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Formulation and Characterization of Herbal creams from Tecoma Stans (L.) Juss. Ex (herbal Plant) for the healing of skin Irritation

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Abstract - A plant-based formulation using an exogenous carrier and/or excipient and an alcohol extract from a Tecoma species (like Tecoma stans). A composition including a combination of the three acids present in the Tecoma species (corosolic acid, oleanolic acid, and ursolic acid) is also provided. We detail the use of such formulations in the treatment of skin lesions (including warts, corns, calluses, and umbilical granulomas) and the alleviation of accompanying symptoms. Despite the prevalence of dermatological conditions including skin illnesses, they are typically disregarded in most communities. This is because, while they rarely pose a direct threat to human life, their aesthetic impact is felt globally. Eczema, bacterial infections, fungal/yeast infections, viral infections, parasitic infections, auto-immune disorders, and other skin illnesses are all instances of common skin ailments. This study aimed to manufacture and test the efficacy of a herbal cream comprising an extract of the plant's flowers preserved in ethanol. Fifteen separate batches, designated FC1 through FC5, were made using varying proportions of the active components and tested for their effectiveness. Based on the evaluation parameters, FC5 was shown to be superior to other formulation codes.

Keywords - Dermatological , Tecoma stans, Eczema, bacterial infections, fungal/yeast infections, viral infections.

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INTRODUCTION

The entire plant, from roots to flowers, has a long history of usage in alternative medicine. In traditional Mexican medicine, the plant is used to cure high blood sugar, digestive problems, liver disease, skin problems, and aches and pains like toothache, headache, joint discomfort, and the common cold. Furthermore, it is an efficient diuretic and an antidote for bites from scorpions, snakes, and rats. Inflammation of the skin is commonly referred to as dermatitis. Dermatitis is a frequent skin disorder with various manifestations and a wide range of potential triggers. It typically manifests as a rash on swollen, reddish skin or itchy, dry skin. It could also lead to skin blistering, oozing, crusting, or flaking. Atopic dermatitis (eczema), dandruff, and contact dermatitis are all forms of this illness.

Common names for the Tecoma stans(L.) Juss.Ex Kunth fam. Bignoniaceae plant are "Piliya (H)" and "Yellow trumpetbusy" (E). The entire plant has a long history of medicinal usage for a wide range of conditions. In herbal medicine, leaves, barks, and roots all serve different purposes. Besides its chlorotic activity, bark is able to relax smooth muscles and exert a modest cardiac tonic effect. Examples of potential medical uses include the investigational management of diabetes, the treatment of digestive disorders, the prevention of yeast infections, and others. Numerous chemicals found there are responsible for the "catnip-like" effects observed in felines. [2]

The use of herbal medicine and the formulations made by them, either on their own or in combination with extract, has grown exponentially

over the past few years. In Indian medical traditions, most doctors make up and deliver their own unique concoctions, either with the raw drug or its extract. Since there hasn't been any previous effort to informulate the dosage form employing bark of a chosen plant, we undertook the present work to formulate and evaluate a herbal cream comprising an ethanolic extract.

OBJECTIVE OF THE STUDY

Formulation of dosage form (Herbal Cream) to provide better efficacy of drug for patient compliance to treat dermatitis.

RESEARCH INVESTIGATION

Material

- ***PILIYA***

Botanical Name: *Tecoma stans* (L.) Juss. Ex Kunth.

Family: Bignoniaceae

Habitat: Wild throughout India

Common Name: Piliya (H), Yellow trumpetbusy, Yello bell (E)

Parts Used: Roots, Leaves, Bark, Bark

- **Preliminary Phytochemical Screening of Extracts**

The various extracts obtained after extraction were subjected for phytochemical screening to determine the presence of various phytochemical present in the extracts. The standard procedures were adopted to perform the study. [5-8]

Tests for Carbohydrates

- **Molisch's Test**

To the Sample 2-3 drops of 1% alcoholic - napthol solution and 2 ml of conc. sulphuric acidwas added along the sides of the test tube. Appearance of purple to violet ring at the junction of two liquids shows the presence of carbohydrates.

