

Formulation and Evaluation of Polyherbal Cream Containing Extracts of *Tridax Procumbens*, *Ficus Religiosa*, *Azadirachta Indica* and *Curcuma Longa*

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ABSTRACT

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Now a day's herbal medicine has great impact on human health and diseases. Herbal medicine plays important role in overall aspects such as economical and medicinal. Although usage of these herbal medicines is increased day by day because of their quality, efficacy and safety. The present research study explores new formulation containing extracts of *Tridax procumbens*, *Ficus religiosa*, *Azadirachta indica* and *Curcuma longa* in the form of cream (O/W). The formulation were characterized by determining the pharmaceutical characteristics such as pH, appearance, viscosity, spreadability, etc. The phytochemical constituents such as carbohydrates, alkaloids, steroids, etc were detected with the help of identification tests. The cream formulation were designed by using excipients such as stearyl alcohol, beeswax, sorbitol monooleate, methyl paraben, propyl paraben and liquid paraffin. As compared to allopathic medicines herbal medication is considered as safer. Whereas allopathic medications are associated with some side effects. Whereas cream formulation is much better as compared to other formulations for absorption and penetration of active moiety topically.

Keywords: *Tridax procumbens*, *Ficus religiosa*, *Azadirachta indica*, *Curcuma longa*, honey, eucalyptus oil, extract, herbal cream formulation (O/W).

I. INTRODUCTION

Medicinal plants are known to be a major source to cure various issues in human since former time. In our world one-fourth of population is depend on traditional medicines to cure various conditions and ailments in human beings. For prevention and to cure diseases recently attention is paid towards utilization of eco-friendly and bio-friendly plant

based products. Herbal remedies plays an important role in curing various ailments and this are getting increasing patient compliance as they are devoid of typical side effects of allopathic medicines. Therefore turning to safe, effective and time tested ayurvedic herbal formulations would be a preferable option. So there is need to investigate and formulate new such a herbal drugs for better patient acceptance and compliance. Indian folk medicine

contains many prescriptions for therapeutic purposes such as inflammation, wound healing, skin infections, etc. Herbal medicines in wound healing management involves disinfection, debridement and providing suitable environment for natural healing process.

Thus, the main objective of this study is to formulate and evaluate polyherbal cream which can be used as anti-coagulant, anti-microbial, anti-inflammatory, to cure boils, treat infectious skin diseases, anti-fungal, analgesic and wound healing. This present study involves the extract of *Tridax procumbens*, *Ficus religiosa*, *Azadirachta indica*, and *Curcuma longa*. Additionally honey and eucalyptus oil is used. These plants have been used separately for treating various skin issues in older times. But now this formulation can be used as all in one cream for more effective treatment.

- *Tridax procumbens* have kingdom-Plantae, subkingdom- Tracheobionta, division-Spermatophyta, subdivision-Magnoliophyta, class- Magnoliopsida, subclass- Aseridae, order- Asterales, order-Asterales, family- Asteraceae, genus- *Tridax* and species- *procumbens*.
- *Ficus religiosa* have kingdom- Plantae, subkingdom- Viridaeplantae, phylum-Tracheophyta, subphylum- Euphyllopsida, class- Magnoliopsida, subclass- Dilleniidae, Order- Urticales, Family- Moracea, genus- *Ficus* and species- *religiosa*.
- *Azadirachta indica* have kingdom- Plantae, division- Magnoliophyta, class- Magnoliopsida, order – Sapindales, genus- *Azadirachta* and species- *indica*.
- *Curcuma longa* have kingdom- Plantae, subkingdom- Tracheobionts, super division-Spermatophyta, division- Mangoliophyta, order- Zingiberales, family- Zingiberaceae, genus- *Curcuma* and species- *longa*.

This plant extracts includes some of the activities which are already proved in research papers and new formulation is prepared. These activities are as follows,

1. Anti- coagulant
2. Anti- microbial
3. Anti- inflammatory
4. To treat boils
5. Anti- fungal
6. Analgesic
7. Wound healing
8. Treat various skin conditions

II. METHODS AND MATERIAL

Collection of Plants

The entire plant of *Tridax procumbens*, leaves of *Ficus religiosa*, leaves of *Azadirachta indica* and rhizomes of *Curcuma longa* were collected from the botanical garden of Samarth Institute of Pharmacy, Belhe. Soon after the collection, parts of these plants are cleaned, dried in shade and crushed to a coarse powder, and stored in an air tight plastic container, until further use.



