

Clinical Evaluation of Pullaas (*Rhododendron arboreum* Sm.) in the Management of Shweta Pradara (Leucorrhoea) through Oral Administration and Vaginal Douche: An Open Randomized Control Trial

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Background: *Rhododendron arboreum* Sm. (Burans) is a Himalayan medicinal plant rich in bioactive compounds with therapeutic properties. It is traditionally used for conditions like nasal bleeding and gynecological disorders. This study evaluates its oral and local use in managing Shweta Pradara (leucorrhoea) as a safe Ayurvedic alternative.

Objectives: To assess and compare the therapeutic potential of *Rhododendron arboreum* Sm. as an oral and combination therapy (oral + local) in reducing symptoms of Shweta Pradara (leucorrhoea).

Materials and Methods: This was an Open-Label, Comparative Clinical Study which include 30 female patients diagnosed with Shweta Pradara. The study was conducted under 2 groups. In group A-15 patients received Yoni Dhavana (vaginal douching) with *R. arboreum* decoction and group B - 15 patients received both Sharkara Kalpana (syrup) orally and Yoni Dhavana (vaginal douching) locally. Treatment administered for a specific period (typically 21–30 days depending on protocol) and assessment is made by different subjective and objective parameters.

Results: Both groups showed improvement in symptoms of Shweta Pradara. Group B (oral + local therapy) demonstrated significantly better results in reducing abnormal discharge, relieving itching, controlling odour, and restoring vaginal health.

Conclusion: *Rhododendron arboreum*'s diverse pharmacological properties and traditional usage underscore its potential in treating gynecological conditions like Shweta Pradara. Its application in both systemic and local therapies offer a holistic approach, aligning with Ayurvedic principles and providing a natural alternative to conventional treatments.

Keywords: Burans, Leucorrhoea, vaginal douche, wet film

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Introduction

Rhododendron arboreum Sm., commonly known as *Pullaas*[1-3] or *Burans*, is a prominent Himalayan plant esteemed for its medicinal properties & cultural significance. Traditionally, it has been utilized to address various ailments, including nasal bleeding, diarrhea, reduced appetite, gynaecological disorders etc.[4-6] Ayurveda, a thousand years old system of medicine, emphasizes both theoretical knowledge & practical application. Acharya Sushruta has stated that theoretical knowledge without its application is like a soldier facing battle with fear.[7] *Shweta Pradara*, often symptom of various *Yonivya-padas*, can present as a distinct condition, is often believed to be treated with *Pullaas* traditionally. *Shweta Pradara*, commonly referred to as leucorrhoea, is characterized by abnormal white vaginal discharge and is a prevalent gynecological concern. [8,9] The word *Shweta Pradara* is not described in *Ayurvedic Samhitas*. It is considered a symptom rather than disease, often associated with imbalances in *Kapha* and *Vata Doshas*. [10-12] Since it is symptom of disease, etiopathogenesis of principal disease would be etiopathogenesis of *Shweta Pradara*. Factors such as excessive coitus, frequent abortions, sedentary lifestyle, and improper dietary habits during menstruation and ovulation are commonly implicated in its manifestation.[13-15] Modern medicine identifies parallels in infections like trichomoniasis and candidiasis, which, despite being treatable, often exhibit recurrent episodes and side effects. This underscores the need for alternative therapeutic approaches that are both effective and have minimal adverse effects.

Rhododendron arboreum Sm., *Burans* (*Pullaas*) is rich in bioactive compounds such as flavonoids, tannins, saponins, and phenolic acids, contributing to its therapeutic potential. These constituents are associated with anti-inflammatory, antioxidant, antimicrobial, hepatoprotective, and immunomodulatory activities.[16-20] This study aims to evaluate the clinical efficacy of *Pullaas*, administered orally in *Sharkara Kalpana* (juice) form and locally as a vaginal douche (*Yoni Dhavana*), in managing *Shweta Pradara*. By exploring this traditional remedy, the research seeks to provide a safer and holistic alternative to conventional treatments, aligning with Ayurvedic principles and addressing the limitations of modern therapeutic modalities. (Figure 1)



Figure 1: Pullas flower bud and flower

Materials and Methods

Selection of Patients: 30 patients between 25–50 years of age suffering from *Shweta Pradara* were selected randomly from the OPD/IPD of RGGPG Ayurvedic Hospital, Paprola.

