CONCEPT OF SHODHANA (DETOXIFICATION) PROCESS AND ITS EFFECTS ON TOXIC HERBAL PLANT LANGALI (GLORIOSA SUPERBA LINN.)

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Abstract:
An ayurveda suggest that the use of natural drugs obtained from plants, animals, and mineral origin, it can be divided under poisonous and nonpoisonous category.The some herbal drugs possess unwanted impurities and toxic substances which can lead to harmful health problems. As per many scientists all medicinal plants are not safe it contain many toxic and harmful phytoconstituents. Sodhana is the purification process use to convert poisonous drug into nonpoisonous ones. Hence, the process involves purification as well as reduction in the levels of toxic principles and some impurities. Herean attempt traditional and conventional shodhana process uses for purification of the langali (Gloriosa superb linn.) to enhance therapeutic effects. Preliminary physicochemical parameters was applied for evaluation of ashodhita and all shodhita samples, the results showed that the reduction of toxic principle and impurities after shodhana.

Key word: Ayurveda, Toxic plant, Shodhana, Purification, Phytoconstituents

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Introduction

Ayurveda contains a many herbal drugs obtain from various natural sources. The some drugs contains toxic principles consider under poisonious and semipoisoniouscategory[1].which possess unwanted impurities and toxic substances is harmful to health, in many ayurvedic texts such as yoga Ratnakar and Rasa Ratna samuchhaya& in Schedule – E of Drugs and Cosmetics Act (1940)[2]. Shodhana is detoxification process use for purification of toxic drugs.vatsanabha (Aconitum species), semecarpus anacardium, strychnosnux-vomica, acorus calamus, abrusprecatorius etc., are some of the interesting examples of toxic plants which are used in the Indian system of medicine[3,4,5].Using proper purification methods the toxic drug become nontoxic[6]. The concept of sodhana in ayurveda not only covers the process of purification of physical as well as chemical impurities but also covers the minimization of side effects and improving the therapeutic efficacy of the purified drugs[7]. There are two main types of shodhan i.e.samanya (general) and vishesh (specific), therefore ayurveda recommend different procedure for shodhan of a specific vishadravya i.e. swedana, mardana, murchana, patan, avap, nirvap, prakshalan, nimjjan, bharjan, sanyog, vibhang, pachan, shoshan, sthapan, nishtush[8].

Langli (Gloriosa superb Linn.) is one of the endangered species among the toxic medicinal plants that undergoes the process of shodhana prior to use in the ayurvedic system of medicine.Langli (Gloriosa superb Linn.) is a striking tuberous climbing plant with brilliant wavy edged, yellow and red flowers that appears from November to March every year[9]. It is growing in different region of India. Popularly it is known as *Langali*in Gujarati, *Kalahari* in Hindi and Glory lily in English. This plant is a part of folk medicine from ancient time[10]. Different methods of shodhana have been mentioned to remove its toxicity involving different media specific to substances such as gomutra, alkaline media[11].

Fig.1 Whole plant of Langali

Fig.2 Tubers of Langali

Material and method:

The Gloriosa superba roots were collected from supplier indianjadibooti, Delhi. Root sample was authenticated by Dr. Sunita Garg, former chief scientist, Head, RHMD, CSIR-NISCAIR, Delhi. gomutra, alkaline media and water were used for the shodhana of Gloriosa superba root.

Nimjjan (Dipping) method for Detoxification of Gloriosa superba roots (Langli) [12]:

In nimjjan method keeping raw drug in specific liquid for specific time period. The Chemical constituent change from higher concentration to lower concentration takes place. E.g.vastnabha shodhana in gomutra.

Procedure:

Gloriosa roots (10g) were cut into small pieces and soaked in 100 ml gomutra (cow's urine, pH between 7.8 to 8.2) for 24 hr. at room temperature the roots were then washed with warm water and air dried. An alternative to the traditional sodhanaprakriya were also carried out using alkaline medium (0.84% w/v sodium hydrogen carbonate Ph 8) in place of gomutra which is used in the conventional technique and control study using water as the medium[13].

