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Research Article

PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF *RASNADI BASTI* IN THE MANAGEMENT OF *VANDHYATVO* W.S.R TO ANOVULATION

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ABSTRACT

Rasnadi basti is mainly indicated for the *Vataj* disorders i.e*., Vibandha, Anaha, Aruchi, Shoola, Vandhyatva, Pradara, Prameha, Yonidosha, Pandu,* etc. It is having properties like *Sarvaroganivarana, Shukrajanana, Vrushya,* and *Pumsavana Parama.* Acharya Siddhinandan Mishra has mentioned the effectiveness of *Rasnadi basti* in the treatment of *Vandhyatva. Vandhyatva* (infertility) has got many etiological factors; one among them is anovulation. *Vata* is governing factor of the whole reproductive physiology & any vitiation in *Vata* may lead to anovulation. *Basti Karma* is the best choice for the treatment of *Vata Dosha*. In the study, *Rasnadi Basti* was given to one of the trial group having infertility due to anovulation. So, for the assurance of the quality of herbal compounds used to prepare *Rasnadi basti*, its pharmacognostic and pharmaceutical analysis was necessary. **Methods:** Freshly prepared *Rasnadi Basti* was subjected to microscopic evaluation for pharmacognostic & physiochemical analysis like specific gravity & solid content. **Results:** Pharmacognostical study showed the presence of certain identifying characteristics of the ingredients of *Rasnadi basti* i.e., *Rasna, Eranda, Patala, Musta, Vacha, Pippli, Agnimantha, Kustha, Yastimadhu, etc.* In pharmaceutical study, the preliminary physiochemical analysis showed solid content of 52.53% w/v & specific gravity of 1.0242. **Conclusions:** Pharmacognostical and physico-chemical observations revealed the specific characteristics of all active constituents of *Rasnadi basti* and confirmed the purity and genuinity of the formulation.

INTRODUCTION

Rasnadi Basti is having properties like *Sarvaroganivarana, Shukrajanana, Vrushya,* and *Pumsavana Parama.*[1] Acharya Siddhinandan Mishra has mentioned the effectiveness of *Rasnadi basti* in the treatment of *Vandhyatva.* It is mainly indicated for the *Vataj* disorders i.e*., Vibandha, Anaha, Aruchi, Shoola, Vandhyatva, Pradara, Prameha Yonidosha, Pandu,* etc. *Vata* is governing factor of the whole reproductive physiology. The main factors involved in the *Samprapti* of Anovulation are *Vata- Kapha Pradhana Dosha Dushti* and *Rasa Dhatu Dushti, Aartavavaha Strotodushti and Agnimandya* at *Jatharagni* as well as *Dhatvagni* Level.

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Therefore, any vitiation in *Vata* will certainly affect the ovulation. *Basti Karma* is the best choice of treatment for *Vata Dosha* and *Vata* associated with *Kapha* and *Pitta* as it controls *Vata* at its *Moolasthana Pakvashaya*. Thus, all metabolic processes under the control of *Vata* are automatically regulated by *Basti*. [2] Infertility is recognized as a Global public health issue by WHO. [3] Infertility defined as one year of regular unprotected coitus without success to conceive, is one of the most prevalent chronic health disorders involving young adults. Anovulation accounts for 30%-40% of the causes of female infertility [4]. Fallopian tube blockage is another common cause of infertility. Endometriosis can also contribute to infertility. In addition, anatomical abnormalities, such as fibroids or scar tissue, cervicitis, chronic PID, etc can also contribute to the inability of sperm to meet the egg or cause the egg to fail for implantation in the uterine wall. Ovulation refers to the physical act of rupture of the follicle with the extrusion of the oocyte. When the follicle does not

rupture then ovulation fails and it is called anovulation. Due to today's lifestyle, the incidence of ovulatory dysfunction is increased which ultimately leads to infertility.

MATERIALS AND METHODS

Collection, Identification and Authentication of Raw drugs

The raw materials were procured from the pharmacy of ITRA, Jamnagar and some none available drugs were collected from the local market of Jamnagar. They all were identified and authenticated in the pharmacognosy laboratory of ITRA, Ministry of Ayush, Govt. of India, Jamnagar. The ingredients and parts used for the preparation of *Rasnadi Basti* are given in Table 1.

