World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 5.088

A PHARMACOGNOSTICAL STUDY OF *LANGALI* (*GLORIOSA SUPERBAA* LINN) *MOOLA*- A ANALYTICAL STUDY

***[1]Dr. Madhu Pathak and [2]Dr. Himani Goswami**

[1]Asst. Professor, Department of Agad Tantra, SGT University, Gurugram.
[2]Asst. Professor, Department of Moulik Siddhant, SGT University, Gurugram.

***Corresponding Author: Dr. Madhu Pathak**
Asst. Professor, Department of Agad Tantra, SGT University, Gurugram.

Article Received on 21/04/2019 **Article Revised on 11/05/2019** **Article Accepted on 01/06/2019**

ABSTRACT

Langali is one among the *Upavisha* according to various *Nighantu* in *Ayurveda*. *Acharya Charak* has mentioned *Langali* under *Moolaja visha.* So, the useful part of *Langali is moola*. To reduce the toxic effect of a drug in *Ayurveda Shodhana Samskara* is mentioned. For this sample of *Langali moola* was collected from natural habitat and *Shodhana* was done by *Gomutra*. To compare the Physicochemical and Phytochemical analysis for both the samples that is *Ashodhita* sample (A. S.) and *Shodhita* sample (S.S.) of *Langali Moola* were done. The values such as total ash, water and alcohol soluble extractive values of the *Shodhita* samples were found to be increased. Qualitative analysis of samples shows presence of alkaloids, saponin, tannins and carbohydrates before and after *Shodhana* procedures. Thus the current study shows the importance of *Shodhana Samskara.*

KEYWORDS: *Langali*, Phytochemical, *Shodhita*, *Ashodhita.*

INTRODUCTION

Gloriosa Superba Linn (Family: Liliaceae) is branched herbaceous climber commonly found throughout in India. Roots of *Gloriosa Superba* are fibrous and tapering ends (‘V’shape) roots. Leaves are sessile scattered or opposite and sometimes arises from the separation of the internodes, teranately whorled, ovate/ lanceolate, acuminate tip ending in a tendril like spiral, nerves parallel. Flowers are large axillary, solitary or subcorymbose. Fruit are capsule form, linear oblong, three celled. Seeds are Sub-globose, testa spongy, wing like.[1] *Brihatrayee* does not mention the *Shodhana* of *Langali* Other classical texts of *Ayurveda*, categories it under *Upavisha varga*,[2] and advocate certain *Shodhana* (purificatory) procedures for *Langali* before its internal administration.[3]

Chemical constituents[4] It contain essential oil, Benzoic acid, Salicylic acid, Choline, Dextrose, Palmic acid, Phytosterol including stigma-sterol, a mixture of phytosterolins containing stigma sterol glycoside and some resinous matter, an enzyme which readily hydrolyses amygdaline is present. Colchicine and Superbine are two main alkaloids present in Gloriosa Superbaa

Fatal Dosage[5]
Pure colchicine-7 to 60 mg
Tubers of *Langali*- 2.5 to 5 gm.

Toxic Effects
Acute poisoning[6]
- Severe vomiting
- Diarrhoea
- Abdominal pain
- Hypotension
- Respiratory Failure
- *Akshep* (Convulsions)[7]
- *Annanalika Daha* (Burning in GI track)
- Burning in Uterus
- Circulatory embarrassment, collapse and death

Chronic poisoning[8]
Common effects after plant ingestion include nausea, vomiting, diarrhoea, abdominal pain, and tachycardia and chest pain. More severe effects such as hypotension and shock, delirium, loss of consciousness, convulsions, respiratory distress, haematuria, oliguria, transient leucocytosis followed by leucopenia, thrombocytopenia with hemorrhages, anemia, muscle weakness which may progress to polyneuropathy.

Antidote[9]
Sarkara khand is given with *Takra* (buttermilk) as *Anupana*, *Ghritapana* is advised.

