Research Article

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A COMPARATIVE STUDY OF STHAVARA VISHA BHALLATAKA IN RELATION TO ITS SHODHANA SANSKARA

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ABSTRACT

Ayurveda has described shodhana sanskara (Purification process) of Poisonous plants before its therapeutic use. But no observatory post process changes are described by Ayurveda. So it is an effort to put forth scientific evaluation & presentation of shodhana sanskara of Bhallataka. Aim of the study was to evaluate the changes occurring in Bhallataka (*Semecarpus anacardium*) fruit after its Shodhana Sanskara (Purification process) by various methods as described in texts with the help of modern parameters such as ash value, extractive value, phenol assay, TLC etc. Well ripened fruits of Bhallataka fruits were selected. Their Shodhana Sanskara (Purification process) was done by five different methods as by rubbing with brick powder (Sample 2), in Dolayantra (Swing Apparatus) with Shodhana dravyas as Coconut water (Sample 3), Cow urine (Sample 4), Mixture of buffalo dung and water(Sample5) and in Distill water (Sample 6) as a control group. Analytical study of Ashuddha (Impure) Bhallataka (Sample1) and five shodhita (Purified) sample of Bhallataka was done with the help of parameters such as Loss or gain of weight, aqueous extractive value, Alcohol extractive value, Ash value, Phenol Assay and TLC. % loss of weight was highest in Sample 2 (15.25%) whereas 1.01% weight was gained in Sample 4. Aqueous extractive value of Sample4 was highest (16.73%) as compared to Sample 1. pH of aqueous extract of Sample4 was slight alkaline (7.2827).Alcohol extractive value was higher in Sample 6 (36.96%), Sample 5 (36.83%) and Sample 3 (36.46%). Total ash value was highest in Sample 2 (17.9249%).Water soluble ash value was highest in Sample 3 (10.3519%) whereas acid insoluble ash was highest in Sample 2 (14.3399%).Phenol content was lowest in Sample 4 (257.5mg/100gm).In TLC, yellow spot(Rf0.62) was missing in sample2 and present in all others. One purple spot (Rf 0.86) present in sample 4 was absent in all others. Study shows remarkable difference in various parametric values of Ashuddha (Impure) and five Shodhit (Purified) samples of Bhallataka fruit which can be considered differentiating tests for Ashuddha (Impure) and Shodhita (Purified) samples and also can be applied for Shodhita Bhallataka.

Key words: Ayurveda, Sthavara Visha, Bhallataka, *Semecarpus anacardium*, Shodhana Sanskara, Purification process

INTRODUCTION

Life on earth is nature's gift to mankind. Ayurveda the fundamental science of life is evolved primarily for maintenance of good health and to cure the diseases. The principles of Ayurveda are time tested but the time demands evaluation and expression of these principles & theories in terms of contemporary science. This requires extensive research work in Ayurvedic field. Acharya Charaka says, any poison if processed or used properly is a potential medicine and any medicine with improper use is fatal poison.[1] This treasure knowledge of converting a life threatening poison to a life saving drug is described in Ayurvedic samhitas. This conversion requires some specific pharmaceutical process, one of them is a Shodhana Sanskara (Purification process). The act of treating a substance with advised matter by rubbing, steaming etc., so as to eliminate harmfulness is known as Shodhana Sanskara (Purification process).[2] When shodhana sanskara is carried out, the poisonous plants are attributed with certain properties like rasayana, yogwahi, tridoshaghna, brihan, viryavardhak and prandayi.[3] Shodhana sanskara should be done on poisonous plants before its therapeutic use. This process reduces toxicity of poisonous plants considerably and keeps it to required optimum level.[4] This process brings about some changes in physical appearance and chemical composition of the substance. Hence it is necessary to study these changes scientifically on modern parametric ground.

Now-a-days number of Ayurvedic pharmaceutical companies are preparing medicines from poisonous herbs. But it is the matter of discussion whether they are doing Shodhana sanskara (Purification process) of these poisonous herbs properly as mentioned in Ayurvedic samhitas or not. If the proper processing techniques are not followed, there is a chance of retaining harmful characters in the prepared medicine which in turn may prove fatal.

Charaka and Sushruta divded all poisons in two categories that is Sthavara visha and Jangama visha.[5,6] Sthavara visha are immovable poisons which includes plant and mineral origin poisons. And Jangama visha includes movable poisons that is venom of different animals. Bhallataka i.e. *Semecarpus anacardium* which is the matter of study in this research is described in Sthavara visha in brihatrayee. Bhallataka is mentioned in Upavisha varga in Rasatarangini.[7] Nevertheless it is common drug indicated therapeutically for the management of various diseases. Number of Ayurvedic formulations includes this drug after its proper Shodhana sanskara (Purification process).

If juice of Bhallataka comes in contact with body, produces daha(severe burning sensation), and vrana(ulcer). If it comes in contact with mouth severe burning inflammation may occur. Hence to avoid these complications Bhallataka used in medicine after its shodhana.[8] One of the cause of

agantuj shotha (exogenous swelling) is contact of fruit and flower of Bhallataka.[9] Ayurveda has described Shodhana sanskara of Bhallataka, before its therapeutic use. But no observatory post process changes are described in Ayurveda and also physical and chemical changes due to Shodhana (Purification) has not been studied with reference to modern parameters

Ayurvedic and modern literature related to this subject has been reviewed in this study. Experimental and laboratory work was carried out. This study is an attempt to put forward some valuable information and interpretations related to Shodhana Sanskara (Purification process) of sthavara visha Bhallataka.

Aims and objectives

1. To study various methods of Shodhana sanskara (Purification process) of sthavara visha Bhallataka.
2. To evaluate the changes occurring in Bhallataka fruit after its Shodhana Sanskara (Purification process) by various methods as described in texts with the help of modern parameters such as ash values, extractive values, phenol assay, thin layer chromatography (TLC) etc.

