add glow to the skin and to promote wound healing[1].

Neem is a tree Azadirachta indica belonging to Meliaceae Family. The bark, leaves, and seeds are used to make medicine. Less frequently, the root, flower, and fruit are also used. Neem leaf is used for leprosy, eye disorders, bloody nose, intestinal worms, stomach upset, loss of appetite, skin ulcers, diseases of the heart and blood vessels (cardiovascular disease), fever, diabetes, gum disease (gingivitis), and liver problems[2]. The leaf is also used for birth control and to cause abortions. Some people apply neem directly to the skin to treat head lice, skin diseases, wounds, and skin ulcers; as a mosquito repellent; and as a skin softener. Neem is also used as an insecticide. Of all the herbs used within Ayurveda, tulsi (Ocimum sanctum Linn) is preeminent, and scientific research is now confirming its beneficial effects. There is mounting evidence that tulsi can address physical, chemical, metabolic and psychological stress through a unique combination of pharmacological actions. Tulsi has been found to protect organs and tissues against chemical stress from industrial pollutants and heavy metals, and physical stress from prolonged physical exertion, ischemia, physical restraint and exposure to cold and excessive noise. Tulsi has also been shown to counter metabolic stress through normalization of blood glucose, blood pressure and lipid levels, and psychological stress through positive effects on memory and cognitive function and through its anxiolytic and anti-depressant properties. Tulsi's broad-spectrum antimicrobial activity, which includes activity against a range of human and animal pathogens, suggests it can be used as a hand sanitizer, mouthwash and water purifier as well as in animal rearing, wound healing, the preservation of food stuffs and herbal raw materials and traveler's health[3].

- Ideal Properties of Herbal Cream:
- It got to condense at body temperature.
- It need to not commonly be weakened.
- Ought to give a cooling affect on the skin after exterior application.
- Less sleek than treatment and successfully spread on the skin.
- The pH of the cream must be perfect from 4.6-6.0.
- It got to enter the epidermis (by implies of characteristic handle ).

- Its consistency have to be be moo adequate to permit basic spreading.
- It have to be be non-toxic.
- The excipients got to be reliable with each other.
- It have to be be sterile.
- It need to be non-irritant.
- It got to be non-inflammatory[4]

**Anatomy Of Skin:-**

Skin is the biggest organ within the body and covers the body's whole outside surface. It is an noteworthy and vital organ. It could be a beefy surface with hair, nerves, organs and nail. It comprises of hair follicles which grapple hair strands into the skin. It act as boundary between exterior and interior environment. It is made up of three layers, the epidermis, dermis, and the hypodermis, all three of which change altogether in their life structures and work. The skin's structure is made up of an complicated organize which serves as the body's starting boundary against pathogens, UV light, and chemicals, and mechanical damage. The skin has distinctive thickness and surfaces. It moreover directs temperature and the sum of water discharged into the environment. It permits sensation such as touch, warm, and cold. It too watches the bones, muscles and other crucial organs of our body[5].

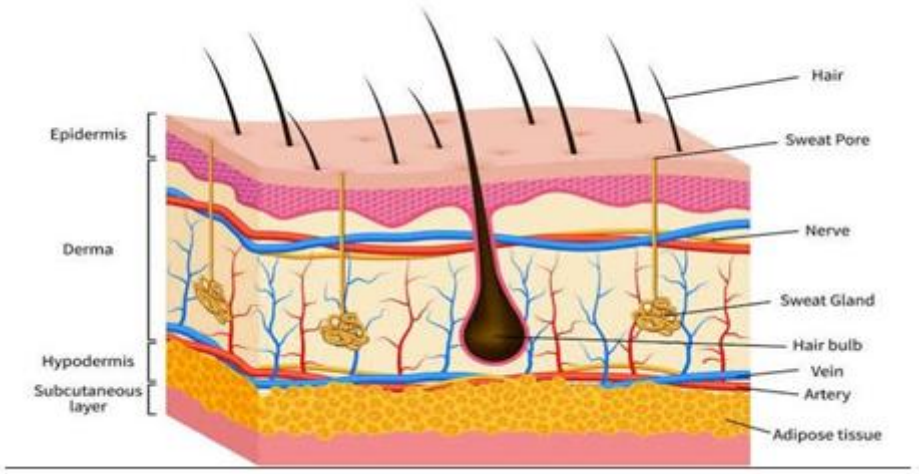


**Fig 1: Anatomy of skin.**

1) Various Herbs Used In Preparation Of Cream

NEEM

- Family:-Meliaceae

- Biological source: Fresh or dried leaves and seed oil Azadirachta indica.
- Biological name: Azadirachta indica
- Therapeutic Use:

