IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Formulation And Evaluation Of Multipurpose Herbal Cream Of Neem, Turmeric And Tulsi Extract

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Abstract: -

Objective: -

To formulate and evaluate multipurpose herbal cream using Neem, Turmeric and Tulsi extract to give anti-inflammatory, anti-fungal and anti-bacterial effect.

Methods: -

The cream was prepared by using cream base which is liquid paraffin, beeswax, methyl paraben, stearic acid, cetyl alcohol, glycerin, distilled water, Aloe vera gel, extracts of Neem, Turmeric and Tulsi. The cream was prepared by slab technique or extemporaneous method for mixing the cream in geometric manner to provide a smooth texture and for mixing of all ingredients properly. From using trituration method by mortar pestle, we have formulated NEM4, batch of our herbal cream. NEM4, batch were evaluated / test for different parameters like physical evaluation, irritancy, washability, pH determination, phase separation, spreadability, Greasiness, Homogeneity after observation in all over batches NEM4 batch was giving the best result.

Results: -

NEM1-NEM5, formulations, showed good appearance, almost neutral pH, no erythema, edema and redness on skin during irritancy study, easily washable, good spread ability and no phase separation. The formulations NEM4, were found stable at room temperature and it was giving best result.

Conclusion: -

By using Neem, Turmeric, Tulsi and Aloe-vera gel the herbal cream showed multipurpose effect such as anti-inflammatory, anti-fungal and anti-bacterial also all herbal ingredients were used to showed different significant activities. Based on the results we can say that formulations NEM4, were stable at room temperature and can be safely used on the skin.

Keywords: -Neem, Turmeric, Herbal Cream, Bees Wax, Skin Irritancy Test

Introduction: -

Creams are semi-solid emulsions used on the skin for therapeutic, protective, or cosmetic purposes. They combine water and oil phases, stabilized by emulsifiers, to form a smooth mixture. Key components include water for hydration, oils for moisturizing, emulsifiers for stability, thickeners for consistency, humectants for moisture retention, preservatives for safety, and active ingredients for specific benefits. [1] The herbal cream is basically oil in water type of emulsion. An ointment is semi-solid dosage preparation intended for infected diseases which carries water, waxes, hydrocarbons and volatile oils as a semi-solid. [3] The skin is the largest organ of the body. It is made of water, proteins, fats and minerals with total area of about 20 square feet and is flexible, self-repairable. Skin protects the body from germs and the elements. Skin helps to feel sensation like hot and cold and regulated the temperature of the body. [4] There is wide need to substitute harmful manufactured specialist from base utilizing normal specialists. Aloe vera, Neem, Turmeric, these three natural fixings are utilized in our arrangement. Aloe vera goes about as Hostile to maturing, mitigating, lotion, lessen skin break out and pimples. Neem is utilized to advance injury mending, assuages skin dryness, tingling and redness and lessening pigmentation and scar is additionally utilized. Turmeric is utilized as antibacterial and adds gleam to the face.

Ideal characteristics of Herbal Cream: -

1. It should have Good Appearance
2. It should spread easily on the skin
3. Nonirritant to the skin
4. They should remove oil, sebum, dirt, dead cells from skin
5. They should form emollient film which should remain on skin after application
6. They should also provide softening, lubricating and protecting the skin apart from cleaning
7. They should non-greasy and non-staining
8. They should not change membrane and skin functions. [4]

Botanical Information of Ingredients: - [5,18,19,20,21]

Table No. 1: - Botanical Information of Neem

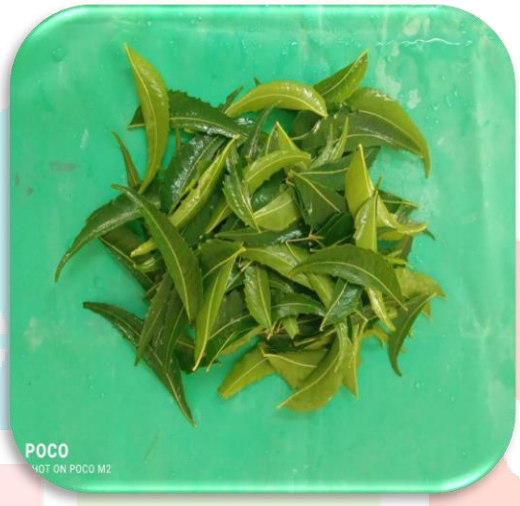
1) Neem: -	
Family: MELIACEAE	MELIACEAE
Biological Source:	It consists of the leaves and other aerial parts of Aza cardia Indica
Biological Name:	Azadirachta indica
Part Used:	Leaves
Medicinal Use of Neem:	1. Use to treat inflammation. 2. Use to cure skin problems like acne. 3. Used as an antiseptic. 4. It balances oil production. 5. It reduces post-acne scars.
	

