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Research Article

Formulation And Evaluation of Antimicrobial Cream Containing Leaves Extraction of Mulberry and *Tridax Procumbens*

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ABSTRACT

Herbal Medicine occasionally appertained to as Herbalism or Botanical Medicine, is the use of sources for their remedial or medicinal value. The condiment is a factory or factory part valued for its medicinal, sweet rates. Herb shops produce and contain a variety of chemical substances that act upon the body. The Herbal Cosmetics defined as beauty products, which retain desirable physiological conditioning, similar as skin mending, smoothing, and appearance, enhancing and conditioning parcels because of herbal constituents. Cream was formulated with ingredients are mulberry and tridax procumbens. phrasings were stimulated for colorful physicochemical parameters include appearance, type of conflation, pH, Texture, feel upon operation, antimicrobial test, spreadability, etc. This work substantially focuses on the assessment of the microbial quality of Formulated ornamental medications.

INTRODUCTION

The creams are considered an important part of the cosmetic product as a topical preparation since ancient times due to their relief on the skin and its removal. From cosmetic purposes, Medicinal creams have a variety of applications such as cleansing, beautifying, changing appearance, moisturizing etc. It also plays a vital role in

treating skin conditions. These include protecting the skin from bacterial and fungal infections, and promoting the healing of minor cuts, burns, and sores. These fragile arrangements are safe for public and private use. Human skin is vulnerable to damage but has the potential to heal itself. However, a natural healing process can take time and there is also a risk of infection especially in the early stages of injury. In such cases, medicinal

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creams can be applied to the injured area to speed up the healing process and prevent the wound from becoming infected. This review emphasizes the use of drug delivery systems in topical formulations, specifically focusing on wound healing creams. It includes an overview of the wound healing process, formulation techniques for creams, their classification according to therapeutic action, benefits and limitations, key features, types of creams, and the various parameters used to evaluate their effectiveness^[1,2].

TYPES OF CREAM

They are divided into two types:

Oil-in-Water (O/W) creams are emulsions where small oil droplets are evenly distributed within a continuous water phase. In this type of formulation, oil acts as the internal phase while water serves as the external medium, making it an oil-based emulsion suitable for non-greasy and easily washable applications.

Water-in-Oil (W/O) creams consist of water droplets dispersed within a continuous oil phase. Here, water forms the internal phase and oil acts as the external medium, resulting in a water-based emulsion. These formulations tend to be more occlusive and are ideal for dry or dehydrated skin due to their ability to retain moisture^[1,2].

Mulberry: Mulberry is a member of the Moraceae family and can be set up in a wide range of climatic and environmental conditions, from tropical to temperate. Moraceae generally known as the mulberry or fig family, is a flowering factory family that includes further than twenty- four species, each with one species and at least a hundred variants. The name Morus comes from the Latin word 'mora,' which means 'detention,' most presumably due to the sluggish growth of its youths. Mulberry is a fast- growing evanescent

factory that grows in a wide range of climatic, topographical, and soil conditions and is set up throughout the world, from temperate to tropical zones. Mulberry as a whole factory has long been used as a functional food due to the presence of rich phytochemical rudiments^[3]. Mulberries or their excerpts have antimicrobial, anti-hyperglycemic, anti- hyperlipidemic, anti-inflammatory, and anti-cancer parcels and are used to treat a variety of acute and habitual diseases. Morus species' fruits, leaves, outgrowths, and bark all have substantial anti-tyrosinase inhibitory exertion, making them a good choice for use as a decolorizing component in cosmetics.

- Mulberry (Morus) belongs to the Moraceae plant family and includes several species, such as the black mulberry (M. nigra), red mulberry (M. rubra), and white mulberry (M. alba).
- Native to China, this tree is now cultivated in many regions, including the United States, Europe, Asia, and Africa.
- Mulberry leaves have a variety of culinary, medicinal, and industrial applications.
- Mulberries are the fruits of mulberry trees (Morus sp.) and related to figs and breadfruit.
- America The trees are traditionally grown for their leaves mainly in Asia and North as they're the only food that silkworms eat.
- They carry colourful berries most commonly black, white, or red that are often made into wine, fruit juice, tea, jam, or canned foods, but can also be dried and eaten as a snack.
- Due to their sweet flavour, emotional nutritional value, and various health benefits, mulberries are gaining popularity worldwide.