The final product i.e., *Rasnadi Basti* was prepared freshly at procedure room of *Prasutitantra & Streeroga,* I.T.R.A, Jamnagar. Once the formulation was ready, it was subjected to pharmacognostical and pharmaceutical evaluation at pharmacognosy and pharmaceutical laboratory, I.T.R.A, Jamnagar respectively.

Method of Preparation

Preparation of *Nirooha Basti Dravya*

Each time *Basti* was freshly prepared at the time of administration. First of all, fine powder of *Kalka Dravya* (each 8gm); *Kushtha*, *Mulethi, Peelisarso, Musta, Vacha, Kutaj & Pippali* are mixed and soaked in water overnight. *Kwatha Dravya- yavakut* of *Rasna, Agnimanth, Patla, Sonapatha, Eranda, Amaltas, Kantakari, Brihati, Gambhari, Shalaparni & Prushniparni* was soaked in 1600ml water overnight and boiled next morning till 1/4th (440ml) of water remains. [5] 12gm *Saindhava* was triturated in a clean mortar with pestle and powdered. 96gm *Makshika* was added gradually & continued triturated until cracking sound was heard. *Sneha (Tila taila) 110ml* was added to this mixture little by little and again triturated. Then paste of *Kalka* followed by *Kwatha* was added little by little and mixed properly to make homogenous emulsion and heated gently in a water bath (slightly above body temperature). This mixture will be filtered and poured into an enema pot and fixed with nozzle.

Table 1: *Rasnadi Basti* (Reference- Acharya Siddhinandan Mishra)

Kwatha Dravya				
No	***Sanskrit* name**	**Latin Name**	**Part used**	**Proportion**
1	*Rasna*	*Pluchea lanceolata* C.B.	Root	440ml
2	*Agnimantha*	*Premna mucronata* R.oxb	Root bark	
3	*Patala*	*Stereospermum suaveoleus* DC	Stem bark	
4	*Shyonaka*	*Oroxylum indicum* Vent	Root bark	
5	*Kantakari*	*Solanum surattense* Burm.f.	Whole plant	
6	*Brihati*	*Solanum indicum* linn.	Whole plant	
7	*Gambhari*	*Gmelina arborea* linn	Stem bark	
8	*Shalaparni*	*Desmodim gangeticum* DC.	Root	
9	*Prushniparni*	*Uraria picta* Desv.	Whole plant	
10	*Eranda*	*Ricinous communis* Linn	Root bark	
11	*Aragwadha*	*Casssia Fistula* Linn	Fruit pulp	
***Kalka Dravyas* (Each Drug 8 Gram)**				
12	*Kushtha*	*Saussurea lappa* C.B. Clarke	Root	
13	*Yashtimadhu*	*Glycyrrhiza glabra* Linn	Root	
14	*Pita Sarsapa*	*Brassica nigra* L.	Seeds	
15	*Musta*	*Cyperous rotundus* L	Root	
16	*Vacha*	*Acorus calamus* Linn	Root	
17	*Kutaja*	*Holarrhena antidysenterica* Linn.	Stem bark	
18	*Pippali*	*Piper longum* Linn	Fruits	

Others				
19	*Madhu*	*Honey*	-	96gm
20	*Saindhava*	*Rock salt*	-	12gm
21	*Tila*	*Sesamum indicum* lams	*Taila*	110ml

Regime

Drug	*Rasnadi Kala basti*	
Dose	800ml	
Route	Rectal	
Kala	Morning (8.30-10 am), before food	
Duration	After menstruation stops, *Basti* was given for 16days or till ovulation	

Pharmacognostical Study

The pharmacognostical study was divided in to organoleptic study and microscopic study of the finished product.

- **Organoleptic study**

The genuinity of the polyherbal formulation can be found with organoleptic characters of the given sample. Organoleptic parameter comprises taste, color, odor and touch of *Rasadi Basti* which was scientifically studied as per the standard references. [6]

- **Powder microscopy**

  Freshly prepared drug was studied microscopically and microscopic characters of individual drugs were noted. Microphotographs of the sample were taken under Carl-Zeiss trinocular microscope.