Literature Review

Methods of Shodhan sanskara of Bhallataka in different Ayurvedic texts are as follows:

In Rasatarangini

i) With brick powder (Ishtika churna)[10]

Bhallataka fruits and brick powder (ishtika churna) are filled up in a pottali (Cloth bag) made up of 3-4 folds of cotton cloth. This pottali is rubbed by hand by applying moderate pressure. When brick powder become wet with oil and the skin of Bhallataka fruit is peeled off, it is washed with hot water. In this process Bhallataka becomes shuddha (purified).

ii) With coconut water (Narikela jala)[11]

Bhallataka fruits are cut in two pieces are placed in a pottali. This pottali is placed in Dolayantra (Swing Apparatus) filled up with coconut water. Dolyantra is heated for about 1-2 h. In this process Bhallataka becomes shuddha (purified).

In Bhaishajyaratnavali [12]

Bhaishajyaratnavali described the same procedure as mentioned in Rasataragin*i* i.e. swedana of Bhallataka fruits in Narikela ambu (coconut water) in Dolayantra (Swing Apparatus).

In Rasatantrasara Va Siddhaprayogasangraha[13]

i) The Bhallataka fruits which are submerged in water are rubbed with brick powder to make it shuddha. These shuddha Bhallataka are used for preparation of kwtha (decoction).
ii) Mixture of one part of buffalo dung and four part of water is taken in a Dolayantra (Swing Apparatus). A pottali containing Bhallataka fruits are placed in it. The dolyantra is heated for 12 hrs.

The entire process is repeated for 12 hours each with cow urine and cow milk. Now the Bhallataka fruits are taken out of pottali and are washed with hot water and the receptacle of fruits are carefully removed. These Bhallataka fruits are subjected to boil in coconut water for 12 hrs. Thus Bhallataka fruits becomes shuddha which are powdered and used for therapeutic use.

In Agadatantra (Part II) Upavisha[14]

i) Fruits of Bhallataka are cut vertically. Kernel of the fruits is removed. These fruits are wrapped up with two blotting paper one above another and and pressed. Thus the expressed oil soaked by the blotting papers. Now the Bhallataka fruits are washed with cold water and dried.
ii) Bhallataka fruits are cut in two pieces and mixed with brick powder (ishtika churna). The pottali containing this mixture is rubbed. The brick powder should be changed for 2-3 times. After completion of rubbing the Bhallataka fruits are sorted out and washed with cold or hot water and dried. In this process the expressed oil is partially absorbed by brick powder and partially washed out with water while washing.
iii) The pottali containing vertically cut Bhallataka fruits is placed in Dolayantra (Swing Apparatus) containing green coconut water. This Dolayantra (Swing Apparatus) is heated to get shuddha Bhallataka fruits.
iv) Bhallataka fruits are boiled in a Dolayantra (Swing Apparatus) containing buffalo dung or cow's urine for one prahara (3 hours). Then it is washed with hot water and cut in two pieces vertically. Kernel of fruit is removed and fruits are powdered for therapeutic use. In this process Bhallataka become shuddha.

Semecarpus anacardium Linn. is a moderate-sized deciduous tree, reaching up to height of 12-15 m. and girth of 1.25 m. found in the outer Himalayas from Sutlej to Sikkim and fairly common throughout the hotter parts of India as far east Assam. Bark dark brown, rough; leaves large simple, 17.5-60.0 cm. x 10.0-30.0 cm., obovate-oblong; flowers small ,dull greenish yellow, dioecious, in terminal panicles; drupes 2.5 cm. long, obliquely ovoid, smooth and shining, black when ripe situated on a fleshy orange coloured receptacle. The fleshy orange cup (hypocarp) of fruit is eaten when quite ripe; it is slightly astringent. The pericarp abounds in a black, oily, bitter and highly vesicant juice, which has been traditionally used for marking linen. The vesicant juice, known in the trade as Bhilawan Shell Liquid (BSL) is a rich source of phenols. [15]

Pillay and Siddiqui have isolated following constituents from juice of pericarp:-(1) a monohydroxyphenol (semecarpol) - 0.1% of the extract (2) An O-dihydroxy compound(Bhilawanol) - 46% of the extract (3) A tarry non-volatile corrosive residue forming about 18% of the nut. [16]

The most significant component of the *S. anacardium* Linn are bhilwanols, phenolic compounds, biflavonoid, sterols, anacardoside, semecarpetin etc. [17]

There are lots of effects of the shodhana process on quantity of phytoconstituents and also on pharmacological action of the *Semecarpus anacardium* Linn. There is not any significant change in the amount of total flavonoids content & total carbohydrate content in the *Semecarpus anacardium* due to shodhana process but there is drastically change in concentration of total phenolic content due to shodhana process. **[18]**

EXPERIMENTAL STUDY

As per literature references, shodhana sanskara of Bhallataka reduces its toxicity and enhances its therapeutic

properties. Physical and chemical changes due to Shodhana has not been studied with reference to modern parameters. Hence the study of Bhallataka shodhana was carried out with the help of modern parameters to see whether it reduces its toxicity or not.

Analytical study includes phenol assay as phenol is significant ingredient and other parameters like ash value, extractive values, Thin layer chromatography (TLC) follows testing of drugs which is mentioned in The Ayurvedic Pharmacopoeia of India. [19]

MATERIAL AND METHODS

Well ripened fruits of Bhallataka were selected.

Shodhana sanskara (Purification process)) of Bhallataka was done-

a) By rubbing with brick powder (Sample 2)

b) In Dolayantra (Swing Apparatus) with shodhandravyas like-

i) Coconut water (Sample 3)

ii) Cow urine (Sample 4)

iii) Mixture of buffalo dung and water (Sample 5) as per Ayurvedic texts

iv) And Later on shodhana (purification) was carried out with distill water (Sample 6) as control group.

Ashuddha ((Impure) Bhallataka (Sample1) and five Shodhita (Purified) samples of Bhallataka were analyzed for physical and chemical parameter.

Method of selection of Bhallataka fruits

Bhallataka fruits were collected from the market.

