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A Pharmaceutico-Analytical Study of *Raala Malahara* and experimental evaluation of its Wound Healing Activity

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ABSTRACT

Background: In present era, Skin disease has become a misery, suffering, depression and economical loss as it is becoming common and lowered threshold for seeking medical attention. Microorganisms are present everywhere in the surroundings which are responsible for large number of infectious diseases in human beings. These problems can be avoided with *Malaharayogas* explained by our *Aacharyas*. *Raala Malahara* is one among them which is mentioned in *Rasatantra Saara Va Siddha Prayoga Sangraha*. **Methodology:** Raw materials viz *Raala*, *Tuttha* and *Tila Taila* were screened and collected. *Raala* and *Tuttha* were finely powdered. *Tila Taila* as the base for *Malahara*, it was prepared with maceration procedure until a creamy, semisolid mixture occurs. This semisolid mixture is called as *Raala Malahara*. It was stored in glass jar containing water and every day the water was changed to maintain its properties. *Raala Malahara* was subjected for the Analytical studies, Phyto-chemical studies and experimental studies for its wound healing activity. **Results:** Results of Analytical study of *Raala Malahara* shows values as follows: pH value: 6.94, Loss on Drying: 61.427%, Rancidity test: Negative, Spreadability: 42mm, Fat content: 15.584%. Result of the experimental study shows that *Raala Malahara* possesses better results as Wound healing agents especially in excisional wounds. **Conclusion:** *Raala Malahara* possesses better results as Wound healing activity in excisional wounds.

Key words: *Raala Malahara*, Wound healing activity.

INTRODUCTION

The term 'Vrana' is derived from the verbal root 'Vran' meaning "splitting/tearing" of the body. It means anything that causing discontinuity of the skin and

other tissue under it. The term *Vrana* was used by the *Aacharyas* because it occupies the skin or the area of the body and also the *Vrana Vastu* (scar/cicatrix formed later) does not get lost or disappear even after healing and remains till the body survives. Wound is defined as the disruption of anatomic and cellular continuity of tissue caused by chemical, physical, thermal, microbial or immunological injury to the tissue. Wound healing processes consists of integrated cellular and bio chemical cascades leading to reestablishment of structural and functional integrity of the damaged tissue.^[1] *Malahara Kalpana* comes under *Bahya Kalpana* (external application). The word 'Malahara' was adapted by *Yogaratanakara* from the word *Malaham*^[2] or *Marham* which is originated from Unani system of medicine. The word *Malahara* means that it removes *Mala* from *Vrana*, *Vidradi*, *Twakvikara* etc. These are widely used ointments with many

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advantages. Base materials are required for preparation of *Malahara* & *Sikta Taila* is one among them which is commonly used. Base which is the chief ingredient of *Malahara Kalpana* should be smooth, soft, should not produce irritation & sensitization of skin. This is similar to ointments (unguentum) in modern pharmaceuticals.^[3] *Raala Malahara* is one among them which is mentioned in *Rasatantra Saara Va Siddha Prayoga Sangraha*^[4] and it is a herbo-mineral formulation consists of *Tila Taila*, *Sarjarasa*, *Neela Tutta* intended for external application in *Vrana*. Hence, this study is undertaken to evaluate its physico-chemical analysis and wound healing activity of *Raala Malahara*.^[5]

Sarjarasa^[6] - *Vateria indica* resin is used in treating infected wounds, diarrhoea, earache, intestinal worms, etc. the gum resin is used as a base to prepare sticks used for herbal smoking in Ayurveda. It belongs to Dipterocarpaceae^[7] family. It occurs in rough irregular, solid brittle masses, breaking into angular pieces, 1.5cm thick, pale white or light yellow in colour, odour fragrant, taste bland and astringent.^[8,9]

MATERIALS AND METHODS

Collection of samples

All three ingredients viz *Raala*, *Tuttha* and *Tila Taila* were collected from Trichy Ayurvedic Union, 2/14, Agraharam, Bommasamudram, Vayalur Road, Trichy, Tamilnadu.