Figure No. 1 :- Mulberry

Tridax Procumbens:

Tridax procumbens Linn. (Figure 2) generally known as fleece button is a imperishable factory belonging to the family Asteraceae. It's a native to the tropical Americas, but has been introduced to tropical, tropical, and mild temperate regions worldwide, it's frequently lodging at knot solitary, long stalked, unheroic compound, heterogamous, bisexual flower with white flowing heads and veritably hair, with coarsely toothed, petiolate, ovate or lanceolate leave. Whole arial part is useful medicinally, leaves retain crack mending, insecticidal, antisecretory and hypotension action, while seeds are used to control bleeding. *Tridax procumbens* is extensively distributed in India up to 2400 m above ocean level. The leaves have medicinal value and used to treat catarrh, dysentery and Diarrhoea, the different splint excerpts are used to Antiseptic to treat fresh cut crack, burns in anaemia. It contains flavonoid, alkanoid, carotenoid, cinnamates, lignans, benzoic acid outgrowth, phytosteroid tannin, crude proteins storytellers, answerable carbohydrates and calcium oxide. It's wide spread distribution and important as a weed are due to its spreading stem and abundant seed product. *Tridax procumbens* is a weak straggling condiment about 12–24 cm long with many leaves 6–8 cm long and veritably long slender solitary peduncles a bottom long and further. It has two types of flower shaft-boutonnieres and fragment-boutonnieres, rudimentary placentation. Fruit is cypsela. The

juice uprooted from leaves is directed applied on crack. Its splint extracts used for infections on skin conditions in folk drug [4].



Figure No. 2 :- *Tridax Procumbens*

AIM AND OBJECTIVES

AIM OF THE STUDY -

To Formulate and evaluate antimicrobial cream containing leaves extract of mulberry and *tridax procumbens*.

OBJECTIVE OF THE STUDY -

The purpose of the present investigation is to formulate and evaluate a herbal skin cream for wound healing. Herbal plants like mulberry, *tridax procumbens* are used for formulation of herbal skin cream for wound healing. Then the formulated skin cream is evaluated for parameters like physical properties, pH, viscosity, spreadability and stability of the formulated cream. The excipient concentrations are varied in order to find out the best formulation with better spreadability, stability etc.

1. To set the formula for herbal cream by using different herbs.
2. To formulate herbal cream by using proper procedure.
3. To evaluate formulated product by using different tests like, pH, Spreadability, etc.

METHODOLOGY



PLANT PROFILE

MULBERRY -

Morus nigra L. (black mulberry)

- This plant has a small to medium size, reaching nine meters in height. It has juicy fruits with extraordinary dark purple-black colour and a unique and
- slightly acidic flavour. The fruit can be eaten directly or used to make jam or juice.
- Their leaves have 10–12 cm of length and 6–10 cm of width, and their fruit has 2–3 cm of length.
- It has the highest antioxidant content, having the highest total phenolic and flavonoid contents among the three types [5].

Scientific name: Morus nigra L.

Common names

- English: black mulberry, bender tree, Persian mulberry
- French: mûrier noir
- German: schwarzer Maulbeerbaum
- Spanish: moral negro, morera negra

Antonyms:

- English: black mulberry
- Afrikaans: swartmoerbe
- Arabic: tert
- French: mûrier noir
- German: schwarzer Maulbeerbaum
- Japanese (Rōmaji): kuromi-guwa
- Portuguese: amoreira-negra
- Spanish: moral negro

Family: Moraceae Origin

Uses: Fruit eaten out of hand; used as a shade tree; attracts wildlife

Leaves: deciduous; rough; frequently unlobed

Flowers: All species have either male or female flowers (dioecious); trees may be sold as male or female

