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An experimental study of efficacy of *Shala patra churna* in contact poisoning due to *Bhallataka taila* in albino mice

Research Article

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Abstract

Bhallataka (*Semicarpus Anacaardium Linn. Anacardiaceae*) is mentioned as a poisonous medical plant under drug and cosmetic act 1940. Local application of *Bhallataka* is more common as many people use *Bhallataka* as home remedy for relieving *pain*. *Bhallataka* oil is used commercially in industry for preparation of dyes etc. So, exposure to oil and contact poisoning of *Bhallataka* is quite common in India. According to *Yogaratnakara*, *Shala Patra Churna*, internally & externally application on the whole body immediately relieves the poisonous effect of *Bhallataka*. Aim: To study efficacy of *Shala Patra Churna* in contact poisoning due to *Bhallataka Taila* in Albino mice. Objective: To study antitoxic properties of *Shala Patra Churna* in contact poisoning due to *Bhallataka Taila*. Material and methods: Preparation, authentication, and standardization of *Bhallatak Tail* and *Shala Patra Churna*. 3 groups were made each of 6 mice. After application procedure, all mice were observed for 24 hours for any signs. Rating of skin reaction was evaluated as per the Indian Standard BIS (Bureau of Indian Standards)1992. Test sample and standard drug applied for 7 consecutive days. Observation and results: Observation done in 3 groups of animals for the duration of 7 days study. All the necessary precautions were taken to carry out each step during study. Conclusion: Effect of local application of *Shala patra churna* is equivalent to the standard drug (silver nitrate gel). Therefore, *Shala* plant can be significantly used for the treatment of *Bhallataka* induced contact poison.

Key Words: *Bhallatak Tail, Semecarpus Anacardium Linn*, Poisonous plants, *Shala Patra Churna,* Contact Poisoning.

Introduction

Ayurveda has eight main pillars including *Agadtantra* which deals with *Nidana* and *Chikitsa* of poisoning due to different *Sthavar* (Inanimate) & *Jangam* (Animate) poisons & even *Kritrim* (Artificial) poison. (1) A substance which after entering the body, disturb natural and psychological function of body is called as *Visha* (poison). It also defined as substance which when administered, inhaled, or ingested, incapable of acting on the human body and there by destroy life. *Bhallataka* (*Semicarpus Anacaardium Linn. Anacardiaceae*) is mentioned under *Upavisha* group. In *Ayurvedic* classics, it is described as a poisonous medical plant under drug and cosmetic act 1940. (2) Tarry oil present in the pericarp of fruit cause blister on contact. *Bhallataka* has been used for medical and non-medical purpose like marking of cloth, hair dye etc since ancient times. When *Bhallataka Taila* gets in contact with skin it causes irritation, inflammation, pain, itching, blister, skin lesion resembles bruise and later turn in to ulcer with sloughing of skin (3) and eczematous eruptions. (4,5) In modern science, the term bioassay it used to describe the use of living organism to quantitate the amount particular toxicity present. Also, the branch of toxicity, testing involves the short terms test for acute toxicity tests multigenerational chronic toxicity. Most used bioassay aquatic as well as vertebrate and invertebrate animals. (6) In view of its several potent medicinal properties, it is acclaimed as *Ardhavaidya* in *Ayurveda* and as a Golden acorn at the time of Galen in the western world. In India, the plant is used by *Ayurvedic* practitioners and traditional healers across the country albeit with caution. (7) In ancient *Ayurvedic* literatures, various references are seen about animal experiment for examination of poisonous food and selection of food for king. Various references, regarding animals, that when they consuming poisoned food crows lose their voice, flies do not sit on such food and if by chance they sit they die. (8, 9) The plant belonging to *Anacardiaceae* family has potential to produce allergic manifestations through contact dermatitis. (10) *Bhallataka* is used in treatment of various diseases like *Grahaniroga, Hridaroga, Panduroga, Gulma, Udavarta* and *Shoola*. (11) It also used as *Rasayana* and for increasing life expectancy. (12) Considering the importance of *Bhallataka*, present study is under taken. In *Ayurvedic* literature, cautions