MATERIAL AND METHOD

Langali roots were taken, cut into pieces and then dipped in *Gomutra* for one day.[10] Then roots were taken out from *Gomutra* and dry under shade. After drying roots were subjected for the analysis (ww. Bolo ji, swapanil tunsalkar)

Analytical specification of crude drugs[10]

1) Determination of foreign organic matter - 100 gm of sample is weighed and spread on a white tile or glass plate uniformly, without overlapping. Inspected the sample with naked eyes by means of lens of 5X magnification power or above. The foreign organic matter (other than the sample if any) is separated. After complete separation, the matter separated is weighed.

Physico-chemical analysis of *Ashodhita* and *Shodhita Langali moola*

Determination of loss on drying - 2 gm of powdered test sample is weighed. Placed in china dish and dried in oven at 100 – 105^{0}C. The sample is taken out, it is cooled in desiccators and loss in weight is recorded. This procedure is repeated till constant weight is obtained.

Loss on drying (%) = Loss in weight x 100 /w ('W' = Weight of the drug powder in gram).

Determination of Total Ash value - 2 gm of weighed test sample is taken in a silica crucible. The powdered sample is scattered at the bottom of crucible. The muffle furnace is incinerated by gradually increasing the temperature till to 450^{0}C or heat should not exceed i.e. until the sample powder is free from carbon. Then cooled in a desiccators. The ash is weighed, and percentage of ash is calculated with reference to the air-dried drug sample.

$$\text{Ash value (\%)} = \frac{100 \times \text{Wt. of ash}}{}$$

Determination of acid – insoluble ash value - Using 25 ml of dilute HCl (0.5N), the ash from the dish, used for the total ash value determination is washed into a beaker. Wire gauze is placed over a Bunsen flame and the washed HCl is boiled for 5 minutes. Filtered through ash less fitter paper, washed with hot water, then the filter paper with residue is folded and placed in a crucible. The muffle furnace is incinerated till 250^{0}C. Then cool it and the residue is weighed. The acid insoluble ash of the crud drug with reference to the air dried sample of crude drug is calculated.

$$\text{Acid insoluble ash value (\%)} = \frac{100 \times \text{Wt. of residue}}{\text{Wt. of sample}}$$

Determination of Alcohol soluble extractive value for both samples:

Determination of Alcohol Soluble Extractive

Ingredients: -

a) Powdered drug – 5 gm
b) Alcohol (90%) – 100 ml

For water soluble extractive values of both the sample same as alcohol soluble extractive value but instead of alcohol, chloroform water is used

Determination of Extractive Value[11]

The dried powered of *Langali Moola* extracted with the mixture of water and alcohol (50:50) by using soxhelet apparatus. The hydro alcohol was done for one week to obtain the extract of Gloriosa Superba. Then the extract was evaporated in water bath at 50 ^{0}C to dry (or till the alcohol smell is lost completely). After drying the respective extract was weighed and yield recorded. The physical characters were noted.

Phyto-Chemical Analysis[12]

1) Test of carbohydrates: Molisch's Test- 2 – 3 ml aq. Extract + few drops of alpha naphthol solution in alcohol, shake and add concentrated H_2SO_4 from sides of test tube. Violet ring is formed at the junction of 2 liquids.
2) Test for reducing Sugars: Fehling's Test: Mix 1 ml Fehling's A and 1 ml Fehling's B solution boil for 1 minute. Add equal volume of test solution. Heat in boiling water for 5 – 10 minutes.1st a yellow, then brick red precipitate is observed.
3) TEST FOR PROTEINS: Biuret Test (General Test) : To 3 ml T. S., add 4% NaOH and few drops of 1% $CuSO_4$ solution. Violet or pink colour appears.
4) TESTS FOR AMINO ACIDS: Test for Cysteine: To 5 ml T.S. and add few drops of 40% NaOH and 10% lead acetate solution. Boil than black precipitate of lead sulphate is formed.
5) Tests For Tannins and Phenolic Compounds: To 2 – 3 ml of aqueous or alcoholic extracts, add few drops of Lead acetate solution
6) TESTS FOR STEROIDS: Salkowski reaction: To 2 ml of extract, add 2 ml of chloroform and 2 ml concentrated H_2SO_4. Shake well. Chloroform layer appears. Red and acid layer shows greenish yellow fluorescence.
7) TLC Identification tests[13]