Fruit: Prolific, black multiple fruit drupelets; 1–1.5 in. (2.5–4 cm); berries cling to the branch

Season: Early May to early June

Origin: The black mulberry is native to western Asia and is the species most cultivated worldwide for its fruit. Long ago, this species found its way to ancient Greece and Rome, and thence to other parts of Europe. As if foreshadowing the confusion between common names and fruit colours, the Roman author Ovid, in the first century BC, recounts in his story of Pyramus and Thisbe that the black mulberry was originally white-fruited. The fruit turned dark red as a memorial of the blood of these ill-fated lovers, forbidden by their families to marry. Pyramus plunged his sword into his heart, and then Thisbe, arriving later and realizing what had happened, took the sword and followed him into death [6].

Leaves:

- Black mulberry leaves are rough and frequently unlobed, like those of red mulberry, but the black mulberry has sturdier twigs and thicker buds.
- Morus nigra is relatively hairy, giving a soft pubescent feel when gently stroked.
- Leaves of Morus nigra and Morus rubra (and most hybrids) will have a sandpaper-like texture when stroked gently on the upper surface in the direction of the petiole. Morus alba cultivars will feel almost the same in either direction.
- M. nigra has large, dark brown or black buds (hence "nigra") relative to other mulberries.



Flowers:

- Mulberry trees are either dioecious or monoecious, and occasionally a tree may even change from one sex to another. High temperatures, strong light, and long days favour maleness in mulberries, while their opposites, as well as high humidity, bring out female flowers.
- The flowers are held on short, green, pendulous, non-showy catkins that appear in the axils of the current season's growth and on spurs on older wood.
- Red mulberry (*M. rubra*) can have both male and female trees as well as male and female flowers on the same tree. Only female trees or those with both male and female flowers will produce fruit.



FIGURE NO.3 : FLOWER OF MULBERRY

Fruit:

- Mulberries of the *Morus nigra* species are generally regarded as the most scrumptious. Laboratory tests constantly show them to be advanced in sugars, antioxidants, and organic acids (element of flavor) than other mulberries [7,8].
- The collaborative fruit, which may be red, green, white, grandiloquent, or black in color, is composed of the blown ovaries of multitudinous bitsy flowers. The fruit stem entered the length of the fruit [9].
- Fruits of *Morus nigra* are large and juicy, with a unanimous mix of agreeableness and tartness that makes it the best-seasoned species of mulberry. The stimulating courtesan taste is in

some ways evocative of grapefruit. It leafs out nearly two months after the other two species, and fruits grow late, from midsummer into afterlife.

- Seeds are infrequently set up in *Morus nigra* fruit in the United States, most probably due to the lack of pollinators, since shops bought then are generally dioecious ladies.
- The ripe black berries are sweet, juicy and stimulating [10].



NO. 4 : FRUIT OF MULBERRY

TRIDAX PROCUMBENS

The factory bears white or unheroic flowers with three toothed shaft boutonnières. The leaves are toothed and generally anchor shaped. Its fruit is hard achene covered with stiff hairs and having a featherlight, premium like white pappus at one end^[11,12] Calyx is represented by scales or reduced to pappus. The factory is invasive in part because it produces so numerous of these achenes, up to 1500 per factory and each achene can catch the wind in its pappus and be carried to some distance. This weed can be set up in fields, meadows, crop lands, disturbed areas, meadows and roadsides in areas with tropical or tropical climate. A check of literature revealed insulation of tannins, flavonoids, glycosides, isoflavonoids, steroids, saponins, lipids, phospholipids, resins, sterols, reducing sugars, phenols, anthraquinone and catechol^[13].

INDIAN NAMES:



- Hindi Ghamra.
- Sanskrit Jayanti Veda.
- Marathi Dagadi Pala and Ghav Pala
- Malayalam Chiravanak ^[14].

TAXONOMICAL CLASSIFICATION:

- Kingdom: Plantae
- Subkingdom: Viridiplantae
- Superdivision: Spermatophytina
- Class: Magnoliopsida
- Superorder: Asterales
- Order: Asterales
- Family: Asteraceae
- Genus: *Tridax* L.-tridax
- Species: *Tridax procumbens* L. ^[15].