Table No.2: - Botanical Information of Turmeric

2) Turmeric: -	
Family:	Zingiberaceae
Biological Source:	Turmeric is a product of Curcuma longa, a rhizomatous herbaceous perennial plant belonging to the ginger family Zingiberaceae, which is native to tropical South Asia.
Biological Name:	Curcuma longa
Kingdom:	Plantae
Medicinal Use:	1. Use to treat disorders of the skin. 2. Use to treat respiratory tract infection. 3. Use to treat problems in the digestive system. 4. Use as an antiseptic. 5. It helps to heal acne. 6. Prevents premature aging. 7. Lightens hyperpigmentation.

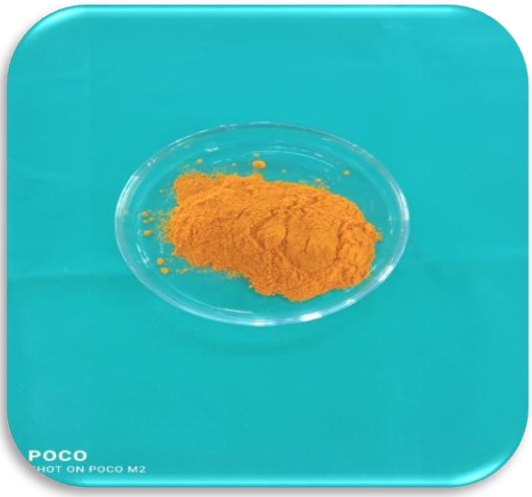


Table No.3: - Botanical Information of Aloe-Vera

3) Aloe-Vera: -	
Family:	Asphodelaceae
Biological Source:	Dried latex of leaves
Biological Name:	Aloe barbadensis Miller
Kingdom:	Plantae Part Used: Leaves
Medicinal Uses:	1. Used as anti-microbial. 2. Use to cure skin injuries. 3. Use as an anti-inflammatory. 4. Helps to soothe and sunburn. 5. Helps to moisturize the skin. 6. Lightens blemishes on the skin.

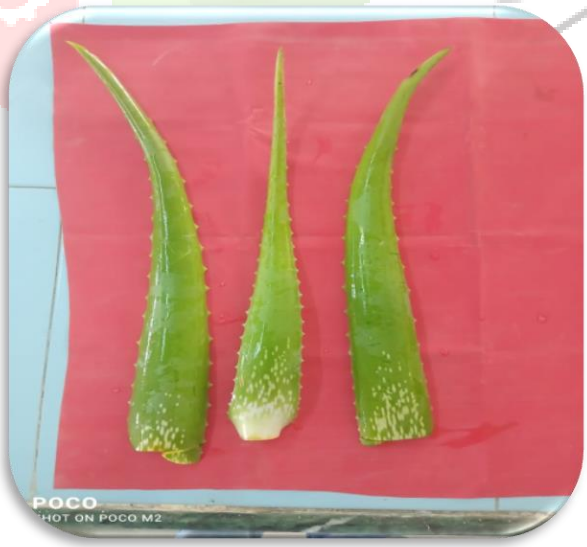
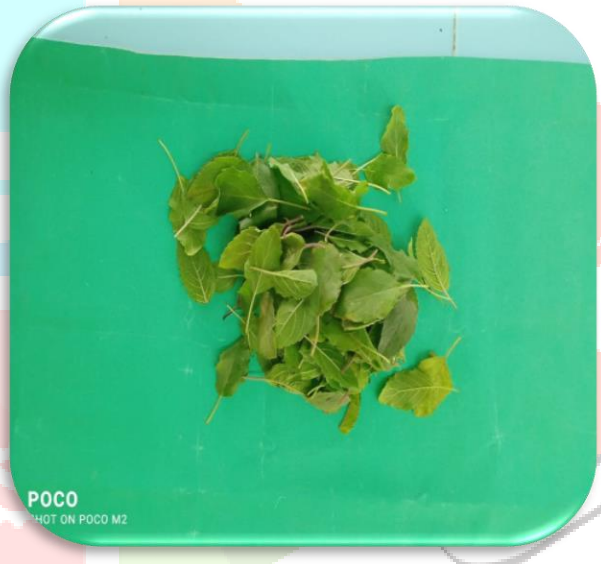