- **Fehling Test**

To the sample add fehling reagent, appearance of brick red precipitate shows presence of carbohydrates.

Test for Glycosides

- **Legal's Test**

To the sample add 1 ml of pyridine and few drops of sodium nitropruside solutions and then it was made alkaline with sodium hydroxide solution. Appearance of pink to red colour shows the presence of glycosides.

- **Borntrager's Test**

Sample was treated with chloroform and then the chloroform layer was separated. To this equal quantity of dilute ammonia solution was added. Ammonia layer acquires pink color, showing the presence of glycosides.

- **Baljet's Test**

To the sample add picric acid, orange color shows presence of glycosides.

Test for Proteins and Free Amino Acids

Small quantities of the sample was dissolved in few ml of water and treated with following reagents.

Million's reagent: Appearance of red color shows the Presence of protein and free amino acid.

Ninhydrin reagent: Appearance of purple color shows the Presence of Proteins and free amino acids.

Biuret's test: Equal volumes of 5% sodium hydroxide solution & 1% copper sulphate solution was added. Appearance of pink or purple color shows the presence of proteins and amino acids.

Preparation of Herbal Cream

Plant Extracts : Formulation utilised Tecoma stans ethanolic extracts derived from dried barks.

The Extraction Characteristics: The pH, solubility, colour, and smell of the extract were measured. An Herbal Anti-Fungal Cream is being created.

Formulation of herbal cream was described, including the following steps: [13-14]

Preparation of oil phase: In a porcelin dish, we melted the appropriate amount of stearic acid, cetyl

alcohol, and almond oil at a temperature of 70^0 degrees Celsius.

Phase aqueous preparation: Dried Tecoma stans (Barks) plant material, ethanolic extracts, glycerol, methyl paraben, triethanolamine, and water were placed in a second porclean dish and heated to 700 degrees Celsius.

Table 1: Formulation of herbal cream containing ethanolic extract of *Tecoma stans* (Barks)

Ingredients	Formulation Code							
	FC1	FC2	FC3	FC4	FC5	FC6	FC7	FC8
EETSB	0.5	0.75	1.0	1.5	0.5	0.75	1.0	1.5
Stearic acid	5	5	5	5	10	10	10	10
Cetyl alcohol	10	10	10	10	5	5	5	5
Almond oil	5	5	5	5	5	5	5	5
Glycerol	3	3	3	3	3	3	3	3
Methyl paraben	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Triethanolamine	qs	Qs	qs	qs	qs	qs	qs	qs
Water (100 ml)	qs	Qs	qs	qs	qs	qs	qs	qs
Total weight	100	100	100	100	100	100	100	100

Note: All values are taken in gm

RESULTS AND DISCUSSION

Characterization of Herbal Cream

It would be very fascinating to see an examination into the efficacy of plant extracts and their formulations in the context of an induced systemic and local infection paradigm. Several researchers have investigated the efficacy of plant extracts and their formulations in the treatment of systemic illnesses as well as fungal infections. It was also pointed out that these days, there are a number of herbal formulations available on the market that can be used to treat fungal infections, and these formulations have very few or no unfavourable or side effects. The current investigation was carried out with the intention of developing and analysing a herbal cream that contains an ethanolic extract of Tecoma stans (Bark)

To validate the created formulation's efficacy, a number of different evaluation parameters were carried out, and the extract that was chosen, EETSB, together with a number of different excipients that were chosen were blended together in accordance with the formula that was indicated.