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about its use are reported as it is hot in potency, producing rash and burning sensation after improper use. Chances of accidental poisoning causing contact dermatitis. *Shorea Robusta Roth* is traditionally used for several ailments including wounds and burn by different tribal groups since ages. *Shala* is used in various skin diseases like *Kushtha* and it has the property of *Swedapanayan* i.e., which decrease the sweat. (13) *Shala* has some special properties like *Vrana shodhan* (wound cleaner), *Vrana ropan* (wound healing) and *Jantughna* (disinfectant).

The present clinical study done at Mumbai, Maharashtra on *Bhallataka* reports adverse drug reactions in 25% of patients in the form of itching, maculo-papular rashes. (14) The incidence of contact dermatitis in general population was estimated to be 1.7-6.3%. (15) The median prevalence of contact allergy to at least 1 allergen was 21.1% (12.5-40.6%), based on data collected on all age group and all countries. (16) *Bhallataka* is irritant vegetable organic poisons. In our country, it is commonly used in medicinal and non-medicinal purpose. Local application of *Bhallataka* is more common as many people used *Bhallataka* as home remedies for relieving of pain, *Bhallataka* oil is used commercially in industry for preparation of dye etc so exposure to oil and contact poisoning of *Bhallataka* is quite common in India. In *Ayurvedic* literature mentioned in *Yogratnakar* that *Shala Patra Churna* on internally & externally application on the whole body immediately eliminate the poison of *Bhallataka* i.e., *Semicarpus Anacardium.* (17) In case of *Bhallataka* contact poisoning, it is most seen externally than internally so, *Shala Patra Churna* used for external application.

Aim

To study efficacy of *Shala Patra Churna* in contact poisoning due to *Bhallataka Taila* in Albino mice.

Objectives

1. To study antitoxic properties of *Shala Patra Churna* in contact poisoning due to *Bhallataka Taila*.
2. To study different *Ayurvedic* and modern literatures related to *Bhallataka* related contact poisoning.
3. To study literature of herbal drug *Shala Patra Churna* from various *Ayurveda* scriptures and textbooks.

Material and methods

To assess the efficacy of drug it is necessary to standardize the drug before using in experiments. The *Bhallataka Taila* and *Shala Patra Churna* were prepared as per guidelines and standard procedure given in textbook under the guidance of guide and HOD of *Rasashastra* and *Bhaishajaykalpana* department of home institute.

Preparation of *Bhallataka* Oil (18)

In *Sushruta chikitsasthana* method of extraction of *Bhallataka taila* is mentioned. Two earthen pots of equal size were taken. Out of two earthen pots, one pot had done *matakapad* for seven times called that *pishta swedan* pot. *Bhallataka* fruits were slightly crushed and kept inside *pishta swedan* jar. After that mouth of *pishta swedan* pot was covered by iron mesh. This pot was placed over second similar earthen pot by upside down i.e., mouth of both the pots should be joined and is sealed with *multani mitti* and dried in shade. After drying the *Yantra* was kept in *puta*. Over *pishta swedan* pot, cow dung cake were piled and ignited. By the heat, oil of *Bhallataka* fruits gets accumulated at the bottom of earthen pot. This is called as *patalyantra*, and it is used for extraction of oil from *Bhallataka* fruits.

For preparation of *Shala Patra Churna*

Dried herb is crushed properly and filtered with the help of cloth to obtain fine powder i.e., *churna*. *Churna* was mixed with water to get little thick consistency which was used in the form of *lepa* for local application.

Authentication and Standardization

Authentication were carried out at *Dravyaguna* Department of home institute and standardization of drug in government recognized laboratory as per API.

