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Review Article - Review Article on Pharmaceutico Analytical Study And Standardization of Pratapa

Martanda Rasa.
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Abstract:

Pratapa Martanda Rasa is a Khalviya Rasayana mentioned under Jwara Chikitsa in the text Rasendra Sara Sangraha. It is mainly indicated for Jwara Roga.The four key ingredients of Pratapa Maratand Rasa are Shuddha Vatsanabha,Shuddha Tankana, Shuddha Hingula and Shuddha Jayapala Beeja. It was prepared in the post graduate department of Rasashastra and Bhaishajya Kalpana, Gomantak Ayurveda Mahavidyalaya and Research Centre, Shiroda- Goa. Pratapa Maratanda Rasa was prepared in three batches. The Analytical study was conducted and the study includes organoleptic characters, Physico - chemical characters like Loss on drying at 110°c, Water soluble extractive, Acid soluble extractive, Total ash, Acid insoluble ash, pH,Assay for tannins,phenols,alkaloids,glycosides, Microbial studys, Heavy metal, TLC, hardness, uniformity of weight, Disintegration time and HPTLC.Analytical study of Pratapa Maratand Rasa was found to be within the pharmaceutical standards.

Key Words: Pratapa Martanda Rasa, Analytical study, Physicochemical parameters, Jwara.

Introduction:

Ayurveda, one of the oldest medical systems, This establishes Ayurveda as a vital aspect of Vedic knowledge aimed at preserving health and preventing illness. Rasashastra and Bhaishajya Kalpana branches emerging as key fields focusing on the therapeutic applications of minerals and metals. Rasashastra is "the science of mercury," explores Rasadravyas—medicinal substances derived from minerals—demonstrating a sophisticated understanding of their properties and effects on the human body.

Rasashastra classifies medicines into four categories: Khalviya Rasayana, Parpati Rasayana, Pottali Rasayana and Kupipakwa Rasayanas. Khalviya Rasayanas are particularly notable for their extensive medicinal properties and ease of preparation, making them popular in general practice. The preparation principles, such as Bhavana and Mardana samskaras, ensure their therapeutic safety and efficacy.

This study aims to explore overlooked potent Rasa Aushadhi in Ayurveda, establish Standard Operating Procedures (SOPs) and create analytical data for this medicine. The focus is on Khalviya Rasayana "Pratapa Martanda Rasa[1]," referenced in the classical text "Rasendra Sara Sangraha." By investigating this neglected Rasa Aushadhi, the research seeks to enrich the understanding of its therapeutic potential and standardize its preparation, ultimately contributing to the broader acceptance and utilization of Ayurvedic treatments in modern healthcare practices.

Aim and Objectives:

To carry out the Pharmaceutical study, Analytical study and Standardization of Pratapa Martanda Rasa.

Materials and methods:

The key ingredients of Pratapa Martanda Rasa are Shuddha Vatsanabha, Shuddha Hingula, Shuddha Jayapala, and Shuddha Tankana. It was prepared in the postgraduate department of Rasashastra and Bhaishajya Kalpana, Gomantak Ayurveda Mahavidyalaya and Research Centre, Shiroda, Goa. Pratapa Martanda Rasa was prepared in three batches.

The Analytical study included organoleptic characteristics, physicochemical characteristics such as loss upon drying at 110 °C, water-soluble extractive, acid-soluble extractive, total ash, acid-insoluble ash, pH, Assay for Tannins, Phenols, Alkaloids, Glycosides, Microbial Study, Hardness, Disintegration time, Uniformity of weight, Heavy Metals, TLC and HPTLC.

Table no. 1: The Ingredients with composition and part used.

	Name of Drugs	L.N.	Part used	Composition
1.	Shuddha Vatsanabha	Aconitum ferox	Roots	1 Part
2	Shuddha Hingula	Cinnabar	-	2 Part
3	Shuddha Jayapala	Croton tiglium	Seed	3 Part
4	Shuddha Tankana	Borax	-	4 Part

Review of literature: Khalviya Rasayanas are significant in Ayurvedic medicine due to their straightforward preparation using Khalva yantra, making them easier to use than other methods. They offer benefits such as lower dosages, quick action, and longer shelf life. When prepared according to classical texts, they are effective and safe. Additionally, in-house preparation enhances clinical effectiveness and economic viability for patients. Their simplicity, efficacy, and safety make them valuable in Ayurvedic pharmacology and clinical practice.

Pratapa Martanda Rasa is a Khalviya Rasayana and it is indicated in Jwara Roga[2]. The reference of Pratapa Martanda Rasa is mentioned in Rasendra Sara Sangraha by shri Gopala Krishna Bhatta of 15th century A.D.