Table No.4: - Botanical Information of Tulsi

4) Tulsi Leaves: -	
Synonym: -	Ocimum tenuiflorum, commonly known as holy basil
Biological source: -	Tulsi consists of the fresh and dried leaves of Ocimum species like Ocimum sanctum L. and Ocimum basilicum L. etc.
Family: -	Lamiaceae
Chemical constituents: -	The Tulsi plant contains numerous active compounds and the major compounds are linalol, eugenol, methyl chavicol, methyl cinnamate, linolen, ocimene, pinene, cineol, anethol, estragole, thymol, citral, and camphor
Uses: -	● Tulsi helps in skin brightening. ● Tulsi helps in curing acne face marks. ● Tulsi can help in tightening skin pores. ● Tulsi helps in curing skin infections and any sort of skin allergies. ● fights acne; promotes healthy skin aging ● It eases eczema; works wonders for treating skin conditions ● It is a good source of vitamin K is extremely useful for skin ● It aids in anti-aging
	

Classification of Creams:

Types of creams according to function, characteristic properties and type of emulsion:

1. Make-up cream (o/w emulsion): a) Vanishing creams b) Foundation creams.

2. Cleansing cream, cleansing milk, cleansing lotion (w/o emulsion)

3. Winter cream (w/o emulsion): a) Cold cream or moisturizing creams.

4. All-purpose cream and general creams.

5. Night cream and massage creams.

6. Skin protective cream.

7. Hand and body creams. [8]

Advantages of Cream: -

1. Re-hydrate dried skin.

2. Replenish extra dry or rough spots on the skin.

3. Smooth calluses.

4. Feel and smell good.

5. Help yourself relax.

6. Soften the roughest parts of your body.

7. Make your skin glow. [9]

The herbs used in cosmetic preparations have varieties of properties like anti-inflammatory, anti-septic and anti-bacterial, etc. herbal products having no side effects compared with synthetic formulations. [14] The objective of this research work was to formulate and evaluate the multipurpose herbal cream which does not cause any side effects or adverse reactions. The cream also acts as a skin tone in day-to-day life by giving even skin tone. This cream also used as an inflammatory and fungal infection.

Material and Method: -

Materials: -

Neem Powder, Turmeric Powder, Tulsi Powder, Aloe-vera, Bees Wax, Liquid Paraffin, Methyl Paraben, Rose Oil, Stearic Acid, Cetyl Alcohol, Glycerin, this all the excipients were collected from our college SSJIPER, Jamner.

Method for Preparation of Herbal Cream: -

• Take the liquid paraffin and beeswax in a borosilicate glass beaker at 75 ^{0}C and maintain that heating temperature (Oil phase).

• In other beaker, dissolve borax and propyl paraben in distilled water by maintaining temperature 75 ^{0}C with water bath. Stir the solution with glass rod until all solid particles gets dissolved (Aqueous Phase).

• Then gently add heated aqueous phase in heated oily phase with continue stirring. Also added all the ingredients in this phase.

• After mixing both phases, immediately add Aloe vera gel, Neem extract and Turmeric, Tulsi extracts into it with continuously triturate by mortar and pestle until it will form a smooth cream.

• When the cream is formed, then add rose oil as fragrance.

• Then transfer this cream in slab and mix the cream in geometric manner to provide a smooth texture and for mixing of all ingredients properly.