Pharmaceutical Study

Physico-chemical analysis

With the help of various standard physico-chemical parameters, *Rasadi Basti* was analyzed.

RESULTS

The initial purpose of the study was to confirm the authenticity of the drugs used in preparation of *Rasadi Basti*. For this, all the ingredients were subjected to organoleptic and microscopic evaluations to confirm the genuineness of the raw drugs. Later after the preparation of formulation, pharmacognostical and pharmaceutical evaluation was carried out. Organoleptic evaluation includes screening of organoleptic characters like colour, odor, taste, etc. of the *Rasadi Basti.* (Table no.2)

Table 2: Organoleptic characters of *Rasadi Basti*

Parameter	**Results**
Color	Brownish reddish
Odor	Aromatic
Taste	Bitter
Consistency	Liquid
Touch	Slippery

Microscopic Evaluation

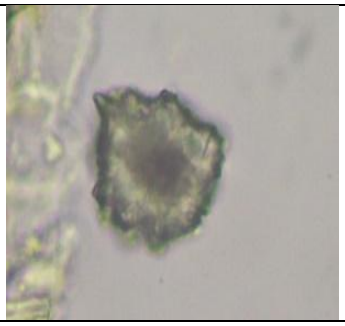
Microscopic evaluation of *Rasadi Basti* was studied under a microscope for the presence of characteristics of ingredient drugs. The diagnostic characters are:

Table 3: Pharmacognostical parameters of powder characteristics of *Rasnadi Basti*

Sr. No.	Name of Drug	Part used	Characters Observed
1.	*Rasna*	Root	Parenchyma cells, Acicular crystals and raphids of calcium oxalate, scalariform vessels, Fragments of cork in surface view
2.	*Agnimantha*	Root bark	Fragments of pitted vessels, lignified fibres, brown constant, cork exfoliated or crushed, sieve tubes, companion cells.
3.	*Patala*	Stem bark	Lignified fibre, Lignified parenchyma of *Apamarga*, Pollen grain, Simple and compound starch grains, Simple trichome of *Patala*
4.	*Shyonaka*	Root bark	Annular vessels, simple trichome, spiral vessels, stellate trichome of *Shyonaka*
5.	*Kantakari*	Whole plant	Annular vessels, endosperm, fibres, stratified cells of *Kantakari*
6	*Brihati*	Whole plant	Border pitted vessels, starch grains, Rhoimboidal crystals, rosette crystals, lignified fibres of *Brihati*
7	*Gambhari*	Stem bark	Beaded parenchyma, pollen grain, simple fibre with lumen, starch grains of *Gambhari*
8	*Shalaparni*	Root	Simple starch grain with hilum, spool cells, stone cells, simple grains of *Shalaparni*
9.	*Prushniparni*	Whole plant	Crystal fibres, pitted crystals, stained lignified crystals of *Prushniparni*
10.	*Eranda*	Root bark	Compound starch grains of *Eranda*
11.	*Aragwadha*	Fruit pulp	Acicular crystals, *annular raisins* of *Aragwadha*
12.	*Kushtha*	Root	Starch grain, stained pitted vessels of *Kushtha*
13.	*Yashtimadhu*	Root	Stained lignified fibres, prismatic crystals of *Yashtimadhu*
14.	*Pitta Sarsapa*	Seeds	Epidermal cells, starch grains with hylem, pollen grains of *Pitta Sarsapa*
15.	*Musta*	Root	Starch grains of *Musta*
16.	*Vacha*	Root	Beaded parenchyma, pollen grain, simple fibre with lumen, starch grains of *Vacha*
17.	*Kutaja*	Stem bark	Simple starch grain with hilum, spool cells, stone cells, simple grains of *Kutaja*
18.	*Pippali*	Fruits	Crystal fibres, pitted crystals, stained lignified crystals of *Pippali*

