



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 Issue: XII Month of publication: December 2021

DOI: <https://doi.org/10.22214/ijraset.2021.39488>

www.ijraset.com

Call:  08813907089

E-mail ID: ijraset@gmail.com

Formulation of Herbal Gel for Wound Healing from Hollarrhena Pubences, Withania Somnifera, Azadirachta Indica, Curcuma Longa

Miss. Lavhale Harshada Ramdas¹, Prof. Aswar. A. R.², Dr. Hingane L. D.³

^{1,2}M.Pharmacy (Pharmacognosy)

³Aditya Pharmacy College, BEED 431122

Abstract: The present research has been undertaken with the aim to formulate and evaluate the herbal gel containing alcoholic extract of Hollarrhena pubences (kurchi), Withania somnifera (ashwagandha), curcuma longa (turmeric), Azadirachta indica (neem). The gel formulation prepared by using various polymer bases (methyl cellulose). The stability study has been carried as per ICH guideline. The results show that the gel formulation containing kurchi, ashwagandha, turmeric, neem has better stability than others. All formulations studied on animal model (rat). The present work justifies the use of herbal gel containing ashwagandha, turmeric, neem, kurchi for wound healing.

Keywords: wound healing; Hollarrhena pubences, withania somnifera, curcuma longa, azadirachta indica; topical gel.

I. INTRODUCTION

Various plant species have served as a source of medicine for people all over the world. Herbal medicine treatment is effective and has less side effect. India has a rich tradition of plant-based knowledge of health care. Plants and their extracts have potential for treatment of wound healing. The aim of the present study is to formulate and evaluate herbal gel containing extract of hollarrhena pubences, withania somnifera, curcuma longa, azadirachta indica for wound healing. Wound is a term applied for the disruption of anatomic continuity of a tissue with or without microbial infection. Most single synthetic drug formulations in the market are not reliable for their wound healing properties and some formulations also have irritation-like properties. Several medicinal plants have been found to have wound healing properties. Some plant extracts have been formulated for clinical use in wound management and have proved safe and efficacious.

The present study was undertaken to validate the effectiveness of the extract of hollarrhena pubences, withania somnifera, curcuma longa, azadirachta indica by formulating ethanolic extract in gel polymer (methyl cellulose).

A. Role of Herbal Ingredients

Hollarrhena pubences is widely used in Ayurveda. Its seeds are used as antihelminthic. And its leaves have antifungal property. In Ayurveda it is used for the treatment of many diseases. It also shows antimicrobial and wound healing properties.



Family: Apocynaceae

Chemical constituents: kurchessine, conessine, isoconessimine.

B. *Withania Somnifera*

Withania somnifera is cognitive enhancement as an antioxidants, as a anti- inflammatory agent and for immune system support, it also have wound healing herb. Chemicle constituents: Alkaloids (anaferine, anahygrin), steroidal lactones(withanolides, withaferines).

C. *Curcuma Longa*

Curcuma longa (turmeric) which consist of dried as well as fresh rhizome of the plant traditional it has been proved that it has anti-inflammatory, antioxidant, anticancer and antiseptic and also wound healing.

Chemicl constituents: Curvimenol, curcumin nourishment to the skin, useful in detoxification, treat fungle infection, and also has wound healing property.



Chemicle constituents: axadirachtin, nimbidin, sodium nimbinat, salanin, nimbinat.

D. *Azadirachta Indica*

Neem leaves has lots of medicinal properties, it has antiinflammatory propety, nourishment to the skin, useful in detoxification, treat fungle infection, and also has wound healing property.

Chemicle constituents: axadirachtin, nimbidin, sodium nimbinat, salanin, nimbinat.