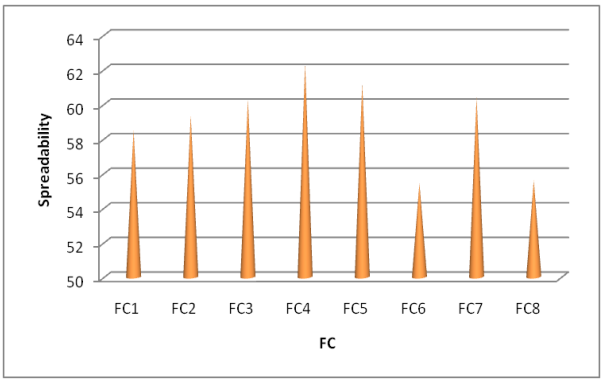
Evaluation of the prepared herbal cream containing EETSB was carried out in accordance with the established protocols. Table 2 has an explanation of the results in further depth.

The highest amount of the substance, 98.89%, was discovered in sample FC5. As a result, this formulation was taken into consideration in the process of determining the drug release. According to the findings of the drug release profile, the formulation FC5 has a maximum drug release of 97.32% after eight hours of administration. (Table 3)

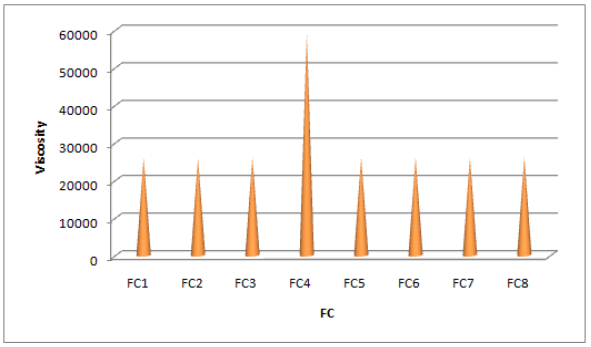
Table 2; Parameters defining the nature of Tecoma stans bark ethanolic extract-based herbal cream

FC	Appearance	pH	Viscosity	Homogeneity	Spreadibility	Smear	Emollience y	Emulsion
FC1	Pale brown	7.1	26030	H	58.48	NG	NRL	o/w
FC2	Pale brown	7.0	25819	H	59.34	NG	NRL	o/w
FC3	Pale brown	7.2	26244	H	60.28	NG	NRL	o/w
FC4	Pale brown	7.0	59012	H	62.34	NG	NRL	o/w
FC5	Pale brown	7.0	26016	H	61.20	NG	NRL	o/w
FC6	Pale brown	7.2	25914	H	55.42	NG	NRL	o/w
FC7	Pale brown	7.1	25903	H	60.38	NG	NRL	o/w
FC8	Pale brown	6.9	26232	H	55.59	NG	NRL	o/w

Note: H=Homogeneous, NH=Non homogeneous,, G=Greasy, NG= Non-greasy, NRL=No residue left, LR=Residue left



Graph 1: Spreadability of herbal cream



Graph 2: Viscosity of herbal cream

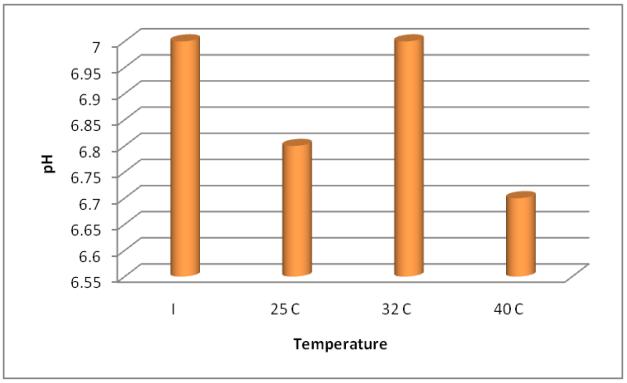
Table 3: % Drug release of optimized herbal cream (FC 5) containing a ethanolic extract of *Tecoma stans* bark