Authentication of drug

The authentication of the raw drug was done at the *Rasashastra* and *Bhaishajya Kalpana* P.G department laboratory, Ramakrishna Ayurvedic Medical College Hospital and Research Centre, Yelahanka, Bangalore.

Preparation of *Raala Malahara*

Preparation of *Raala Malahara* was done at *Rasashastra* and *Bhaishajya Kalpana* P.G department *Rasashala*, Ramakrishna Ayurvedic Medical College Hospital and Research Centre, Yelahanka, Bangalore.

The *Tutta* and *Raala* both were finely powdered. *Tila Taila* was taken in a vessel and heated up until fumes starts appearing. Then the stove is put off and both the

powdered ingredients were added one by one and stirred well until they were completely mixed homogenous. The mixture was then filtered and kept for rest until they were cooled. Then they were macerated well with water until the water gets warmth. Once the water gets warmth, it was decanted and fresh water was used for further maceration. This maceration procedure was continued several times until a creamy, semisolid mixture occurs. This semisolid mixture is called as *Raala Malahara*. It was stored in glass jar containing water and every day the water was changed to maintain its properties.

Photographs of preparation of *Raala Malahara*

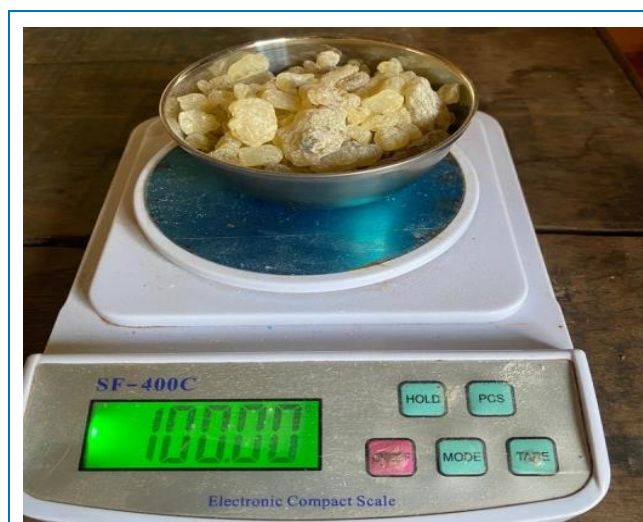


Fig. 1: *Raala*



Fig. 2: *Tuttha*

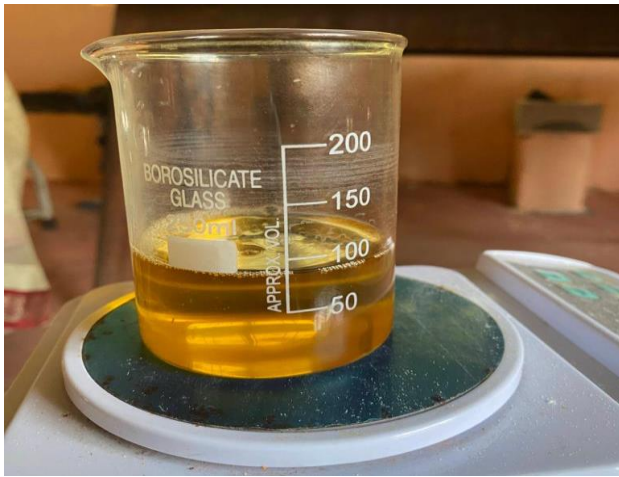


Fig. 3: Tila Taila



Fig. 6: Pounding Raala and Tuttha



Fig. 4: Weighing Raala



Fig. 7: Heating Tila Taila



Fig. 5: Weighing Tuttha



Fig. 8: Adding Pounded Drugs



Fig. 9: Mixing the Drugs



Fig. 10: Filtering the Mixture



Fig. 11: Maceration no. 1



Fig. 12: Maceration no. 12

Organoleptic Parameters

The samples were subjected for organoleptic examinations viz Appearance, Colour, Consistency and odour of the sample were observed.

Experimental evaluation by excisional wound

The experimental study was conducted in “Invivo Biosciences Lab”, No.23, Katha No. 3169, Assessment No. 154, Kodigehalli Village, Off Magadi Road, Yeshwanthpur Hobli, Bengaluru.