The all samples ashodhit, shodhit with gomutra, shodhit with alkaline medium and shodhit with water were distributed respectively G1,G2,G3 andG4.

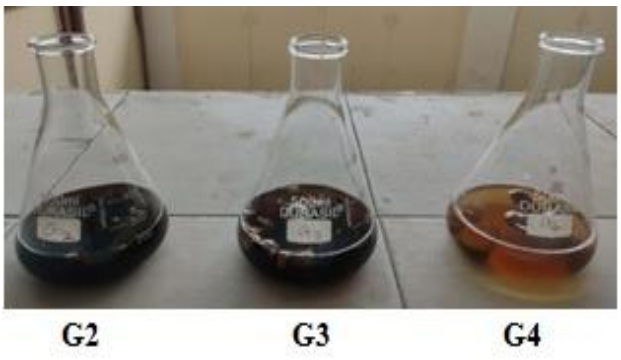

Fig. 3 shodhana process

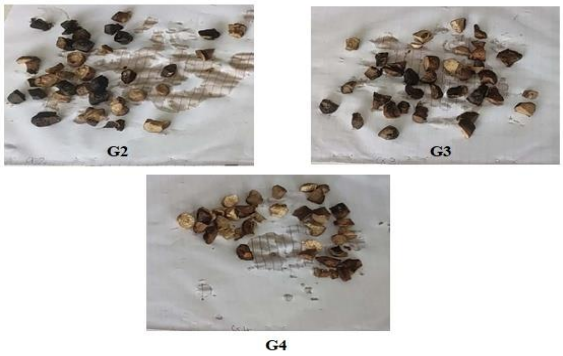

Fig. 4 postshodhita samples

Preliminary physicochemical parameters for evaluation of ashodhita and shodhita Gloriosa root:

1. Determination offoreign organic matter.

Method: 100 gm of sample is weighed and spread on a white tile or glass plate uniformly, without overlapping. The sample was inspected with naked eyes by means of lens of 5X magnification power or above. The foreign organic matter (other than the sample if any) was separated. After complete separation, the separated matter was weighed as foreign organic matter in terms of percentage w/w, present in the samples was determined.

Fig.5 Foreign organic matter detection

2. Determination of moisture content / loss on drying:

Method: 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.

Where 'W' is = Weight of the drug powder in gram.

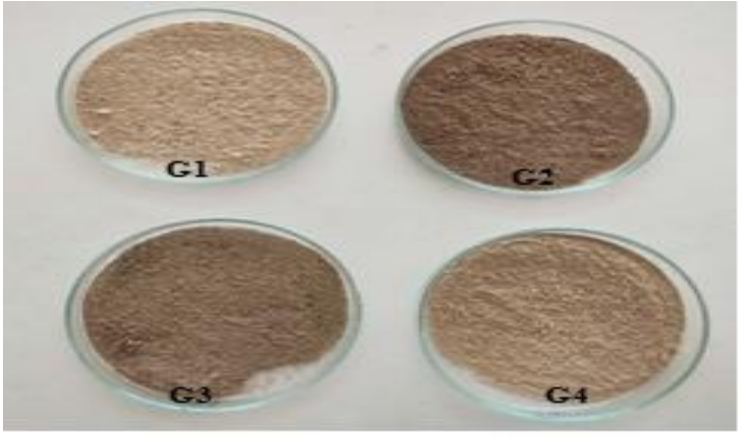

Fig. 6 Moisture content detection

3. Determination of total Ash value:

Method: 2 gm of weighed test sample is taken in a tarred platinum or silica crucible, previously ignited and weighed. The powdered sample is scattered at the bottom of crucible. The muffle furnace is incinerated by gradually increasing the temperature 0 till to 450 C or heat should not exceed the dull redness of material, i.e. until the sample powder is free from carbon. Then cooled in desiccator. The ash is weighed, and percentage of ash is calculated with reference to the air-dried drug sample.

