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FORMULATION AND EVALUATION OF HERBAL OINTMENT OF ETHANOLIC EXTRACT OF ACALYPHA INDICA LINN.

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ABSTRACT

Acalypha indica is an important Indian medicinal plant and widely used in Ayurveda and siddha for management of various disease. Previous studies reported the activity of analgesic, anti-inflammatory, anti-bacterial, anti-viral ana anti-fungal properties of acalypha indica. The present study investigated the potential wound healing activity of ethanol leaf extract o acalypha indica L topical formulation. Fresh plant samples were extracted via a maceration in increasing polarity using petroleum ether, chloroform and methanol. Hence a study was conducted to formulate wound healing ointment containing methanolic extract of acalypha indica and showing effective antibacterial activity. Several researches revealed the antibacterial, antioxidant and anti-inflammatory properties of these plant. Extracts and chemical constituents of this plant possess useful pharmacological activities. The main pharmacological activity of acalypha indica is wound healing property. These results suggest that ointment of ethanol leaf extract of acalypha indica could be an answer to facilitate wound healing, to approve the traditional claims of the plant in wound healing activity.

KEYWORDS: Acalypha indica, ethanolic extract, ointment base, wound healing property.

INTRODUCTION

The plant acalypha indica is commonly known as Indian acalypha and it belongs to the family Euphorbiaceae. Thecommon names of Acalypha indica are Indian Acalypha (English),

Brennkraut (German), Alcalifa (Brazil), Ricinela(Spanish). It is a common annual herb found mostly in waste places and fields in Southern Nigeria and West Africa since it has anthropogenic tendencies towards settled areas. It is also widespread across Asia, backyards of houses and wasteplaces throughout the plains of India.[2]

The plant acalypha indica is a small eract herb up to 60cm tall with a few ascending branches which are angled and pubescent. The parts of plant which are used for therapeutic activities are leaves, roots, stalk(young root) and flower.[1] Acalypha indica contains a variety of phytochemicals including flavonoids, tannins and alkaloids which have anti-inflammatory and anti-microbial properties, according to recent research. Because of these properties, the plant could be used to treat skin infection caused by pathogens such as bacteria and fungi.[9]

This research will also provide a basis for the development of new, more effective and safe skin care prodycts, which will be beneficial for millions of people suffering from skin infections and inflammation worldwide. In this study, the ethanol extract of acalypha indica was formulated into an ointment, because it is most suitable pharmaceutical preparation for medicinal purpose for the skin because of the longer contact between the the skin and drug.[2,6]

BENEFITS OF ACALYPHA INDICA[3]

- Anti-inflammatory property
- Wound healing property
- Anaesthetic activity
- The ability to treat worms
- Antibacterial property
- Anti-venom property
- Anti-ulcer property
- Anti-diabetic property
- Antioxidant property
- Diuretic activity
- Antifungal property

MATERIALS METHODS

Collection of Plant Material

The acalypha indica linnleaves were collected from in and around Perambalur. These are authenticated by botanist, department of botany, national college, Trichy. Then the leaves cleaned properly and shade dried at room temperature.

Prepartion of Acalypha Indica Extract

Leaves of the plant were collected and washed thoroughly with distilled water and shade dried for 10 days. Dried leaves were ground into powder form. 100gm powder was imbibed with 350ml of 90% ethanol for 3hrs. and transferred to percolator with addition of 150ml of 90% ethanol for maceration for 7 days with occasional stirring. Finallyethanolic extract was collected and concentrated to get blackish green residue. The extract was stored in the airtight container at cool and dark place.[4]

OINTMENT FORMUALTION

Table 1: Formulation of ointment base.[8]

S.no	Chemical name	Company name
1	Wool fat	Nice
2	Cetosteryl alcohol	Nice
3	Hard paraffin	Nice
4	Yellow soft paraffin	Nice

Table 2: Formulation of herbal ointment.[8]

S.no	Name of ingredients	quantity of be taken		
		F1	F2	F3
1	Prepared acalypha indica extract	0.08	0.10	0.12
2	Ointment base q.s	10g	10g	10g

Procedure For Preparation of Herbal Ointment[8]

a) Initially ointment base was prepared by weighing accurately grated hard paraffin which was placed in evaporating dish on water bath. After melting of hard paraffin remaining ingredients were added and stirred gently to aid melting and mixing homogeneously followed by cooling of ointment base.

b) Herbal ointment was prepared by mixing accurately weighed Neem and Turmeric extract to the ointment base by levigation method to prepare a smooth paste with two or three times its weight of base, gradually incorporating more base until to form homogeneous ointment, finally transferred in a suitable container.

EVALUATION OF HERBAL OINTMENT

Colour and Odour

Physical parameters like colour and odour were examined by visual examination.