Selection of experimental animal

- Wister strain albino rats were selected from animal house
- The rats were maintained under strict laboratory conditions, controlled with environmental, temperature, humidity and light dark cycles.
- Rats were fed with balanced diet.

Route of administration: External application

Wound Healing Activities

For excision wound model, animals are divided into three groups each consisting of ten animals as follows,

Group 1 - is a control group, no intervention was done

Group 2 - is a standard group, will be treated with Povidone iodine ointment

Group 3 - is a trail group, will be treated with *Raala Malahara*

Experimentation

The wound healing property of the trial drug *Raala Malahara* can be analyzed in albino rats by Excision wound model. The technique consists of the following stages,

1. Pre - operative stage
2. Operative stage
3. Post - operative stage

1. Pre- operative stage

The selected albino rats numbering 30 were divided into 3 groups of 10 rats each, one group each for Control, Standard, Trial 1.

2. Operative stage

a) Materials required

For experimental study the materials required are, Albino rats 30 in number, Ketamine, Albino rat cages, Scissors, Betadine, mosquito forceps, artery forceps, blunt forceps, surgical cotton, surgical gloves, scalpels.

b) Excision wound model

This was conducted according to the technique developed by Morton and Malone. The animals were anaesthetized using ketamine intra-peritoneal injection. After the animals were sufficiently anaesthetized, they were secured to the dissection plate in prone position. The hairs were removed from the part to be operated. The area was cleaned with betadine. A round seal of 2.5 cm in diameter was impressed on the dorsal thoracic central region 5cm away from the areas of the anaesthetized rats. Full skin thickness from the marked area was excised in circular fashion with the help of forceps, surgical blade and scissors. The approximate area thus formed was 500mm². After achieving full hemostasis, the animals were placed in individual cages.

3. Postoperative stage

External application of *Raala Malahara* was started in different groups from the day of surgery (0 day). Every post-wounding day the wounds were cleaned with normal saline and the trial drug was applied to the trial group. The wounds were cleaned daily with normal

saline in control groups. All the rats were given normal food and water.

Excision wound model

To monitor the changes in the wound shapes, the wound margins were traced on a thin transparent polythene sheet from the day of wounding (0 day) and continued till the complete healing of the wound. This was again retraced on a millimeter scale graph paper. The observations of percentage of wound closure were made on the 4th, 8th, 12th, and 16th post wounding days.

Photographs of Experimental Study - Wound Healing Activity

Fig. 13: Excisional Wound in Albino Rats



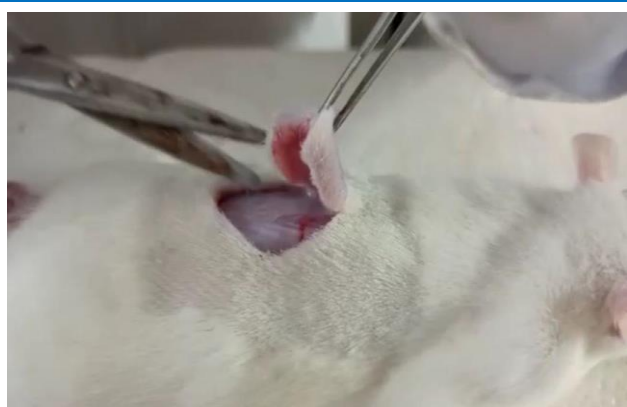


Fig. 14: Application of Raala Malahara In Excisional Wound



OBSERVATION AND RESULTS

The organoleptic parameters results are:

Table 1: Showing Results of organoleptic parameters

Organoleptic parameters	Results
Rancidity test	Negative
Spreadability	42mm
Fat content	15.584%
Loss on Drying	61.427%

The experimental results are:

Table 2: Excisional Wound Area - Control Group % inhibition

Group name	Animal No.	% inhibition			
		Day 4	Day 8	Day 12	Day 16
Control	1	16.97	31.29	73.02	85.40
	2	22.36	43.06	78.33	89.86
	3	37.74	40.39	80.95	87.65
	4	27.88	30.62	75.71	82.58
	5	19.02	46.57	74.83	92.59
	6	29.26	50.07	83.55	92.14

