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EVALUATION OF ANTIBACTERIAL ACTIVITY OF FORMULATED HERBAL LOTION USING ETHANOLIC EXTRACT OF CROTALARIA PALLIDA & BREYNIA-VITIS-IDAEA

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ABSTARCT
Herbal word is symbol of safety in contrast to synthetic one which has no adverse effects on human health. Herbal preparations like herbal tablets, herbal shampoos and herbal lipstick, herbal lotion etc. it has become more popular among the consumer herbal medicine represent the fastest growing segment to heal the various ailments. Lotion maintains skin's hydration levels by locking in the moisture, keeping the skin healthy, soft, and supple. Unlike a cream, the lotions are less greasy and have more water content. The present work deals with the evaluation of antibacterial activity of formulated herbal lotion using Ethanolic extract of Crotalaria pallida and Breynia-vitis–idaea. Different types of formulation oil in water (O\W) herbal lotion namely F1 to F4 were formulated by incorporating different concentration of Crotalaria pallida and Breynia vitis idaea. The lotion formulation showed no redness, edema, inflammation and irritation during sensitivity test indication that it is safe to use. Stability studies of the lotion showed that the lotion was stable after three months. The ingredients in the herbal lotion are all natural and safe to use. Attempt was also made to evaluate the antibacterial activity of herbal lotion and F3 was found better antibacterial activity and accepted by the volunteers.

KEYWORDS: Crotalaria pallida, Breynia Vitis idaea, Alovera.

INTRODUCTION

The skin, being the largest organ in the body, guards the underlying muscles, bones, ligaments and internal organs interfaces with the environment, as well as protecting the body against pathogenic microbes. Not with standing, infectious skin diseases such as skin abrasions, burns, acne, dermatitis, and sebaceouscysts have become everyday incidences and constitute a reoccurring health problem that affects all human age groups. Over the years, bacterial skin disorders such as impetigo, ecthyma; folliculitis, eczemas, and urticarias are one of the most common causes of hospital visits in the country. Overcrowding, malnutrition and humidity, heat, food, and medication allergies cause some of these skin diseases.[1]

The development of drug resistance in human pathogens against commonly used antibiotics has necessitated the search for new antimicrobial substance from other sources. Screening of medicinal plants for antimicrobial activities and photochemical is important for finding potential new compounds for therapeutic uses. Therefore, current scientific investigation is identifying new leads from the plant sources possessing significant antibacterial activity.[2]

Crotalaria Pallida: Crotalaria pallida Aiton. belongs to the family Fabaceae.

Breynia Vitis–idaea

Breynia vitis-idaea (Burm.f.) Fischer. (Phyllanthaceae) is an evergreen, glabrous tree or large shrub. Found in the Gangetic plain, western peninsula, China, and Sri Lanka. These plants are planted as ornamental hedge in garden. Bark is yellowish grey, leaves are alternate dark brown or black when dry, flowers are small, greenish yellow or pink, and dull red. Root, leaves and bark are medicinal. Roots decoction is used as mouthwash.[3] It is used for curing body aches and skin diseases. In coastal Karnataka, A herbal paste prepared by grinding leaves of this plant for repeated application on the lesions of the skin will cure the herpes.[4] Leaves of Breynia vitis-idaea is used to treat psoriasis, scabies and other skin diseases[5]

MATERIALS AND METHODS

The ingredients Crotalaria Pallida and Breynia Vitis idaea leaves were procured from natural vicinity of Byndoor town, Udupi city, Karnataka, India during the month of September 2023.

Dryingof leaves: The collected leaves were washed with running water, shade dried for 2days and made into coarse power, stored in air tight container.

Extraction of Crotalaria Pallida and Breynia-Vitis-Idaea[6]

1. About 200 grams of dry powder leaf of Breynia vitis-idaea and Crotalaria Pallida was extracted first with ethanol (60-80℃) for 72 hours.
2. The powdered drug was dried and packed well in Soxhlet apparatus and extracted.
3. The extract was concentrated by vacuum distillation to reduce the volume to 1/10; the concentrated extract was transferred to 100 ml beaker and the remaining solvent was evaporated on a water bath.
4. Dark greenish colored extract was obtained. The concentrated extract was then kept in desiccators to remove the excessive moisture.
5. The dried extract was packed in air tight glass container for further studies.

Fig 1: Extraction of Crotalaria pallida.

Fig 2: Extraction of Breynia Vitis idaea.

Formulation of herbal lotion[2]

1. Weigh all the ingredients as per formulation.
2. Alovera gel was taken in separate clean beaker then stirred it till it gets converted into little bit creamy form.
3. Then honey and leaf extracts were added and mixed.
4. Then another beaker was taken and in that Almond oil and Glycerin was added.
5. Then almond oil and glycerin mixture was slowly added to the first beaker containing Alovera gel and mixed it thoroughly.
6. After mixing all ingredients rose water and coconut milk was added as per consistency.
7. As mentioned below, four different formulations were prepared.