Inclusion criteria

Married female patients of age between 25-50 years willing for trial were selected. Diagnosis was made on the basis of following symptoms like - *Yoni Srava* (vaginal Discharge), *Yoni Kandu* (Vaginal Itching), *Durgandha* (Odour), *Katishoola* (Backache), *Udar-shoola* (Pain in lower abdomen), *Yoni Daha* (Burning sensation in Vagina).

Exclusion Criteria

Patients not willing for trial & not fulfilling inclusion criteria. Unmarried and pregnant women. Patients of known cases of diabetes mellitus, hypothyroidism, hyperthyroidism etc. or having abnormal vaginal discharge due to benign growth and malignancy, pregnancy and pelvic pathology, STDs etc. will be excluded from the study.

Withdrawal criteria

Table 1: Therapeutic Protocol for Study Groups

Parameters	Group 1 (Yoni Dhavana Only)	Group 2 (Yoni Dhavana + Sharkara Kalpana)
Treatment	Yoni Dhavana (vaginal douche)	Yoni Dhavana + Oral Sharkara Kalpana
Yoni Dhavana	15 gm decoction once daily	15 gm decoction once daily
Dosage		
Sharkara Kalpana	Not applicable	20 ml of flower juice, orally, twice daily
Duration	14 days	14 days
Follow-up Schedule	Day 7, Day 14 (end of treatment), Day 21 (post-treatment)	Day 7, Day 14 (end of treatment), Day 21 (post-treatment)

Participants were withdrawn from the study in the event of noncompliance with the treatment regimen or if any new co-morbid condition arises during the trial period that necessitates immediate pharmacological intervention. Those participants who voluntarily choose to discontinue their participation at any point during the study were allowed to do so without prejudice. (Table 1)

Assessment Criteria

Table 2a: Subjective Criteria Table

Symptom	Grade 0	Grade 1	Grade 2	Grade 3
Yoni Srava (Vaginal Discharge)	No discharge	Mild, persistent, moisturizes vulva	Moderate, frequently need to change undergarments	Severe, need to use extra cloth or pad
Yoni Kandu (Vaginal Itching)	No itching	Occasional itching	Present but does not affect day-to-day work	Continuous itching which affects daily work
Durgandha (Odour)	Absent	Mild	Moderate	Severe
Katishoola (Backache)	No pain	Mild (Can withstand pain and manage routine work)	Moderate (Cannot manage routine work and needs rest)	Severe (Cannot withstand pain and is bedridden)
Yoni Daha (Burning sensation in vagina)	No burning sensation	Mild burning	Moderate burning	Severe burning
Udar Shoola (Pain in lower abdomen)	No pain	Mild pain throughout the day, relieved by rest	Moderate pain, interferes with physical activity and not relieved by rest	Severe pain, interferes with physical activity and needs analgesics

Table 2b: Objective Criteria

Parameter	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4
Consistency of Vaginal Discharge	Watery	Mucoid	Creamy	Curdy	—
Color of Discharge	Whitish	Yellowish	Greenish	Brownish/Black	—
Smell of Discharge	Smell non-offensive	Foul smell while performing speculum (p/s)	Foul smell per short distance	Unable to stand near patient due to foul smell	—
Vaginal Congestion	Absent	Mild	Moderate	Severe	—
Congestion of Cervix	Absent	Mild	Moderate	Severe	—
Discharge from External OS	Absent	Mild	Moderate	Severe	—
Site of Erosion	No erosion	At upper/lower lip	Around OS	Whole cervix	—
Wet Film Examination	Only epithelial cells present	Non-specific (Bacilli, cocci) without pus cells	Specific (Candida, Trichomonas) without pus cells	Non-specific (Bacilli, cocci) with pus cells	Specific (Candida, Trichomonas) with pus cells

Patients were evaluated based on a graded scale for symptoms like vaginal discharge, itching, odor, backache, abdominal pain, and burning sensation. Vaginal and cervical findings along with wet smear reports were also considered. Different grades were given for subjective (**Table 2a**) and objective criteria (**Table 2b**).