Pharmaceutical Study : Collection and Authentication of Raw Drugs:

Vatsanabha (Aconitum ferox) Purchased from J.K. Herbs & Spices, Khari Baoli, Delhi. Hingula (Cinnabar), Jayapala Beeja (Croton Tiglium) & Tankana (Borax) Purchased from Manakarnika Aushadhalaya pvt. Ltd. pune. Vatsanabha, Jayapala were identified on the basis of its morphological characters by the Department of Dravyaguna Vijnana, Gomantak Ayurveda Mahavidyalaya and Research Centre, Shiroda, Goa. Hingula and Tankana were identified by the Department of Rasashatra and Bhaishajya Kalpana, Gomantak Ayurveda Mahavidyalaya and Research Centre, Shiroda, Goa.

Three Batches of Pratapa Martanda Rasa i.e. Batch A, Batch B, Batch C were prepared according to the Khalviya Rasayana preparation method. The Pradhana Karma included following steps 1. Samanya Shodhana of the drugs (table 2), 2. Vishesha Shodhana of Vatsanabha[3], Vishesha Shodhana of Hingula[4], Vishesha Shodhana of Jayapala Beeja[5], Vishesha Shodhana of Tankana[6] (table 3) 3.Drying of the drugs (table 4), 4. Choornikarana of drugs (table 5), Sieving of the powders (table 6,), Preparation of Pratapa Martanda Rasa (table 8), Vati nirmana (table 9),Preparation of Pratapa Martanda Rasa in three batches.

Samanya Shodhana was done to remove the physical impurities Vishesha Shodhana of Vatsanabha was carried out using Gomutra for removing Visha Dosha. It took 5 days to complete. The procedure Vishesha Shodhana of Jayapala Beejas was carried out using Dola yantra Swedana for 3 hr in Godugdha, Jayapala remained in kalka form and hence it was not subjected to sieveing. Vishesha Shodhana of Hingula was carried out using Bhavana of Ardraka Swarasa. Vishesha Shodhana of Tankana was done by Heating in Iron pan. Vatis of 1 Ratti were prepared after Mardana with Jala Bhavana (q.s.). Drying was carried out to prohibit the microbial growth and to ensure highest quality of the formulation, it was done for 3 days.

Table no. 2 : The weight of the drugs before and after Samanya Shodhana

Sr. no.	Name of the drug	Part used	Wt. before shodhana	Wt. after shodhana	Loss
1	Vatsanabha	Root	110 gm	106 gm	04 gm
2	Hingula	-	200 gm	200 gm	00 gm
3	Jayapala Beeja	Beeja	350 gm	338 gm	12 gm
4	Tankana	-	450 gm	450 gm	00 gm

Table no. 3 : The weight of drugs Before and After Vishesha Shodhana

Sr.no.	Drug name	Before shodhana	After shodhana	Loss
1	Vatsanabha	100 gm	96 gm	04 gm
2	Hingula	200 gm	188 gm	12 gm
3	Jayapala Beeja	300 gm	272 gm	28 gm

4	Tankana	450 gm	260 gm	190 gm	

Table no. 4 : Quantity of the drugs Before and After drying.

Sr. no.	Name of the drug	Wt. before Drying	Wt. after drying	Loss
1	Shuddha Vatsanabha	96 gm	88gm	8 gm
2	Shudha Hingula	188 gm	184 gm	4 gm
3	Shudha Jayapala beeja	272 gm	256 gm	16 gm
4	Shudha Tankana	260 gm	260 gm	0 gm

Table no. 5 : Weight of the drugs Before and After Choornikarana

Sr. no.	Name of the drug	Wt. before Choornikarana	Weight after Choornikarana	Loss
1	Shuddha Vatsanabha	88 gm	78 gm	10 gm
2	Shuddha Hingula	184gm	181 gm	3 gm
3	Shudha Jayapala Beeja	256 gm	240 gm(Kalka Form)	16 gm
4	Shuddha Tankana	260 gm	256 gm	4 gm

Table no. 6 : Weight of the powder of drugs Before and After Sieving

Sr. no.	Name of the drug	Wt. before sieving	Wt. after sieving	Loss
1	Shuddha Vatsanabha	78 gm	69 gm	9 gm
2	Shudha Hingula	181 gm	174 gm	7 gm
3	Shudha Jayapala Beeja	_	_	_
4	Shudha Tankana	256 gm	252 gm	4 gm

Table no. 7 : Characteristics of the powders

Sr. no.	Name of the Drug	Appearence	Colour	Odour	Taste
1	Shuddha Vatsanabha	Fine powder	light brown	Gomutra - Gandhi	Bitter
2	Shudha Hingula	Fine powder	Light brown	Odour of Ardraka	Specific
3	Shudha Jayapala Beeja	Kalka	Brown	Strong Aromatic	Bitter
4	Shudha Tankana	Fine powder	White	-	Bitter

Table no. 8 : Quantity of the ingredients of s for the preparation of Pratapa Martanda Rasa.