FORMULATION DESIGN

Table 1: Excipients with their prescribed quantities in the formulation of herbal lotion.

Name of Ingredients	F1	F2	F3	F4
Alovera gel	6ml	5ml	5ml	7ml
Crotalaria pallida	1g	0.5g	2g	-
Breynia Vitis idaea	-	0.5g	2g	1g
Honey	4ml	5ml	5ml	3ml
Almond oil	2ml	1ml	2ml	1ml
Glycerin	3ml	4ml	3ml	4ml
Rose water	2ml	2ml	2ml	2ml

EVALUATION OF FORMULATED HERBAL LOTION[7]

Physical appearance: The appearance of the lotion was observed by visual examination.

Colour: The colour of the cream was observed by visual examination.

Odour: The odour of the lotion was tested by smelling.

p^H: p^H of prepared herbal lotion was measured by using digital PH meter.

Spreadability: Spreadability of formulated lotion was measured by placing sample in between two slides then compressed to uniform thickness by placing a definite weight for defined time.

Irritancy test: The lotion was applied to a specific area of the left- hand dorsal surface. Irritancy, oedema was checked up to 24hrs. & reported.

Stability Test: To check the microbial growth, the formulation was placed in the centre of the petri dish, and then the plates were incubated at 37°C for 72 hrs.

ANTI-BACTERIALSTUDYOFHERBALLOTION

Antibacterial properties of plant extract should be performed using agar disc diffusion using Gram-positive micro-organism (e.g., Staphylococcus aureus, Bacillus subtilis*)* and Gram-negative micro-organism (e.g., Pseudomonas aeruginosa*)*. Platesshouldbeincubatedat 37^{o}C for 24 to 48 hours. The diameter of zone of inhibition (ZOI) off our incubated plates was measured in millimetres (mm) and compared.

For Gram Positive Bacteria (Staphylococcusaureus)

F 1: Zone of inhibition: 12mm

F 2: Zone of inhibition: 17mm.

F 3: zone of inhibition: 22mm

F 4: Zone of inhibition: 5mm.

For Gram negative bacteria (Pseudomonas aeruginosa)

F 1: Zone of inhibition: 14mm.

F 2: Zone of inhibition: 20mm.

RESULTS AND DISCUSSION

Evaluation results of formulated herbal lotion.

Parameters	**F1**	**F2**	**F3**	**F4**
Appearance	Lotion type	Lotion type	Lotion type	Lotion type
Colour	Greenish.	Dark greenish.	Dark greenish.	Dark greenish.
Odor	Aromatic.	Aromatic.	Aromatic.	Aromatic.
p^{H}	4	4.5	4.9	4.6
Irritation Test	Non-irritable & non allergic on the skin	Non-irritable& non allergic on the skin	Non-irritable& non allergic on the skin	Non-irritable& non allergic on the skin
Spreadability	Easily spreadable.	Easily spreadable.	Easily spreadable.	Easily spreadable.
Removal Test	Easily removed from the skin by using water	Easily removed from the skin by using water	Easily removed from the skin by using water	Easily removed from the skin by using water

Evaluation results of antimicrobial study.

Formulation	Zone of inhibition (Staphylococcus aureus)	Zone of inhibition (Pseudomonas aeruginosa)
F 1	12mm	14mm
F2	17mm	20mm
F 3	22mm	25mm
F 4	5mm	7mm

F3 herbal lotion has maximum zone of inhibition compared to other three formulations. Therefore F3 has maximum antibacterial activity.

A gram negative bacterium (Pseudomonas aeruginosa) is much prone to this antibacterial lotion compared to Gram positive bacteria.

DISCUSSION

Now days, research is going in around the world to exploit the traditional plants for therapeutic value scientifically. The qualities like low toxicity, inexpensive and potent pharmacological activities made medicinal plants very useful to mankind. For the past two decades, there has been an increasing interest in the investigation of different extracts obtained from traditional medicinal plants as potential sources of new antimicrobial agents.[2] From this investigation we concluded that the formulation of lotion F3 showed good antibacterial activity against gram positive and gram-negative bacteria and it was found to be harmless against human.

CONCLUSION

The present study has been satisfactory attempt to evaluate the antibacterial activity of crotalaria pallida and Breynia Vitis idaea using formulated herbal lotion from the reproducible results of executed experiments. It can be concluded that, Formulation of herbal lotion was done by adding the extract. The prepared lotion was evaluated for various parameters like consistency, $p^{H,}$ spreadability etc. Antibacterial activity of different concentration of extract and herbal lotion was carried out.

The research concluded that F3 herbal lotion has more antibacterial activity compared to other three formulations.

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