The fruits which submerged in the water selected for Shodhana sanskara (Purification process) while the floating fruits were discarded.[20]

Characteristic of selected Bhallataka fruits

Some physical characters of fruits were as follows-

- Colour - Dark brown
- Shape - Heart shape
- Weight - 2.452 g $\pm$ 0.587
- Density- 1.1243g/cc $\pm$ 0.0728

Density: Bhallataka fruits were randomly selected from the collected sample. They were dropped in water. 14 of them submerged and 3 remained floating. It was decided to determine density of those 14 fruits which submerged in water and considered as matured. Fruits of Bhallataka were weighed. Volume of fruit was obtained by recording water displaced by fruits in measuring jar. Thus density of fruit was calculated by using formula D=M/V. Then mean density was derived from the data.

Shodhana Sanskara (Purification process)

Shodhana sanskara (Purification process) of Bhallataka fruits which submerged in water was carried out according to texts Rasatarangini and Agadtantra (Part-II) Upavisha.

Shodhana (Purification) with brick powder

Receptacles of selected Bhallataka fruits were drawn out and they were cut in two pieces. Their total weight was 50.230g. These fruits were rubbed with 250 g of brick powder in a cloth bag for 1 hour. Some quantity of oil in fruits was absorbed by brick powder. This cloth bag was kept under observation for next 24 hours. After 24 hours color of brick powder turned black. Bhallataka fruits were then separated and further rubbed with 250 g of fresh brick powder. The process was repeated on second and third day; where the change in color of brick powder was dark maroon and as original brick powder respectively. Hence the process was stopped here. Bhallataka fruits sorted, rinsed with water and dried. Then they were packed in a polythene bag and kept in freeze.

Shodhana (Purification) in Dolayantra (Swing Apparatus) by using different Shodhana dravyas (Purification liquids)

Common Procedure

Receptacles of selected Bhallataka fruits were drawn. Their total weight was near about 50g. Dolayantra (Swing Apparatus) was assembled in earthen pot having capacity of 1 liter. The pottali was suspended to a glass rod on the mouth of pot in such a way that it did not touch the bottom of pot. Approximately 500 ml of Shodhana dravya (purification liquid) was filled in pot and pottali was put in such a way that it was swinging and submerged in shodhana dravya. The pot was heated to boil gently the shodhana dravya for 3 hour. Shodhana dravya(purification liquid) was added frequently to maintain the level of the shodhana dravya. This in turn increase the heating by ½ an hour as it decreases the temperature of shodhana dravya. Hence a total 3 ½ hours heating was given. After this Bhallataka fruits were drawn out and dried. Then they were packed in polythene bag and kept in freeze.

i) With coconut water

Weight of Bhallataka fruits without receptacles and cut in two pieces was 50.6g. Green coconut water was used for Shodhana (Puriification) of Bhallataka fruits. Temperature during shodhana was 96 to 97^0 C (gentle boiling).

ii) With cow urine

Weight of Bhallataka fruits without receptacle was 50g. Cow urine sample collected from Go-Vigyan Anusandhana Kendra, Nagpur was used for shodhana. Temperature during shodhana was 97.5 to 98^{0}C (gentle boiling)

iii) With mixture of buffalo dung and water

Weight of Bhallataka fruits without receptacle was 51.11g. Mixture of one part of buffalo dung and four part of water was used for shodhana. Temperature during shodhana was 95 to 97^{0}C (gentle boiling)

iv) With distill water

Weight of Bhallataka fruits without receptacles was 50.070g. Distill water was used for shodhana. Temperature during shodhana was 98 to 99.50^{0}C (gentle boiling). Oozing of Bhallataka oil was observed on outer surface of earthen pot.

Analytical Study

1. Loss or gain in weight due to Shodhana (Purification): Initially near about 50g of Bhallataka fruits without receptacles were taken for each Shodhana sanskara. After shodhana sanskara, five samples of Bhallataka were kept on hot plate at 50 ^{0}C for 48 hours, then at room temperature for 6 hours. Shodhita (Purified)

samples were weighed. Loss or gain in weight of Shodhita (Purified) samples is shown in Table 1 & Figure 1. After weighing, the samples were crushed to coarse pasty mass for their further analytical study.

2. Aqueous extractive value: Aqueous extractive value shows the water soluble portion of the samples. Coarse pasty mass of the drug was suspended separately in 100ml of chloroform-water in conical flask with their mouth closed. The flasks were shake for six hours then left for 18 hours and filtered. 25 ml of the filtrate was evaporated in tarred china dish to dryness on water bath. Finally heated to 105 ^{0}C to constant weight. Aqueous extractive values of ashuddha (impure) and shodhita (purified) samples are shown in Table 2 & Figure 2. pH of aqueous extractive of samples are also shown in Table 3 & Figure 3.

3. Alcohol extractive value: Alcohol extractive value shows the alcohol soluble portion of the sample. The procedure same as that for aqueous extract was followed here using 100 ml of rectified spirit instead of chloroform-water. Alcohol extractive values of ashuddha (impure) & shodhita (purified) samples are shown in Table 4 & Figure 4.

4. Ash Value: Total ash value gives information regarding inorganic content of the samples. Water soluble ash gives information about alkali, metals whereas acid insoluble ash gives information about silicate or sand present in the samples.

Accurately weighed about 2g of the samples were incinerated to constant weight in tard silica crucible and the weight of ash taken after cooling the crucible in desiccators and total ash value was obtained.

Similarly water soluble ash and acid insoluble ash was also determined by boiling the ash for 5 minutes with 25 ml. of water and with 25 ml of dil. Hcl respectively. Then the residue in sintered glass crucible was weighed. Total ash value, water soluble ash value and acid insoluble ash values are shown in Table 5 & Figure 5-7 .

5. Phenol assay 100 mg of the samples was extracted with 10 ml of 80% ethanol by grinding it in sand. The supernatant was separated after centrifugation and the residue was again extracted with 5ml of 80% alcohol. The supernatant were mixed and evaporated to dryness and the residue was extracted with 5 ml of distill water.