Immunomodulatory, Anti-Inflammatory, Antihyperglycemic, Antiulcer, Antimalarial, Antifungal, Antibacterial, Antiviral, Antioxidant, Antimutagenic, Anticarcinogenic[6].

| | |
|---|---|
|  |  |
| **Fig 2: Neem** | **Fig 3: Tulsi** |

- Medicinal uses:-

Neem leaves are used for leprosy, eye diseases, nosebleeds, intestinal worms, stomach upset and loss of appetite, skin ulcers, heart and blood vessel disease (cardiovascular disease), fever, diabetes, gum disease (gingivitis), and liver disease. The leaves are also used to control birth and cause abortion[7].

- Benefits of Neem Leaf Powder:-

- It acts as a shield against dandruff.
- It can be used on both the face and hair.
- Treat dry scalp to make it smooth and shiny.
- Increase radiance and produce an aging effect.
- Increment blood course.
- Aid in the treatment of ulcers.
- Keep skin healthy and glowing.
- Neem has antibacterial properties that will help you get rid of pimples.
- Neem lightens and blurs acne scars.
- Neem is calming in nature with unsaturated fats and glycosides.

- Neem is rich in antioxidants and vitamin E, which reduce wrinkles.
- The fatty acids and vitamin E in neem nourish the skin[8].
- Assist with relieving skin inflammation.
- Treat skin inflammation.
- Forestall skin contamination.
- Gives the skin an even tone.
- Offers anti-aging benefits[9].

2) **TULSI**

- Family: Lamiaceae
- Biological name: Ocimum tenuiflorum
- Biological source:-Fresh and dried leaves of Ocimum species like Ocimum sanctum L.also, Ocimum basilicum L.[10]

- **Medicinal uses:-**

Sacred basil contains cell reinforcements like L-ascorbic acid and eugenol, which safeguard the heart from unsafe free revolutionaries. Eugenol has additionally been displayed to bring down blood cholesterol levels.

Tulsi helps reduce uric acid in the body by having a mild diuretic and identify its effects. The acetic Acid in holy Basil helps dissolve stones. Tulsi is a headache remedy that can relieve migraine pain. Tulsi's anti-inflammatory properties help prevent bacterial, viral and fungal infections, thus supporting eye health. It also relieves the eyes puffins and reduces stress[11].

- **Benefits of Tulsi leaf:-**

Natural immunity, Reduce stress and blood pressure, Good for healthy skin, Upholds the soundness of maturing skin, Mitigates skin conditions like dermatitis, It is good for skin treatment, Advantages of vitamin K, It is exceptionally valuable for the skin, Helps prevent aging, Prevent acne[12].

## 2. MATERIAL and METHODS

- **Selection of plant materials and method**

- Collection of plant material:

Neem Azadirachta indica leaves and Tulsi leaves Ocimum sanctum were collected from local area from Pune. The plants were identified by Dr. Gautam Palshikar, Genba Sopanrao Moze

College of Pharmacy Pune.

- Chemicals and Reagents

Almond oil was obtained from Dabur India limited. Methyl paraben, Propyl paraben, Borax, Beeswax were issued from college laboratory.

- Instruments and Equipments.
- UV Spectrophotometer
- Digital pH meter
- Brookfield Viscometer
- Extraction of plant material

Both Neem and Tulsi leaves were shade dried for 4 days and size reduced using mixer grinder converted into coarse powder and passes through sieve number.

The coarse powder was stored for further studies.

Both Neem and Tulsi leaves were macerated using ethanol .The extraction was carried out for 3 days taking 100 gms of plant material with 500 ml of ethanol. The extract was evaporated using hot plate apparatus and the obtained extracts were preserved for further studies[13].

- Study of monograph and chemical constituents

A) Neem

- Common Name - Neem.
- Scientific Name- Azadirachata lndica.
- Biological Source- whole part of plant.
- Family- Meliaceae.
- Kingdom- plant.

