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Formulation and Evaluation of Antifungal Cream from *Acorus Calamus* Linn and *Hyptis Suaveolence* Poit Oil

Rishabh Mishra[1], Vikash Jakhmola[2], S. P. Bhatt[3]
[1, 2, 3]*Uttaranchal Institute Of Pharmaceutical Sciences*

Abstract: ***Plan: The aim of current investigation to develop a novel cream formulation from essential oil of Acorus calamus and Hyptis suaveolence for the treatment of skin infection.***
Preface: The delivery of pharmaceutical products through topical route is widely accepted for skin infection. So the development of topical formulation are designed to produced a systematic effect and benifical for the account of several advantages over other route of drug administration.
Methodology: Cream formulation consisting essential oil of Acorus calamus (Vach) and Hyptis suaveolence (Vilayati tulsi) was prepared and the formulation was subjected, microbial studies and In- vitro diffusion studies of formulation.
Result: The developed cream from essential oil was found to be safe and effective in skin infection
Keyword: Acorus calamus, Hyptis suaveolence, Cream formulation.

I. INTRODUCTION

The medicinal plant find application in pharmaceutical, cosmetic, agricultural and food industry. The use of medicinal herb for curing disease has been documented in history of all civilisation.
Man in the prihistoric era was probably not aware about the health hazard associated with the irational therapy. With the beginning of medical research, it was discovered that plants contain active ingredients that are accountable. Herbs are used for their medicinal properties.

A. Acorus Calamus (Sweet Flag)

1) Plant Description

Scientific Name- Acorus calamus Linn
Family-Acoraceae
Order- Acorales
Kingdom-Plantae
In the traditional medical system, this is a well-known medicament.
Chromosome number. Diploid (2n=24)
Origin-North America

2) Botanical Description

a) It is tall perennial wetland monocot plant.
b) It has dark white spongy scars on its leaves.
c) The leaves are few and distichously alternate.Leaf size-1-1.7cm.
d) Flowers-3 to 8cm long Cylindrical,greenish brown.
e) The leaf has a single prominent mid-vein and a slidely elevated secondary vein on both sides.
f) Flowers from early to late summer.
g) Grow in marshy places up to and altitude of 2000m.like himalaya,manipur,Nega,and some parts of south India.

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3) Uses

a) Anti fugal and antibacterial activity
b) Antidiabetic activity
c) No tropic activity
d) Anti depressant activity
e) Anticancer activity
f) Antioxidant
g) Repellent
h) Wound healing activity

Fig1:Acorus calamus

B. Hyptis Suaveolens

Hyptis suaveolens is an erect annual herb branched and measuring between 50cm and 2m high.
It is a plant strongly aromatic,entirely pubescent,4-angle stem marked with strong furrows,with leaves simple, opposite, oval & axillary inflorescence loose group of small blue flower.
The fruit is a nutlet black.
Name-Hyptis suaveolens
Scientific Name-Mesosphaerum suaveolens
Common name-Pignut or chan,wildspikenard,horehound,vilayati tulsi etc.
Family-Lamiaceae
Order- Lamiales
Genus- Mesosphaerum
Kingdom- Plantae
Species- M. *Suaveolens*

1) Medicinal Uses

a) Antifungal activity
b) Antibacterial activity
c) Anti cancerous activity
d) Anti diabetic activity
e) Anti fertility activity
f) Anti malarial activity
g) Insect repellent & Larvicide activity
h) Antiviral activity
i) Wound healing activity
j) Anti inflammatory activity

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2) Chemical Composition

Suaveolens seed oil contained linoleic acid(76.13%),oleic acid(10.83%),palmitic acid(6.55%), stearic acid(4.56%) & heptacosanoic acid(1.94%) etc. As the major consituents.