Time (Hr)	% Drug Release
0	0
2	33.86
4	62.49
6	88.48
8	97.32

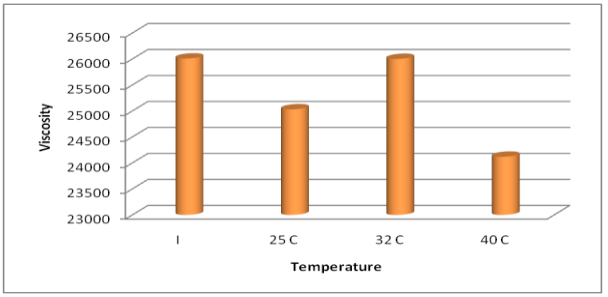
Stability studies are one of the important parameter to establish the safety and efficacy of the product and to determine the optimum temperature and RH desired for the formulation, hence the formulation was loaded in humidity chamber at 25± 2°C / 60% RH ± 5%, 32 ± 2°C / 60% RH ± 5% and 40 ± 2°C/ 75% RH ± 5% and after the six month of time durations, the results were evaluated.

Table 4: Stability Studies of Herbal Cream(FC5) Containing EETSBat 25°C ± 2°C/60% RH ± 5% RH, 32°C ± 2°C/60% RH ± 5% & 40°C ± 2°C/75% RH ± 5% RH

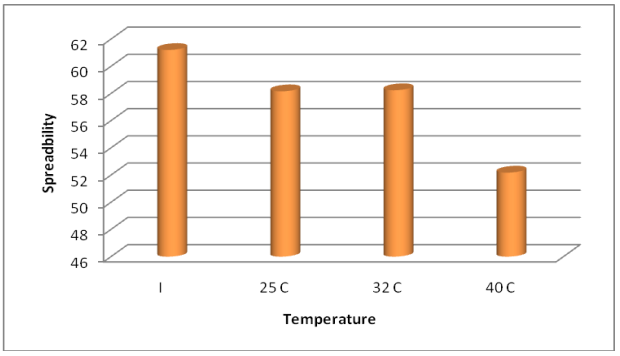
Parameters	FC5			
	Initial	Final at 25°C & RH 5%	Final at 32°C & RH 5%	Final at 40°C & RH 5%
Appearance	Pale brown	Pale brown	Pale brown	Pale brown
pH	7.0	6.8	7.0	6.7
Viscosity (cps)	26010	25032	26002	24120
Homogeneity	H	H	H	H
Spreadibility (g.cm/sec.)	61.20	58.16	58.24	52.18
Type of Smear	NG	NG	NG	NG
Emolliency	NRL	NRL	NRL	NRL
Type of Emulsion	o/w	o/w	o/w	o/w
% Dug Content	98.89	96.30	96.89	93.22
% Drug Release	97.32	95.48	96.28	92.14



Graph 3: pH of Herbal Cream(FC5) Containing EETSB



Graph 4: Viscosity of Herbal Cream(FC5) Containing EETSB



Graph 5: Spreadbility of Herbal Cream(FC5) Containing EETSB

CONCLUSIONS

Herbal medicines represent the fasted growing segment to heal the various aliments. Possibly, herbal user desire to assume control over their own health care needs. Perhaps the large, impersonal health care system is unpatable to many and they turn to herbal medicines as an alternatives patient may feel alienated by increasingly busy physicians who have less time to spend with them, and they may turn to herbal drugs because they feel they can gain some control, obviously if peoples are going to use herbals as part of their health care routine, they must find out about the herbs and what they do. The natural drugs somehow contain the vital force that is going to improve their health.

This research work comprises of '***Formulation and Characterization of Herbal creams from Tecoma Stans (L.) Juss. Ex (herbal Plant) for the healing of skin Irritation***'. The parameter employed for this purpose include development of standardization parameters as per WHO Guidelines, successive extraction of plant material, preliminary phytochemical screening, certain *in vitro* biological, formulation and characterization of herbal cream, estimation of active constituent in herbal cream and biological screening of optimized herbal cream.

Based on the data, we may infer that a cream containing an ethanolic extract of T. stans bark is effective. There is hope in the medication content and release profile for the FC5 formulation. Research into Tecomastans, in particular the separation and characterisation of novel chemicals from the extracts, could pave the way for the creation of new formulations of dosage forms like ethosomes, phytosomes, niosomes, etc., for the treatment of dermatitis.

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