Interventions

The selected intervention involved two therapeutic approaches using *Rhododendron arboreum* Sm. (*Pullaas*) in different formulations. Patients in Group 1 received only *Yoni Dhavana* (vaginal douche) prepared from a decoction of *R. arboreum* flowers. The decoction was freshly prepared each day by boiling the prescribed quantity of dried flowers in water and was administered once daily in a lukewarm state under aseptic conditions. In Group 2, patients received a combined therapy consisting of both the oral administration of *Sharkara Kalpana* (herbal syrup/juice formulation) and *Yoni Dhavana* as described for Group 1. The oral syrup was prepared using *R. arboreum* flower juice processed with sugar and preserved as per classical Ayurvedic guidelines for *Sharkara Kalpana*. It was administered in a dose of 10 ml twice daily after meals with lukewarm water. The treatment in both groups was continued for a period of 21 to 30 days, depending on the severity of symptoms and patient response. Patients were also advised to maintain proper genital hygiene and follow dietary and lifestyle modifications as per Ayurvedic recommendations to support the treatment protocol. They were randomly divided into two groups. Group 1, received only *Yoni Dhavana* and Group 2, received *Yoni Dhavana* + oral *Sharkara Kalpana* (**Table 1**).

Data Collection, Management, and Analysis

Data collection methods

The necessary data for this study was gathered through a CRF, which was maintained by Author 1. This form included all relevant clinical details such as patient demographics, medical history, laboratory results, and outcome measures. After the data was collected, it was verified by all authors to ensure accuracy and completeness.

Frequency of data collection and assessments

Data collection was carried out at multiple time points to ensure accurate monitoring of therapeutic outcomes and safety.

Baseline data were recorded on Day 0, including patient demographics, clinical symptoms, laboratory parameters, and findings from vaginal and cervical examinations. Follow-up assessments were conducted weekly, specifically on Day 7, Day 14, and Day 21, to evaluate symptom progression, monitor adverse events, and adjust treatment if necessary. Final evaluation was done at the end of the treatment period (Day 21–30) based on individual patient response. During each visit, both subjective parameters (such as vaginal discharge, itching, odour, and pain) and objective criteria (including vaginal examination, wet smear findings, and lab tests like ESR and pH) were recorded using a structured Case Report Form (CRF). This periodic monitoring helped in assessing the clinical efficacy, safety, and patient compliance throughout the trial duration.

Data Management

Data were recorded using structured Case Report Forms (CRFs) for each patient. All entries were made manually and verified for completeness and accuracy. Each participant was assigned a unique code to maintain confidentiality. Baseline, follow-up, and final assessment data were documented systematically. CRFs were stored securely and accessed only by authorized staff. Electronic data, where applicable, were protected with password encryption. Data were checked for errors, missing values, and inconsistencies. Quality control measures ensured adherence to protocol and accuracy. No interim analysis was done; final analysis followed study completion. All data were analyzed using appropriate statistical tools.

Statistical Methods

The data collected during the study will be entered into Microsoft Excel for organization and analysis. Objective parameters, such as laboratory test results, were presented as mean and standard deviation, with paired *t*-tests used to compare before and after therapy within groups. Subjective parameters, including symptoms reported by patients, were summarized as frequency and percentage, and appropriate tests will be applied to compare them before and after treatment. For statistical analysis, chi-square tests or normal variate *Z*-tests will assess associations in baseline data, while paired *t*-tests will compare continuous data within groups, and unpaired *t*-tests will compare continuous data between groups.

Chi-square tests will be used for dichotomous (nominal) unpaired data. *AP*value of less than 0.01 was considered statistically significant, ensuring that the results are reliable and meaningful for evaluating the effectiveness of the intervention.

Harms

No major adverse events were reported during the study. A few participants experienced mild burning during initial *Yoni Dhavana*, which resolved spontaneously. No allergic reactions, infections, or systemic side effects were observed. Laboratory parameters remained within normal limits post-treatment. Overall, the interventions were well tolerated and considered safe.