FIG. 5 FLOWERS OF TRIDAX



FIG 6: LEAVES OF TRIDAX PROCUMBENS PROCUMBENS

TRADITIONAL USES:

Traditionally, *Tridax procumbens* has been in use in India for crack mending and as an anticoagulant, antifungal, and nonentity repellent^[16,17]. The juice uprooted from the leaves is directly applied on injuries. Its splint excerpts

were used for contagious skin conditions in folk drugs. It's used in Ayurvedic drug for liver diseases, hepato protection, gastritis, and heartburn. *Tridax procumbens* is also used as treatment for boils, pocks, and cuts by original healers in corridor of India.

MORPHOLOGICAL FEATURES:

Tridax procumbens L. is a small imperishable condiment having short, hairy blade like leaves. Corolla is unheroic in colour. It's a common weed grows in open places, coarse textured soils of tropical regions, sunny dry points, fields, waste areas, meadows and stacks. It's a semi prostrate, periodic, creeper condiment^[18].

Biology The imperishable condiment reproduces by seed and requires full exposure for growth. The condiment is tolerant to failure, heat and moisture, pollution, shore, pitch and wind^[20].

CHEMICAL CONSTITUENTS:

The phytochemical study revealed presence of flavonoids, carotenoids, alkaloids, tannins and saponins. The adjacent profile shows that the plant is rich in sodium, potassium and calcium ^[19]. Leaf of *Tridax procumbens* mainly contains proteins, fiber, carbohydrates, and calcium oxide. Whereas the fumaric acid and tannin has also been reported in the plant. Oleanolic acid was obtained in good amounts from *Tridax* and found to be a potential antidiabetic agent when tested against a glucosidase. A number of chemical constituent were reported from the plant that are alkaloids, flavonoids, carotenoids, fumaric acid, lauric acid, tannins etc ^[20]. The medicinal values of the plants depend on the presence of certain chemical substances (secondary metabolites) that are involved in production of different kinds of effects on human body. Some compounds are responsible to give plants the irs pecificodorsando ther sare

responsible for imparting different colours to plants ^[21]

PHARMACOLOGICALACTIVITY:

1. Wound Healing
2. Hepatoprotective
3. Immunomodulatory
4. Antidiabetic Activity
5. Antimicrobial Activity
6. Anti-Cancerous Activity
7. Hypotensive
8. Repellency Activity
9. Anti-Urolithiatic Activity
10. Hypoglycemic and Antihyperglycemic Activity
11. Anthelmintic Activity ^[22].

Soxhlet extraction

Soxhlet extractor was invented in 1879 by Franz von Soxhlet, a German chemist. The original use of this apparatus was the extraction of a lipid from a solid material. It is an apparatus used in the laboratory for extracting a compound with a limited solubility in a solvent and where the impurity is insoluble in that solvent ^[17]. This is one of the conventional solid/liquid extraction method which consists in extracting directly from the raw material using a solvent and an extractor.

Chemical:

The chemical solvents and other products that have been used in the experiments and methods are the following:

- Distilled water
- Syringe filter
- Ethanol (C₂H₆O) was supplied by Molar Chemicals Kft, purity: 99.5%.
- Chloroform (CHCL₃) was supplied by Molar Chemicals Kft, purity: 99%.

- Diethyl Ether (C₂H₅) was supplied by molar chemical Kft, purity: 98%.