	7	40.10	56.30	84.58	94.09
	8	21.84	45.14	74.30	95.61
	9	22.96	40.63	81.12	92.45
	10	27.20	51.67	86.32	93.92
	Mean	26.53	43.58	79.27	90.63
	SEM	2.40	2.62	1.49	1.33

Table 3: Excisional Wound Area - Povidone Iodine % inhibition

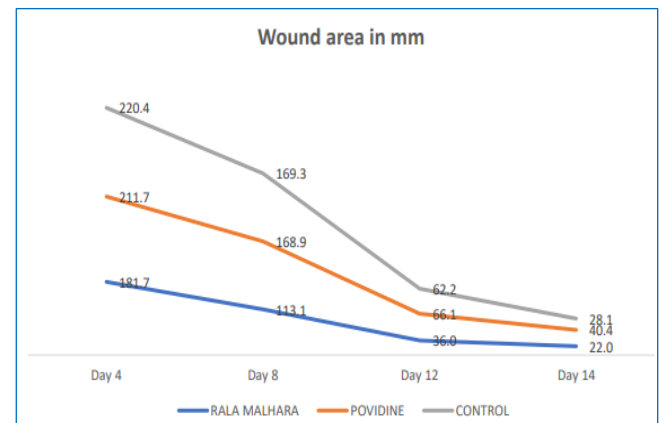
Group name	Animal No.	% inhibition			
		Day 4	Day 8	Day 12	Day 16
Povidine	1	33.48	45.55	75.87	85.07
	2	29.78	43.89	87.26	90.36
	3	19.79	39.29	79.91	82.14
	4	22.76	49.17	81.94	90.44
	5	31.12	46.43	82.48	89.29
	6	29.99	40.32	80.21	89.51
	7	28.50	44.17	65.67	78.83
	8	26.76	36.55	73.96	92.81
	9	28.28	39.22	72.81	82.50
	10	44.02	52.39	79.48	84.26
	Mean	29.45	43.70	77.96	86.52
	SEM	2.05	1.56	1.92	1.44

Table 4: Excisional Wound Area - Raala Malahara % inhibition

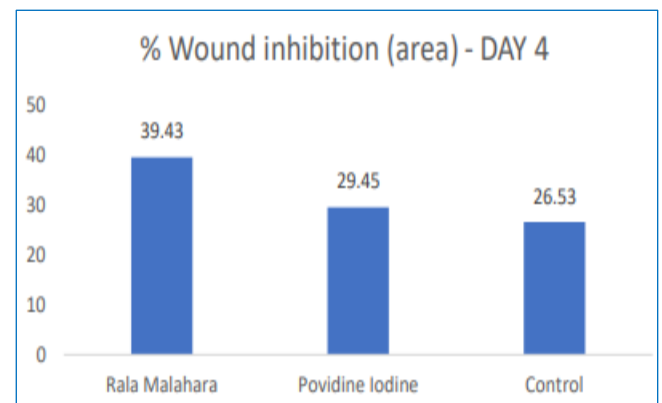
Group name	Animal No.	% inhibition			
		Day 4	Day 8	Day 12	Day 16
Rala Malahara	1	41.03	61.60	89.94	94.51
	2	63.76	74.70	91.27	95.36
	3	34.54	56.94	88.58	95.66
	4	28.38	66.56	87.60	90.05
	5	44.35	65.88	90.59	93.06
	6	41.02	67.25	84.15	89.44

	7	32.58	57.05	89.47	92.38
	8	32.31	52.99	82.56	89.23
	9	43.04	61.65	88.48	94.94
	10	33.29	58.22	87.33	91.91
	Mean	39.43*	62.28*	88.00	92.65
	SEM	3.19	2.03	0.87	0.78