Sr. no.	Name of the Drug	Quantity taken Batch A	Quantity taken Batch B	Quantity taken Batch C
1	Shuddha Vastanabha Choorna	5 gm	5 gm	5 gm
2	Shudha Hingula Choorna	10 gm	10 gm	10 gm
3	Shuddha Jayapala Beeja Kalka	15 gm	15 gm	15 gm
4	Shuddha Tankana Choorna	20 gm	20 gm	20 gm
5	Jala	Q.S.	Q.S.	Q.S.

Table no. 9 : Obtained quantity of Pratapa Martanda Rasa

Batch	Total quantity of ingredients	Quantity of bhavana drava	Total weight of pills	Number of vatis	Total Wt. Loss	Wt. Loss in %
Batch A	50Gm	50 ml	48.12 Gm	385	1.88 gm	3.76 %
Batch B	50Gm	45 ml	48.75 Gm	390	1.25gm	2.5 %
Batch C	50Gm	60 ml	47.50 Gm	380	2.5 gm	5.0 %

Analytical Study[7]:

Organoleptic characteristics, physicochemical characteristics such as loss upon drying at 110 °C, water-soluble extractive, acid-soluble extractive, total ash, acid-insoluble ash, pH, Assay for Tannins, Phenols, Alkaloids, Glycosides, Microbial Study, Hardness, Disintegration time, Uniformity of weight, Test for Heavy Metals and TLC were done in **Sciore research Private Limited, Bhosri, Pune, Maharashtra.**

Table no. 21 : Organoleptic characters of three batches of Pratapa Martanda Rasa

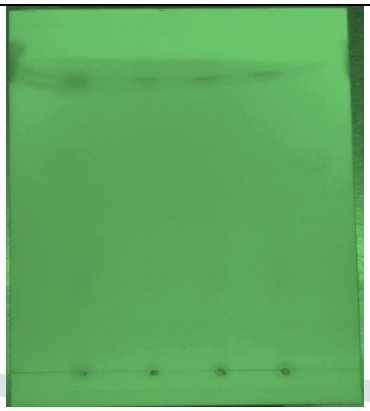
Test	Pratapa Martanda Rasa (Batch A)	Pratapa Martanda Rasa (Batch B)	Pratapa Martanda Rasa (Batch C)
Colour	Reddish Brown	Reddish Brown	Reddish Brown
Odour	Characteristic	Characteristic	Characteristic

Taste	Katu rasatmaka	Katu rasatmaka	Katu rasatmaka
Touch	Rough	Rough	Rough

Table no. 22: Physico-chemical values of Pratapa Martanda Rasa

	Batch A	Batch B	Batch C	Average
Loss on drying on 110^0 C	5.51 % w/w	4.87 % w/w	4.28 % w/w	4.88 % w/w
Water soluble extractive	44.63 % w/w	42.51 % w/w	45.64 % w/w	44.26 % w/w
Alcohol Soluble extractive	24.37 % w/w	18.02 % w/w	18.48 % w/w	20.29% w/w
Ash	2.41 % w/w	2.41 % w/w	2.67 % w/w	2.49 % w/w
Acid insolvable ash	3.24 % w/w	4.59 % w/w	3.61 % w/w	3.81 % w/w
PH	7.5	7.6	7.7	7.6
Average weight of tablet	128 mg	128 mg	128 mg	128 mg
DT	23 mins	23 mins	23 mins	23 mins
Hardness	3.2 Kg/cm^2	3.2 Kg/cm^2	3.2 Kg/cm^2	3.2 Kg/cm^2
Tannis	Negative	Positive	Positive	Positive
Alkaloids	Positive	Positive	Positive	Positive
Phenols	Positive	Positive	Positive	Positive
Glucosides	Positive	Positive	Positive	Positive
Total bacterial count	9540 CFU/gm	11250 CFU/gm	11240 CFU/gm	10746 CFU/gm
Total Fungal count	2150 CFU/gm	2360 CFU/gm	2540 CFU/gm	2350 CFU/gm
Lead	1.21 ppm	1.33 ppm	1.28 ppm	1.27 ppm
Mercury	0.95 ppm	1.05 ppm	1.21 ppm	1.21 ppm
Arsenic	0.50 ppm	0.75 ppm	0.85 ppm	0.7 ppm
Cadmium	ND	ND	ND	ND

TLC : The sample solution was prepared using mobile phase. Precoated silica TLC plates were used for TLC. Spot of solution was placed using micropipette tip on TLC plates and plates were kept in the mobile phase. Solvent was allowed to migrate up to the required length. Plates were observed under the UV light for presence of bands.