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

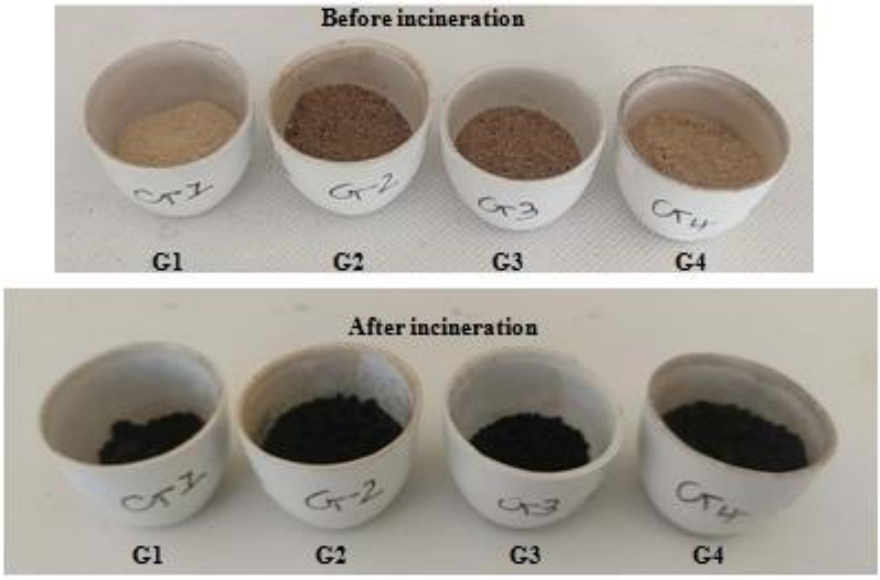

Fig. 7 Total Ash value detection

(a) 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 0 crucible. The muffle furnace is incinerated till 250 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.

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

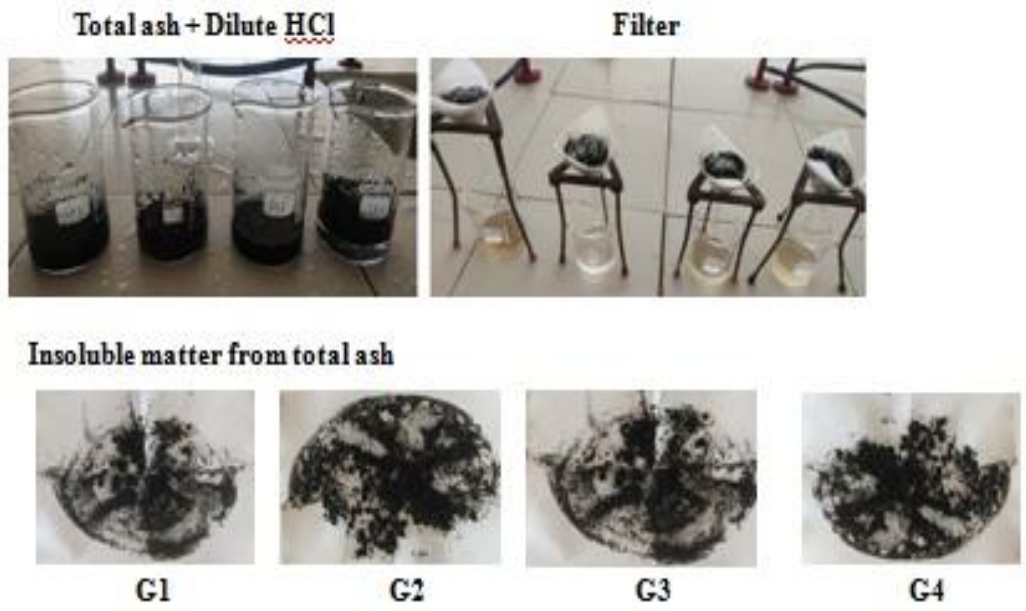

Fig. 8 Acid insoluble ash value detection

(b) Determination of water – soluble ash value:
To the crucible containing the total ash, add 25ml of water and boil for 5 minutes. Collect the insoluble matter in a sintered glass crucible or on an ashless filter-paper. Wash with hot water and ignite in a crucible for 15 minutes at a temperature not exceeding 450^{O}C.
Subtract the weight of this residue in mg from the weight of total ash. Calculate the content of water-soluble ash in mg per g of air-dried material.

