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FORMULATION AND EVALUATION OF MULTIPURPOSE HERBAL LOTION

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ABSTRACT

Objective: To formulate and evaluate herbal lotion using ethanolic extract of Citrus lemon leaves and comparative study with normal alcoholic extract of lemon leaves for multipurpose effect.

Methods: The lotion was prepared by using the W/O emulsion method in which water phase is Bentonite, glycerine Triethanolamine and oil phase Cetyl alcohol, steric acid, mineral oil Methyl paraben is using as a preservative. We have developed two batches of our herbal lotion, namely F1HL, F2HL. All two batches were evaluated for different parameters like organoleptic, pH, viscosity, Spreadability, homogeneity etc.

Results: All the two formulations F1HL, F2HL showed good appearance, pH adequate viscosity, Spreadability, homogeneity and compatibility was observed. Also, the formulations F1HL, F2HL showed no redness, erythema and irritation during irritancy study and they were easily washable. All the two formulations F1HL, F2HL were stable at room temperature.

Conclusion: All herbal ingredients showed significant different activities. Based on the results, we can suggest that all the formulations F1HL, F2HL were stable and can be safely used on the skin.

Keywords: Lemon leaves, Herbal lotion, Herbal formulations, Multipurpose lotion.

INTRODUCTION

The use of medicinal herbs and herbal medicine is an age-old tradition and the recent progress in modern therapeutics has stimulated the use of natural product worldwide for diverse ailments and diseases and worth remarking that its valuable biological activities are underestimated in modern phytotherapy and cosmetology [1]. Citrus limon (L.) Brum. f. is a tree with evergreen leaves and yellow edible fruits from the family Rutaceous. In some languages, C. limon is known as lemon (English), Zitrone (German), le citron (French), limón (Spanish), and nongaming, (Chinese) and limon fruit juice (lemon juice) has traditionally been used as a remedy for scurvy before the discovery of vitamin C [2]. Lotions are defined as monophasic or biphasic solution, emulsion or suspension design to apply on unbroken and also broken or inflamed skin without friction and types of lotions are simple lotion, therapeutic lotion, emulsion lotion and suspension lotion [3]. Lemon is used as a treatment of scurvy, sore throats, fevers, rheumatism, high blood pressure, and chest pain [4].

MATERIALS AND METHODS

Collection of plant material

The lemon citrus leaves were collected from a plantation in Newai, Tonk, Rajasthan. It was authenticated by department of Botany, Rajasthan University, Jaipur, Rajasthan.

Preparation of extract

1. In this process leaves of the plant will be collected and washed thoroughly with distilled water and shade dry for 10 days. Dried leaves were grinded into powder form and make extraction with alcoholic solution with the help of extraction process according to reviewed articles. These methods could be-
    1. Maceration
    2. Decoction
    3. Soxhlet Extraction
    4. Hot Extraction

In which the 500 g of dried powder of Lemon leaves was extracted in ethanol by Soxhlet extraction method. The extraction process was carried, filtrates and collected in a beaker [5,18].

Figure:1- Extraction process for lemon leaves.

Phytochemical screening

The phytochemical screening of drug extracts was carried out according to standard method (Trease & Evans 1989).

S/No.	Chemical Test	Present/Absent
1.	Alkaloids	Present
2.	Glycosides	Present
3.	Carbohydrates	Present
4.	Saponin	Present
5.	Flavonoids	Present

Table-1: Chemical test of Phytoconstituents

Excipients and herbal ingredients with their roles

After the phytochemical screening of drug extracts, we will represent about excipients and ingredient of formulation which is given the **(Table-2)** [7]

S/N	Ingredients	Category
1.	Herbal Drug	Herb extract
2.	Water	Diluent
3.	Bentonite	Thickening agent
4.	Methyl paraben	Preservatives
5.	Glycerine	Humactant
6.	Triethanolamine	Neutralizer
7.	Cetyl alcohol	Co-emulsion
8.	Steric acid	Emulsifier
9.	Methyl paraben	Preservatives
10.	Mineral oil	Occlusive

Table 2: Role of ingredients

FORMULATION OF LOTION

The herbal lotion of lemon leaves was formulated by W/O emulsion method.

S/N	Ingredients	Category	Lemon leaves extract **(F1HL)**	Formulation **(F2HL)**
1.	Herbal Drug	Herb extract		
Water Phase				
2.	Water	Diluent	40ml	40ml
3.	Bentonite	Thickening agent	1.25 gm	1.25 gm
4.	Methyl paraben	Preservatives	0.05gm	0.05gm
5.	Glycerine	Humectant	1.5 ml	1.5 ml
6.	Triethanolamine	Neutralizer	0.45gm	0.45gm
Oil Phase				
7.	Cetyl alcohol	Co-emulsion	1gm	1gm
8.	Steric acid	Emulsifier	1.25 gm	1.25 gm
9.	Methyl paraben	Preservatives	0.05gm	0.05gm
10.	Mineral oil	Occulsive	2.5ml	2.5ml

Table-3: List of Ingredients used in the formulation

Figure:2- Formulation of herbal lotion.