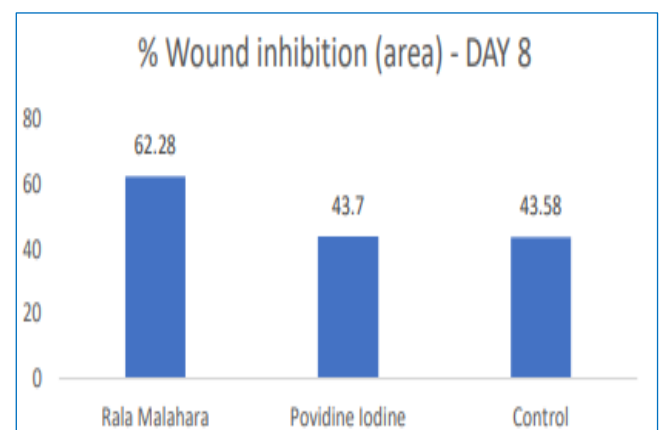
Graph 1: Showing wound area in mm



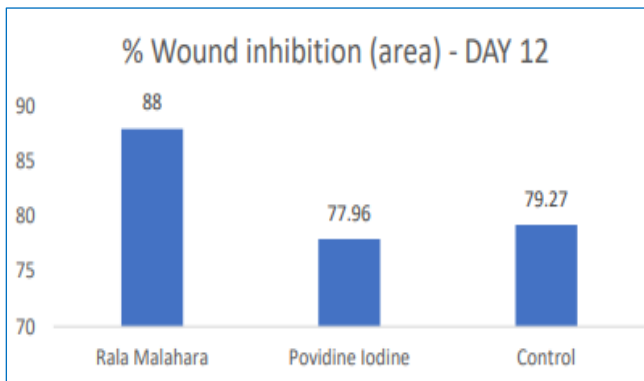
Graph 2: Showing % of wound inhibition on day 4



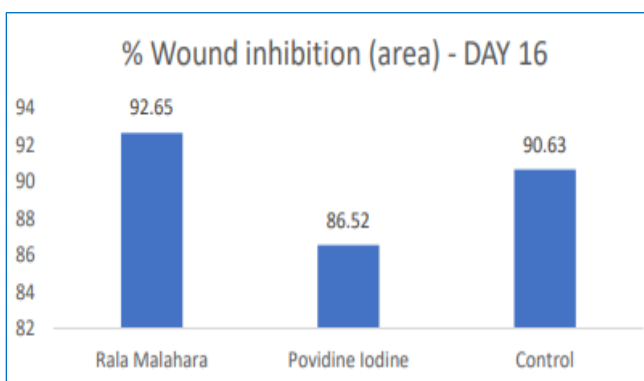
Graph 3: Showing % of wound inhibition on day 8



Graph 4: Showing % of wound inhibition on day 12



Graph 5: Showing % of wound inhibition on day 16



DISCUSSION

Discussion on Analytical Study

pH of *Raala Malahara* was 6.94 which is acidic in nature. This acidic nature possessed in *Raala Malahara* could be the reason for non-contamination of wound by the microbes, fungus or viruses. This doesn't cause any harmful effect or reaction to the skin. Fatty matter of *Raala Malahara* 15.584% which is under the normal limit. Rancidity test of *Raala Malahara* is negative, means that the product is stable in terms of its quality. Loss on drying of *Raala Malahara* was 61.427%, which indicates that the *Malahara* possess sufficient amount of moisture content in it. Thus, it will not make the wound dry by which itching can be controlled. Spreadability of the Sample *Raala Malahara* was found to be 42mm, which shows that the *Malahara* can be easily applied on the surface of the skin.

Discussion on Experimental Study

In this study it was found *Raala Malahara* showed marked reduction in wound area compared against

control and standard group on day 4 and day 8. Even on day 12 and day 16 *Raala Malahara* shows better wound healing percentage as compared against control and standard group. However on day 12 and day 16 wound healing in all the groups was almost similar because of the natural wound healing process that take place in the animals. Even then *Raala Malahara* was used for healing the wound is because to soothen the wounded area and to avoid itching, burning sensation, microbial contamination and faster healing of wound.

CONCLUSION

In the Pharmaceutico-analytical study of *Raala Malahara* and experimental evaluation of its wound healing activity it is found that *Raala Malahara* has possessed significant effect in healing the wound. The Analytical study values were also under the normal limits which shows the potential of the drug in healing the wound effectively.

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