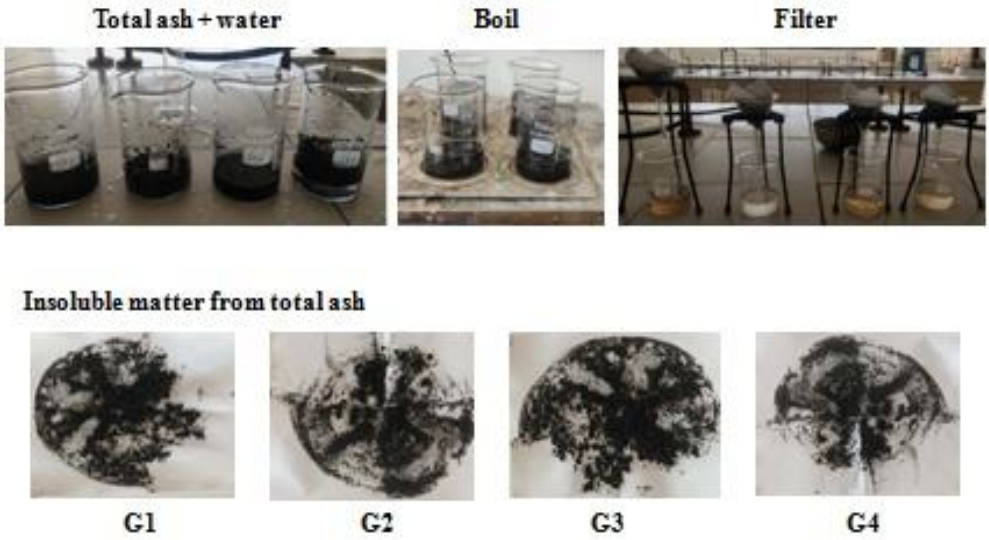

Fig. 9 water soluble ash value detection

4. Determination of extractive value for both samples:
Determination of Alcohol Soluble Extractive values for both ashodhita & shodhita samples:
Method: About 5 gm of the powdered drug is weighed in a beaker and transferred it to a dry 250 ml Iodine flask. 100 ml graduated cylinder is filled to the required mark with the solvent, 90% alcohol. The flask is stopper and set aside for 24 hours shaking with frequently at the interval of 6 hours (maceration). Filter into a 50 ml cylinder after sufficient filtrate has collected; transfer 25 ml of the filtrate to a weighed 25 ml beaker. Evaporated to dryness on water bath and complete the drying in an oven at 100^{o}C for about 10 –15 minutes.Cooled in desiccators and weighed.The percentage w/w of extractive is calculated with reference to the air dried drug.