Consistency

Smooth and no greediness is observed.

pH

pH of prepared herbal ointment was measured by using digital pH meter. The solution of ointment was prepared by using 100ml of distilled water and set aside for 2hrs. pH was determined in triplicate for the solution and average value was calculated.[8]

Spreadability

The spreadability was determined by placing excess of sample in between two slides which was compressed to uniform thickness by placing a definite weight for definite time. The time required to separate the two slides was measured as spreadability. Lesser the time taken for separation of two slides results better spreadability. Spreadability was calculated by following formula

$$S=M\times L/T$$

Where, S= Spreadability

M= Weight tide to the upper slide

L= Length of glass slide

T= Time taken to separate the slides[8]

Extrudability

Extrudability test is the measure of the force required to extrude the material from a collapsible tube when certain amount of force has been applied on it in the form of weight. In thepresent study the quantity in percentage of ointment extruded from the tube on application of certain load was determined. The extrudability of prepared neem and turmeric containing ointment formulations was calculated by using following formula

Extrudability = Amount of ointment extruded from the tube x100/Total amount of ointment filled in the tube.[8]

LOD

LOD was determined by placing the formulation in Petri dish on water bath and dried for the temperature 105oC.

Solubility

Soluble in boiling water, miscible with alcohol, ether, chloroform.

Washability

Formulation was applied on the skin and then ease extend of washing with water was checked.

Non Irritancy Test[5]

Herbal ointment prepared was applied to the skin of human being and observed for the effect. The test is performed by applying the small amount sample to the hand and observed for 24hours to check the effect like redness, erythema, inflammation etc. Hence, no such effect was observed, it is non irritant to the skin.

Determination of Absorption Maxima

Maximum absorbance of the Acalypha Indica extract was found to be 0.66 at 270.0nm.

Maximum Absorbance of the Acalypha Indica Extract

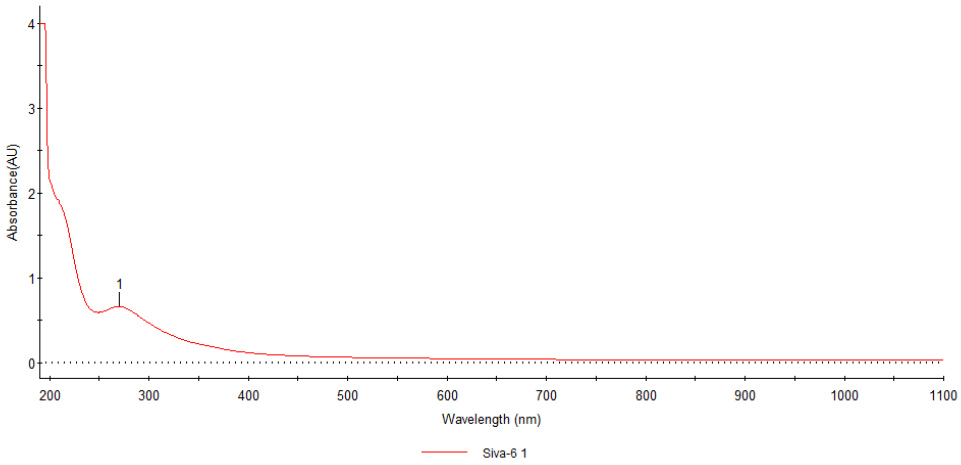
Preparation of Stock Solution

A standard stock solution containing 1mg/ml that is 1000µg/ml is prepared by dissolving 100mg of Azadirachtin in 100ml distilled water.

Preparation of Working Standard Solution

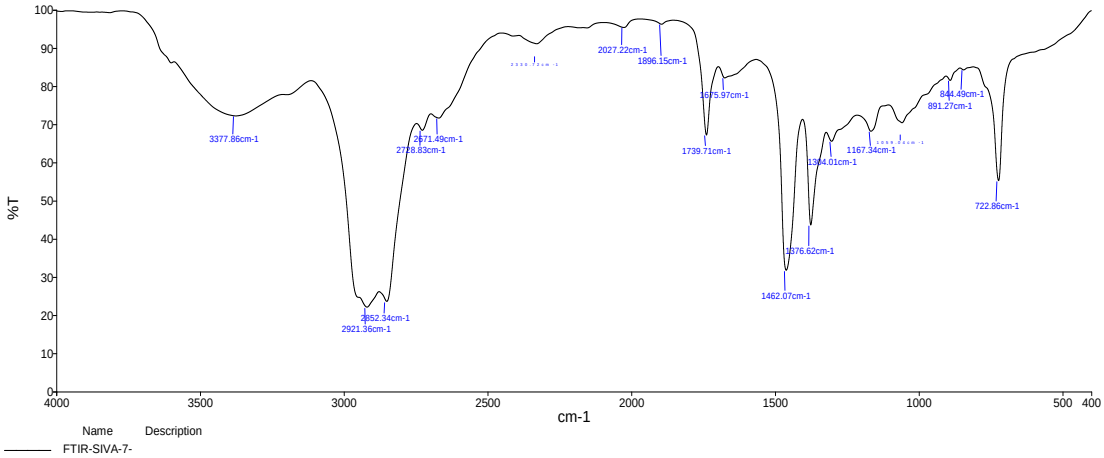
A working standard containing 100µg/ml is prepared by diluting the above stock solution taking 1ml in 100ml distilled water.