Fig2:Hyptis suaveolones

II. MATERIALS & METHODOLOGY

A. Materials

Propylene Glycol, Bee wax, Stearyl Alcohol, Cetyle Alcohol, purchased from Vinayak Scientefic Industry, Selaqui(Dehradun). Triethanolamine, Propyl paraben, Methyl Paeaben, Liquid Paraffin, purchased from Pure chem Laboratories, Dehradun
Steric acid Steric Acid was purchased from Vinayak Scientefic Industry,Dehradun& Hyptis suavelones entire plant was obtained from Ranipokhri,near Jolly grant (Dehradun) &Acorus calamus was collected from UIPS botanical garden

B. Preparation of Crèam Formulation

1) *Preparation of Aqueous Phase:* The water was heated to 65-70° C. Propylene glycol, terithanolamine, methyl paraben & propyl paraben were added and the temperature was maintained to 65-70° C.
2) *Preparation of Oil Phase:* White bee wax, stearic acid, stearyl alchol, cetyl alcohol were melted in a stainless steel vessel & to this mixture paraffin (liquid) was added and allowed to melt. The temperature of oil phase is maintained between 65-70° C.

C. Development of Cream Formulation

Oil portion was then slowly added to the aqueous phase while maintaining the temperature at 65-75 7 mixed for 10 to 15 minutes. When the addition of oil phase is done the solution is gradually dropped to 40 with continuous stirring and garlic oil is added. The obtained emulsion is then cooled to room temperature to form a semi-solid cream base. The pH of the crème base was kept between 4.5-6.

Part A(Oily phase)		Part B(Aqueous phase)	
Ingredients	Quantity	Ingredients	Quantity
Stearic Acid	2.6%	Propylene glycol	5.2%
White Bees Wax	1.5%	Triethan olamine	2%
Stearyl Alcohol	5%	Methylene Paraben	0.01%
Cetyl Alcohol	6.4%	Propyl paraben	0.04%
Mineral Oil	5%	Water	Up to 100%
Hyptis suaveolens	5%		
Acorus calamus	3.5%		

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D. Evaluation Parameters

Take about 1gm of the crème in a clean petri dish and observe visually.

E. Physical Examination

The prepared topical crème were inspected visually for their colour, homogeneity, consistency spreadablity& phase separation. The pH of the crème is measured by using pH Paper.

F. Viscosity

The viscosity of the creme formulated is measured by "Brook field Viscometer LVD" using spindle S-94 At different speeds and shear rates. The viscosity determination is done at room temperature.

G. Tube Extrudability

Metage cream extruded from tube on application of finger pressure. The formulation is extruded in a clean collapsible aluminium tube of 5gm capacity with a nasal tip of 5mm opening. The extrudability was then determined by measuring the amount of crème extruded through the tip when pressure is applied from the finger.thod adopted for evaluating cream formulation was based upon the quantity in perc.

H. Micro Biological Studies

Microbiological testing is done by 'Disk Diffusion Method' by studying the out come of inhibition zone. In it the sample of active moiety from the antifungal creme is dropped in centre of culture of petri dish of culture of following colonies-

1) Staphylococci
2) Streptrococci
3) Yeast Mold.

The Inhibition zone is measured by 'Zone Reader'

III. RESULT

1) *Physical Evaluation:* The creme obtained is Yellowish in color & Having a smooth texture. It is Homogenous with no sign of phase separation.
2) *pH Measurement:* The pH of the creme was found to be 6.2
3) *Viscosity Measurement:* It was found to be 67545 with Brook's Field Viscometer.

A. Microbiological Studies

From the microbial study it was found that the cream showing good effect on microbial growth the zone of inhibition was calculated by zone reader. The zone of inhibition of candida albicans was 41.34 mm and E. Coli it was 33.23mm.

Fig:3- Against. E. Coli

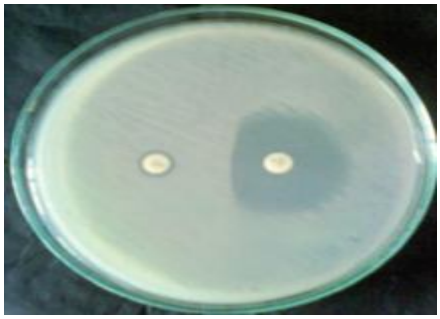

Fig:4- Against Candida albicans

Bacteria	Zone of inhibition
Candida albicans	41.34mm
E. coli	33.23mm

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IV. DISCUSSION

From the above above compiled data the study clearly shows that the formulation is showing good in- vitro anti-fungal activity against E.coli & Candida albicans.

