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FORMULATION AND EVALUATION OF MULTIPURPOSE ANTIBACTERIAL HERBAL CREAM

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ABSTRACT: THE GOAL OF THE STUDY WAS TO FORMULATE A CREAM WITH COMPOSITION FOR TREATING BACTERIAL SKIN INFECTION AND WHICH ENHANCE SKIN PROPERTIES. THIS FORMULATION BELONGS TO A MEDICINAL CREAM THAT HAS TWO ANTI-BACTERIAL ACTIVE COMPONENTS. IT REVEALS A FORMULA FOR TREATING BACTERIAL SKIN INFECTIONS, AS WELL AS OTHER COMPONENTS THAT CAN HELP IMPROVE SKIN ISSUES. FOR SKIN INFECTIONS, THE TOPICAL APPROACH IS THE BEST OPTION. BECAUSE OF THE NUMEROUS ADVANTAGES OVER TRADITIONAL USES THE DEVELOPMENT OF TOPICAL DRUG DELIVERY SYSTEMS WITH SYSTEMIC EFFECTS APPEARS TO BE ADVANTAGEOUS FOR A VARIETY OF MEDICATIONS. TURMERIC, NEEM AND TULSI ARE THE ACTIVE HERBAL INGREDIENTS USED TO TREAT BACTERIAL SKIN INFECTIONS. IT MAY SHOW ANTIMICROBIAL, ANTIBACTERIAL AND ANTI- INFLAMMATORY PROPERTIES. IF ALSO INCLUDES , SOLVENTS, PRESERVATIVES, AND WATER IN THE CREAM BASE. WHEN THE ACTIVE COMPONENTS ARE COMBINED, THEY PROVIDE A POTENT ANTIBACTERIAL EFFECT. SEVERAL EXPERIMENTS WERE DONE ON THE BASIS OF METHOD AND RESULT WE CONCLUDE THAT THE DRUG GIVING [HOW MANY PERCENTAGES OF DRUG GIVING EFFECT} TO ASSESS THE PHYSICOCHEMICAL CHARACTERISTICS OF FORMULATED CREAM, SUCH AS VISUAL INSPECTION, PH MEASUREMENT, SPREAD ABILITY, ETC. THE MEDICATED CREAM WAS GOOD IN CONSISTENCY AND COLOR.

KEYWORDS: **TURMERIC, NEEM EXTRACT AND TULSI, ANTIBACTERIAL ACTIVITY, STAPHYLOCOCCUS**

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INTRODUCTION

Staphylococcus Aureas:- This is highly infectious conditions commonly caused by stphylococcous aureus. Superficial pustules develop, usually round the nose and mouth. It is spread by direct contact and affects mainly Childrens and immunosuppressed individuals. This bacteria are spread by having direct contact with an infected person, by using a contaminated object, or by inhaling infected dropelets dispersed by sneezing or coughing.Skin infections are common, but the bacteria can spread through the bloodstream and infect distant organs

Layers of Epidermis :-The layers of the epidermis include the stratum basale (the deepest ponion of the epidermis), stratum spinosum, stratum granulosum, stratum lucidum, and stratum corneum (the most superficial portion of the epidermis).

Stratum spinosum :- 8-10 cell layers Stratum granulosum :- 3-5 cell layers

Stratum lucidum :- 2-3 cell layers

Dermis :- The dermis is connected to the epidermis at the level of the basement membrane and consists of two layers, of connective tissue, the papillary and reticular layers which merge together without clear demarcation.

Hypodermis :- The hypodermis is deep to the dermis and is also called subcutaneous fascia. If is the deepest layer of skin and contains adipose lobules along with some skin appendages like the hair follicles