Fig 01- *Tridax procumbens* Fig 02- *Ficus religiosa*



Fig 03- *Azadirachta indica* Fig 04- *Curcuma longa*

Preparation of Plant Extract

Powdered parts of plants like *Tridax procumbens*, *Ficus religiosa*, *Azadirachta indica* and *Curcuma longa* were extracted by using maceration technique.

- *Tridax procumbens*- 50 gm of dried portion was poured in 250 ml of methanol. Later it was suspended for 7 days by stirring it from time to time. On 8th day it was sorted out by using Whatman no.1 filter paper and filtrate was collected and evaporated to obtain semi solid extract.
- *Ficus religiosa*- 20 gm of dried portion was poured in 200 ml of methanol. Later it was suspended for 48 hours by stirring it from time to time. After that it was sorted out by using Whatman no.1 filter paper and filtrate was collected and evaporated to obtain semi solid extract.
- *Azadirachta indica*- 15 gm of dried portion was poured in 150 ml of methanol. Later it was suspended for 72 hours by stirring it from time to time. After that it was sorted out by using Whatman no.1 filter paper and filtrate was collected and evaporated to obtain semi solid extract.
- *Curcuma longa*- 20 gm of dried portion was poured in 200 ml of methanol. Later it was suspended for 48 hours by stirring it from time to time. After that it was sorted out by using Whatman no.1 filter paper and filtrate was collected and evaporated to obtain semi solid extract.



Fig 05- Maceration process

Development of herbal cream formulation

O/W cream- The oil soluble components like stearyl alcohol, beeswax, sorbitol monooleate liquid paraffin were taken in a china dish and kept on water bath at 75° C. In other beaker water, extracts of *Tridax procumbens*, *Ficus religiosa*, *Azadirachta indica* and *Curcuma longa* were melted at 75° C. After heating, oil phase was taken in mortar and paste and slowly the water phase was added and triturated them till clicking sound was heard. At last, when temperature gets cooled down honey, eucalyptus oil were added with addition of preservatives.

Table 1- Cream base formula for 30gm

Sr. No	Ingredients	F2
1	Stearyl alcohol	10 g
2	Beeswax	7.0 g
3	Sorbitol monooleate	4.0 g
4	Methyl paraben	0.025 g
5	Propyl paraben	0.015 g
6	Liquid paraffin	1 ml

Table 02 – Formula for development of cream

Sr. No	Extracts	Batches (in gm)			
		F1	F2	F3	F4
1	<i>T. procumbens</i>	1.5	2	2	2
2	<i>F. religiosa</i>	1	2	1	1.5
3	<i>A. indica</i>	1	1	1	0.5
4	<i>C. longa</i>	0.5	0.5	1	1
5	Honey	1	1	0.5	0.5
6	Eucalyptus oil	1	1	0.5	0.5

Physicochemical characterization of the formulation

- **Colour and appearance:** Colour and appearance was examined by visual examination.
- **pH:** The pH meter was calibrated using standard buffer solution. About 1 g of cream was weighed and dissolved in 100 ml of distilled water and set aside for 2hrs and then pH was measured.
- **Spreadability:** The spreadability was determined by placing excess sample (1g) in between two slides which was compressed to uniform thickness by placing a definite weight (50g) for definite time (5 min). The time required to separate the two slides was measured as 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 slide.
- **Viscosity:** Viscosity of the formulation was determined by Brookfield Viscometer at 50 rpm, using spindle no. 64.
- **Washability:** The washability of the cream was determined by applying the cream over the skin and the extend of easy washing with distilled water was manually observed.
- **Stability studies:** The stability studies were carried out for the prepared herbal formulation at different temperature conditions (4° C, 27 °C and 37 °C).
- **Phase separation:** Formulation were formulated as O/W cream, so as per days passed we observed if any phase separation was occurred or not.
- **Greasiness:** When cream were applied, it is checked weather if the smear was oily or greasy like nature.
- **Preliminary phytochemical screening**