Ethics and Dissemination

Research ethics approval

The study protocol, informed consent forms, and other necessary documentation for review to ensure the study meets ethical standards and protects the rights and well-being of participants were submitted to IEC and have been approved by Institutional Ethics Committee, Rajiv Gandhi Government Post Graduate Ayurvedic College and Hospital, Paprola (IEC No. Ayu./IEC/2021/1255) and is registered under the Clinical Trials Registry of India (CTRI/2022/06/043198) on dated 13/06/2022.

Consent

Informed consent was obtained from all participants by the primary investigator, and participants were fully informed of the study's objectives, procedures, potential risks, and benefits. Consent was voluntary, and participants were given adequate time to ask questions and consider participation.

Confidentiality

Personal information about potential and enrolled participants were collected and maintained in a way that ensures confidentiality & privacy. Participants' identities were protected by using coded identifiers and keeping all personal data in secure locations. Data was shared only with authorized personnel involved in the study, and access will be strictly controlled.

Ancillary And Post-Trial Care

Participants were provided with appropriate guidance on personal hygiene and lifestyle throughout the study.

Any minor health concerns during the trial were addressed free of cost. No major adverse events occurred requiring post-trial medical intervention. Patients were advised follow-up care and maintenance measures after treatment completion. They were assured access to Ayurvedic outpatient services for future support if needed.

Results

Table 3: Comparative Summary of Symptom Improvement Between Two Treatment Groups

Symptom	% Change (Group 1)	% Change (Group 2)	T-test	p-value	Significance
Yoni Srava	53.33%	86.67%	-2.59	0.015	Significant
Yoni Kandu	36.11%	72.73%	2.08	0.05	Significant
Durgandha	45.00%	70.83%	-1.28	0.216	Not Significant
Yoni Daha	70.83%	88.46%	-1.16	0.257	Not Significant
Katishoola (Backache)	14.29%	78.57%	-4.95	0.000	Significant
Udarshoola (Lower Abd. Pain)	35.71%	78.57%	2.70	0.012	Significant
Consistency of Vaginal Discharge	48.89%	73.33%	-1.59	0.123	Not Significant
Color of Vaginal Discharge	35.56%	60.00%	-1.54	0.136	Not Significant
Smell of Vaginal Discharge	10.00%	75.00%	3.54	0.003	Significant
Vaginal Congestion	46.67%	86.67%	-3.11	0.004	Significant
Secretion from External OS	33.33%	86.67%	-4.41	0.000	Significant
Cervical Congestion	43.33%	80.00%	-2.42	0.022	Significant
Erosions	25.00%	68.75%	-2.10	0.050	Significant
Wet Film Examination	37.50%	100.00%	-3.18	0.007	Significant

Grouped data analysis demonstrated consistently greater improvement in Group 2 compared to Group 1 across all evaluated clinical parameters. Improvement in *Yoni Srava* was 86.67% in Group 2 and 53.33% in Group 1, while *Yoni Kandu* improved by 72.73% & 36.11%, respectively. *Durgandha* showed 70.83% improvement in Group 2 versus 45% in Group 1, & *Yoni Daha* improved by 88.46% in Group 2 and 70.83% in Group 1. *Katishoola* improved by 78.57% in Group 2 compared to 14.29% in Group 1, while *Udarshoola* showed 78.57% and 35.71% improvement in Groups 2 & 1, respectively. Improvement in consistency of vaginal discharge was 73.33% in Group 2 and 48.89% in Group 1, and color improved by 60% and 35.56%, respectively. Smell of vaginal discharge improved by 75% in Group 2 and 10% in Group 1. On per-speculum examination, vaginal congestion improved by 86.67% in Group 2 and 46.67% in Group 1; secretion from external OS by 86.67% and 33.33%; cervical congestion by 80% and 43.33%;

And cervical erosions by 68.75% & 25%, respectively. On wet film examination, complete clearance (100%) was observed in Group 2 compared to 37.50% improvement in Group 1. (Table 3)

Overall Effect of Therapy: Table 4 (a & b)

1. Overall intergroup comparison of therapy: (Fig. 2a)

The difference between the grade was significant more in group 2 which signifies that group 2 showed more improvement than group 1. The percentage improvement was also significantly more in group 2 then in group 1.