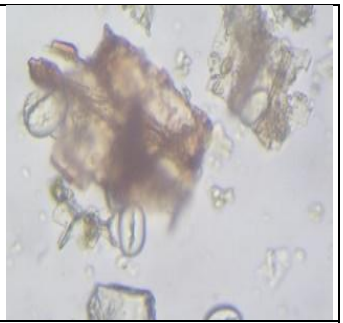
Fig. 1 Microphotographs of ingredients found in *Rasadi Basti*

1. Starch grains of *Eranda*

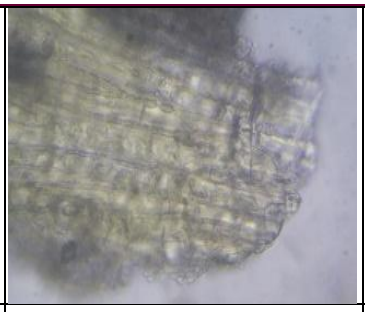
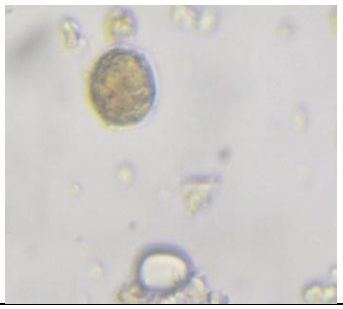
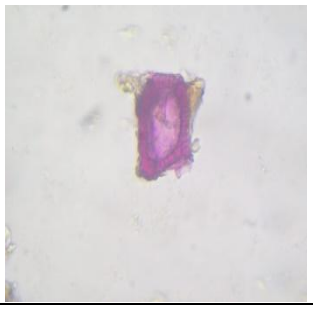
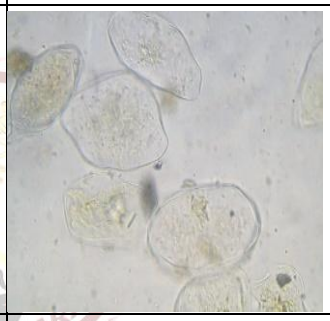
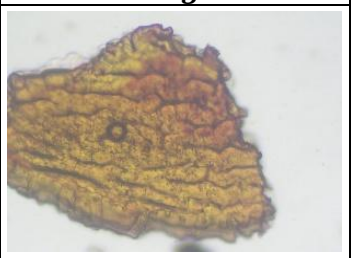


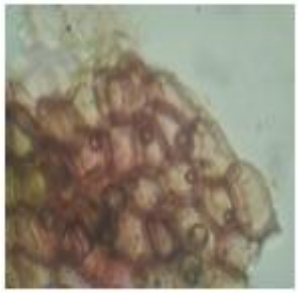
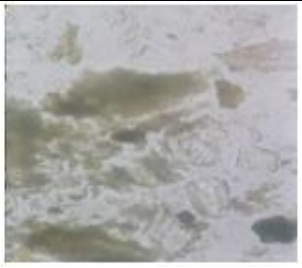
2. Rosette crystal of *Eranda*

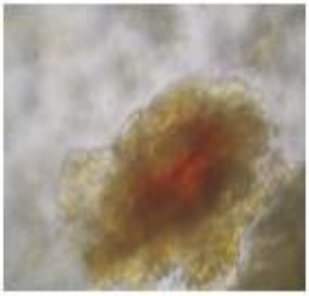
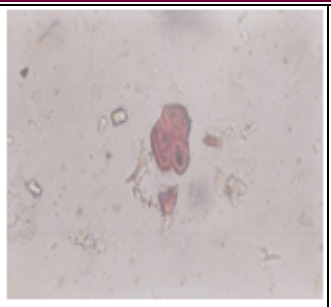
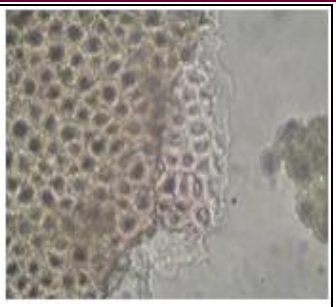
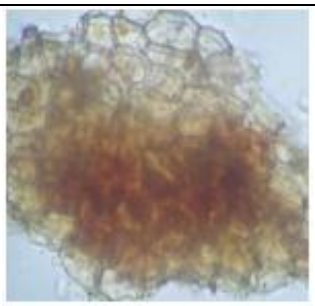
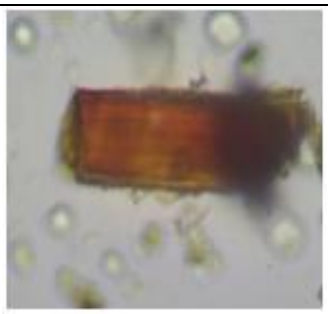
3. Cork cells of *Eranda*