Standardization of Drug (19):

Both drug samples were sent for standardization to NABL Accredited Laboratories (which is certified by food & drug administration M.S. and AGMARK). Standardization of both drugs were done as per criteria mentioned in API (Ayurveda Pharmacopoeia of India).

Method of Animal Experiment

- Consent of Institutional Animal Ethical Committee taken before the initiation of the experiment.
- Animal experiment was done according to OECD guidelines and CPCSEA guideline.

Table No.1: Details of animals studied

Animal Species	Albino Mice
Strain	Swiss Albino
Source of Animal	Research care center and animal care shelter
Environmental condition	Room temperature maintained between 22-30^{0}C, relative humidity 50-6-% and illumination cycle set to 12 hours light and 12 hours dark.
Average weight of mice	20-25 grams
Number of Mice	18 (6 in each group)
Age of Mice	6-8 weeks
Gender of Mice	50 % males and 50% females
Route of drug administration	Local application of *Churna*
Duration of drug administration	7 days
Identification	By unique identification number marked by writing on case tag and by corresponding in the experimental room after veterinary examination.

Selection of Animals

Mice of 20-25 gm were selected. 50% male & 50% Female were selected. Mice were also kept under observation before application of *Ballataka beeja taila* as they should remain healthy and free from any infection. Same diet and water were scheduled and provided.

Preparation of mice before applying *Bhallataka Taila*

All 18 mice were prepared for experiment only at desired area that is from back of each mice and hair was removed. For identification of groups, male and female mice were stained with same colour or markings. Each mouse was applied to *Bhallataka Taila* one by one at their backside. After application procedure, all mice were observed for 24 hours for any sign.

Table No.2: Group of Animal Experiments

Group number	Group name	Specification (n=6)
1	DC	Disease Control (*Bhallataka* oil application only
2	STD	*Bhallataka* application + Standard drug-silver nitrate gel (0.2%)
3	Test	*Bhallataka* application + *Shala Patra Churna*

Calculation of Dose (20)

According to *Sharangdhar Samhita,* dose of *Vishaghna lepa 1/3 Anguli (utsedha)* was considered. It was applied on Albino Mice according to Age and Weight.

All mice were observed for 24 hours for any signs. Rating of skin reaction was evaluated as per the Indian Standard BIS (Bureau of Indian Standards)1992. Test sample and standard drug applied for 7 consecutive days. After 7 days of application, observations were noted for all the parameters.

Table No.3: Assessment criteria

Parameters	Symptoms	Grade
***Shoth* (i.e., oedema)**	No oedema	0
	Very slight oedema (immediate rebound with 2 mm pit)	1
	Moderate oedema (less than 15 sec rebound with 3-4 mm pit)	2
	Severe oedema (rebound between 2-3 min with an 8 mm pit)	3
***Kandu* (i.e., itching)**	Absent (No itching)	0
	Mild (2-5 times a day)	1
	Moderate (6-8 times a day)	2
	Severe (Continuous itching)	3
Blisters	No venous congestion, Normal skin	0
	Mild congestion, Normal skin wrinkles present	1
	Moderate congestion, Normal skin wrinkles disappear	2
	Marked congestion, Skin blister present	3
	Severe congestion, Leading to partial skin necrosis	4
***Raga i.e.,* Erythema**	Normal skin colour	0
	Mild (Pink macules)	1
	Moderate (Pink-red macules)	2
	Severe (Red macules)	3

Procedure

- In each group, weight of animals was taken first and noted.
- Animals were shaved on the back with an electric clipper.
- *Bhallataka Taila* was applied to mice.
- After that mice were observed for sensitivity and duration of action for 24 hours.
- After that skin reaction was observed.
- Skin reaction and other signs was observed for few hours to days.
- Rating of skin reaction was evaluated as per the India standard BIS (Bureau India standards)1992.

During observation, Blister, Inflammation, Erythema, Itching, Oedema were assessed.