Table 03 – Phytochemical screening

Sr.	Phytochemical	Test
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No	Constituents	
1	Test for Carbohydrates	- Molisch's test - Fehling's test - Benedict's test
2	Test for Alkaloids	- Hager's test - Mayer's test - Hager's test
3	Test for Steroids and Terpenoids	- Salkowski test - Liebermann-Burchard test
4	Test for Glycosides	- Keller-Killiani test - Legal's test
5	Detection of Phenolic compounds and Tannins	- Lead acetate test - Ferric chloride test
6	Test for saponins	-Foam test
7	Flavonoids	-Shinodas test

- **Antimicrobial activity**

Antimicrobial study of formulated cream was conducted by pour plate method. Agar plate was sterilized as per standard procedure. Agar was prepared and poured in petri plate. Cream were put into hole to observe microbial growth around it. It was incubated for 48 hours. And then it was observed.

III. RESULT AND DISCUSSION

Colour and appearance

Table 04- colour and appearance

Test	Appearance
Colour	Dark Green
Appearance	Oily creamy.

pH

Table 05- pH

Sr. No.	Batch	pH
1	F1	6.49
2	F2	6.51

3	F3	6.45
4	F4	6.42

Spreadability**Table 06- Spreadability**

Sr.No.	Batch	Spreadability
1	F1	7.4 g.cm/cm
2	F2	7.5 g.cm/cm
3	F3	7.3 g.cm/cm
4	F4	7.3 g.cm/cm

Viscosity**Table 07- Viscosity**

Sr.No.	Batch	Viscosity
1	F1	22810
2	F2	24020
3	F3	21852

Phase separation**Table 10- Phase separation**

Sr.No.	Batch	Phase separation
1	F1	No
2	F2	No
3	F3	No
4	F4	No

Greasiness**Table 11- Greasiness**

Sr.No.	Batch	Greasiness
1	F1	Non-greasy
2	F2	Non-greasy
3	F3	Non-greasy
4	F4	Non-greasy

Preliminary phytochemical screening**Table 12 – Phytochemical screening**

Sr. No	Phytochemical Constituents	Result
1	Test for Carbohydrates	(+) ve
2	Test for Alkaloids	(+) ve
3	Test for Steroids and	(+) ve

4	F4	21090
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Washability**Table 08- Washability**

Sr.No.	Batch	Washability
1	F1	Easily Washable
2	F2	Easily Washable
3	F3	Easily Washable
4	F4	Easily Washable

Stability Studies**Table 09- stability**

Sr.No.	Batch	Stability
1	F1	Found stable upto 2 months it may be more than 2 months if studied further.
2	F2	
3	F3	
4	F4	

	Terpenoids	
4	Test for Glycosides	(+) ve
5	Detection of Phenolic compounds and Tannins	(+) ve
6	Test for saponins	(+) ve
7	Flavonoids	(+) ve

Anti-Microbial Activity**Table 13- Anti-microbial activity**

Sr.No.	Batch	Microbial Growth
1	F1	Not found
2	F2	Not found
3	F3	Not found
4	F4	Not found

IV. CONCLUSION

From our ancient period, herbal plant parts and crude drugs were directly used as a medicine. But in this research paper it is formulated with new cream. The plant and their parts such as *Tridax procumbens* (entire plant), *Ficus religiosa* (leaves), *Azadirachta indica* (leaves), and *Curcuma longa* (rhizomes) was taken for this present study and formulated for cream

and their properties. As this cream (O/W) formulation was found to be good with characteristics w.r.t such as pH, viscosity, spreadability, etc. Additionally honey and eucalyptus oil in the formulation were added. As this formulation was successfully prepared with help of cream base which contains stearyl alcohol, bees wax, sorbitol monooleate, etc. As a preservative methyl paraben and propyl paraben were used. Sample of this formulation shows anti-microbial activity against staphylococcus aureus. As this individual extracts have different properties such as anti-coagulant, wound healing, etc which is already proved in other papers. As mixture of this extracts, develop in new cream formulation in this present which will show this entire properties and can be effective and safe. Thus it is concluded that growing demand for herbal formulation in the market is increasing day by day due to it is safe and effective. And one of the reason behind this formulation is its better absorption and penetration of the active moiety into the systemic circulation for early and better effect.

Further more, different agents can be used in the formulation. And long term studies and clinical trials can also possible if this work yields encouraging results. This formulation can also be incorporated in different suitable dosage forms such as ointments, gels, etc.

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