0.2ml. of this extract was diluted to 3 ml and 0.5ml Folin-Ciocalteu reagent (FCR) was added to it and allowed to stand for 3 minutes then 2 ml of 20% of sodium carbonate was added to it. The O.D. was measured at 650 nm after one hour. With the help of O.D. Phenol value of the samples were determined and it is shown in Table 6 & Figure 8.

6. Thin layer chromatography (T.L.C.):- Thin layer chromatography gives information regarding chemical components present in the samples. Thus here changes in the chemical composition due to shodhana (purification) with respect to ashuddha (impure) sample can be ascertained by T.L.C. by comparing various bands present in their TLC pattern. Thin layer chromatography was carried out on silica gel $60F_{254}$ plates using Toluene: Methanol: Ethyl acetate (1: 0.2: 0.04) solvent system. Rf values of various samples are shown in Table 7-10.

OBSERVATIONS AND RESULTS

Laboratory experiments were carried out to obtain values of following parameters for Ashuddha (Impure) and variously shodhita (Purified) samples. The observations and results are as follows-

Table1: Percentage of Loss/ Gain in Weight due to Shodhana (Purification) of Various Samples

No.	Samples of Bhallataka fruits	Weight before shodhana	Weight after shodhana	Percentage of loss/gain in weight
1.	Brick-powder shodhita	50.230 g	42.570 g	-15.25%
2.	Coconut-water shodhita	50.60 g	47.210 g	-6.70%
3.	Cow urine shodhita	50.00 g	50.520 g	+1.04%
4.	Buffalo dung & water mixture shodhita	51.11 g	47.72 g	-6.63%
5.	Distill water shodhita	50.070 g	48.110 g	-3.91%

Table 2: Aqueous Extractive Value of Various Sample

No.	Samples of Bhallataka Fruits	Aqueous extractive value
1.	Ashuddha	10.11%
2.	Brick powder shodhita	10.50%
3.	Coconut water shodhita	8.22%
4.	Cow urine shodhita	16.73%
5.	Buffalo dung-water mixture shodhita	7.92%
6.	Distill water shodhita	6.94%

Table 3: pH Of Aqueous Extract of Various Samples

No.	Samples of Bhallataka Fruits	pH of Aq. extract
1.	Ashuddha	5.1705
2.	Brick powder shodhita	5.0275
3.	Coconut water shodhita	4.6644
4.	Cow urine shodhita	7.2827
5.	Buffalo dung-water mixture shodhita	5.1815
6.	Distill water shodhita	3.9053

Table 4: Alcohol Extractive Value of Various Samples

No.	Samples of Bhallataka Fruits	Alcoholic extractive value
1.	Ashuddha	25.54%
2.	Brick powder shodhita	8.74%
3.	Coconut water shodhita	36.46%
4.	Cow urine shodhita	28.72%
5.	Buffalo dung-water mixture shodhita	36.83%
6.	Distill water shodhita	36.96%

Table 5: Ash Value of Various Samples

No.	Samples of Bhallataka fruits	Total ash	Water soluble ash	Acid insoluble ash
1.	Ashuddha	2.2727%	0.6892%	0.0652%= nil
2.	Brick powder shodhita	17.9249%	1.0521%	14.3399%
3.	Coconut water shodhita	11.5729%	10.3519%	0.2065%
4.	Cow urine shodhita	6.6700%	4.43%	0.54%
5.	Buffalo dung-water mixture shodhita	2.6480%	0.9556%	0.0298%= nil
6.	Distill water shodhita	2.0059%	1.1876%	0.0199%= nil

Table 6: Phenol Assay of Various Samples

No.	Samples of Bhallataka Fruits	Phenol assay (mg/100g)
1.	Ashuddha	882.78
2.	Brick powder shodhita	588.09
3.	Coconut water shodhita	335.60
4.	Cow urine shodhita	190.47
5.	Buffalo dung-water mixture shodhita	382.50
6.	Distill water shodhita	257.50

Table 7: Rf Values of Various Samples in Thin Layer Chromatography

No.	Sample	Rf value under visible light	Rf value after spray H_2SO_4 reagent before heating	Rf value after spray H_2SO_4 reagent after heating
1.	Ashuddha	0.45, 0.55, 0.70	0.41, 0.52, 0.55, 0.66	0.21, 0.37, 0.41, 0.47, 0.55, 0.62, 0.94
2.	Brick powder shodhita	0.45, 0.50	0.41, 0.52, 0.55	0.21, 0.41, 0.47, 0.94
3.	Buffalo dung-water mixture shodhita	0.45, 0.76, 0.82	0.41	0.21, 0.29, 0.41, 0.47, 0.55, 0.62
4.	Distill water shodhita	0.45, 0.76, 0.82	0.41, 0.66, 0.72	0.21, 0.29, 0.41, 0.47, 0.55, 0.62
5.	Coconut water shodhita	0.45, 0.76, 0.82	0.41, 0.66, 0.72	0.21, 0.29, 0.41, 0.47, 0.55, 0.62
6.	Cow Urine shodhita	0.45, 0.76, 0.82, 0.86	0.41, 0.66, 0.86	0.21, 0.29, 0.41, 0.47, 0.62, 0.86

