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PHYSICO&PHYTO-CHEMICAL ANALYSIS OF INDIGENOUS DRUG

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ABSTRACT

Indigenous drug is a herbal formulation, ingredients used in the drug are *Gokshura*, *Punarnava*, *Gorakshaganja* and *Yava* has *Mutrala*, *Ashmarighna*, *Shothahara* properties. Attempt has been made to study physico & phyto chemical analysis of the drug. Preliminary Physico Phytochemical studies was done using standard procedure with aqueous, chloroform, ethanol, methanol and acetone extracts of Indigenous drug. The different extracts of Indigenous drug were extracted by Soxhlet apparatus (Hot percolation method). The results of the test showed the presence of carbohydrate, flavonoids, tannins, diterpenes and phenols and absence of quinone, alkaloids, saponins, gums and mucilage. The ingredients of the drug has *Mutrala*, *Ashmarighna*, *Shothahara* property along with analgesic, anti- inflammatory, anti-bacterial, antiurolithiatic and wound healing action which are mainly needed for treating *Mutrashmari.*

KEYWORDS: Indigenous drug, Physico & Phyto chemical analysis, *Mutrashmari*, *Mutrala*, *Ashmarighna*, *Shothahara.*

INTRODUCTION

In Ayurvedic classics, number of Drugs, have been told in the management of *Mutrashmari*, specially the *Gokshura, Yava, Gorakshaganja, Punarnava* and *Shwetaparpati* have got strong action, by the virtue of their Properties like *Mutrala, Ashmarighna, Sothahara*. *Mutrashmari* (urolithiasis) is a very painful condition with acute onset sometimes unsustainable and may manifest with *Mutrakruchra* (dysuria), *Mutrasanga* (urine retention), *Vrukka shopha* (Hydronephrosis) or renal failure. In almost all the Ayurvedic classics *Mutrashmari* has been dealt in detail. Here the management of *Mutrashmari* consists of *Nidana Parivarjana*, *Shamana Chikitsa*. Appropriate Ayurvedic management of *Mutrashmari* can help in minimizing the incidence and also treating *Mutrashmari* completely. An effort is made here to study the chemical composition of drugs to validate the formulation.

AIMS AND OBJECTIVES

To study in detail about Physico & Phyto chemical properties of Indigenous drug.

MATERIAL AND METHODS

Source Of data

Classical text books of AyurvedaText books of Modern Science.
Published article from periodic journals and other magazines.

DETAIL STUDY OF INGREDIENTS OF INDIGENOUS DRUG

Sl no	***Punarnava***	***Gokshura***	***Gorakshaganja***	***Yava***
Botanicalname	*Boerhavia diffusa*	*Tribulus trestris*	*Aerva lanata*	*Hordeum vulgarae*
Family	*Nyctaginaceae*	*Zygophyllaceae*	*Amaranthaceae*	*Graminae*
Rasa	*Madhura tikta, kashaya*	*Madhura*	*Tikta, kashaya*	*MadhuraKashaya*
Guna	*ruksha*	*Guru Snigdha*	*Lagu, teekshna*	*Laghu, Ruksha*

Virya	*Ushna*	*Sheeta*	*Ushna*	*Ushna*
Vipaka	*Madhura*	*Madhura*	*Katu*	*Madhura*
Karma	*Mutrala, shothahara, anulomana*	*Mutrala*	*Ashmari bhedhana*	*Mutrala*
Rogagnatha	*Vatashleshmahara Pandu shotha*	*Vata-pittaharaAsmari, Mutra-Kruchra, Rasayana, Klaibya*	*Kapha-vatahara*	*Kaphashanaka Mutrakruchrahara*
Chemical composition	*Punarnavine*	*Fixed oil, essential oil, resin, nitrate and alkaloid*	*Palmitic acid, betasitosterol*	*Protiens, carbohydrates, free amino acids,vitamins, tanninsand Flavonoid glycosides- Luteolin and Orientin*
Part used	*Root*	*seed*	*beeja*	*Beeja*

PHYSICOCHEMICAL ANALYSIS OF INDIGENOUS DRUG

The preliminary physicochemical screening test was carried out for **INDIGENOUS DRUG** as per the standard procedures mentioned hereunder.

