

“Formulation of Morinda Wound Healing Ointment”



Tole S.B, Demgunde N.D., Joshi A.A., Korekar S.L

Abstract: The biological process of Wound healing comprises the trauma and pathologic condition of the oral mucosa. For this requires proper management so the wound heal faster and without any complication. The strong indicator of wound healing is the increase in number of fibroblast cells in the oral mucosa. The remodelling phase of wound healing shows decreasing fibroblast cell proliferation and then collagen fibres are synthesized. Noni plant have tremendous medicinal uses, by observing this fact Noni leaf (*Morinda citrifolia* L.), a part of the noni plant, was successfully used in present research to make ointments to heal soft tissue in wounds. The leaves of *Morinda* have potential chemical compounds such as glycosides, sterol, amino acids and scopletin that may be useful in the wound repair process. In addition to this *Morinda citrifolia* leaf contains active substances such as saponin, tannin, polyphenol flavonoid, and triterpen. The purpose of this research is to discover the activeness of the *Morinda citrifolia* leaves extracts in normal solvent such as ethanol to make ointments in order to arrest the growth of the bacteria. [1] By using maceration extract of morinda leaves done successfully, ointment made and done the evaluation test such as spreadibility, diffusion study, washability and very important antimicrobial test. The entire test gives corresponding good result, so the present research showing good response to healing mechanism of wounds. [3]

Key Words-Wound, Noni plant, Ointment, *Morinda citrifolia* L., Indian mulberry, Cheese fruit

I. INTRODUCTION

Herbal medicine is the fulcrum of complementary and alternative medicine, which is from ancient times used in all over the world. The usefulness of herbal medicine cuts across gender, social, racial classes in both developed and developing countries. Herbal remedy is used for its least side effects and permanent cure from number of diseases. Because of poor hygienic condition wound healing is one of the most common diseases in developing countries. By the accidental injury healing of wounds start and it can for varying period of time. Depending upon the extent of wounds the process can be categorized into three stages. i.e. inflammatory phase, proliferative phase and remodeling phase. Which ultimately controls the strength and appearance of healed tissues. Healing of wound occurs in several steps which involves coagulation, inflammation, formation of granulation, tissue matrix, formation of remodelling of connective tissue, collagenisation and acquisition of wound strength. [1]

Natural herbal ointments are more acceptable, because as compare to synthetic one they are safer with very less side effects. Herbal formulation has tremendous demand in the world market. In the present formulation of wound healing herbal remedy are the main ingredients in the extract of powdered leaves of *Morinda Citrifolia*. which contains glycosides, acids, sterols and also amino acids. The role of ointment bases is mainly stabilize the other chemicals in the herbal formulation and also provide softening effect at the site of wound application. The antimicrobial capacity of various part of *Morinda* other than the leaves was reported by several researcher, according to study of **Abdul Mushin M Shami, 2016.**, to isolate the anthraquinone fractions isolated from the fruit and roots of *Morinda*, can be a new source of antimicrobials against pathogenic bacteria and act as an antioxidant. It could be proved that the anthraquinone of the plant had a good source of antimicrobials against pathogenic bacteria.

In addition to this, most important contribution are given by **Reem Abou Assi et al, 2017.**, fresh Tahitian *M. citrifolia* leaf juice, its leaf extract not only in ethanol but also in complex solvent such as methanol and hexane. Topical wound healing properties of all solvent extract were studied. All *Morinda citrifolia* leaf extracts showed a wound healing activity at a concentration dependent manner. As already knowing that leaf of *Morinda citrifolia* contains saponin, flavonoid, polyphenol, tannin and triterpen. All these constituents have the function as antibacterial components, So this aspect was taken by **A Pongoh et al., 2018** for the purpose to investigate the activeness of the *Morinda citrifolia* leaf extract in order to stop the growth of the specific bacteria such as *aeromonas hydrophilla*. This bacteria is responsible for the occurrence of motile *Aeromonas* Septicemia disease (MAS) on freshwater fish. This research was carried out invitro. The method is totally assayed as an antibacterial test which is totally based on soft diffused paper disc. (ethanol 96%). The results of the study showed that *Morinda citrifolia* leaf extract was effective to regist the growth of the bacteria such as *aeromonas hydrophilla*. The present research is deals, to make the herbal ointment from leaves of *Morinda Citrifolia* for the purpose of wound healing and protection of the skin from UV-radiations. ¹To obtain ethanolic extract of *Morinda* Leaves. To study antimicrobial activity of *Morinda* Ointment and also to do evaluation of the *Morinda* Ointment.