Table 8: Rf Values Under Visible Light

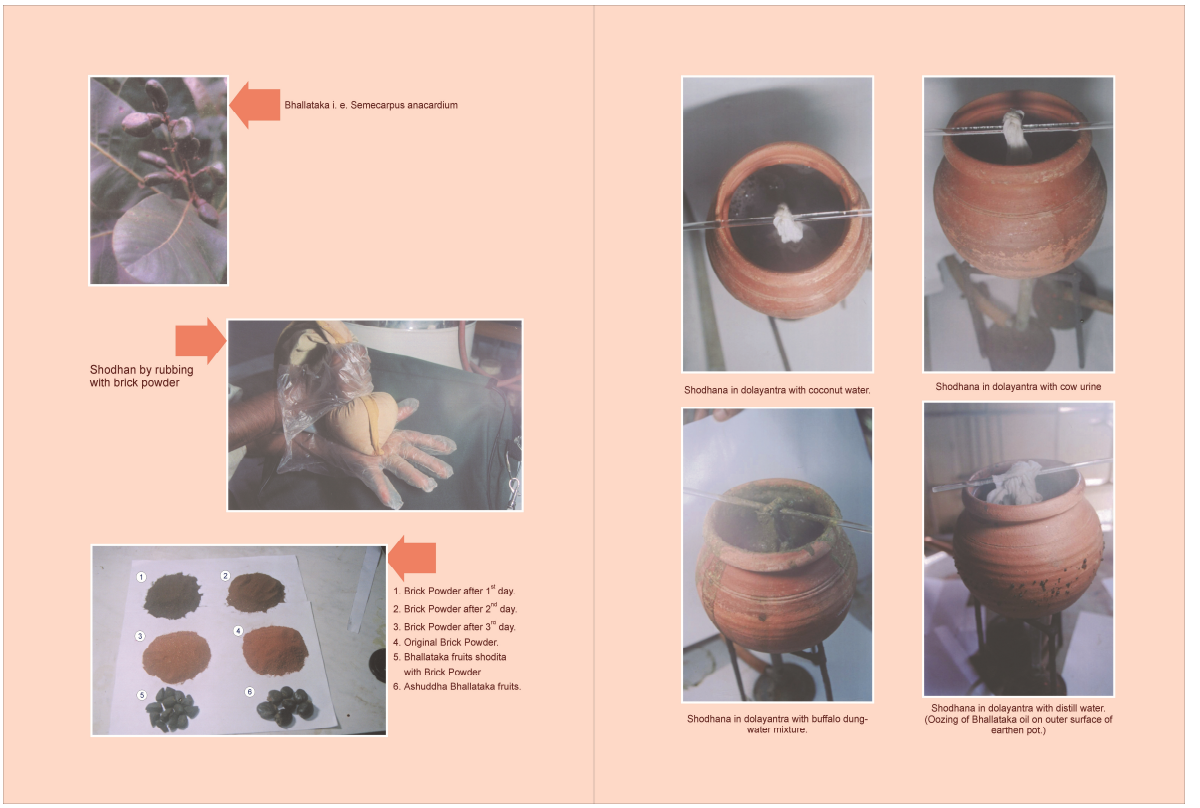
No.	Samples	Rf Values					
		0.45 (Gray)	0.55 (Gray)	0.70 (Gray)	0.76 (Gray)	0.82 (Gray)	0.86 (Violet)
1.	Ashuddha	+	+	+	-	-	-
2.	Brick powder shodhita	+	+	-	-	-	-
3.	Buffalo dung-water mixture shodhita	+	-	-	+	+	-
4.	Distill water shodhita	+	-	-	+	+	-
5.	Coconut water shodhita	+	-	-	+	+	-
6.	Cow urine shodhita	+	-	-	+	+	+

Table 9: Rf Values After spray H_2SO_4 Reagent Before Heating

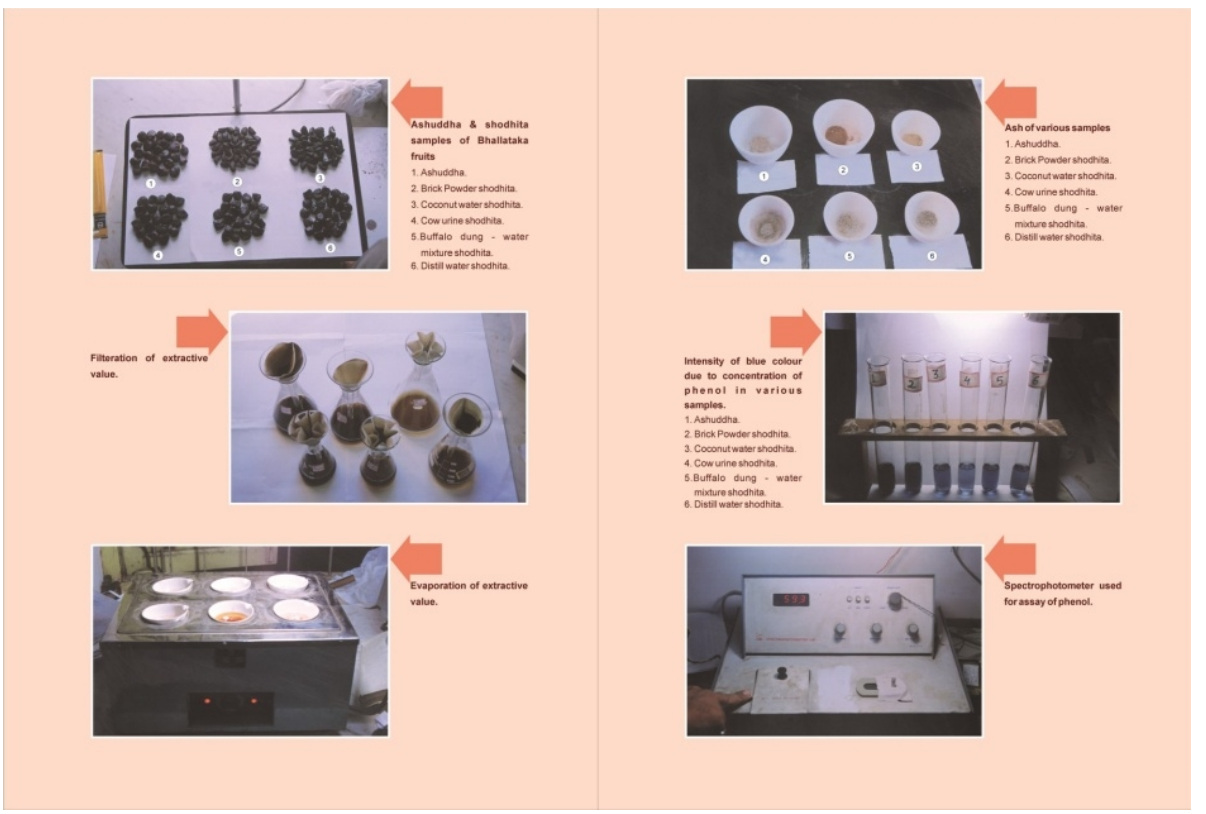
No.	Samples	Rf Values						
		0.41 (Gray)	0.52 (Gray)	0.55 (Gray)	0.66 (Gray)	0.72 (Gray)	0.78 (Gray)	0.86 (Violet)
1.	Ashuddha	+	+	+	+	-	-	-
2.	Brick powder shodhita	+	+	+	-	-	-	-
3.	Buffalo dung-water mixture shodhita	+	-	-	-	-	-	-
4.	Distill water shodhita	+	-	-	+	+	-	-
5.	Coconut water shodhita	+	-	-	+	+	-	-
6.	Cow urine shodhita	+	-	-	+	-	-	+