Duration of lowering or vanishing the local effect of *Bhallataka taila* in: -

- Standard drug group
- *Shala Patra Churna* (topical application) observed daily for 7 days.
- The wound was as it is i.e. no any medicine was applied.
- Comparative observation was tabulated.

Dosage

Twice a day as a local application.

Observations & results

Observations were done in 3 groups of animals for the duration of 7 days study. All the necessary precautions were taken to carry out every step during study.

Dorsum of every animal was trimmed and applied with *Bhallataka taila* (sufficient to cover the area), except Disease control group animals. Observation of animals were done for 24 hrs for any signs of toxicity. Redness was observed on the skin. As per the Indian standards BIS (Bureau of Indian standards) 1992 Rating of skin reaction was evaluated. STD group animals received silver nitrate gel (0.2%) application STD drug and Test sample (*Shala patra churna*) was applied for 7 days in BD Dose & daily observation is done. And, body weight of all animals was measured weekly.

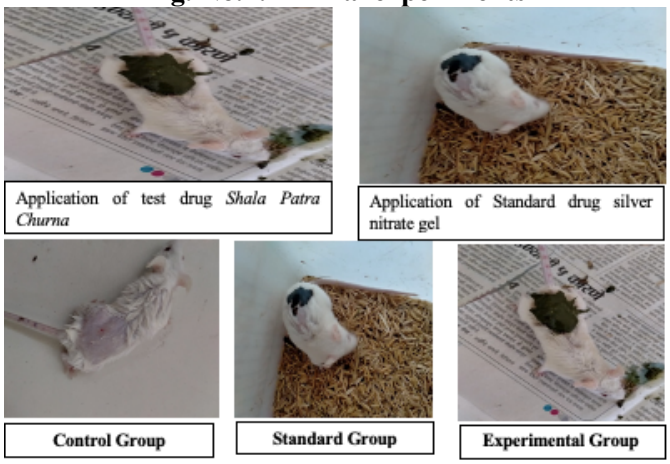
Observations

1. In mice, on Day 7 of the experiment after *Shala patra churna* application, significant change in the oedema score was observed in Test group and STD group ($p<0.0002$) animals when compared to DC.
2. In mice, on Day 7 of the experiment after *Shala patra churna* application, significant change in the Itching score was observed in Test group and STD group ($p<0.0002$) animals when compared to DC.
3. In mice, on Day 7 of the experiment after *Shala patra churna* application, significant change in the Blister score was observed in Test group with 75% effect and in STD group with 100 % effect ($p<0.0002$) animals when compared to DC.

4. In mice, on Day 7 of the experiment after *Shala patra churna* application, significant change in the Erythema score was observed in Test group with 86 66.66% effect and in STD group with 100 % effect ($p<0.0002$) animals when compared to DC.

Figure 1: Drugs used for Experiment

Fig. No.2: Animal experiments



Statistical Analysis

Collected data was entered into Microsoft excel spreadsheet. Tables and charts were generated using Microsoft Word and Microsoft excel software. Categorical variables (Symptoms) were expressed in frequency and percentages. Categorical variables were compared before and after treatment in each group by performing sign rank test. Change in symptoms after treatment between 3 groups were compared by Kruskal Wallis ANOVA test. $p<0.05$ was considered as statistical significance. Statistical software STATA version 14.0 was used for data analysis.

Indication for P value

- If p value ≥0.05= Non significant
- If p value ≤0.05= Significant
- If p value ≤0.01= Highly significant
- If p value ≤0.001 = Extreme Highly significant

Table 4: Comparison of score of Oedema (*Shotha*) between day-0 and day-7 in each group

Symptoms Score	Group A		Group B		Group C	
	Day-0	Day-7	Day-0	Day-7	Day-0	Day-7
3	6 (100)	0	6	0	6	0
2	0	6 (100)	0	0	0	0
1	0	0	0	0	0	0
0	0	0	0	6	0	6
Z-value	2.449		2.449		2.449	
p-value	0.0143, S		0.0143, S		0.0143, S	

Above showed that severity of Oedema (*Shotha*) in 3 groups. In Group A, 6(100%) animals had symptoms score 3+ on day-0 and on day-7, 6(100%) had symptom score of 2+. There was significant reduction in symptoms score of oedemas in Group-A with p-value of 0.0143, significant.