2. Overall effect of therapy in 30 patients: (Fig-2b)

It was observed that overall 10% patients were cured, 43.33% patients were markedly improved, 33.33% patients were moderately improved, 10% were mildly improved & 3.33% remained unchanged

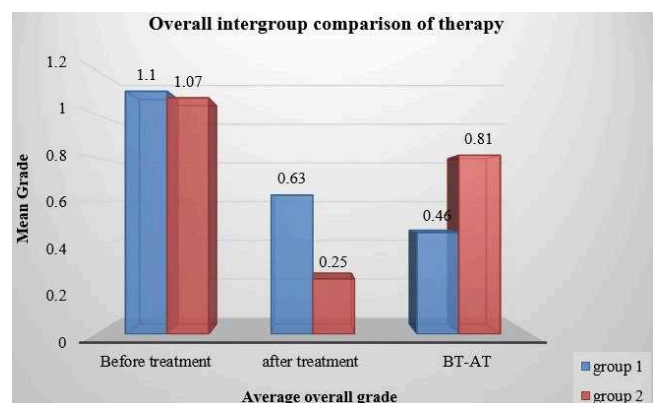
Table 4a: Overall intergroup comparison of therapy.

	Group 1		Group 2		t-test p-value	
	Mean	SD	Mean	SD		
Before treatment	1.10	0.30	1.07	0.30	0.261	0.796 NS
After treatment	0.63	0.21	0.25	0.20	5.100	<0.001 HS
BT-AT	0.46	0.22	0.81	0.16	-4.97	<0.001 HS
%age improvement	42.06	14.77	78.10	13.95	-6.88	0.000 HS

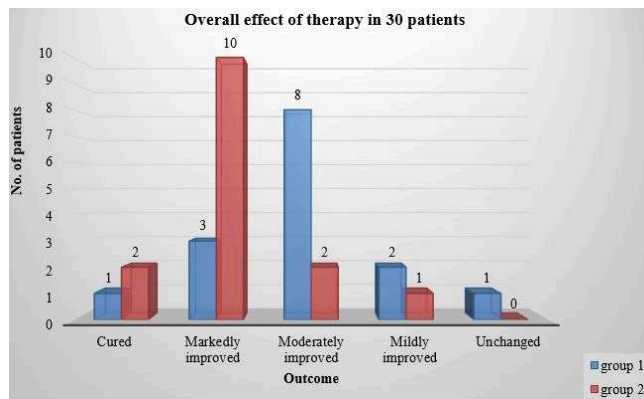
Table 4b: Overall effect of therapy in 30 patients.

Outcome	Group 1		Group 2		Total	Chi square	p-value
	N	%	N	%	N %		
Cured	1	6.67%	2	13.33%	3 10.00%	19.69	<0.001
Markedly improved	3	20.00%	10	66.67%	13 43.33%		
Moderately improved	8	53.33%	2	13.33%	10 33.33%		
Mildly improved	2	13.33%	1	6.67%	3 10.00%		
Unchanged	1	6.67%	0	0.00%	1 3.33%		
Total	15	100.00%	15	100.00%	30 100.00%		

1. Overall intergroup comparison of therapy. (Fig. 2a)



2. Overall effect of therapy in 30 patients. (Fig. 2b)



Laboratory Investigations. (Table 5)

It was also observed that hemoglobin insignificantly increased, neutrophils, ESR significantly decreased in group 2 after treatment also, pus cells, epithelial cells significantly decreased in group 2 after treatment. pH also decreased in both groups but the decrease was not significant.