Method of extraction:

For this operation, an approximate amount of 30 g was measured into the paper thimble placed inside the chamber. Also 240 ml of solvent was introduced in the solvent flask. three solvents with different polarities were applied: ether, chloroform and 96% ethanol. The Soxhlet apparatus was connected to a cooler and the round bottom flask containing the solvent was immersed in silicon oil. First the cooling water of condenser was turned on, then the heating element of silicon bath was switched on for the solvent is heated, and the extraction can start. The extraction run until the solvent in the Soxhlet apparatus became transparent again, which showed the end of extraction. It took around 3 days (18 hours more or less) in the case of raw material with diethyl ether, and one day extract with chloroform and 4 days (24 hours) for raw material with 96% ethanol extraction. After the Soxhlet extraction was done, the evaporation of the liquid is necessary in order to get the extract without solvent. For this, each flask had to be evaporated in the rotary evaporator using a vacuum pump and a control valve. After this step only the extract obtained as a product remains in the flask, which is collected in a sample bottle. The extracted material was dried and discarded. The solvent evaporated and condensed is collected in another flask and returned to a bottle for reuse. ^[17]



Figure No 8.: Extraction of Mulberry

Infusion: Tridax procumben

- It consists of pouring water over the drugs and
- Then allowing it to keep in contact with water for the stated period, usually 15 minutes, with occasional stirring and Processes used for extraction
- finally filtering off the liquid.

**FIGURE NO.9 : TRIDAX INFUSION EXTRACT****PROCEDURE:**

All ingredients were weighed accurately. Bees wax was melted into a porcelain dish and then liquid paraffin was added. After homogenization, olive oil was added into above melted base. Borax was dissolved into sufficient quantity of water with plant extract and it was warmed. The water was added drop by drop with vigorous stirring into the oily portion. Then melted mass was allowed to cool to get desired consistency.

**FIGURE NO.10 : FORMULATED CREAM****PREPARATION OF CREAM –****FORMULATION COMPONENT:****TABLE NO. 1: FORMULATION TABLE OF HERBAL ANTI MICROBIAL CREAM**

Sr.no.	Ingredients	Quantity Formulation F1	Quantity Formulation F2	Roles of ingredients
1	Beeswax	5 gm	5gm	Cream base
2	Liquid Paraffin	7 ml	7.5gm	Cream base
3	Borax	2 gm	1.5gm	Preservative
4	Water	5 ml	4.5gm	vehicle
5	Methyl paraben	0.02 gm	0.02gm	preservative
6	Mulberry extract	1 gm	1gm	Anti-microbial agent
7	Tridax procumben extract	1 gm	1gm	Wound healing agent

Evaluation of cream -

1) Evaluation of cream pH of the cream: Using normal buffer solutions Using normal buffer solutions, the pH meter was performed calibration. Approximately 0.5 g of the cream was balanced and dissolved in 50.0 ml of distilled water, calculating its pH. In a 100ml beaker, 5 ± 0.01 g of the cream was correctly measured. 45ml of water was applied and the cream was spread therein. Using the pH meter, the pH of the suspension was estimated at 27°C. The cream pH was found to be

in the range of 6-7.5, which is good for the PH of the skin. All the formulations showed pH closer to the appropriate skin.

2) Organoleptic evaluation: The cream thus acquired was evaluated for its organoleptic properties, such as color, odor, and condition. The appearance of the cream was measured and graded by its roughness and Colour.

3) Dye test: This process was pertained from the work of Dhase and Team in the time 2014. It

combines the scarlet red color with the cream. With a cover slip, place a drop of the cream on a bitsy slide covering it and examine it under a microscope. The ground is tintless if the scattered droplets appear red. The cream is a kind of o/ w. In the w o form cream, the contrary condition occurs, i.e. the scattered droplets appear tintless in the red ground.

4) Homogeneity: The formulations were tested for the homogeneity by visual appearance and by touch.

5) Spreadability studies: Spreadability is expressed in terms of your time in seconds taken by two slides to slide far- down from the expression, placed between, under the appliance of a particular cargo. Two glass slides of ordinary confines were named. The expression whose spreadability had to be determined was placed over one of the slides and the other slide was placed on top of the phrasings was crammed between the two slides across the length of 5 cm alongside the slide. 100 g weight was placed upon the upper slide so as that the expression between the two slides was pressed slightly to form a thin subcaste. The cargo was removed and therefore the relatively expression clinging to the slides was scrapped off and one of the slides was fixed on which the expression was placed. The alternate portable slide was placed over it, with one end tied to a string to which cargo could be applied with the help of a simple pulley and a visage. A 30g weight was placed on the visage and therefore the time taken for the upper slide to travel the space of 5.0 cm and separate distant from the lower slide

under the direction of the cargo was noted. The Spreadability(S) are frequently determined using the formula.

$$\text{Spreadability} = m \times l / t$$

m = weight tied to the upper slide (30g)

l=length of glass slide (5cm)

T = time taken in seconds.