In Group-B, all 6(100%) had symptom score of Oedema 3+ on day-0 and on day-7, there was no symptoms of Oedema in all animals. There was significant reduction in symptoms of Oedema after treatment with p-value of 0.0143, significant.

In Group-C, all 6(100%) had symptom score of Oedema 3+ on day-0 and on day-7, there was no symptoms of Oedema in all animals. There was significant reduction in symptoms of Oedema after treatment with p-value of 0.0143, significant.

Table 5: Comparison of effect of treatment on Oedema symptoms at day-7 between 3 groups

Effective-ness of treatment	Group A	Group B	Group C	p-value
	66.67	100	100	0.0002, HS

Above table showed that effective of treatment in group-A was 66.67%, in group-B, it was 100% and 100% effectiveness treatment was observed in Group-C. Hence effect of treatment on symptoms of Oedema was significantly more in Group-B and group-C as compared to Group-A with p-value of 0.0002 which was highly significant.

Table 6: Comparison of score of Itching (*Kandu*) among 3 groups

Symptoms Score	Group A		Group B		Group C	
	Day-0	Day-7	Day-0	Day-7	Day-0	Day-7
1	6	6	6	0	6	0
0	0	0	0	6	0	6
Z-value	--		2.449		2.449	
p-value	--		0.0143, S		0.0143, S	

Above showed that severity of Itching (*Kandu*) in 3 groups. In Group-A, no change was observed in symptoms on animals.

In Group-B, all 6(100%) had symptom score of Itching 1+ on day-0 and on day-7, there was no symptoms of Itching in all animals. There was significant reduction in symptoms of Itching after treatment with p-value of 0.0143, significant.

In Group-C, all 6(100%) had symptom score of Itching 1+ on day-0 and on day-7, there was no symptoms of Itching in all animals. There was significant reduction in symptoms of Itching after treatment with p-value of 0.0143, significant.

Table 7: Comparison of effect of treatment on Itching (*Kandu*) symptoms at day-7 between 3 groups

Effective-ness of treatment	Group A	Group B	Group C	p-value
	No change (0 %)	100 %	100 %	0.0002, HS

Above table showed that effective of treatment in group-A was 0%, in group-B, it was 100% and 100% effectiveness treatment was observed in Group-C. Hence effect of treatment on symptoms of Itching was significantly more in Group-B and group-C as compared to Group-A with p-value of 0.0002 which was highly significant.

Table 8: Comparison of score of Blisters among 3 groups

Symptoms Score	Group A		Group B		Group C	
	Day-0	Day-7	Day-0	Day-7	Day-0	Day-7
4+	6	0	6	0	6	0
3+	0	6	0	0	0	0
2+	0	0	0	0	0	0
1+	0	0	0	0	0	6
0+	0	0	0	6	0	0
Z-value	2.449		2.449		2.449	
p-value	0.0143, S		0.0143, S		0.0143, S	

Above showed that severity of Blisters in 3 groups. In Group-A, 6(100%) animals had symptoms score 4+ on day-0 and on day-7, 6(100%) had symptom score of 3+. There was significant reduction in symptoms score of blisters in Group-A with p-value of 0.0143, significant.

In Group-B, all 6(100%) had symptom score of Blisters on day-0 and on day-7, there was no symptoms of Blisters in all animals. There was significant reduction in symptoms of Blisters after treatment with p-value of 0.0143, significant.

In Group-C, 6(100%) animals had symptoms score of Blisters was 4+ on day-0 and on day-7, 6(100%) had symptom score of Blisters was 1+. There was significant reduction in symptoms score of Blisters in Group-A with p-value of 0.0143, significant.