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Methods and Materials

Phase I

1. Collection of crude drug i.e., Morinda leaves.
2. Drying of Morinda leaves.
3. Extraction of leaves.

Phase II

Formulation and evaluation of Herbal Wound Healing Ointment and evaluation of physical parameter such as colour, odour, appearance, consistency, spreadability,



Fig No: 1 Fresh Morinda Citrifolia Leaves

Phytoconstituent / Chemical Constituent:

Important chemical constituents of Morinda Citrifolia

Leaves are

Glycosides: These are main constituent of morinda leaves. The constituents of glycosides are involved in actual healing process of wound and these are β -D-glucopyranoside, Citrifolinin-A, Asperulosidetetraacetate, β -D-galactopyranoside, Kaempferol, Quercetin, Citrifolinoside.

Sterol: Among sterol, β -sitosterol is main constituent present in Morinda Citrifolia.

Amino Acids: All essential amino acids are present in Morinda Citrifolia leaves and these are Alanine, Tryptophan, Threonine, Cysteine, Isolucine, Lucine, Methionine, Aspartic Acid and also Proline.

Acid: Gallic Acid.[1]

Mechanism of action of phytoconstituents present in various Morinda Leaves:

➤ **Scopoletin:** Scopoletin shows anti-inflammatory mechanisms in the edema.-----

Citrifolinoside: Citrifolinoside that was isolated from the leaves of Morinda Citrifolia. Leaves, showed activity in cell cultures mechanism & also wound healing activity.

Gallic acid: Gallic acid have function in human mast cells for this they fever reduced immunoglobulin E (IgE) which induced histamine release from mast cells. Which was

washability, diffusion Study, pH, loss On drying and antimicrobial Activity.[7]

Pharmacognostical study

Morinda citrifolia is Native to tropical & subtropical Asia and Australia, Dicotyledonae belong to phylum Spermatophyta and subphylum Angiospermae. Synonym of Morinda Citrifolia is Indian mulberry (Noni), Cheese fruit and its biological source is belong to Rubiaceae family which bears fruits Yellowish green/white, 10-18 cm(3.9-7.1 inch) and leaves are green, 20-45cm long, 7-25cm wide. The whole plant have pungent odour.[1]

stimulated pro-inflammatory cytokine gene expression and production of TNF- α and IL-6 in human mast cells.[1]

II.METHOD OF EXTRACTION

Take 706 gram leaves of fresh Morinda citrifolia and washed with distilled water. Then washed leaves are dried at 50°C temperature in hot air oven for 18 hours. A dried leaf was grinded by using blender for to make fine powder. Extraction was done by Maceration technique. For this purpose a tightly closed glass chamber was chosen with addition of 96% ethanol as solvent in which Morinda citrifolia L leaves powder was added. The incubation period for submerisation of powder was four (04) days. To make viscous extract of Morinda citrifolia L leaves the filtration assembly was carried. After completion of incubation period, the filtration of powder was carried with a buchner funnel that had been previously coated with filter paper and that was placed into the glass chamber for to obtain filtrate and residue. Then the filtrate was called for evaporation using a heating mantle at a temperature of 40°C for to obtain a viscous extract. Then the viscous extract was stored at temperature between 0-4°C.[2]

Formulation of Morinda Ointment

Firstly decided ingredients & its quantity for making ointment base (10 gm), then adding to its Morinda leaf viscous extract (0.5gm) for making wound healing ointment.



Table No-01 Composition of ingredients for wound healing ointment.

Sr. No.	Ingredients	Quantity taken
1	Ointment Base	10gm
2	Hard Paraffin	0.5gm
3	Cetostearyl Alcohol	0.5gm
4	Yellow Soft Paraffin	8.5gm
5	Wool Fat	0.5gm
6	Morinda leaf viscous extract	0.5gm

The morinda ointment was prepared by using ointment base, which was prepared by using hard paraffin that was placed in evaporating dish on water bath. The hard paraffin was melted then simultaneously other ingredient was added to it and to perform the stirring. When the ointment base showing homogeneous appearance then addition of weighed Morinda Citrifolia leaf viscous extract to the cooled ointment base. By using levigation method for to make smooth paste. After completion of whole process the suitable container was chosen for to fill the herbal Morinda Ointment.[7]

III.EVALUATION OF OINTMENT

The prepared Morinda ointment was evaluated. The formed Morinda ointment have brownish red in colour, persist pungent odour. Good in appearance and have smooth consistency & no greediness are observed. Spreadability was good and easily washable with tap water/ warm water. Under diffusion study the time (after 60 minutes) was taken by ointment to get easily diffused. The diffusion study was performed on agar nutrient medium. For this study a whole board at the centre of medium was taken and ointment was placed in it. It has good diffusible property on nutrient agar media whereas loss. On drying (LOD) was performed to the formulation, for that purpose formulation was placed in Petri-dish on the water bath and it was dried by the application of temperature in between 10 to 50 °C. By using digital P^H meter the measurement of P^H was carried out. For this purpose by using 100 ml of distilled water the solution of ointment was prepared and it was set aside for 2 hrs. No evidence of skin irritation and allergic Sensitization were reported.[9]