6) Antimicrobial test: Protocol-The Nutrient agar media was used. Staphylococcus aureus microorganism culture was used. Incubation time was setup for 24hrs.

Method-Agar bore well diffusion method.

Procedure- Escherichia coli (Gram +ve bacteria) suspension was introduced in each plates & 40ml of sterile nutrient agar media was poured into each sterilized plates. The plates were left on the flat solid surface & allow to harden. In each plate 1 cup, 10mm in diameter was bored in the medium with cork borer. The disks of agar were removed by sterilized dissecting needle while being careful not to damage the cups. In each plate equal amount of cream formulation having same strength was placed in the cup & the plates were incubated at $37^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 24hrs.in incubator. The entire operation was carried out under aseptic condition & zone of inhibition was calculated. The zone of inhibition obtained for prepared formulation was showed in figure14.^[20]

TABLE N0. 02: QUALITATIVE TESTS FOR PHYTOCHEMICAL SCREENING

1.Detection of alkaloids

Test		Procedure	Observation	Inferences
1)	Dragendorff's/ Kraut's test	Few mL filtrate + 1-2 mL Dragendorff's reagent	A reddish-brown precipitate	Test compliance
2)	Hager's test	Few mL filtrate + 1-2 mL Hager's reagent	A creamy white/yellow precipitate	Test compliance



3)	Wagner's test	Few mL filtrate + 1–2 drops of Wagner's reagent (along the sides of test tube))	A brown/reddish precipitate	Test compliance
4)	Picric acid test	Few mL filtrate + 3–4 drops of 2% picric acid solution	An orange colour	Test compliance

2.Detection of carbohydrates

1)	Resorcinol test	2 mL aqueous extract solution + few crystals of resorcinol + equal volume of conc. HCl + heated	A rose colour (ketones)	Test compliance
2)	Test for starch	Aqueous extract + 5 mL 5% KOH solution	A cinary colouration	Test compliance

3.Detection of reducing sugar

1)	Benedict's test	0.5mL filtrate + 0.5mL Benedict's reagent + Boiled for 2 min.	Green/yellow/red colour	Test compliance
2)	Fehling's test	1mL each of Fehling's solution A & B + 1mL filtrate + boiled in water bath	A red precipitate	Test compliance

4.Cardiac glycoside

1)	Bromine water test	Plant extract + few mL of bromine water A yellow precipitate	A yellow precipitate	Test compliance
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5.Detection of flavonoids

1)	Lead acetate test	1 mL plant extract + few drops of 10% lead acetate solution	A yellow precipitate	Test compliance
2)	Ferric chloride test	Extract aqueous solution + few drops 10% ferric chloride solution	A green precipitate	Test compliance
3)	Ammonia test	Filtrate + 5mL dil. Ammonia solution + conc. H ₂ SO ₄	A yellow colour	Test compliance

6.Detection of phenolic compound

1)	Iodine test	1 mL extract + few drops of dil. iodine solution	A transient red colour.	Test compliance
2)	Potassium dichromate	Plant extract + few drops of potassium dichromate solution	A dark colour	Test compliance
3)	Lead acetate test	Plant extract is dissolved in 5mL distilled water + 3mL of 10% lead acetate sol.	A white precipitate	Test compliance

7. Detection of tannins

1)	Ferric chloride solution	Plant extract + few drops of ferric chloride solution.	A bluish green or bluish black	Test compliance
2)	Lead acetate solution	Plant extract + few drops of lead acetate solution.	A brownish yellow precipitate	Test compliance
3)	Potassium chromate solution	Plant extract + few drops of potassium chromate solution	A yellow precipitate	Test compliance

Determination Of Total Ash:**PROCEDURE**

- About 3 g of the powdered drug was weighed accurately in a tared silica crucible.
- Crucible with powdered drug was incinerated in muffle furnace by gradually increasing heat (temperature) at 500-800°C until freed from carbon.
- After complete incineration, furnace was off and crucible was remained in it till temperature fall down.
- The crucible was removed from the furnace and cooled after the incineration about 1 hour in a desiccator.
- The ash was weighed and percentage of total ash with reference to the air dried sample was calculated.