• Add few drops of distilled water if necessary. [1]

Formulation Table: -

Table No. 5: - Formulation Batches for preparation of Multipurpose Herbal Cream

Sr. No.	Ingredients	Batches					Uses
		NEM1	NEM2	NEM3	NEM4	NEM5	
1.	Neem Extract	1	1	1.1	1	1.2	Anti-inflammatory, Antifungal
2.	Turmeric Extract	2.8	2.8	2.7	2.7	---	Antiaging, Antibacterial
3.	Aloe-vera Extract	2.6	2.6	2.6	---	---	Emollient
4.	Tulsi Extract	---	---	---	2.6	2.6	Anti-inflammatory, Anti-Bacterial
5.	Bees Wax	2.5	2.5	2.5	2.5	2.5	Emulsifier, Thickener
6.	Liquid Paraffin	15	15	15	20	20	Moisturizing Agent, Skin Softening Agent
7.	Methyl Paraben	0.04	0.04	0.04	0.04	0.04	Preservative
8.	Rose Oil	2 Drops	2 Drops	2 Drops	2 Drops	2 Drops	Fragrance
9.	Lemon Oil	---	---	---	4 Drops	4 Drops	Fragrance
10.	Stearic Acid	3	2	2.5	2.5	3	Emulsifier
11.	Cetyl Alcohol	3	3	2.5	2.5	3	Emulsifier
12.	Glycerin	3 Drops	3 Drops	2 Drops	6 Drops	6 Drops	Emulsifier
13.	D.W.	Q.S.	Q.S.	Q.S.	Q.S.	Q.S.	Vehicle

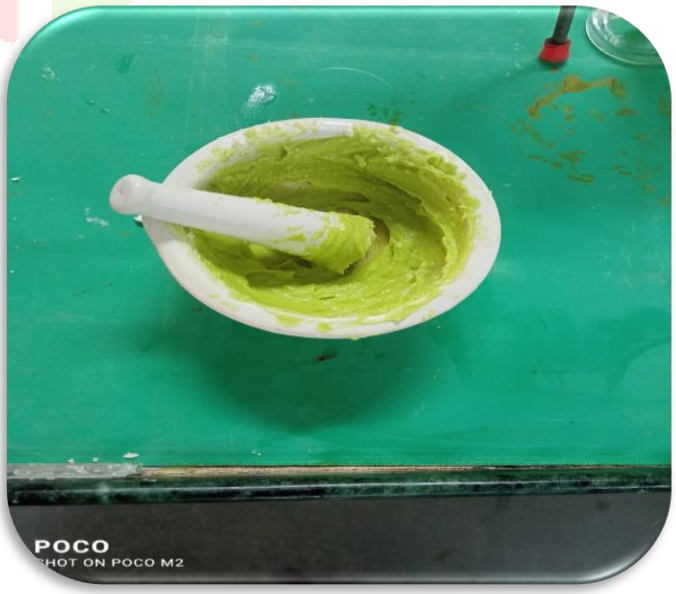


Fig No. 1: - Preparation of Multipurpose Herbal Cream

Evaluation Parameter: -

1) Physical evaluation: -

In this test, the cream was observed for color, odor, texture, state. [3]

2) Irritancy: -

Mark the area (1 cm^2) on the left-hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 h and reported. [10,12,14]

3) Washability: -

A small amount of cream was applied on the hand and it is then washed with tap water. [4]

4) pH determination:

To prepare 1% w/v concentration, a precisely weighed quantity of cream was distributed in water. To find the pH, a calibrated pH meter was utilized. [2,17]

5) Phase separation: -

Prepared cream was kept in a closed container at a temperature of 25-100 ℃ away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked. [7]

6) Spreadability: -

The spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the spreadability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the slides was scrapped off. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted. [7,16]

Spread ability= m × l/t

Where,

m= Standard weight which is tied to or placed over the upper slide (30g)

l= length of a glass slide (5 cm)

t= time taken in seconds

7) Determination of viscosity: -

The viscosity determinations were carried out using a Brookfield Viscometer using spindle number S-64 at a 20 rpm at a temperature of 25 ^oC. The determinations were carried out in triplicate and the average of three readings was recorded. [15]

8) Greasiness: -

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like. [8,12]

9) Homogeneity: -

The formulations were tested for the homogeneity by visual appearance and by touch. [10,13]

Result and Discussion: -

Evaluation results of all the five formulation batches are given below.