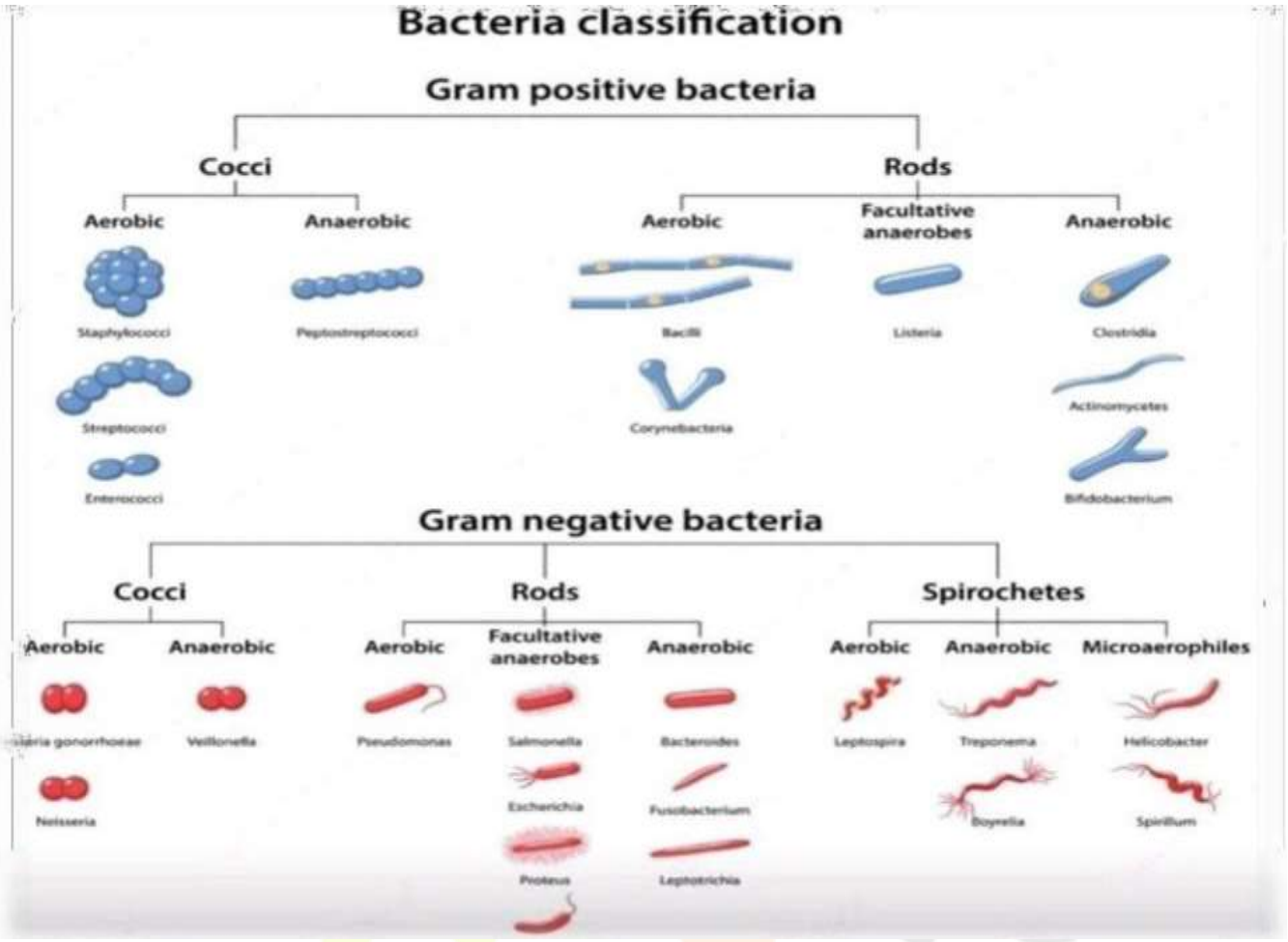
Creams:- Creams are semisolid dosage forms intended mainly for external use and commonly consist of two immiscible phases ,an oily internal phaseand an aqueous phase

Due to emulsified nature of skin surface , drugs formulated as cream more effectively interacts with skin and more readily penetrate through biological membranes . Herbal products are popular due to their minimum risk of side effects with maximum efficacy.0000000000

Typesof Creams

O/W emulsified type	W/O emulsified type
Vanishing cream	Cold cream
Foundation cream	Emollient cream
Shaving cream	

Bacteri **Classification**



Materials And methods:-

Collection of plant Materials:-

Turmeric extract, neem leaves, Tulsi leaves

Sr. no	Ingredients	Roles
	Tulsi	Antibacterial
	Neem	Antimicrobial Agent and Emulsifying agent
	Turmeric	Antibacterial Propenies

Extraction Process:- Tulsi:-

Tulsi leaves were collected and wash with distilled water and dried in hot air oven. Then after proper drying, the leaves were powdered. Then lg tulsi leaf powder and 10 ml dimethyl sulfoxide was taken in the volumetric flask and shaken for 3 d Remi Rsb-12 mechanical shaker. Then solution was heated on water bath at 80 to 100 degree celcius. For few minutes and then concentrated up to 5ml and filtered using a muslin cloth to remove impurities . Then the filtrate or the filter product in which a clear a solution or clear extract of tulsi leaves was used in the preparation.

Neem:-

Neem leaves were collected and washed with distilled water and dried in hot air oven. After proper drying, leaves were powdered. Then 5g neem leaves powdered, 80 **to 100** degree celcius . Dimethyl sulfoxide was taken in a volumetricflask and shaken for 3d on REDMI RSB-12 mechanical shaker. Then the solution was heated on a bath at 80-100 degree celcius and concentrated up to 20 ml and then filtered using muslin clothto remove impurities . Then the filtrate or filter product obtained

, which is a clear **extract** of neem leaves, wns used in the prepariton
meter at a temperature of 25 °C using spindle No. 63 at 2.5 RPM. According to the results all the three formulations showed adequate viscosity.