Table 9: Comparison of effect of treatment on Blisters symptoms at day-7 between 3 groups

Effective-ness of treatment	Group A	Group B	Group C	p-value
	25%	100%	75%	P=0.0002, HS

Above table showed that effective of treatment in group-A was 25%, in group-B, it was 100% and In Group C it was 75% effectiveness treatment was observed. Hence effect of treatment on symptoms of Blisters was significantly more in Group-B as compare to group-C & Group-A with p-value of 0.0002 which was significant.

Table 10: Comparison of score of Erythema (Raga) among 3 groups

Symptoms Score	Group A		Group B		Group C	
	Day-0	Day-7	Day-0	Day-7	Day-0	Day-7
3	6	6	6	0	6	0
2	0	0	0	0	0	0
1	0	0	0	0	0	6
0	0	0	0	6	0	0
Z-value	--		2.449		2.449	
p-value	--		0.0143, S		0.0143, S	

Above table showed that severity of Erythema (Raga)z in 3 groups. In Group-A, no change was observed in symptoms on animals.

In Group-B, all 6(100%) had symptom score of Erythema on day-0 and on day-7, there was no symptoms of Erythema in all animals. There was significant reduction in symptoms of Itching after treatment with p-value of 0.0143, significant.

In Group-C, 6(100%) animals had symptoms score of Erythema was 3+ on day-0 and on day-7, 6(100%) had symptom score of Erythema was 1+. There was significant reduction in symptoms score of blisters in Group-A with p-value of 0.0143, significant.

Table 11: Comparison of effect of treatment on Erythema symptoms at day-7 between 3 groups

Effective-ness of treatment	Group A	Group B	Group C	p-value
	0%	100%	66.67%	P=0.0002, HS

Above table showed that effective of treatment in group-A was 0 %, in group-B, it was 100% and In Group C it was 66.67% effectiveness treatment was observed. Hence effect of treatment on symptoms of Erythema was significantly more in Group-B as compared to group-C & Group-A with p-value of 0.0002 which was highly significant.

Discussion

Manifestation of Results in Groups

Comparison of effect of treatment on score of symptoms were compared by performing Friedman repeated measure ANOVA test for categorical variables.

Comparison of effect on symptoms score at Day 7 from Day 0 by performing Wilcoxon Sign rank test**.**

Effect on Itching

Score for itching was observed for consequent 7 days in all 3 groups, which shows significant reduction of itching in all 3 groups, p value is <0.0143.

When results of day 1 and day 7 were compared it shows 100% efficacy in all the 3 groups.

Effect on Swelling

Score for Oedema was observed for consequent 7 days in all 3 groups, which shows significant reduction of swelling in all 3 groups, p value is <0.0143.

When results of day 1 and day 7 were compared it shows 66.67% effect in disease control group, 100% effect in standard group and 100% effect in Test drug group.

This shows Test drug is equally effective as that of Standard drug.

Effect on Erythema

Score for erythema was observed for consequent 7 days in all 3 groups, which shows significant reduction of erythema in all 3 groups, p value is <0.0143.

When results of day 1 and day 7 were compared it shows 66.67% effect in disease control group and 100 % effect in standard and test drug group.

This shows Test drug is equally effective as that of Standard drug.

Effect on Blisters

Score for blisters was observed for consequent 7 days in all 3 groups, which shows significant reduction of blisters in all 3 groups, p value is <0.0143.

When results of day 1 and day 7 were compared it shows 25% effect in disease control group and 100 % effect in standard and 75% in test drug group.

This shows Test drug is less equally effective as that of Standard drug.

Data obtained from the experimental studies, the result here we are discussing with reference to onset of signs & symptoms of toxic effects of *Bhallataka taila*. Also, it is observed that *Shala patra churna* is effectively work on contact poisoning due to *Bhallataka taila* as stated in literature. Wound Contraction in 0-7 days.