1) Physical Evaluation: -

In this test color, odor, texture, and state of the five formulations were checked.

Table No. 6: - Physical Parameter of Multipurpose Cream

Sr. No.	Parameter	Result
1.	Colour	Creamy White/Pale green
2.	Odor	Aromatic odor
3.	Texture	Smoothy
4.	State	Semi solid

Table No. 7: - Physical Evaluation of Multipurpose Cream

Sr. No.	Parameters	NEM1	NEM2	NEM3	NEM4	NEM5
1.	**Irritancy**	Non irritant	Non irritant	Non irritant	**Non irritant**	Non irritant
2.	**Washability**	Easily washable	Easily washable	Easily washable	**Easily washable**	Easily washable
3.	**pH of cream**	6.9	6.9	6.8	**7.0**	6.8
4.	**Phase Separation**	No phase separation	No phase separation	No phase separation	**No phase separation**	No phase separation
5.	**Speadability**	Easily spreadable (15)	Easily spreadable (18.75)	Easily spreadable (15)	**Easily spreadable (15.2)**	Easily spreadable (17)
6.	**Viscosity (cps.)**	2770	2650	2520	**2750**	2790
7.	**Greasiness**	Non greasy	Non greasy	Non greasy	**Non greasy**	Non greasy
8.	**Homogeneity**	Homogeneous	Homogeneous	Homogeneous	**Homogeneous**	Homogeneous

Preparation of neem extract:

Collect fresh neem leaves and wash it with distilled water. Dried it in hot air oven and then powdered take 5 gm neem powder in 20 ml Dimethyl sulfoxide at 100°C for 5 to 10 minutes. Then filter it by filter paper and clear solution is obtained. [6]

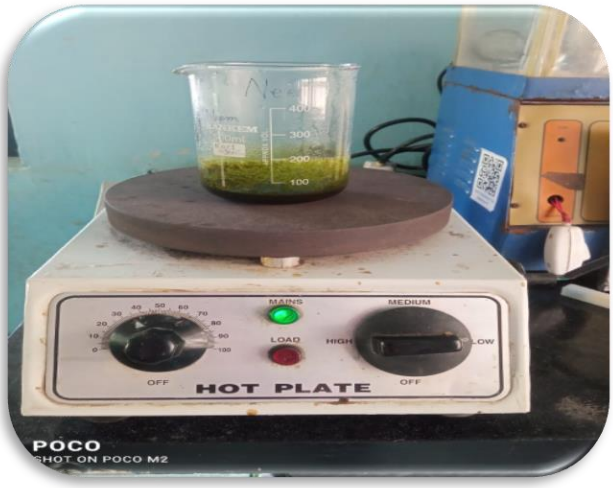


Figure No.2: - Extraction of Neem powder

Extraction process Preparation of turmeric extract:

Take 1 g turmeric powder in 10 ml distilled water and shaken in 250 ml volumetric flask heated in water bath at 80°C to 100°C for 5 to 10 minutes. Then filtered it and it and turmeric extract is obtained. [6]

Fig No.3: - Extraction of Turmeric powder

Preparation of aloe-vera extract:

Collect mature and fresh aloe-vera leaf from plant and washed it with distilled water. Dried it is hot air oven. Leaf dissected longitudinally by sterile knife. The semi-solid aloe-vera is collected. Remove fibers and impurities form it. Aloe-vera extract is obtained. [6,11]