V. CONCLUSION

The formulation of Antifungal agents along with Hyptis suaveolones & Acorus calamus oil exhibited enhanced rate of diffusion and antifungal activity. The result of diffrent chemical and physical test of cream showed that it could use topically in order to protect against skin infection caused by fungus or bacteria.

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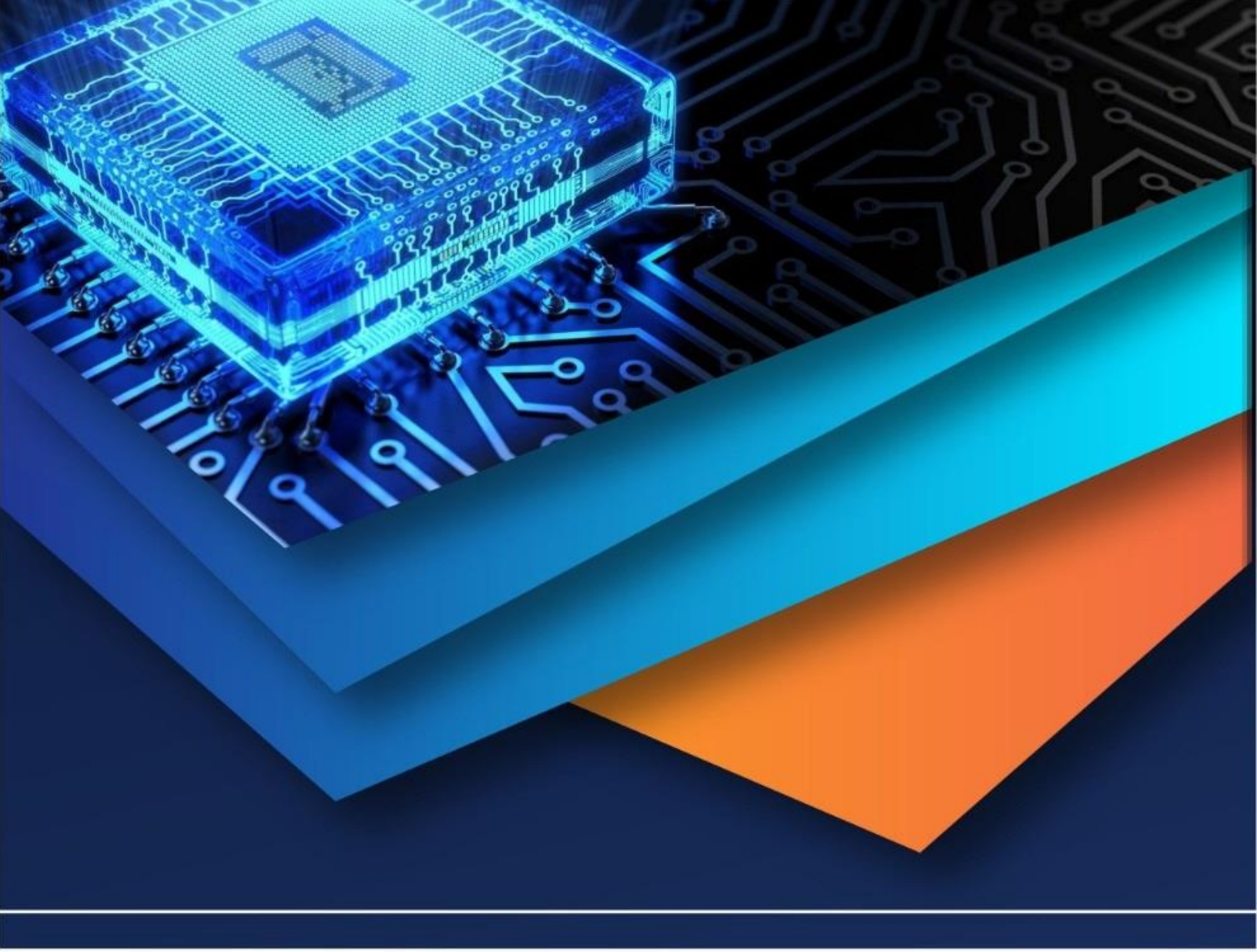

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