During 0-7 days, the mean wound area measurement found significantly decrease in Group 11, Group III. It means the efficacy of *churna* of *shala patra* (Shorea Robusta) and silver nitrate gel shows significant decreased on wound created by *Bhallataka* in 0-7 days. It can say that healing process is found significant at the end of 7 days.

Bhallataka is irritant vegetable organic poisons. In our country, it is commonly used in medicinal and non-medicinal purpose. Local application of *Bhallataka* is more common as many people used *Bhallataka* as home remedies for relieving of pain, *Bhallataka* oil is used commercially in industry for preparation of dye etc. so exposure to oil and contact poisoning of *Bhallataka* is quite common in India.

Mode of action of the Drug

The dermatitis causes due to *Bhallataka* is allergic type of contact dermatitis. These plants mainly act as irritant on skin contact with resultant inflammation, *Bhallataka* contains Urusinol as it is irritant ingredient and it causes allergic contact dermatitis. When *Bhallataka* encounters skin, the acrid juice results in irritation, inflammation, and ulceration.

A 70% ethanol extract of the dried powder resin of *Shorea robusta* was investigated for analgesic activity. The extract (30, 100 and 300 mg/kg, i.p.) produced significant central and peripheral analgesic effect, as is evidenced from increase in reaction time in hot plate and tail flick tests. These results demonstrated that the extracts of S. robusta possess significant analgesic properties. The methanolic and aqueous leaf extract of S. robusta shows analgesic activity with acetic-acid induced writhing and tail flick tests. The dose of both extracts such as methanol and aqueous extract (200 and 400mg/kg i.p.) caused significant reduction of writhing and tail flick method in rats and mice by different ways.

The aqueous extract of leaves of *Shorea robusta* with a dose of 100, 200 & 500 µg/ml, was taken for the activity & compared with the standard Diclofenac doses of 20 & 40 µg/ml, in HRBC membrane stabilization model and same dose of extract was taken for activity & compared with Aspirin 200 µg/ml, using Heat Induced Haemolytic method. The extract of 500 µg/ml showed good result in both models. The methanolic and aqueous leaf extract of S. robusta shows anti-inflammatory activity in carraganeen and dextran induced paw method and cotton-pellet induced granuloma model. The dose of both extracts such as methanol and aqueous extract (200 and 400mg/kg i.p and p.o.) caused significant effect in rats and mice by different ways.

The ethanolic extract of S. robusta (10 and 30 % w/w) applied locally in excised and incised wounds) produced a dose-dependent acceleration in wound contraction and increased hydroxy pyroline content and tensile strength of wound in rats. The result demonstrates wound healing activity of ethanolic extract of S. robusta resin.

So, *Shala patra* has analgesic, anti-inflammatory, and wound healing properties which are required for reducing symptoms produced by *Bhallataka Taila* poisoning.

Limitations of the study

Poisonous drugs cannot be used on humans directly as a part of human rights and safety. Animals (Rats) were harmed during the study.

Scope of further study

In this study, external application of *Bhallatak Tail* is experimented. Further, internal application of *Bhallatak Tail* and treatment of its poisoning can be studied. Moreover, poisonous drugs like *Bhallatak Tail* can also be studied.

Conclusion

It can be concluded that during 0–7-day *Shala patra churna* was applied externally on albino mice in contact poisoning of *Bhallataka Taila* showed significant decrease in mean wound area measurement.

The mean wound area measurement significantly decreases by sliver nitrate gel also during experiment as compared to control group.

Shala patra churna showed faster healing process at the end of 7 days, as mean wound area measurement of Group III (Experiment) decreases in same way as compared Group II (Standard).

It can be concluded that if we apply test drug *(Shala patra churna*) regularly for 7 days, then effect of *Shala patra churna* is equivalent to the standard drug (silver nitrate gel). Therefore, *Shala patra churna* can be significantly used for the treatment of *Bhallataka* induced contact poisoning.

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