Azadirachta indica

E. Chemical Composition Used In Gel Formulation And There Role

- 1) *Methyl Cellulose*: Methyl cellulose is odorless, transparent, stable, oil resistant, non toxic with good film forming property.
- 2) It is non ionic polymer with a linear structure and it was used as a gel formig agent in formulation.
- 3) *Methyl Paraben*: Methyl paraben has good antimicrobial activity hence it is use as a preservative in gel formulation to prevent the microbial contamination.
- 4) *Propyl Paraben*: It has anti fungal activity and also used as preservative in gel.
- 5) *Trietanolamine*: Triethanolamine is used in formulation to adjust the ph of gel.

II. MATERIAL METHOD

Preparation of plant extract: The aerial part of *Hollarrhena pubences*, *Withania somnifera*, *azadirachta indica*, collected from agriculture nurseries. turmeric rhizomes were obtain from local market. The plant specimen was air dried in shade, powdered and were subjected to cold extraction method by maceration with methanol with shaking for 70hrs. after maceration the extract was filtered. The optaine extract kept in a tight container.

Chemicals: methyl cellulose, methyl paraben, propyl paraben, carbomer.

A. Preparation of Herbal Gel

1gm of methyl cellulose was dispersed in 45 ml distilled water with continuous sturing. 4ml distilled water was taken required quantity of methyl paraben and propyl paraben were dissolve by heating on water bath cool the solution then add extract (1gm) of *hollarrhena pubences*, *withania somnifera*, *curcuma longa*, and *azadirachta indica* and mixed the formulation properly in methyl cellulose with continuous stering and then trietanolamine was aaded dropwise to the formulation for adjustment of required skin ph. The gel is ready for use.

Formulation of topicle gel containing:

Sr.No.	Exipient	Quanity
1	Plant extract	1gm
2	Methyl cellulose	1gm
3	Propyl paraben	0.2gm
4	Trietanolamine	0.2 ml

The gel was greenish in color and tranceluent in aapperancr and gave smooth feel on application which was maintain after tested stability study. Ph is also maintain through out the study the initial viscosity of developed gel were mesured by using Brookfield viscometer with spindle.



B. Evaluation of Herbal gel Formulation

- 1) *Physical Evaluation:* Physical parameter such as colour, odour and appearance were checked.
- 2) *Yield Value:* It is a measure of the force required to extrude the material from a deformable bottle tube. It is checked by using an instrument called penetrometer.
- 3) *Viscosity:* Viscosity of gel was measured by using Brookfield viscometer with spindle.
- 4) *Mesurement of Ph:* Ph of gel was measured by using ph meter.
- 5) *Spreadability:* Spreadability was determined by the apparatus which consists of a wooden block which was provided by a pulley at one end. By this method spreadability was measured on the basis of slip and drug characteristics of gel.
- 6) *Stability Study:* The stability study was performed as per ICH guidelines. The formulated gel was filtered into collapsible tubes and stored at different temperature and humidity conditions.
- 7) *Skin Irritation Test:* 0.5gm of the herbal gel was used as a test substance and was applied to the skin and covered with a gauze patch. The patch was loosely held in contact with skin by means of a semi-occlusive dressing for a duration of one hour and the gauze was removed. It was observed that the applied area has no sensitivity to the skin.

C. Experimental Procedure

2 Albino rats weighing 150-200 gm weight were used for study. Animals were anesthetized prior to and during creation of wound. Dorsal fur of the animals was shaved with a razor. The wound was created by using a surgical blade and scissors. After creation of wound, the herbal formulated gel was applied to the first rat and the other formulation to the second rat. The wound healing of both rats was observed after some days. The herbal gel showed a faster rate of wound healing as compared to other formulations.