TLC fingerprinting is done for 4 different extract of Gloriosa Superbaa Linn. TLC was carried out of both the sample that *Shodita* sample and *Ashodita* sample. For this, aluminium sheet was used to separate the active compound which was present in the extract. Sample were spotted on plates (thin layer chromatography plates) which were developed in methanol-chloroform(1:20) Observe the plate under UV light at 254 nm, different retention factor (R_f) values are noted and compared with the standards for Alcoholic & Aqueous extract of sample A & S . Different solvents system were used-

Solvent system A

Stationary phase: Silica gel G

Mobile phase -Acetone: Dichloromethane: Ammonia 8: 4: 0.1

Solvent system B

Stationary phase: Silica gel G

Mobile phase: Chloroform: Methanol 9: 1

Solvent system C
Stationary phase: Silica gel G

Mobile phase: Toluene: Ethyl Acetate: Formic acid 6: 3: 1

RESULTS AND DISCUSSION

Table 1: Analytical Specifications of Crude drug.

Sl. No.	Parameters	Sample A	Sample S
1.	Foreign Organic Matter	Nil	Nil
2.	Insect infested matter	Nil	Nil
3.	Sand and Silica	Nil	Nil

Table 2: Physico-chemical Analysis of *Langali*.

Estimations	Sample A	Sample S
Moisture content estimation	17.1%	20%
Ash value estimation	3.54%	5.01%
Acid insoluble estimation	1.009%	1.734%

Table 3: Test for Inorganic components.

Test	Results	
	***Ashodita* Sample**	***Shodita* Sample**
Calcium	-	-
Magnesium	-	-
Iron	+	+
Sulphur	+	+
Chorine	+	+
Carbonate	-	-
Nitrates	_	_

Table 4: Phyto-chemical analysis *Langali.*

Test	Results			
	***Ashodita* Sample**		***Shodita* Sample**	
	Aqueous Extract	**Alcoholic Extract**	**AqueousExtract**	**Alcoholic Extract**
Carbohydrate	+	+	+	+
Steroid	+	+	_	_
Alkaloid	+	+	+	+
Tannin	+	+	+	+
Non-reducing Sugar	_	+	_	_
Proteins	_	_	_	_
Amino Acids	_	_	_	_
Saponin	+	+	_	_

TLC Results of *Langali*

Table 5: Solvent system.

Samples	Rf in Visible light	Rf in U.V light
Sample Ashodhita (Aq.)	0.24	0.90, 0.53
Sample Ashodhita (Alco.)	0.17, 0.7, 0.91	0.64,0.49, 0.89
Sample Shodhita (Aq.)	0.28	0.7, 0.27
Sample Shodhita (Alco.)	0.18, 0.64, 0.81	0.66, 0.36, 0.83

Table 6: Solvent system B.

Samples	Rf in Visible light	Rf in U.V light
Sample A (Aq.)	0.49	0.60
Sample A (Alco.)	0.89	0.49
Sample S (Aq.)	0.31	0.82
Sample S (Alco.)	0.24	0.89

Table 7: Solvent system C.

Samples	Rf values
Sample A (Aq.)	0.76, 0.51
Sample A (Alco.)	0.079, 0.12, 0.16, 0.31, 0.49, 0.51, 0.59, 0.77
Sample S (Aq.)	0.18, 0.42
Sample S (Alco.)	0.075, 0.13, 0.17, 0.29, 0.35, 0.55, 0.72

Langali is poisonous drug, but at the same time it is very effect therapeutically. In *Ayurveda Shodhana samkara* is mentioned for poisonous drug. For *Langali Shodhana Gomutra* is mentioned in *Ayurveda Prakash*.[14]

The Preliminary phytochemical studies in the test drugs revealed the presence of Saponins in *Ashodhita Langali moola* and it was absent in *Gomutra Shodhita*. In *Shodhita Langali Moola* Steroids were found to be absent. The increase in loss on drying in *Shodhita* samples indicates the *Shodhita* samples contain more moisture than the *Ashodhita* sample, it may be because, roots were kept in the (liquid medias) *Gomutra*. The increase in the ash values of the *Shodhita* samples can be hypothesized as the addition or transfer of inorganic constituents of *Gomutra* like magnesium, Iron, Copper, Manganese, calcium salts, mineral salts to roots of Gloriosa Superba. The reduction in the extractive values in the *Shodhita* samples indicates media may act like the solvent system to extract the toxic alkaloids like as that of the cold and hot maceration type of extractions. Keeping the *Langali moola* in *Gomutra* resembles the cold maceration type of extraction It might be the reason for the gradually reduction in the extractive values in all the *Shodhita* samples.