Phase separation

*Prepared cream was kept in a closed container at a temperature of 25-100 *C 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 three formulations.*

Spreadability

Turmeric:-

Take 1 g turmeric powder in 10 ml distilled water and shaken in 250ml volumetric flask heated in water bath at 80 degree celcius to 100 degree celcius for 5 to 10 minutes .
Then filtered it . and then turmeric extract is obtained.

Mechanism Of Action

The extract of Neem and tulsi has significant antibacterial activity against Staphylococcus aureus and E coli . Staphylococcus aureus
i.e. gram positive bacteria are more susceptible than escheria coli i.e gram negative bacteri

Slab Technique Method

1. The formula for the crcam is given upper side Heat liquid paraffin and beeswax in a borosilicate p•lass beaker at

   75 C and maintain that heating temperature. (Oil phase

2. In anothcr beaker, dissolve borax, methyl paraben in distillcd w'ater and heat this beaker to 75 °C to dissolve borax and methyl parabcn and to get a clcar solution (Aqueous phase). Then slowly add this aqueous phase to heated oily phase.

3. Then add a measurcd amount of Tulsi estract, Necm estract and turmeric extract stir vigorously until it torms a smooth cream.

4. Then add tew drops of rose oi1 as a fragrancc Put this crcam on thc slab and add fcw drops

5. Distilled w'ater if necessary and mix the cream in a geometric manner the slab to gis'e a Smooth Gesture to the crcam and to mix all the ingrcdicnts properly

6. This method is called as Slab techniquc or extcmporaneous method of preparation ot cream

Formulation of cream:-

S.r No. FIH	**Ingredients** F2H	**Formulation** F3H		
	Necm extract	0.5ml	0.2ml	t).4ml
	Tulsi Extract	1.5inl	1ml	1ml
	Turmeric Extract	1.5m1	1ml	1ml
	Bees Wax	3g	3.5g	3.2g
	Liquid paraffin	10ml	l5ml	l2ml
	Borax	0.2g	0.4g	0.3g
	Methyl paraben	0.2g	0.02g	8.83g
	Distilled Watcr	Q.S	Q.S	Q.S
	Rose oil	Q.S	Q.S	Q.S

Evaluation of cream

Physical evaluation

In this test, the cream was observed

texture, state

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 edemaif any for an interval up to 24 h and reported.

Wash ability

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

0.5 g cream was taken and dispersed in 50 ml distilled water and then P^H was measured by using digital P" meter .

Viscosity

Viscosity of cream was done by using Brooke field viscometer at a temperature of 25 °Cusing spindle No. 63 at 2.5 RPM .

Phase separation

Prepared cream was kept in aclosed container at temperature 25-100 degree celcius away from light. Then phase separation was checked for 24h for 30 d. Any change in the phase separation was observed. According to the results no phase separation was observed in all the three formulations.

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.

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 (table 10].

Compatibility study

Compatibility study of the herbal APls was done by using IR spectroscopy and the lR spectrum was measured in there solid state. The region in which the lR spectrum was measured falls in between 4000.12 to 525.03. The sensitivity was 75. The characteristics peaks which are observed in the IR spectra of the mixture of herbal APIs are 1026.79, 1368.24, 1438.73, 1604.78, 1728.45, 3289.05 cm '. The same peaks were also observed in the IR spectra of individual herbal APIs.

Results :-

Evaluation results of all the 3 formulations are gives below. Physical evaluation

Physical evaluation

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

Irritancy

Mark the area (1 cm^2) 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 three formulations that is F1H, F2H and F3H showed no sign of irritancy, erythema and edema.

In this test color, odor, texture and state of the three formulations was checked

Sr. No	**Parameters**	**Formulation F1H**	**Formulation F2H**	**Formulation F3H**
	Color	Faint yellow	Faint yellow	Faint yellow
	Odor	Pleasant	Pleasant	Pleasant
	Texture	Smooth	Smooth	Smooth
	State	Semisolid	Semisolid	Semisolid

Irritancy study observations

S. No.	**Formulation**	Irritant effect	Erythema	Edema
	F1H	Nil	Nil	Oil
	F2H	Nil	Nil	Nil
	F2H	Nil	Nil	Oil

Washability

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

According to the results, the P" of all the three formulations that is F1H, F2H and F3H were found to be nearer to skin P" so it can be safely used on the skin.

Washability observations

Sr. No	Formulation	Washability
	F1H	Easily Washable
	F2H	Easily Washable
	F3H	Easily Washable

pH observation table

Sr. No	Formulation	Washability
	F1H	6.7
	F2H	6.2
	F3H	6.6

Viscosity

Viscosity of cream was done by using Brooke field visco

The spreadability of the three formulations that is FIN, F2H, and F3H was carried out and out of that for F2H 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 F2H showed better spreadability.

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 three formulations were non-greasy.

CONCLUSION

By using Turmeric, Neem and Tulsi the cream showed a multipurpose effect and all these herbal ingredients showed significant different activities. Based on results and discussion, the formulations FIH, F2H and F3H were stable at room temperature and can be safely used on the skin.

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