Assay of Isolated Sample of Acalypha indica linn



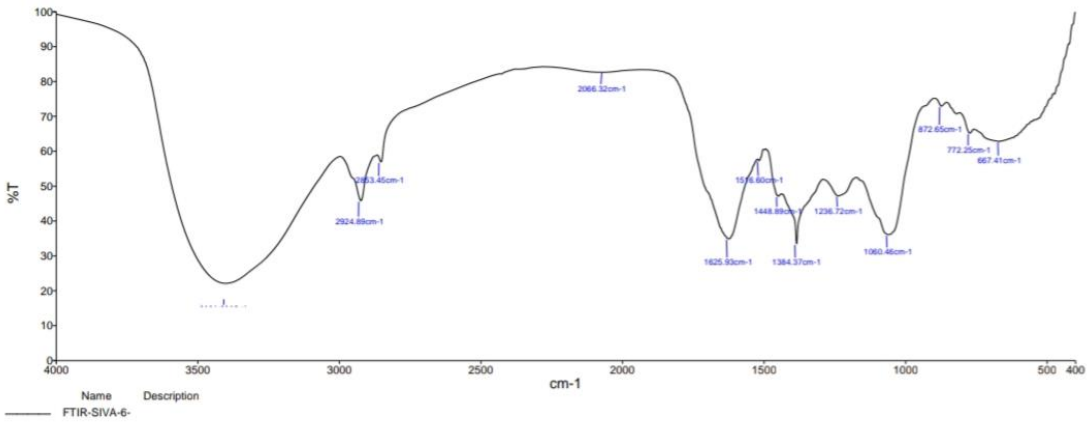
FTIR Analysis

Relation ship between Transmittance and Wavelength



FTIR

spectrum of Ethanolic extract of Acalypha Indica Extract



RESULT AND DISCUSSION

The present study was done to prepare and evaluate the herbal ointment. For this the herbal extracts were prepared by using simple maceration process to obtain a good yield of extract and there was no any harm to the chemical constituents and their activity. The levigation method was used to prepare ointment so that uniform mixing of the herbal ointment base which was stable during the storage. The formulated ointment is evaluated for its physical properties like colour, odour and state. The Formulated ointment are semisolid in nature, characteristic odour are occur and pale green in colour. The texture of ointment are smooth. By visual appearance and touch it is confirmed that all formulation produce uniform distribution of extract in ointment.

The physicochemical properties were studied which shows satisfactory results for spreadability, extrudability, washability, solubility, loss on drying and others.

PHYSICAL PROPERTIES OF HERBAL OINTMENT

Table 3: Physical properties of herbal ointment.

S.NO	Specification	Limit
1	State	Semi solid
2	Colour	Pale green
3	Odour	Characteristic
4	Texture	Smooth

Determination of pH

The pH of the ointment was found to be in range of 5-6.5 which is good for skin pH. All the herbal formulation of ointment were shown pH near to the skin required. i.e. F1-5.4, F2-6 and F3-6.2. The observed pH are near to the skin pH.

Table 4: Determination of pH.

S.no	Formulation	P_H
1	F1	5.4
2	F2	6
3	F3	6.2

Determination of Spreadability

The Spreadability plays a considerable role in patient compliance and ensures uniform application of ointment to a large area of the skin. The low value of spreadability coefficient of the ointment was sufficient suggesting easy spreading. The lower value of spreadability indicates the lesser work required to spread the ointment over the skin. Which means

formulation was easily spreadable by applying small amount of shear. The spreadability test showed that formulation has good spreadable property.

Table 5: Determination of Spreadability.

S.no	Formulation	Spreadability
1	F1	26.5sec
2	F2	29.2sec
3	F3	31sec

EVALUATION PARAMETERS OF HERBAL ONITMENT

Table 6: Evaluation Parameters of Herbal Ointment.

S.NO	Formulation	Colour	P_H	Spreadability	Texture
1	F1	Pale green	5.4	26.5sec	Smooth
2	F2	Pale green	6	29.2sec	Smooth
3	F3	Pale green	6.2	31sec	Smooth

Physicochemical property

Physiochemical parameters	Observation
Colour	Yellow
Odour	Characteristic
Consistency	Smooth
pH	5.4
Spreadability	26.5Sec
Extrdability	0.4gm
Diffusion study (after 60)min	0.7cm
Loss on Drying	30%
Solubility	Soluble in boiling water, miscible with alcohol, ether, chloroform

CONCLUSION

Formulation of herbal ointment was successfully developed that met the relevant pharmaceutical characteristics. The prepared herbal ointment has best properties and having nutritional values using less chemical which protect the skin from the various skin problems. The prepared formulation showed good spreadabilty, no evidence of phase of separation and good consistency. The parameters like visual apparence, nature, pH, state, odour, colour, texture of the prepared formulation are showed the better result during the study. The study determine the good anti microbial activities of the ointment formulation containing the herbal extract. This ointment could become a media to use these medicinal properties effectively and easily as a simple dosage form. The results of different tests of ointment showing that the

formulation could be used topically in order to product skin against damage the comparison of F1, F2 and F3. The F1 produce better activity than F2, F3.

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