The antimicrobial activity was performed to observe the zone of inhibition against the growth of bacteria of the prepared ointment on the nutrient agar media. By using the two bacterial strain i.e., E.Coli & Bacillia Sp., the Cup Plate Method was used for this purpose. The prepared and inoculated plates are incubated in an incubator for 24 hours and then followed by 48 hours. Simutaneously the two standered wound healing ointment (Himalaya & Zakhmeruz) are also used for comparing the zone of inhibition. The results were observed and compared the zone of inhibition with the two Standard ointments from the market i.e., Himalaya & Zakhmeruz..[10]

IV.RESULT AND DISCUSSION

When the ointment applied on skin then it becomes easily removed by the application of water, so the washability was good. The prepared ointment had found Emolliency, slipperiness property which is actually required for the ointment formulation. The pH of the ointment was found to be in range of 5.19-6 which is compatible & good for all skin types. The complete formulations were shown pH nearer to skin required. The prepared formulation produces a uniform distribution of extracts in ointment. This was shown by smooth appereance and it have also slimy touch. When formulations were kept for long time, it was found that ointment does not changes its color.. The results of pH & Loss on Drying (LOD) value of formulations showed satisfactory values. The redness, inflammation and edema were NOT observed. The result of antimicrobial test for E.coli & Bacillia Sp. on nutrient agar media shows significant and moderate Zone Of Inhibition after incubation of plates in incubator for 24 hours followed by 48 hours.[10]

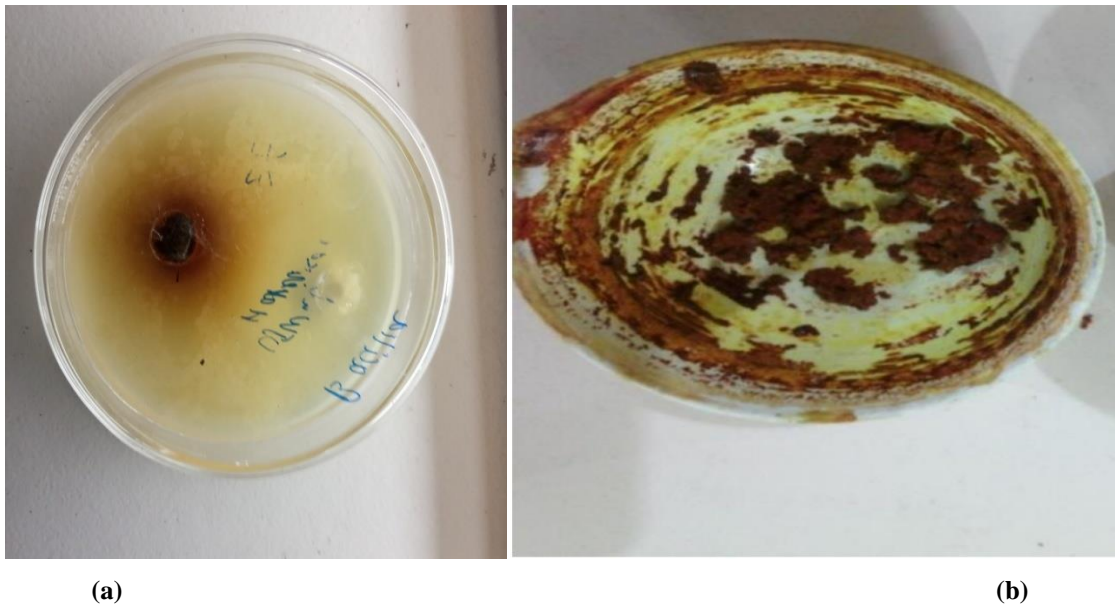
Sr. No	Parameters	Obtained Results
1	Washability	Good
2	Emoliency	Good
3	PH	5.19-6
4	LOD	Within the Limit
5	Antimicrobial activity E. Coli Bacilli	Within the Limit
6	Diffusion Study	Excellent



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Fig.No.2: Zone of Inhibition of Morinda Citrifolia & Standard Ointments Himalaya (H) & Zakhameruz (Z) against Bacillia Sp & E.Coli bacteria.



(a)

(b)

Fig.No.3: Diffusion Study of Morinda Extract (a) & loss on drying test (b)



(c)



(d)

Fig No 4: Consistency, Non-Irritancy test (c) & Washability test (d)

V.CONCLUSION

- As the uses of herbal ointments have been increased in many folds in personal care system for better and long term safety. So we can conclude that the present research work focuses on the potential of morinda ointment from herbal ingredient for wound healing.
- The use of bio active ingredients in Morinda ointment influences biological functions of skins and provide constituents necessary for the wound healing of skin and also provide protection against UV-Radiation and almost antimicrobial.

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