The presence of Colchicine, Lumi-colchicine was confirmed by comparing the Rf values with those of the standard markers by HPTLC.

The colour change in the *Gomutra* indicates the chemical changes occurred between the roots of Gloriosa Superba and the *Gomutra.* The colour change may be due to the migration or transformation of the chemical constituents present of the seeds like the alkaloids i.e. Colchicine, Lumi-colchicine, tannins etc. into the *Gomutra*. Simultaneously the colour of the root turned light that indicates the transfer of the colouring materials from the roots to the media. Phytochemical analysis of the plane *Gomutra* sample was found to have Alkaloids, Carbohydrates, Tannins, and Steroids. This indicates that these substances are added during the process of *Shodhana*.

CONCLUSION

Hence this present study shows the importance of *Shodhna Samskara which is mentioned in Ayurveda* and proves the basic fundamentals of *Ayurveda* i.e. is "*Samskarohinaam Gunataradanam*"

REFERENCES

1. Kirtikar K.R and Basu B.D "Indian Medicinal Plants ' ' Vo l - 3, Chaukambha Pu blications, 2ndEdition, New Delhi, 25235.
2. Shastry Kashinath (Editor) Sharma Sadananda's "Rasatarangini", Motilal banarasdasa Publications, Varanasi, 741.
3. Shri Gulraj Sharma Mishra, "Ayurveda Prakash", Chaukambha Publications, New Delhi, 6/113.
4. Dr.J.L.N. Shastry, Prof.K.C. Chunekar, DravyagunaVijnana, Ed.3rd, 2008, Chukhambha orientaliavaranasi, 1002.
5. Pillay V.V., Comprehensive Medical Toxicology, Paras Medical Publisher, Hydrabad, Ed 2nd, 2008; 849.
6. Pillay V.V., Comprehensive Medical Toxicology, Paras Medical Publisher, Hydrabad, Ed 2nd, 2008; 849.
7. Mishara Edited by Shree shastry B.& Vaishya R., Bhavaprakasha, Purwardhwam, Chukhambha Sanskrit Sansthana, Varanasi, Ed.8, 1993; 314.
8. Nandy A., Principles of Forensic Medicine, New Central agency(P) Ltd., Calcutta, Ed.2nd, 2000; 39: 558.
9. Mishra Banavarilal's "Dravya guna Hastamalaka", Premalata Natani Publication, Jaipur, 3rd Edition, 524.
10. Shri Gulraj Sharma, "Aurvrda Prakash", Chaukambha Publications, New Delhi, 6/114.
11. Department of Indian System of Medicine and Homeopathy, Govt of India "The Ayurvedic Pharmacopoeia of India" Vol 2, Part I, The Controller of Publications, New Delhi, 1st Edition, 190-196.
12. Khandelwal K.R "Practical Pharmacognosy" Nirali Prakashana, Pune 13 th Edition, 2005; 157-158-143.
13. CCRAS "Pharmacopoeial Standards for Ayurvedic Formulations" Yugantar Prakashana Ltd, New Delhi, Revised Edition, 1987; 506.
14. Rajpal V (Editor) "Standardization of Botanicals" Vol-2, Eastern Publishers, Edition, 2005; 145.
15. Shri Gulraj Sharma, "Aurvrda Prakash", Chaukambha Publications, New Delhi, 6/114.
16. Swrnendumitra V. J Shukla Rabinarayana acharya; effect of purificatory measures through cow's Urine and milk on strychnin and brucine content of Kupeelu; African Journal of Traditional; Complementary and Alternative Medicines (AJTCAM), 2012; 9(1).