Table 10: Rf Values After spray H_2SO_4 Reagent After Heating

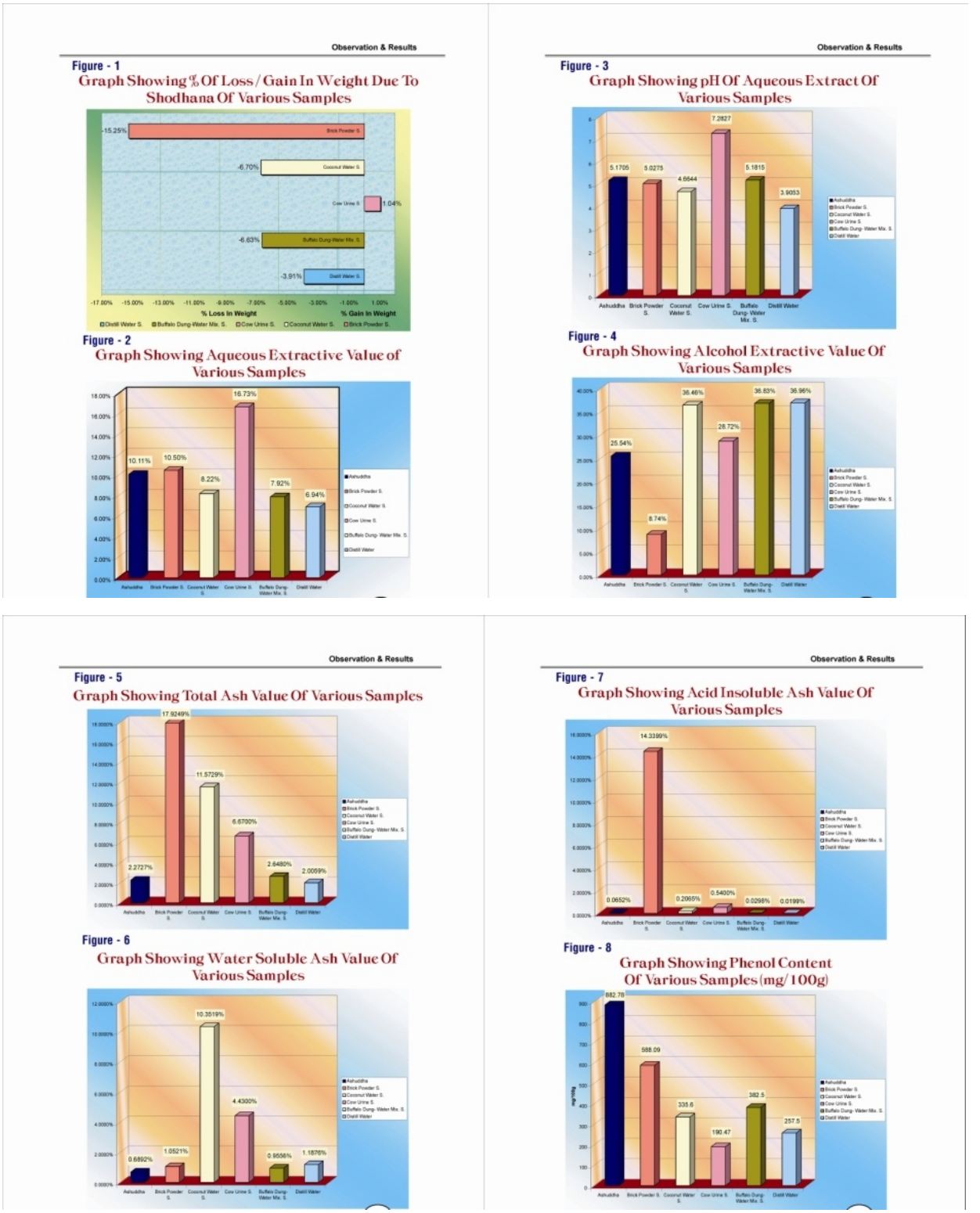
No	Samples	Rf Values								
		0.21 (Gray)	0.29 (Gray)	0.37 (Gray)	0.41 (Gray)	0.41 (Gray)	0.55 (Gray)	0.62 (Violet)	0.86 (Purple)	0.94 (Gray)
1.	Ashuddha	+	-	+	+	+	+	+	-	+
2.	Brick powder shodhita	+	-	-	+	+	-	-	-	+
3.	Buffalo dung-water mixture shodhita	+	-	-	+	+	+	+	-	-
4.	Distill water shodhita	+	+	-	+	+	+	+	-	-
5.	Coconut water shodhita	+	+	-	+	+	+	+	-	-
6.	Cow urine shodhita	+	+	-	+	+	-	+	+	-