Neem is an omnipotent tree and a sacred gift of nature. Neem tree is mainly cultivated in the Indian subcontinent. Neem is a member of the mahogany family: Meliacee. Today it is known by the botanical name Azadirachta indica (A. indica)

- Importance of NEEM:-

- It is effective against skin infection, rashes & pimples.
- Neem have Immunity booster, act as Blood purifier for beautiful & healthy skin, Dispels intestinal worms and parasites, Malaria, Piles, Hair disorder& Oral disorders.
- Neem acts as Antimalerial, Antidiabetics, Antiviral, Antiobesity.
- Neem is rich in fatty acids, including oleic, stearic, palmitic, and linoleic acids.
- Neem is applicable to treat psoriasis and eczema.
- Neem has been applicable to treat acne, reduce blemishes, and improve skin elasticity.

- Neem leaf extract accelerates wound healing through an increased inflammatory response and the formation of new blood vessels[14].

- **Constituents:-**

1) Alkaloids
2) Flavonoids
3) Azadirone
4) Nimbidin
5) Nimbin
6) Terpenoids
7) Steroids
8) Margosicacid
9) Vanilic acid 10)Glycosides
10) B-sitosterol Nimbectin
11) Kaempeerol

B) **Tulsi**

- Common Name - Tulsi
- Scientific Name- Ocimum tenuiflorum
- Biological Source- It is obtained from the leaves Of Tulsi.
- Family- Lamiaceae
- Kingdom- plant

Tulsi is called the Holy Basil' in India with reference made to it in the Holy Scriptures. In its native India, it has been cultivated for nearly 2,000 years. Healers call it tulsi, the Queen of Herbs, the "Incomparable One,"
and it is prominent in Ayurveda and Hinduism for its various therapeutic applications. For skin care, the properties come it's impressive antioxidant abilities and for how it acts as a stress relieving agent.

- Importance of Tulsi :-

- Act as antibacterial, antifungal anti-inflammatory activity.
- Tulsi benefitial for the skin by preventing blackheads, acne and relieves skin infections, toname a few.
- Rich in vitamin K and antioxidants.
- Tulsi benefitial for hair by stimulating blood circulation and promoting hairgrowth amongst

others.

- Tulsi neutralizes free radicals and rejuvenates the skin, reviving the youthful glow.
- Tulsi have Antitusive property[15].

- Chemical Constituents Of Tulsi Are:

1) Eugenol
2) Ursolicacid
3) Rosmarinicacid
4) Oleanolic acid
5) Carvacrol
6) Linalool

B-caryophyllene

- Phytochemical tests

1) Detection test for tannins

- Bromine water test: 10ml of bromine water + 0.5gm plant extract results in discoloration of bromine .
- Braymer's test: 1ml of filtrate + 3ml distilled water + 3 drops of 10% ferric chloride solution gives blue green colour.

2) Detection of Triterpenoids

- Salkowski's test: Filtrate + few drops of conc. $H_2SO_4$ after shaking gives golden yellow layer at bottom.

3) Detection of Flavonoids

- Lead acetate test : 1ml plant extract + few drops of lead acetate solution gives a yellow precipitate.
- Ferric chloride test : Extract in aqueous solution + few drops of ferric chloride solution forms a green precipitate.

4) Detection of phenolic compound

- Lead acetate test : Plant extract is dissolved in 5ml distilled water + 3ml of lead acetate solution gives a white precipitate .
- Potassium dichromate solution : Plant extract + few drops of Potassium dichromate solution gives a dark colour on shaking.

5) Detection test of Alkaloid

- Dragendroff,s test : Few ml filtrate + 1-2 ml Dragendroff's reagent gives a reddish – brown

precipitate.

- Hager,s test : Few ml filtrate + 1-2 ml Hager's reagent forms a creamy white precipitate .
- Picric acid test : Few ml filtrate + 3-4 drops of picric solution gives orange colour to solution[16].

## 3. RESULTS

- Phytoconstituents present in neem

1) Triterpenes 2)Flavonoids 3)Phenols 4)Tannins 5)Saponins 6)Alkaloids

- Phytoconstituents present in tulsi

1) Tannins
2) Phenolic acids
3) Phenols
4) Saponins
5) Flavonoids
6) Triterpenoids