The total ash value for given sample mulberry was found to be 16 % W/W

The total ash value for given sample tridax procumbens was found to be 9.5 % W/W.



Figure 12 : Determination Of Total Ash

RESULT AND DISSCUSION-**CREAM EVALUATION****1) Organoleptic evaluation:**

Organoleptic evaluation revealed that all formulations of herbal multipurpose cream have semisolid in nature, yellow and smooth in appearance and texture.

Table 03 : Organoleptic Properties

Sr.No.	Evaluation Parameter	F1	F2
1	State	semisolid	semisolid
2	colour	green	green
3	odour	aromatic	aromatic
4	texture	smooth	smooth
5	Type of emulsion	o/w	o/w

2) pH and spreadability:

Evaluation related to pH are summarized in Table 04 and 05. All the 2 batches exhibit values in acceptable criteria

Table 04 : Evaluation Parameters of all formulation

Sr.no.	Evaluation parameter	Acceptance criteria	F1	F2
1)	PH	4.5-6	6	5
2)	spreadability	8.50- 11.50 (g cm/sec)	8	9

Table 05: spreadability test

Formulation	Time (sec)	Spreadability (g cm/sec)
F1	50	8
F2	55	10

- Dye test:** Evaluation related to dye test as shown in figure.12 .

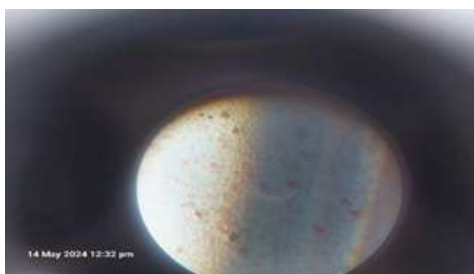


FIGURE NO 13. ETHANOLIC EXTRACT CREAM DYE TEST

- 4) **Antimicrobial test:** The antimicrobial study of formulation revealed that herbal cream possess good zone of inhibition. Batch F1 had high value of zone of inhibition than batch B. (1.1cm)

TABLE 06 : ZONE OF INHIBITION OF HERBAL CREAM

Sr. no	Sample	Quality of sample	Zone of inhibition
1	Formulation 1	0.25 gm	1.1mm
2	Formulation 2	0.25 gm	0.7mm
3	Antibiotic tablet	0.25 gm	1.3mm

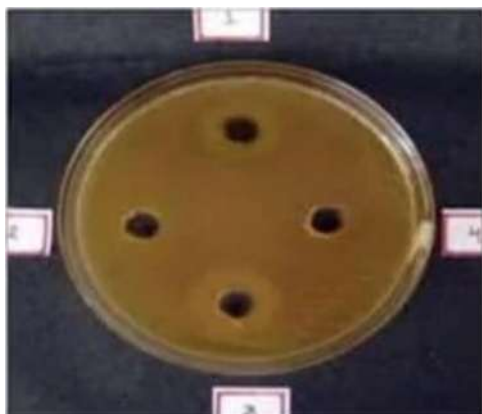


FIGURE 14: ZONE OF INHIBITION OF HERBAL CREAM

1- Formulation A, 2- formulation B, 4- formulation B, 3- antibiotic tablet

CONCLUSION:

The prepared anti-microbial herbal cream (Batch A, B) exhibit good organoleptic properties. pH, and spreadability of all batches, observed in acceptable range. Antimicrobial study of all batch reveals good zone of inhibition against Escherichia

coli, in that A observed highest value (1.4cm). An advantage of formulation of such kind of anti-microbial cream that it can overcome the drawbacks of other cream formulations as it can be used for wound healing.

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