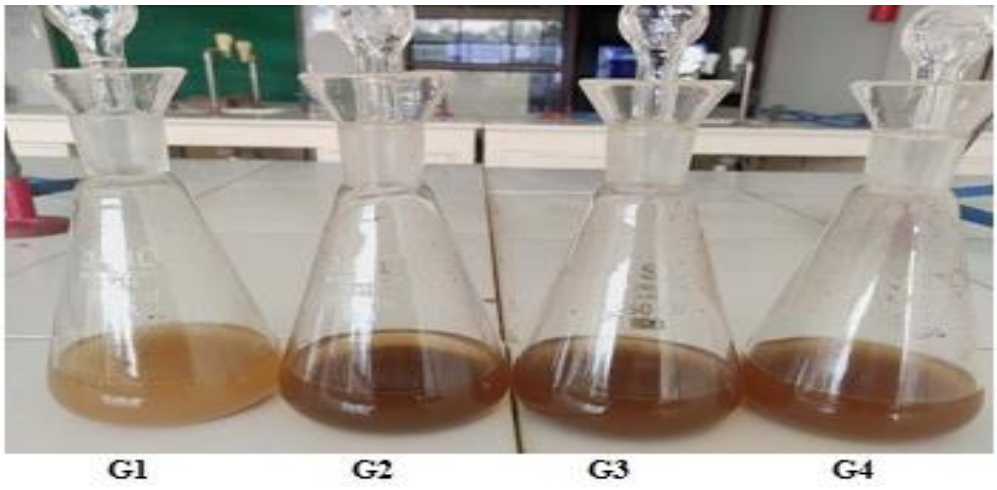

Fig. 10 Alcohol soluble extraction

Determination ofwatersoluble extractive values for both ashodhita & shodhita samples:
Method:Same method follows as determination of alcohol soluble extractive value. In case of water-soluble extractive value, instead of alcohol, water is used.

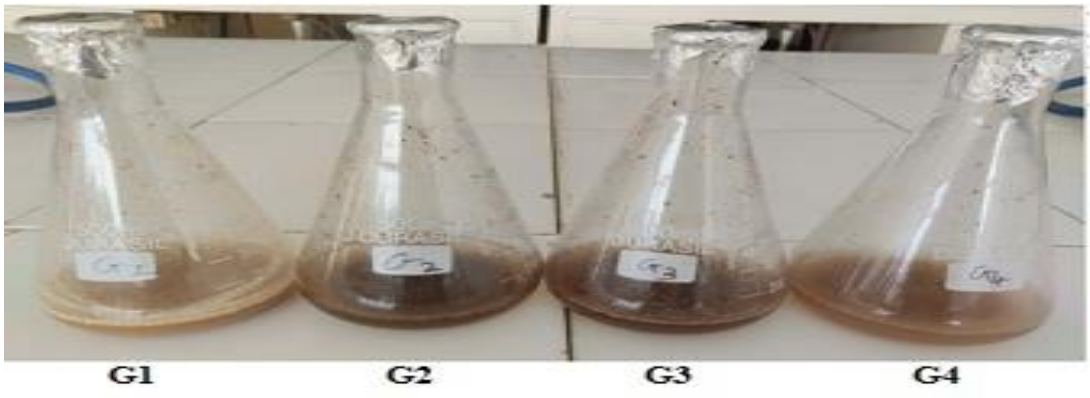

Fig.11 water soluble extraction

Results

Table1: Foreign organic matter for ashodhita & shodhita samples

Sample	Foreign organic matter
G1	Nil
G2	Nil
G3	Nil
G4	Nil

Table2: Loss on drying for ashodhita & shodhitasamples

Sample	Loss on drying % w/w
G1	7.5
G2	11
G3	11
G4	8

Table3: Total Ash value for ashodhita & shodhita samples

Sample	Total ash %w/w	Acid insoluble ash %w/w	Water soluble ash %w/w
G1	9.5	3.5	1.5
G2	4.5	1.5	0.5
G3	3.5	0.5	0.5
G4	7.5	2.5	1.5

Table 4: Extractive value for ashodhita & shodhita samples

Sample	Water soluble extractive value %w/w	Alcohol soluble extractive value %w/w
G1	22.4	3.8
G2	3.75	1.45
G3	4.95	1.98
G4	2.65	1.4