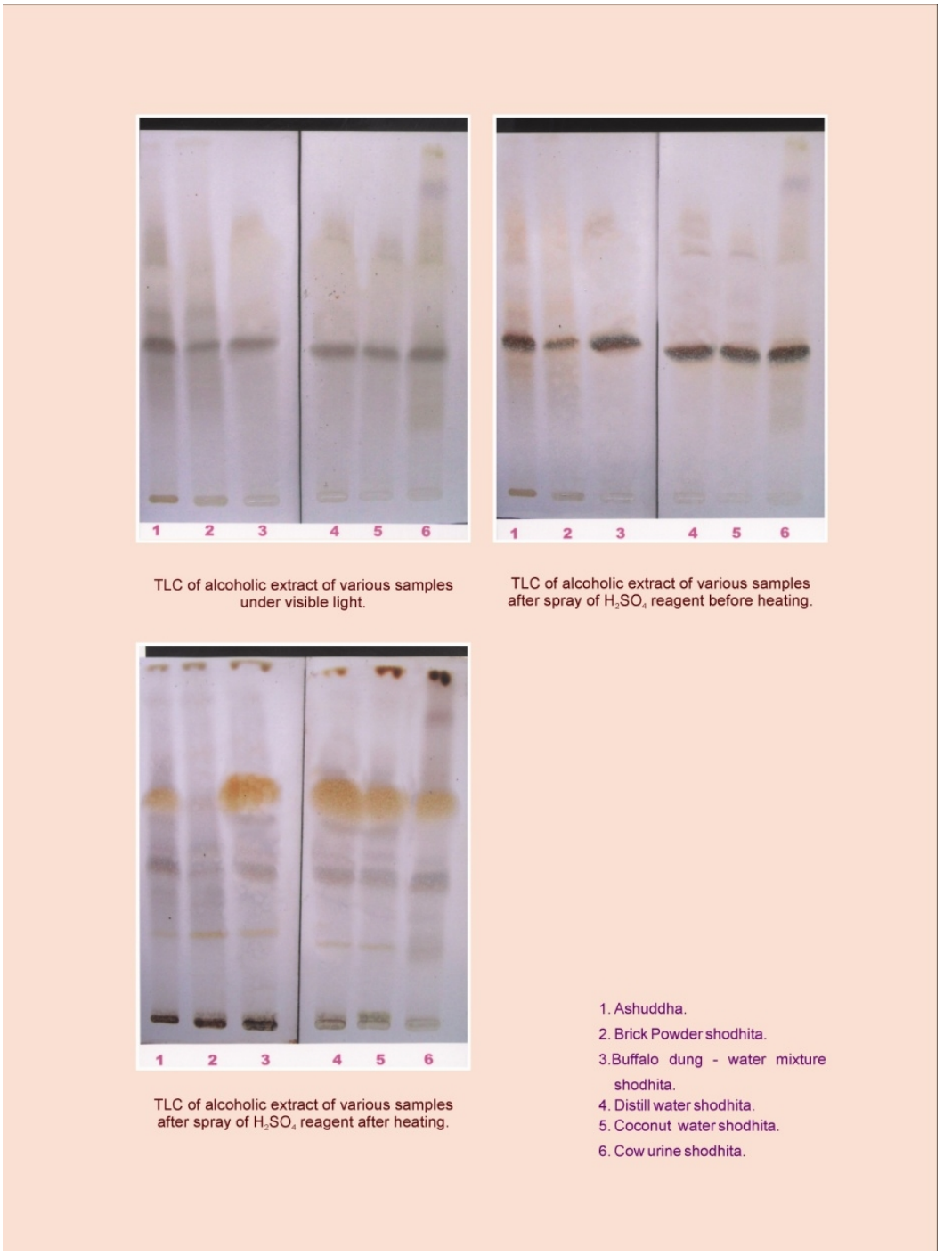
Picture 1: Various Methods of Shodhana Sanskara of Bhallataka



Picture 2: Analytical study of Ashuddha & Shodhita samples of Bhallataka



Figures 1-8: Analytical study of Ashuddha & Shodhita samples of Bhallataka



Picture 3: TLC of Ashuddha & shodhita samples of Bhallataka

DISCUSSION

According to Charaka samhita any poison with its proper administration act as excellent drug and any excellent drug with its improper use can be a poison. Also according to Bhavaprakasha, poisonous plants are subjected to sanskara prior to their therapeutic use. When such shodhana sanskaras are carried out, the poisonous plants are attributed with certain properties like rasayana, yogavahi, tridoshahara, brihana, veeryevardhaka, prandayi etc. Now a days in market a number of Kalpa (medicinal formulations) contains such poisonous plants. If these poisonous plants are not subjected to shodhana sanskara properly, they may act as poison. Consequently their therapeutic preparation will also be poisonous.

The process of converting harmful Gada (poison) in to useful medicine is Shodhana sanskara (purification process) which eliminates their toxic effects. Hence the study was carried out to find out the variations observed in parameters like ash value, extractive value, phenol assay, TLC etc., before and after various methods of shodhana sanskara of Bhallataka fruits. Phenol assay and TLC are the

two main parameters and the other parameters like ash value, extractive value follows the direction of the Ayurvedic Pharmacopoeia of India.