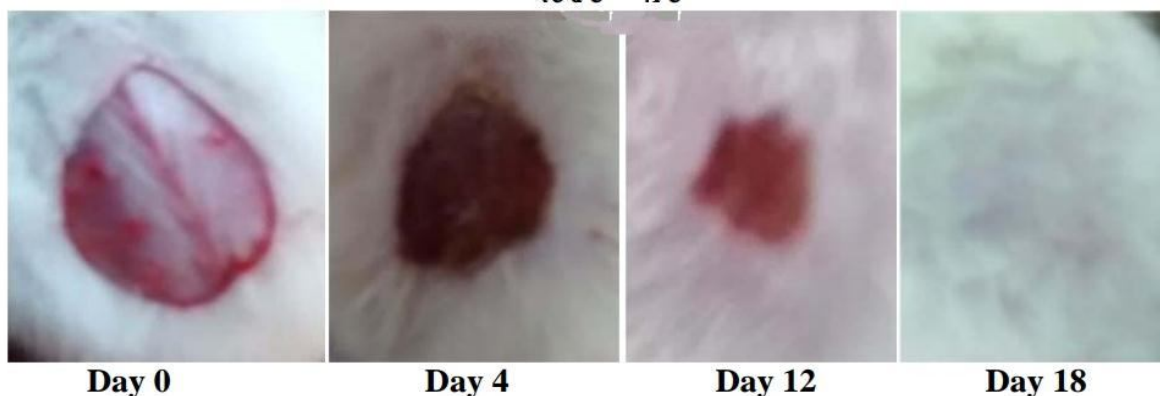
D. Advantages of Formulated Herbal Gel

- 1) More affordable than conventional.
- 2) Side effects do not occur by this gel.
- 3) The formulated gel is cost-effective.
- 4) Irritation is not observed with this gel.
- 5) The herbal gel was very easy to form.



III. RESULT

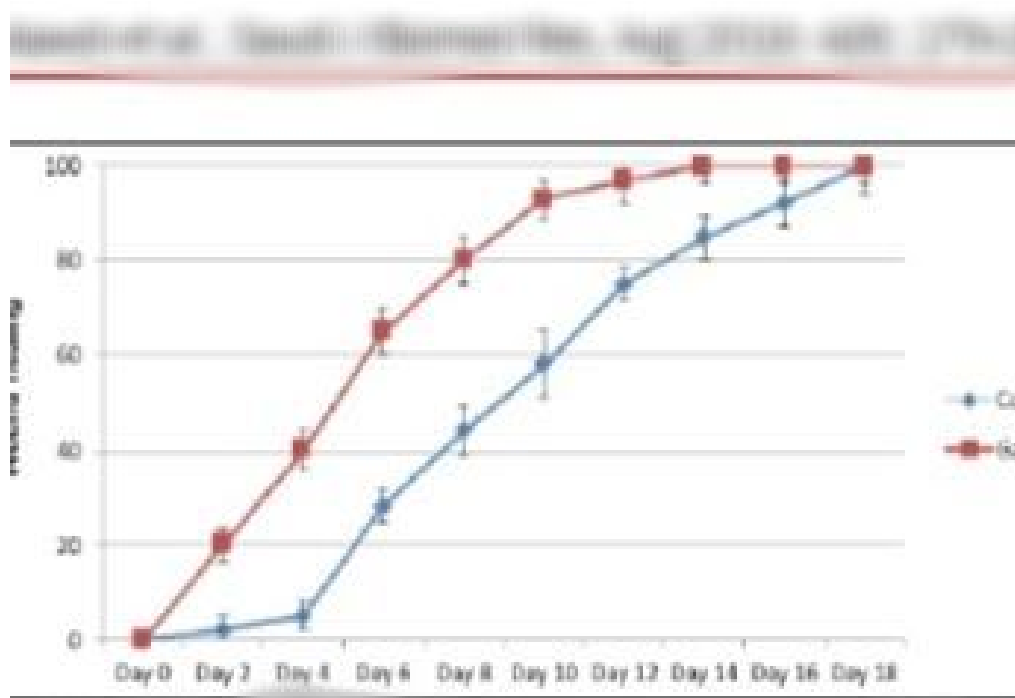
- 1) *Preliminary Phytochemicals Study:* The ethanolic extract of hollarrhena pubences, withania somnifera, curcuma longa, azadirachta indica showed the presence of phytoconstituents like alkaloids, flavonoids, phenols, carbohydrates, tannins, saponins, and steroids.
- 2) *Wound Healing Activity:* The wound healing activity of gel prepared from hollarrhena pubences, withania somnifera, curcuma longa, azadirachta indica is very well. And it has no irritation and other side effects.