EVALUATION OF HERBAL LOTION

The lotion was evaluated for organoleptic properties, homogeneity, irritation test, viscosity, pH, stability and microbial test [8-13].

Determination of organoleptic properties:

The appearance of the lotion was judged by its colour, odour texture, roughness, pearlscence and washing from skin [8].

Determination of pH:

The pH meter was calibrated and measured the pH by digital pH meter placing in the beaker containing 100mg of the at a temperature room temperature [9].

Wash ability Test:

The removal of the lotion applied on skin was done by washing under tap water with minimal force to remove the lotion [10].

Irritancy test:

The lotion was applied on left hand dorsal side surface of 2sq.cm and observed in equal intervals up to 24hrs for irritancy, sensitivity and edema [11].

Determination of homogeneity:

The formulations were tested for the homogeneity by visual appearance and by touch [12].

Spreadability test:

500mg of the lotion was sandwiched between 2 slides. A weight of 200gm was placed on upper slide. The weight was removed and extra formulation was scrapped off. The lower slide was fixed on board of apparatus and upper slide was fixed with non-flexible string on which 100gm load was applied. Time taken by upper slide to slip off was noted down [13].

S = m× l / t

Were,

S – Spread ability

m- Weight tied to upper glass slide.

l- Length moved on a glass slide

t- Time taken.

The determinations were carried out in three times and the average are readings was recorded and calculate.

Determination of viscosity:

The viscosity determinations were carried out using a Brookfield Viscometer (DV II+ Pro model) using spindle number NDJ-8S at a 20 rpm at a temperature of 25oC. The determinations were carried out in triplicate and the average of three times readings was recorded [14].

Stability test:

The stability test of final optimized lotion was measured out and it was found that the lotion was stable in room temperature for at least three months. The value of pH, viscosity and Spreadability all lay within the required range. In which no major changes in values of pH, viscosity and Spreadability as compared to the initial value of formulation [15].

Compatibility study

Compatibility study of the herbal APIs was done by using IR spectroscopy and the IR spectrum was measured in its solid state. The region in which the IR 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^{-1}. The same peaks were also observed in the IR spectra of individual herbal APIs [16, 17].

RESULT AND DISCUSSION

S/No.	Parameter	Observation	
		F1	F2
1.	Appearance	Greenish-white	Greenish-white
2.	Odour	Characteristics	Characteristics
3.	pH	pH 5.5	6.5-7.5
4.	Irritancy test	No redness and edema	No redness and edema
5.	Washability	Easily Washable by tap water	Easily Washable by tap water
6.	Homogeneity • By visual • By Touch	Smooth and Consistent	Smooth and Consistent
7.	Spreadability	Uniform with a value of 35-42 g.cm/sec Easily spreadable	Uniform with a value of 38-44 g.cm/sec Easily spreadable
8.	Viscosity	Viscosity 18000-19000cps.	Viscosity 19000-21000cps.

Table-4: Evaluation Parameter of herbal lotion

Stability test:

To assess the formulation stability, was performed in the lab. Each formulation was stored at 4°C room temperature and 40°C temperature for 2-3 month and observed for physical stability.

Admissibility Conditions (Initial)		Admissibility Conditions (30 Days)
Appearance	Homogeneous Cream	Concordant
Odor	Characteristic odor, Perfumed	Concordant
Color	White Beige	Concordant
pH	5.5-6.0	5.5-6.0
Viscosity	35.000 mPas	45.000 mPas

Table-5: Stability test Parameter of herbal lotion

Ideal Properties of Semisolid Dosage Forms	
1 Physical Properties	
a	Smooth Texture
b	Elegant in Appearance
c	Non-Dehydrating
d	Non-Gritty
e	Non-Greasy & Non-Staining
f	Non-Hygroscopic
2 Physiological Properties	
a	Non-Irritating
b	Do not Alter Membrane/Skin Functioning
c	Miscible with skin Secretion
d	Have low sensitization effect
3 Application Properties	
a	Easily Applicable with Efficient Drug Release
b	Easily Washable with Water

Table-6: Stability test Parameter of herbal lotion

Microbial Test-

Experiment- ISO 21150: Escherichia coli

Conclusion- Lotion was prepared for microbiological tests total viable count and gram-negative pathogens known as Escherchia coli and antimicrobial activity is noted.

Figure:3- Sample preparation

CONCLUSION

This research work unimpeachably exposed the several challenges associated with allopathic lotion such as side effect, high cost and sensitivity. The herbal lotion of crude drugs with the unique properties and prepared by simple W/O methods and less equipment are required. In which the research of study was concluded that poly formulation containing F2 formulation shows better results than other herbal formulation and represent the future scope of herbal formulation. In which herbal lotion was successfully prepared, characterized and evaluated for various aspects.

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