CONCLUSION

This study shown remarkable difference in various parametric values of Ashuddha (Impure) and five shodhita (purified) samples of Bhallataka fruits.The percentage loss in weight due to shodhana (purification) with brick powder is highest i.e. 15.25% where as 1.01% weight is gained in cow urine Shodhita (purified) sample. Aqueous extractive value of cow urine shodhita (purified) sample is highest i.e. 16.73% as compare to Ashuddha (Impure) which is10.50%.pH of aqueous extract of cow urine shodhita (purified) sample is slight alkaline i.e. 7.2827. Alcohol extractive value is higher in distill water shodhita (purified) sample (36.96%), Buffalo dung-water mixture shodhita (purified) sample (36.83%) and coconut water shodhita (purified) sample (36.46%) which are near about same. Total ash value is highest in brick powder shodhita (purified) sample (17.9249%) and coconut water shodhita (purified) sample (11.5729%). Water soluble ash value is highest in coconut water shodhita (purified) sample (10.3519%) whereas acid insoluble ash is highest in brick powder shodhita (purified) sample (14.3399%). Brick powder shodhita (purified) sample has phenol content 588.09 mg/100g which comes after a ashuddha (impure) sample (882.71mg/100g) whereas phenol content is lowest in cow urine shodhita (purified) sample i.e. 190.47 mg/100g. In TLC after spray H_2SO_4 reagent after heating, one yellow spot diffused in nature at Rf 0.62 is missing in Brick Powder shodhita (purified) Sample while it is present in all other samples. Also one purple color spot at Rf 0.86 is found in cow urine shodhita (purified) sample while it is absent in all other samples. The results show remarkable difference in various parametric values of ashuddha (impure) and shodhita (purified) samples which can be considered differentiating tests for ashuddha (impure) and shodhita (purified) samples and can be applied for Shodhita (purified) Bhallataka. On the basis of these studies further tests can be developed to find out whether properly shodhita (purified) Bhallataka has been used in its Kalpa (formulations) available in the market. Similarly any formulation under use if found to be doubtful (toxic) can also be tested. Further study and animal experimentation in this regard will add a useful parameter to study toxicity of plant.

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REFERENCES

1. Pandit K Shastri, Dr. G Chaturvedi, Charak samhita of Agnivesha, 22nd edition, Chaukhambha Bharati Academy,Varanasi; Sutrasthana 1/127, Deerghajeevitiya adhyaya; 1996. p.49.
2. Pandit Kashinath Shastri, Rasatarangini of Sadanand Sharma, Reprint edi., Motilal Banarsidas Prakashak, Delhi; chapter 2/52, Paribhasha vidnyaneeya; 1994. p.22
3. Prof.K.C.Chunekar, Bhavaprakasha Nighantu of shri Bhavamisra, Revised & enlarged edition, Chaukhambha Bharati Academy,Varanasi; Dhatwadivarga/204; 2010. p.621.
4. Prof.K.C.Chunekar, Bhavaprakasha Nighantu of shri Bhavamisra, Revised & enlarged edition, Chaukhambha Bharati Academy,Varanasi; Dhatwadivarga/205; 2010. p.622.
5. Pandit K Shastri, Dr. G Chaturvedi, Charak samhita of Agnivesha, Reprint, Chaukhambha Bharati Academy,Varanasi; Chikitsasthana 23/6, Vishachikitsa adhyaya; 1998. p.624.
6. Dr.Ambikadatta Shastri, Sushrut samhita of sushrut, 14th edition, Chaukhambha sanskrita Bhavan, Varanasi; Kalpasthana 2/3, Sthavara vashavidnyaniyam adhyay; 2003. p.15.
7. Pandit Kashinath Shastri, Rasatarangini of Sadanand Sharma, Reprint edi., Motilal Banarsidas Prakashak, Delhi; chapter 24/163-164, Vishopvishavidnyaniyam; 1994. p.675,676.
8. Pandit Kashinath Shastri, Rasatarangini of Sadanand Sharma, Reprint edi., Motilal Banarsidas Prakashak, Delhi; chapter 24/474-476,Vishopvishavidnyaniyam; 1994. p.734.
9. Pandit K Shastri, Dr. G Chaturvedi, Charak samhita of Agnivesha, 22nd edition, Chaukhambha Bharati Academy,Varanasi; Sutrasthana 18/4, Trishothiya adhyaya; 1996. p.368.
10. Pandit Kashinath Shastri, Rasatarangini of Sadanand Sharma, Reprint edi., Motilal Banarsidas Prakashak, Delhi; chapter 24/477-478,Vishopvishavidnyaniyam; 1994. p.735.
11. Pandit Kashinath Shastri, Rasatarangini of Sadanand Sharma, Reprint edi., Motilal Banarsidas Prakashak, Delhi; chapter 24/479,Vishopvishavidnyaniyam; 1994. p.735.
12. Kaviraj Ambikadatta shastri, Bhaishajyaratnavali of Vd.Rajeshwar Datta,17th edition, Chaukhambha Sanskrita sansthan, Varanasi; Chapter 2/180, Shodhanamarana prakaran; 2004.p.25.
13. Rasatantra Sara Va Siddhaprayoga sangraha, Part- I; 9th edition, Krishnagopal Ayurveda Bhavan (D.T.), P.O. Kaleda Krishna Gopal, Dist.Ajmer; 2000, p.76.
14. Jagganathprasad Shukla, Agadtantra-Upavisha, Part-II; Upavisha Vivarana, Tritiya adhyay, Bhallataka; p.19.
15. Wealth of India Raw Materia, Vol-IX; Revised edition, Directorate CSIR Hill side Road, New Delhi; *Semecarpus;* 1988 p.271,272.
16. DR.K.M.Nadkarni, Indian Matera Medica with Ayurvedic Unani & Home remedies; Reprint, Bombay Popular Prakashan, Bombay; 2269. *Semecarpus anacardium*; 1993. p.1119,1120.
17. Pallavi D. Akare et al, Therapeutic significance of *Semecarpus anacardium* Linn.: A review, Int. J. Res. Ayurveda Pharm. 2015;6(4):463. http://dx.doi.org/10.7897/2277-4343.06490
18. Gajjar et al, Effect of Shodhana process on quantity of phytoconstituents of *Semecarpus anacardium* Linn. , Int. J. of Pharm. & Life sci. 2011; 2(6):805-807.
19. The Ayurvedic Pharmacopoeia of India, Part-I, Volume-II; 1st edition, Government of India, Ministry of Health & Family welfare, Department of ISM & H, The Controller of publications civil lines, New Delhi; Appendix- 2; 1999. p. 190,191,195.
20. Pandit Kashinath Shastri, Rasatarangini of Sadanand Sharma, Reprint edi., Motilal Banarsidas Prakashak, Delhi; chapter 24/473,Vishopvishavidnyaniyam; 1994. p.734.

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