The image show wound healing activity of herble gel prepared from hollarrhena pubences, withania somnifera, curcuma longa, azadirachta indica on animal model (albino rat) on different days.

- 3) *Red Line*: Show wound healing with herble gel formulation of hollarrhena pubences, withania somnifera, cucurma longa, azadirachta indica.
- 4) *Blue Line*: Show wound healing with other formulation.

From graph we find out herble gel formulation show faster rate of wound healing as copare to other formulation.



IV. CONCLUSION

The pharmacological evaluation of the gel was made by wound model. In this study it was seen that the herble concentration of gel showed wound closure as compare to other formulation. The 5% gel show better activity which is highly comparable to standard. Thus from above study it is concluded that the hollarrhena pubences, withania somnifera, cucurma longa, azadirachta indica showed good wound healing. It has no irritation to the skin and has no other side effect.

Natural remedies are more acceptable in the belief that they are safer as compare to synthetic one.

REFERENCES

- [1] Pal S, Shukla Y. Herbal medicine: current status and the future. *Asian Pacific J Cancer Prev* 2003;4:281–8.
- [2] Karodi R, Jadhav M, Rub R, Bafna a. Evaluation of the wound healing activity of a crude extract of *Rubia cordifolia* L. (Indian madder) in mice. *Int J Appl Res Nat Prod* 2009;2:12–8.
- [3] Kumar B, Vijayakumar M, Govindarajan R, Pushpangadan P. Ethnopharmacological approaches to wound healing-Exploring medicinal plants of India. *J Ethnopharmacol* 2007;114:103–13. doi:10.1016/j.jep.2007.08.010.
- [4] KIRTIKAR KR, BASU BD. *Indian Medicinal Plants*. 1918.
- [5] Chothani DL, Patel NM. Preliminary phytochemical screening, pharmacognostic and physicochemical evaluation of leaf of *Gmelina arborea*. *Asian Pac J Trop Biom*
- [6] Harborne AJ. *Phytochemical Methods A Guide to Modern Techniques of Plant Analysis*. Springer Science & Business Media; 1998.
- [7] Dande PR, Talekar VS, Chakraborty GS. Evaluation of crude saponins extract from leaves of *Sesbania sesban* (L.) Merr. for topical anti-inflammatory activity. *Int J Res Pharm Sci* 2010;1:296–9.
- [8] Nagar HK, Srivastava AK, Srivastava R, Kurmi ML, Chandel HS, Ranawat MS. Pharmacological Investigation of the Wound Healing Activity of *Cestrum nocturnum* (L .) Ointment in Wistar Albino Rats 2016;2016. doi:10.1155/2016/9249040
- [9] Garg V, Paliwal S. Wound-healing activity of ethanolic and aqueous extracts of *Ficus benghalensis*. *J Adv Pharm Technol Res* 2011;2:110. doi:10.4103/2231-4040.82957.
- [10] Morton JJ, Malone MH. Evaluation of vulnerary activity by an open wound procedure in rats. *Arch Int Pharmacodyn Thérapie* 1972;196:117–26.
- [11] Sreedhar V, Nath LKR, Gopal NM, Nath MS. In-vitro antioxidant activity and free radical scavenging potential of roots of *Vitex trifoliata*. *Res J Pharm Biol Chem Sci* 2010;1:1036–44.
- [12] Stoline MR. The status of multiple comparisons: simultaneous estimation of all pairwise comparisons in one-way ANOVA designs.



10.22214/IJRASET



45.98



IMPACT FACTOR:
7.129



IMPACT FACTOR:
7.429



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24*7 Support on Whatsapp)