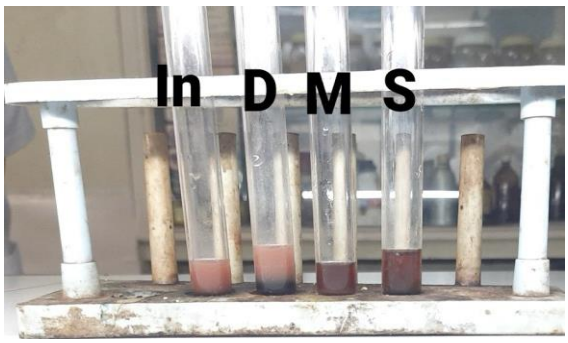


**Fig 4: Phytochemical tests of neem.**

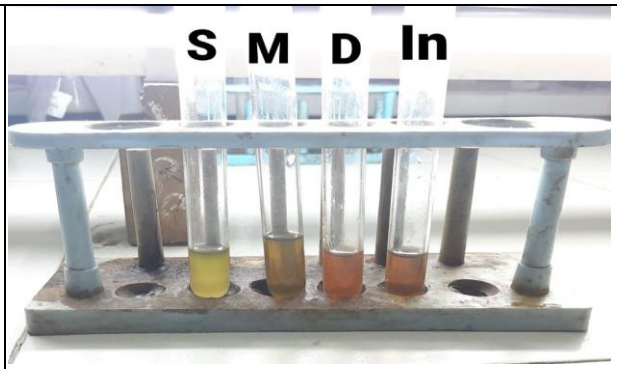


**Fig 5 : Phytochemical tests of tulsi.**

- **Extraction of plant material**

Both Neem and Tulsi leaves were shade dried for 4 days and size reduced using mixer grinder converted into coarse powder and passes through sieve number

The coarse powder was stored for further studies. Both Neem and Tulsi leaves were macerated using ethanol .The extraction was carried out for 3 days taking 100 gms of plant material with 500 ml of ethanol. The extract was evaporated using hot plate apparatus and the obtained extracts were preserved for further studies .

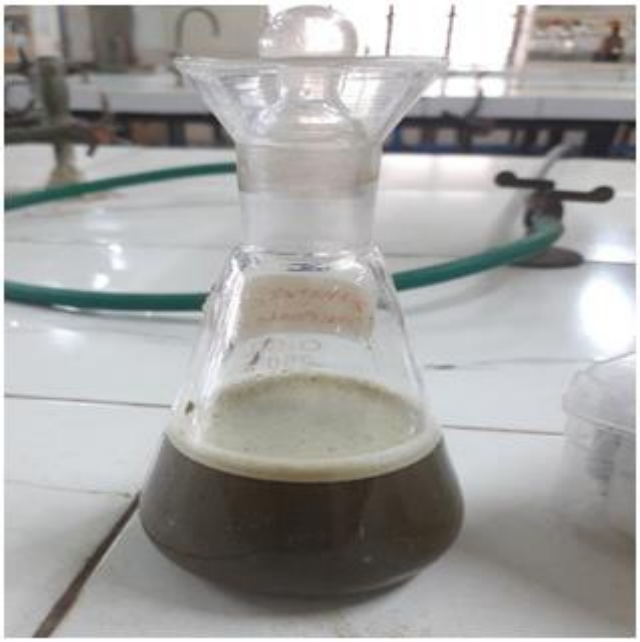

**Fig. 6: Maceration process.**

- Detection of UV-Visible spectrophotometry:

Ultraviolet (UV)-visible (VIS) spectroscopy of molecular sieves will be covered. This constitutes a major part of electronic spectroscopy but has to be discriminated from other techniques also summarized under this term like photoelectron, electron energy loss and X-ray absorption spectroscopy. In optical electronic spectroscopy or electronic spectroscopy in a narrow sense, the probing particle is a photon that excites an electronic transition without modification of the incoming radiation. Complementary methods are either emission, bringing the system back to its ground state, or reflectance, being a combination of both absorption and emission. Emission or luminescence is divided into fluorescence and phosphorescence, respectively, depending on being restricted to or exceeding the excitation period. In the case of coupling the incident radiation to an internal process, the out coming photon has a different frequency.

- Determine of λ max of Neem (Azadirachta indica) –
- Neem standard solution was scanned using a UV spectrophotometer between 200 and 400 nm in ethanol. UV- spectrophotometer (Shimadzu) was used.