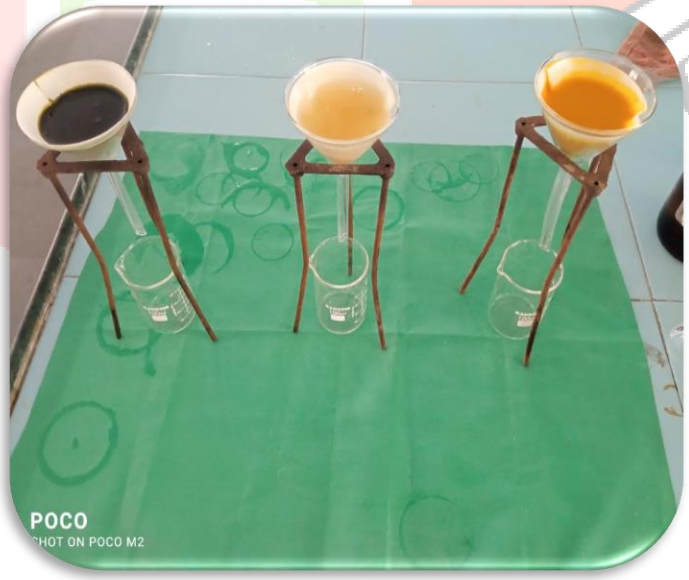


Fig No.4: - Filtration of Neem, Turmeric and Aloe-vera Extract

Preparation of Tulsi Extract: -

After gathering Tulsi leaves, were cleaned in Distilled water in a hot air oven. After the leaves has dried properly, they were pulverized. 100 ml of ethanol, 10 gm of leaves powder were added to a volumetric flask. After that mixture can be cook for 5-10 min. at 80-100 ^{0}C in a water bath after that filter it and tulsi leaves extract were put to the solution. (3)

Fig No.5: - Extraction of Tulsi powder

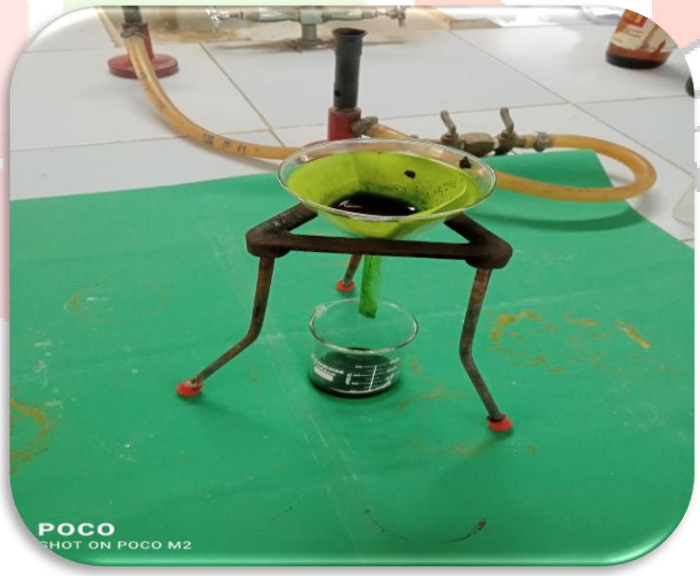


Fig No.6: - Filtration of Tulsi Extract

Evaluation Parameter: -

1) Physical evaluation: -

In this test color, odor, texture and state of the four formulations were checked.

2) Irritancy: -

Mark the area (1 cm2) on left hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 h and reported. According to the results all the five formulations that is NEM1, NEM2, NEM3, NEM4 and NEM5 showed no sign of irritancy, erythema and edema. In that NEM4 was used to apply on the surface of skin and observe the skin after 24 hrs.