1. **Loss on Drying:** An accurately weighed 1g of **INDIGENOUS DRUG** formulation was taken in a tarred glass bottle. The crude drug was heated at 105^0C for 6 hours in an oven till a constant weight. The Percentage moisture content of the sample was calculated with reference to the shade dried material.
2. **Determination of total ash:** Weighed accurately 2g of formulation was added in crucible at a temperature 600^0C in a muffle furnace till carbon free ash was obtained. It was calculated with reference to the air dried drug.
3. **Determination of acid insoluble ash:** Ash above obtained, was boiled for 5min with 25ml of 1M Hydrochloric acid and filtered using an ash less filter paper. Insoluble matter retained on filter paper was washed with hot water and filter paper was burnt to a constant weight in a muffle furnace. The percentage of acid insoluble as was calculated with reference to the air dried drug.
4. **Determination of water soluble ash:** Total ash 1g was boiled for 5min with 25ml water and insoluble matter collected on an ash less filter paper was washed with hot water and ignited for 15 min at a temperature not exceeding 450^0C in a muffle furnace. The amount ofsoluble ash is determined by drying the filtrate.
5. **Determination of water soluble Extractive:** 5gm of air dried drug, coarsely powered **INDIGENOUS DRUG** was macerated with 100ml of distilled water in a closed flask for twenty-four hours, shaking frequently. The Solution was filtered and 25 ml of filtrated was evaporated in a tarred flat bottom shallow dish, further dried at 100^0C and weighted. The percentage of water soluble extractive was calculated with reference to the air dried drugs.
6. **Determination of alcohol soluble extractive:** 1gm of air dried drug coarsely powdered **INDIGENOUS DRUG** was macerated with 20 ml alcohol in closed flask for 24 hrs. With frequent shaking, it was filtered rapidly taking precaution against loss of alcohol 10ml of filtrate was then evaporated in a tarred flat bottom shallow dish, dried at 100^0C and weighted. The percentage of alcohol soluble extractive was calculated with reference to air dried drug.

The observed values of the physic-chemical properties are given below

S.No	Parameters	Percentage
1	Loss on drying	1.5519%
2	Total ash value	6.8350%
3	Acid insoluble ash	1.5045%
4	Water soluble ash	2.0115%
5	Water soluble extraction	7.7548%
6	Alcohol soluble extraction	1.7584%

PRELIMINARY PHYTOCHEMICAL SCREENING OF INDIGENOUS DRUG

The preliminary phytochemical screening test was carried out for each extracts of

INDIGENOUS DRUG as per the standard procedure mentioned here under.

1. **Detection of alkaloids:** Extracts were dissolved individually in dilute Hydrochloric acidand filtered.

Mayer's Test: Filtrates were treated with Mayer's reagent (Potassium Mercuric Iodide). Formation of a yellow colour precipitate indicates the presence of alkaloids.

Dragendroff's Test: Filtrates were treated with Dragendroff's reagent (Potassium Bismuth Iodide). Formation of a red precipitate indicates the presence of alkaloids.

Wagner's Test: Filtrates were treated with Wagner's reagent (Iodine in Potassium Iodide). Formation of brown/reddish precipitate indicates the presence of alkaloids.

2. **Detection of carbohydrates:** Extracts were dissolved individually in 5 ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

Molisch's Test: To 2 ml of plant sample extract, two drops of alcoholic solution of α- naphthol are added. The mixture is shaken well and few drops of concentrated

sulphuric acidis added slowly along the sides of test tube. A violet ring indicates the presence of carbohydrates.

Benedict's Test: Filtrates were treated with Benedict's reagent and heated gently. Orange red precipitate indicates the presence of reducing sugars.

3. ***Detection of saponins Foam Test:*** *0.5 gm of extract was shaken with 2 ml of water. If foam produced persists for ten minutes it indicates the presence of saponins.*
4. **Detection of phenols Ferric Chloride Test:** Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black color indicates the presence of phenols.
5. **Detection of tannins Gelatin Test:** The extract is dissolved in 5 ml of distilled water and 2 ml of 1% solution of Gelatin containing 10% NaCl is added to it. White precipitate indicates the presence of phenolic compounds.