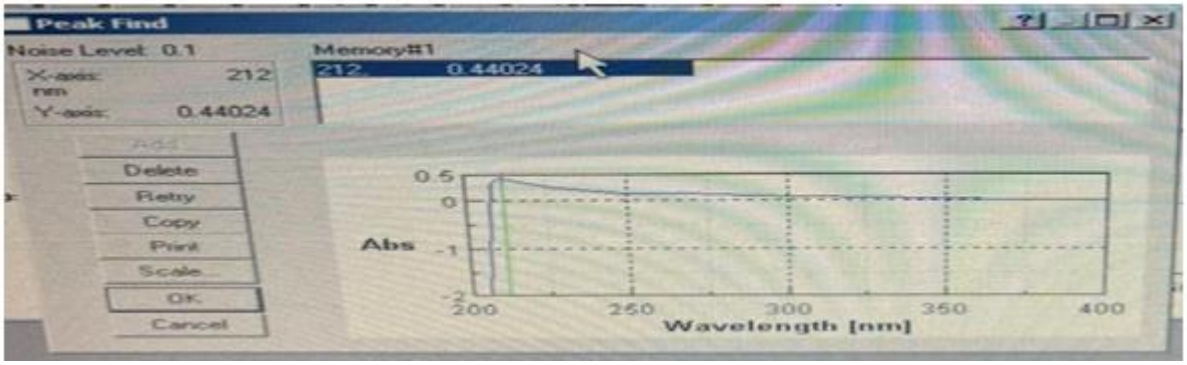


**Fig 7: UV spectrometry of Neem.**

- The λmax of Neem (Azadirachta indica) extract is 212 nm and absorbance was 0.44204 .
- Determine of λmax of Tulsi (Ocimum sanctum Linn)
- Tulsi standard solution was scanned using a UV spectrophotometer between 200 and 400 nm in ethanol. UV- spectrophotometer ( Shimadzu ) was used.
- The λmax of Tulsi (Ocimum sanctum Linn) extract is 288 nm and absorbace was 0.12205 .

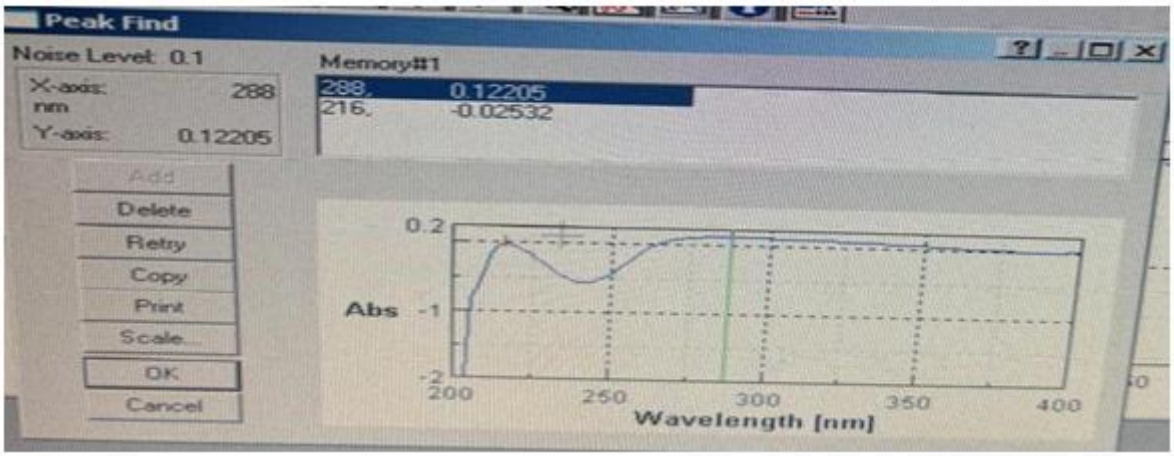


**Fig 8: UV spectrometry of Tulsi.**

- **General Method of Preparation of cream**

 Add the desired amount of the ingredient in sufficient quantity.

 Add water and prepare the solution by heating in a water bath

 Add the required amount of herbal extract to the above solution.

 Add the solution drop by drop to solution 2. When both phases are properly mixed, add methylparaben as preservative.

 Formulated Polyherbal Cream was delayed for approx an hour in a cool, dry place, in direct sunlight, until it hardens Completely and was used after 48 hours of storage at temperature.

 Room temperature for stability and analytical testing.

 Packed in a container and stored in a cool place.

- **Formulation of cream**

 In a borosilicate glass beaker, heat liquid paraffin and beeswax to 75 degrees Celsius and keep it there (Phase of oil).

 Dissolve borax and methylparaben in distilled water in a separate beaker and heat to 75°C to dissolve the borax and methylparaben and obtain a clear solution (This is the aqueous phase.)

 After that, gradually add this aqueous phase to the heated oily phase. Stir in a determined amount of Neem extract and Tulsi extract until a creamy cream develops. Add some amount of almond oil in it to get soft texture.