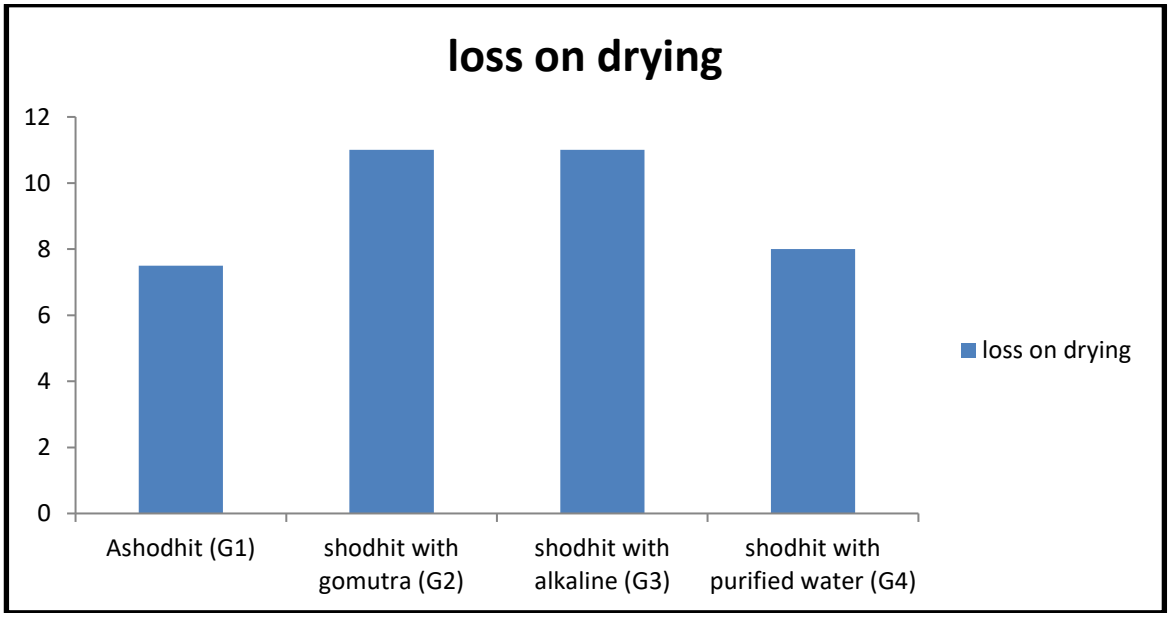

Fig. 12 Moisture content determination

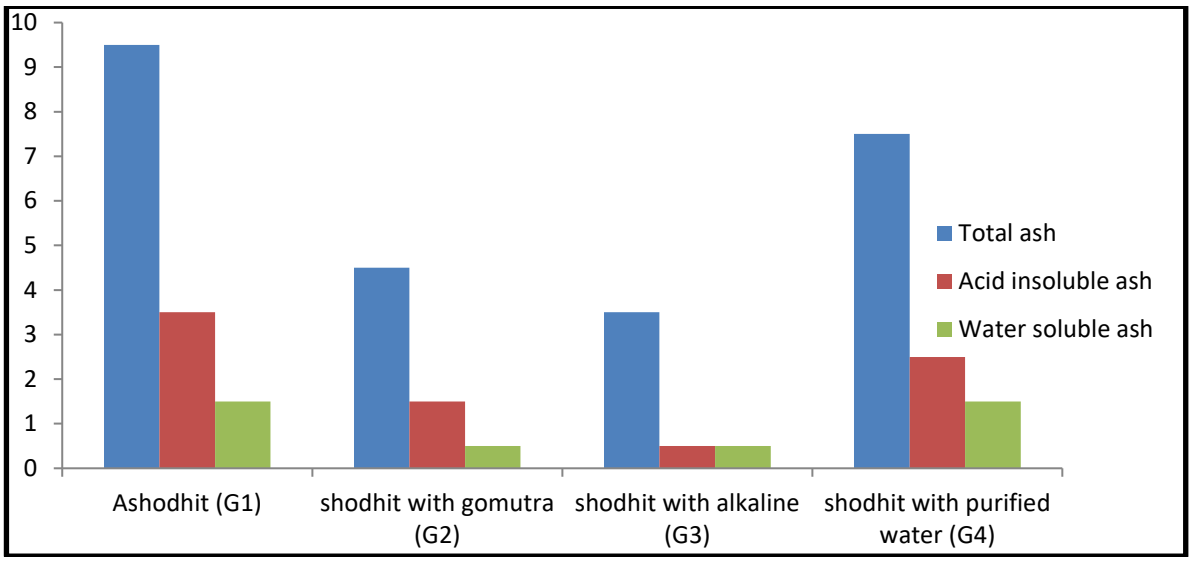

Fig. 13 Ash value determination

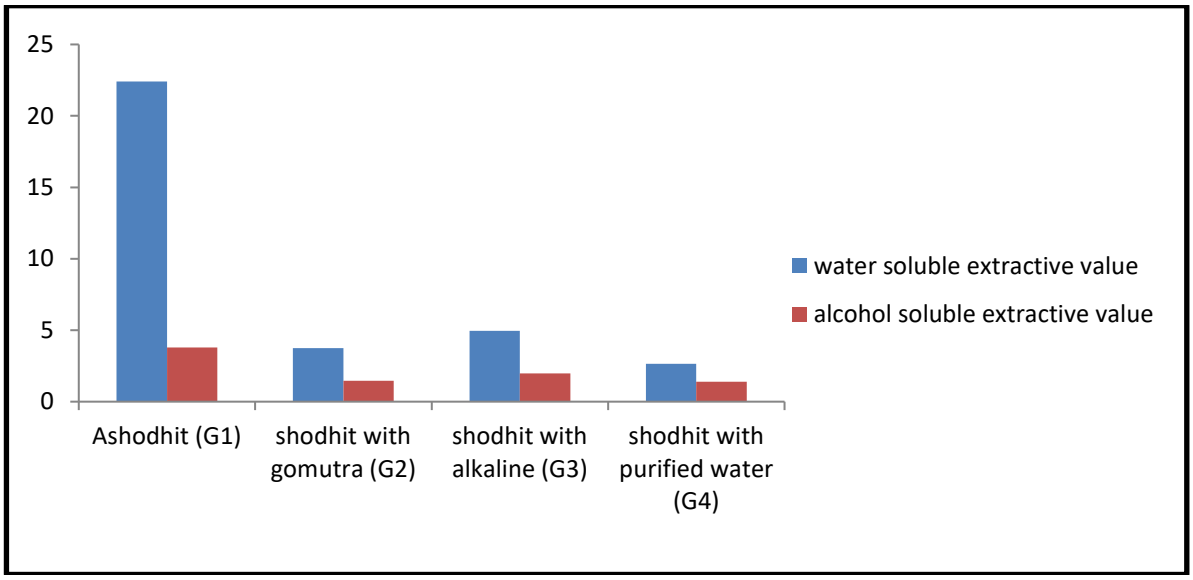

Fig. 14 Extractive value determination

Discussion:

Preliminary Physicochemical investigations were carried out on both Ashodhita and Shodhita samples of Langali, as per the standards of ayurvedic pharmacopoea.

The colour change in the Gomutra and alkaline media indicates the chemical changes occurred between the roots of Gloriosa Superba with two media using for detoxication. The colour change may be due to the transformation of the chemical constituents present in drug like the alkaloids i.e. Colchicine, Lumi-colchicine, tannins etc. into the media.

The Preliminary physicochemical studies in the test drugs revealed the increase in loss on drying in Shodhita samples indicates the Shodhita samples contain more moisture than the Ashodhita sample, it may be due to roots were kept in the (liquid medias) Gomutra, alkaline media and water.

The increase in the ash values of the Ashodhita samples indicate during detoxification some inorganic matter like magnesium, Iron, Copper, Manganese, calcium salts, mineral salts was remove from the drug.

The reduction in the extractive values in the Shodhita samples indicates during detoxification process the toxic alkaloids are extract out by the media.

Conclusion:

The langali is detoxify by nimajjan method prescribe in ayurvedic literature, No any changes in arrangements of cell and tissue during shodhana process because the toxic principle is a higher amount of chemical constituent.The experimental results suggested that the

conventional and traditional sodhana process can reduce the level of toxic constituents and other impuritiesand therefore soluble in gomutra, alkaline media and water.

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