Table 5: Laboratory Investigations

Investigations	Group 1		Group 2		t-test	p-value
	Mean	SD	Mean	SD		
Hb (gm/dl) before treatment	10.27	0.62	9.98	0.55	-1.37	0.18
Hb (gm/dl) after treatment	10.35	0.63	11.07	0.57	3.27	0.00
TLC cells before treatment	7846.6	1699.5	6560.0	1586.0	-1.81	0.23
	7	2	0	1		
TLC after treatment	7206.6	1658.5	5210.0	1595.7	-3.36	0.00
	7	1	0	8		
Neutrophils before treatment	57.27	9.68	59.93	9.09	0.78	0.44
Neutrophils after treatment	57.27	9.68	59.93	9.09	0.78	0.44
Lymphocytes before treatment	36.27	10.17	35.00	7.64	-0.39	0.70
Lymphocytes after treatment	36.27	10.17	35.00	7.64	-0.39	0.70
Monocytes before treatment	1.13	0.99	0.93	0.59	-0.67	0.51
Monocytes after treatment	1.13	0.99	0.93	0.59	-0.67	0.51
Eosinophil before treatment	5.20	0.94	4.13	1.51	-2.33	0.03
Eosinophil after treatment	5.20	0.94	4.13	1.51	-2.33	0.03
Basophil before treatment	0.13	0.35	0.00	0.00	-1.47	0.15
Basophil after treatment	0.13	0.35	0.00	0.00	-1.47	0.15
ESR (mm fall in 1st hr.) before treatment	22.20	10.98	18.47	10.86	-0.94	0.36
ESR (mm fall in 1st hr) after treatment	17.33	7.80	13.13	5.07	-1.75	0.05
FBS (mg/dl) before treatment	82.00	8.19	85.07	10.22	0.91	0.37
FBS (mg/dl) after treatment	80.93	8.17	83.93	10.28	0.88	0.38
Pus cell before treatment	1.67	2.44	1.20	1.93	-0.58	0.57
Pus cell after treatment	0.67	1.18	0.00	0.00	-2.20	0.04
EPC before treatment	0.80	1.37	1.00	1.46	0.39	0.70
EPC after treatment	0.00	.000a	0.00	.000a		
pH of vaginal secretion before treatment	5.03	0.48	4.70	0.49	-1.88	0.07
pH of vaginal secretion after treatment	4.53	0.48	4.20	0.49	-1.88	0.07

Discussion

Pullaas demonstrated promising results in treating *Shweta Pradara* when administered both orally and locally. Its astringent, anti-inflammatory and antimicrobial properties contributed to symptom relief. The dual route of administration ensured both systemic and local action, leading to better outcomes. *Pullaas* is a *Ishad Ukta Dravya*[21] and there is no any description regarding its *Rasa Panchaka* was found in *Ayurvedic* text. But by using organoleptic and taste threshold method it has been concluded that it mainly consists of *Kashaya* and *Tikta Rasa*. These *Rasas* are *Pitta-Kapha Shamaka* and shows *Stambhaka Karma*[22] by the *Guna* present in them which lead to *Samprapti Vighatana* and successfully control and cure *Shweta Pradara*.

With the local application of *Pullaas* in the form of vaginal douche, it acts by virtue of its astringent property which alleviates *Yonidosha*, *Yonisrava* and *Yonishotha*. This helps in removal of shedded epithelial cells and the clue cells on which the bacteria are adherent and has effect on vaginal itching also. Thus, reduces discharge, raises patient's immunity and thus prevents recurrence. The different analytical study on the drug showed the presence of flavonoids and tannins. Flavonoids have antioxidant and immunomodulatory activity whereas tannins also have Astringent and antioxidant action thus they help to check secretions; repair tissues and improves the anabolic activity of the body.

Thus, the drug helps in restoring the normal physiology of vagina and if proper hygiene is maintained afterwards, then infection subsides the chances of recurrence are lesser. When the vagina becomes healthy, the infection causing organisms die off thus the disease subsides.

Conclusion

Rhododendron arboreum Sm.(*Pullaas*) is an effective and safe herbal intervention for *Shweta Pradara* (leucorrhea). Clinical study shows that *Pullaas* is effective in subsidence of cardinal symptoms of *Shweta Pradara* i.e., vaginal discharge, foul smell, itching etc. when used orally. When used locally, it shows its *Sthambhana* and *Ropana Karma* due to its *Kashaya Rasa*. When *Pullaas* is used both orally and locally, it give better results especially in congestion and tenderness of vagina.

The combined approach of oral and local therapy enhances therapeutic efficacy & minimizes recurrence. Further large-scale studies are recommended to validate these findings.

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