 Place the cream on the slab and, if necessary, add a few drops of distilled water. Mix the cream in a geometric pattern on the slab to give it a smooth texture and to thoroughly combine all of the components.

 This technique is known as slab technique or extemporaneous cream preparation.

**Formula of cream**

**Table no. 1 Formula of cream.**

| Sr No | Ingredients | Quantity |
|---|---|---|
| 1) | Neem Extract | 1 ml |
| 2) | Tulsi Extract | 1 ml |
| 3) | Almond oil | 0.5 ml |
| 4) | Beeswax | 4.0 gm |
| 5) | Liquid Paraffin | 15 ml |
| 6) | Methyl Paraben | 0.5 gm |
| 7) | Propyl Paraben | 0.5 gm |
| 8) | Borax | 0.5 gm |
| 9) | Distilled water | q.s |
| 10) | Perfume | q.s |

- **Role Of Ingredients Used in Formulation**

1) Neem : Antibacterial , Antifungal , anti-inflammatory , add glows to the face
2) Tulsi : Antibacterial , Anti-inflammatory, promotes wound healing , relieves skin drynesss itching and redness.

3) Beeswax : Emulsifying agent , stabilizer and gives thickness to the cream .
4) Liquid Paraffin : Lubricating agent .
5) Methyl paraben : Preservative.
6) Propyl paraben : Preservative.
7) Borax : Alkaline agent .

- **Evaluation Parameter**

- Physical Properties:-In this test, the cream was observed for color, odor, texture
- PH:- 0.5 g of cream was taken and dispersed in 50 ml of distilled water, and then the PH was measured using a digital PH meter.

**Fig 10: pH meter.**

- Washability:- A small amount of cream was applied to the hand and then washed with tap water.

**Fig 9: Cream formulation.**

**Fig 11: Washability test.**

Irritancy Test:- Mark an area (1 cm') on the dorsal surface of the left hand. The cream was applied to the designated site and the time was recorded. Irritation, erythema, edema were

monitored at regular intervals up to 24 hours and reported.

- Viscosity:- Viscosity of formulated herbal creams can be determined by using Brookfield Viscometer.at the temperature of 25°C Using Spindle no,63 at.rpm.
- Homogeneity:- The homogeneity of the preparation was tested by visual appearance and touch.
- Spreadability:-The cream was set between two glass slides and squeezed to a uniform thickness by putting a 100g load for 5 minutes. A weight was added to the skillet. The time expected to isolate the two slides, for example the time expected for the upper slide to move over the lower slide, was taken as a proportion of Spredability.
- Phase separation:- The prepared cream was transferred to a suitable container with a wide mouth. The separation of the oil phase and the aqueous phase were kept aside for storage after 24 hours.

**Table no. 2 Evaluation parameters.**

| Sr No | Parameters | Results |
|---|---|---|
| **1.** | Colour | Pink |
| **2.** | Odour | Pleasant |
| **3.** | Emulsion type | O/W type |
| **4.** | Homogeneity | Uniform |
| **5.** | Type of smear | Greasy |
| **6.** | Washability | Washable with soap and water |
| **7.** | pH | 5.2 – 5.4 |
| **8.** | Consistency | Smooth |
| **9.** | Spreadability | Easily spreadable |

## 4. DISCUSSION AND CONCLUSION

The study was undertaken with an aim to formulate polyherbal anti-inflammatory cream. The literature review showed that demand of polyherbal cream is increases day by day. Nowadays herbal cosmetics are gaining popularity among customers there is a growing demand for herbal cosmetics in the world market and they are invaluable gifts of nature. The prepared poly herbal face cream was O/W type. The present study was attempted to make an polyherbal anti-inflammatory cream by using Azadirachta indica and Ocimum sanctum Linn extracts. The extract was prepared by macerating the tulsi and neem leaves in ethanol for 3 days. Phytochemical screening and UV spectroscopy was carried out for both extracts. The prepared

herbal cream was compared with various parameters like colour, odour, pH, Spreadability, Washability, Consistency and was found to be satisfied with all required characterization. The developed herbal cream can be used as an effective cream which shows anti-inflammatory activity. The prepared cream was found to be satisfied for the application on the skin.

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**Declaration of Conflicting Interests and Ethics**

The authors declare that the research was conducted in absence of any conflict of interest. This research did not receive any specific grant from funding agencies in the public, commercial or not for profit sectors.

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