4. Cork cells of *Agnimantha*

			
5. Fibers of *Agnimantha*	**6. Crystal fibers of *Bilwa***	**7. Fibres of *Gambhari***	**8. Lignified cork cells of *Gambhari***
			
9. Lignified stellate trichome of *Kantakari*	**10. Pollen grain of *Kantakari***	**11. Lignified stone cells of *Patala***	**12. Lignified cork cells of *Patala***
			
13. Ligniffied stone cells of *Shyonaka*	**14. *Ramboidal* crystal of *Shyonaka***	**15. Mesocarp cells of *Aragvada***	**16. Scleroids of *Aragvada***
			
17. Simple trichome of *Brihati*	**18. Spiral vessels of *Brihati***	**19. Stellate trichome of *Brihati***	**20. Epicarp cells of *Kantakari***

			
21. Cork Cells of *Kutaja*	**22. Stone Cells of *Kutaja***	**23. Multibranched Trichome of *Kutaja***	**24. Oleoresine *Kutaja***

			
25. Cork Cells of *Kustha*	**26. Stone Cells of *Kustha***	**27. Multibranched Trichome of *Kustha***	**28. Oleoresine-*Kustha***
			
29. Oil Globules of *Sarshapa*	**30. Cork In Surface of *Yestimadhu***	**31. Rhamboidal Crystal of *Yestimadhu***	**32. Sleroides of *Yestimadhu***
			
33. Oleoresin of *Musta*	**34. Lignified Fibre of *Musta***		

Physico-Chemical Parameters

Physico-chemical parameters like Specific Gravity and density of *Basti* were found within the normal range.

1. Determination of Specific gravity: [7]

The specific gravity of a liquid is the weight of a given volume of the liquid at 25°C (Unless otherwise specified) compared with the weight of an equal volume of water at the same temperature, all weighing being taken in air. A Pycnometer of 25ml, capacity is cleaned, dried and weighed. It is filled up to the mark with water at the required temperature and weighed. The Pycnometer is next filled up to the mark with the sample, at the same temperature and weighed. The specific gravity is determined by dividing the weight of the sample in grams by the weight of the water, expressed in gram.

2. Density [8]

Density is the mass of an object divided by its volume. Density often has units of grams per cubic centimeter (g/cm^3). Remember, a gram is a mass and cubic centimeter is a volume (the same volume as 1 milliliter). Density is not something that is directly measured. First measure specific gravity then after measure density

$$S.G. = \frac{\text{density of object}}{\text{density of water}}$$

$$density = \frac{mass}{volume}$$

Detail is given in Table 3.

Table 3: Physicochemical Parameters of *Rasnadi Basti*

No.	Name of the Test	Value
1.	Specific Gravity	1.108
2.	Density	1.2828g/cm3

DISCUSSION

This confirms the presence of all active ingredients of raw drugs in the final product. All the physico-chemical parameters i.e., solid content, specific gravity and pH value were analyzed and found to be within the normal reference range. The physicochemical analysis showed solid content 52.53%w/v and specific gravity 1.0242.

CONCLUSION

The pharmacognostical and physico-chemical analysis of *Rasnadi Basti* confirmed the purity and genuinity of the drug. Genuinity of drugs is of utmost importance in present era where there is more adulteration in drug contents. Information acquired from this study may be beneficial for further research work and can be used as a reference standard for quality control researches.

Declared Ethical Approval: The study was approved by the Institutional Ethics Committee

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