6. Detection of Flavonoids

Alkaline Reagent Test: Extracts were treated with few drops of sodium hydroxide solution. Formation of intense yellow color, which becomes colorless on addition of dilute acid, indicates the presence of flavonoids.

Lead acetate Test: Extracts were treated with few drops of lead acetate solution. Formation of yellow color precipitate indicates the presence of flavonoids.

7. **Detection of diterpenes Copper Acetate Test:** Extracts were dissolved in water and treated with 3-4 drops of copper acetate solution.

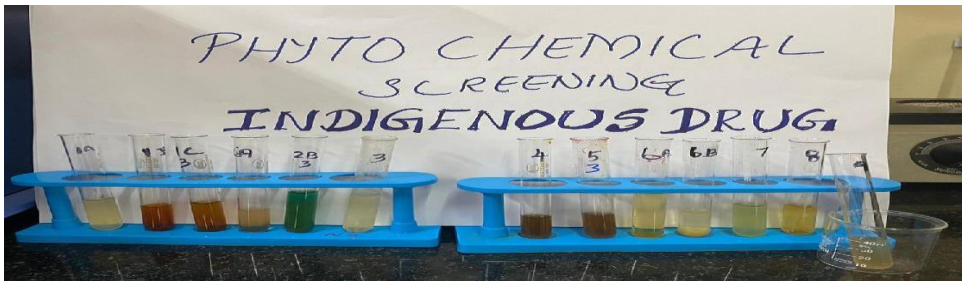
Formation of emerald green color indicates the presence of diterpenes.

8. **Test for Quinones:** Extract was treated with sodium hydroxide blue or red precipitate indicates the presence of Quinones.
9. **Gum and Mucilage:** To 1ml of extract add 2.5ml of absolute alcohol and stirring constantly. Then the precipitate was dried in air and examine for its swelling properties. Swelling was observed that will indicate presence of gum and mucilage.

The Preliminary phytochemical studies of aqueous extract of **INDIGENOUS DRUG** were done using standard procedures. The results were presented in tables. The present study reveals that the bioactive compounds were present in all the extracts of **INDIGENOUS DRUG.**

S.No.	Phytochemicals	Test Name	H2O Extract
1	Alkaloids	Mayer's Test	-ve
		Dragendroff's Test	-ve
		Wagner Test	-ve
2	Carbohydrates	Molisch's Test	+ve
		Benedict Test	+ve
3	Saponin	Foam Test	-ve
4	Phenols	Ferric Chloride Test	+ve
5	Tannins	Gelatin Test	+ve
6	Flavonoids	Alkaline Reagent Test	+ve
		Lead acetate	+ve
7	Diterpenes	Copper Acetate Test	+ve
8	Quinones	Test for Quinones	-ve
9	Gum & Mucilage	Test for Gum & Mucilage	-ve

+ve/-ve present or absent if component tested



DISCUSSION

The observed values of physic-chemical properties of drug are Loss on drying(1.5519%), Total Ash value (6.8350%), Acid insoluble ash (1.5045%), Water soluble ash (2.0115%), Water soluble extraction (7.7548%) and Alcohol soluble extraction (1.7584%).

The results of the Phyto-chemical analysis showed the presence of carbohydrate, flavonoids, tannins, diterpenes and phenols and absence of quinone, alkaloids, saponins, gums and mucilage.

This indicate the presence of anti-oxidants, analgesic, anti-inflammatory, anti- bacterial and wound healing properties in a drug. Various research has been conducted on the anti-urolithiatic property of flavonoids. This might disperse the particles of stone and diminish the size of the stone. So by the presence of flavonoids in the above formulation we can infer that it helps in

reducing size of stone, elimination of stone and avoid recurrence of the condition.

CONCLUSION

The ingredients of the drug has *Mutrala, Ashmarighna, Shothahara* property along with analgesic, anti-inflammatory, anti-bacterial, antiurolithiatic and wound healing action which are mainly needed for treating *Mutrashmari.* Based on the results further the formulation can be used to study in long run if it can prevent the formation or recurrence ofrenal calculi.

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