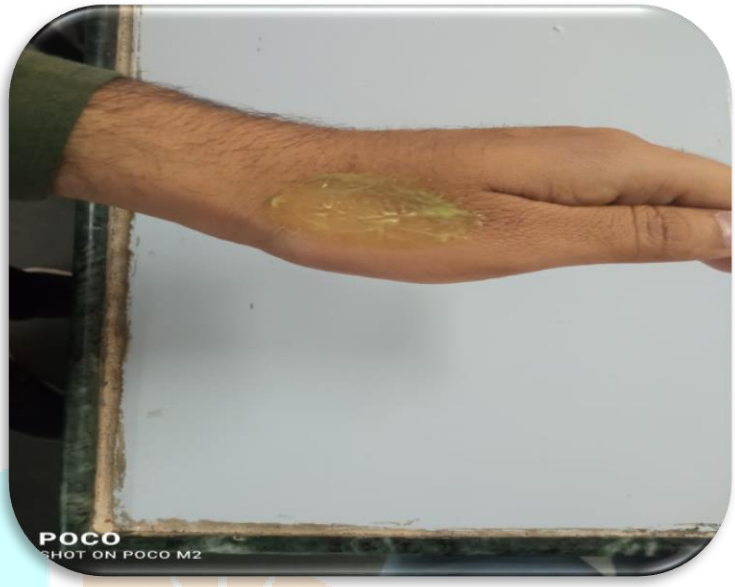


Fig No. 7: - Applying Cream on The Surface of Skin

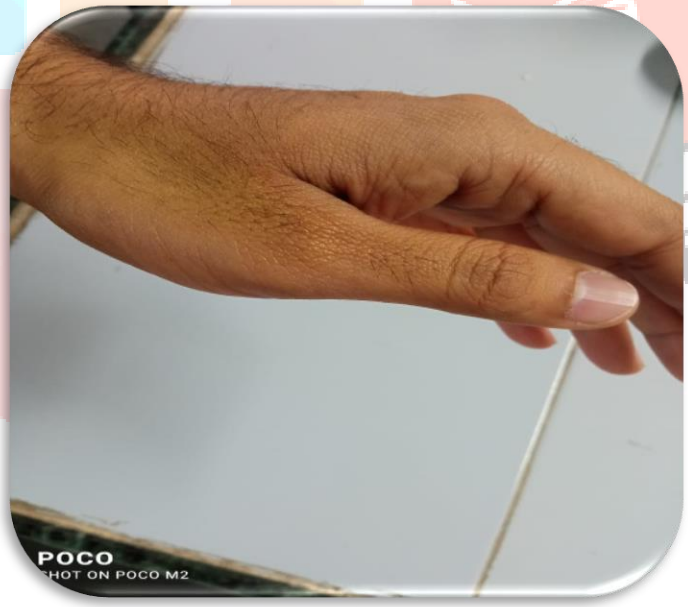


Fig No. 8: - Result of After Applying Cream

3) Washability: -

Washability test was carried out by applying a small amount of cream on the hand and then washing it with tap water. All five formulations were easily washable.

4) pH determination: -

According to the results, the pH of all the five formulations that is NEM1, NEM2, NEM3, NEM4 and NEM5 were found to be nearer to skin PH so it can be safely used on the skin.

5) Phase separation: -

Prepared cream was kept in a closed container at a temperature of 25- 100 ℃ away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked. According to the results no phase separation was observed in all the five formulations.

6) Spreadability: -

The spreadability of the five formulations that is NEM1, NEM2, NEM3, NEM4 and NEM5 was carried out and out of that for NEM4 the time taken by the 2 slides to separate is less so as said in the description of evaluation test lesser the time taken for separation of the two slides better the spreadability so according to this statement NEM4 showed better spreadability.

7) Determination of Viscosity: -

The viscosity determinations were carried out using a Brookfield Viscometer using spindle number S-64 at a 20 rpm at a temperature of 25oC. The determinations were carried out in triplicate and the average of three readings was recorded. And ranges of viscosity of all five batches (NEM1-NEM5) was found in between 2770-2790 cps.

7) Greasiness: -

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like. According to the results, we can say that all five formulations were non-greasy

8) Homogeneity: -

All prepared formulations that are NEM1, NEM2, NEM3, NEM4 and NEM5 produce uniformity of cream. Homogeneity was confirmed by appearance and by touch.

Conclusion: -

The aim of this study was to formulate and evaluate Multipurpose Herbal Cream of Neem, Turmeric and Tulsi Extract for the treatment of inflammation, fungal and bacterial growth, out of all the formulations, the NEM4 formulation or cream was determined to be the most beat and fulfilling batch in all over batches it was giving the best result compare to alternate batches of it. When applied, it felt smooth and cool and had a pale green. The formulation's pH of 7.00 was determined to be suitable for the skin. Additionally, the creams demonstrated no irritancy. The type of smear that appeared on the skin after the cream was applied was discovered to be non-greasy and easily removed with a tap water after wash. The spreadability of the five formulations that is NEM1, NEM2, NEM3, NEM4 and NEM5 was carried out and out of that for NEM4 the time taken by the 2 slides to separate is less so as said in the description of evaluation test lesser the time taken for separation of the two slides better the spreadability so according to this statement NEM4 showed better spreadability. NEM4 are also giving the good Homogeneity was confirmed by appearance and by touch.

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