	Vatsanabha and Pratapmartanda Rasa
Mobile Phase	Methanol: Chloroform (10:90)
TLC Plate Photo	

HPTLC: Was performed in Anchrom enterprises pvt. Ltd Mulund, Mumbai, Maharashtra. Using Camag HPTLC system

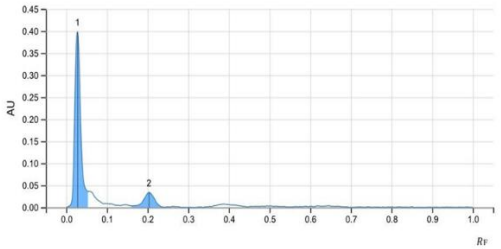
The HPTLC comparative fingerprint analysis of the given polyherbal sample and ingredient was successfully developed using the CAMAG HPTLC System.

Details such as illumination, band colors, RF values are summarized in the tables above.Scanning data has also been provided after derivatizing it with NPA and ASR.

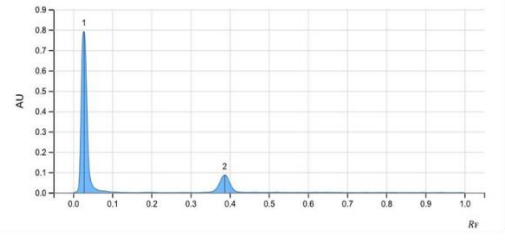
<u>Scanning data after derivatisation with NPA</u>

Rf values of the Vatsanabha and Pratapa Martanda Rasa sample under 366 nm

Track 1 (V*atsanabha*) **TRACK 3 (*Pratapa Martanda Ras*)**

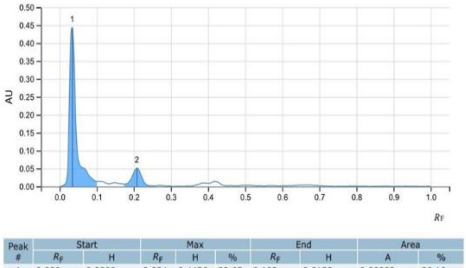


Peak #	Start R_F	Start H	Max R_F	Max H	Max %	End R_F	End H	Area A	Area %
1	0.000	0.0000	0.027	0.3986	92.13	0.055	0.0361	0.00691	86.45
2	0.160	0.0036	0.203	0.0340	7.87	0.242	0.0004	0.00108	13.55



Peak #	Start R_F	Start H	Max R_F	Max H	Max %	End R_F	End H	Area A	Area %
1	0.000	0.0000	0.027	0.7923	90.15	0.095	0.0037	0.01400	83.54
2	0.342	0.0022	0.387	0.0866	9.85	0.434	0.0019	0.00276	16.46

TRACK 5 (Vatsanabha)

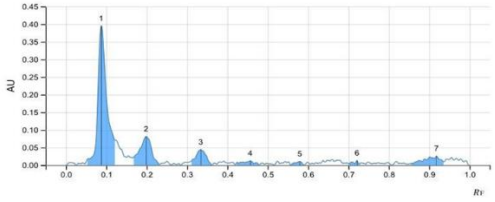


Peak #	Start R_F	Start H	Max R_F	Max H	Max %	End R_F	End H	Area A	Area %
1	0.000	0.0000	0.034	0.4436	89.65	0.103	0.0138	0.00983	86.16
2	0.174	0.0064	0.208	0.0512	10.35	0.255	0.0013	0.00158	13.84

Scanning data after derivatisation with NPA

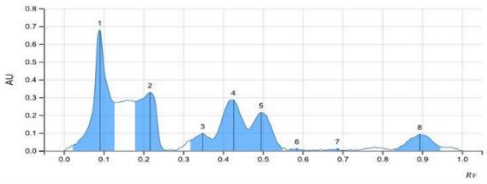
Rf values of the Vatsanabha and Pratapa Martanda Rasa sample under 540 nm

TRACK 1 (V*atsanabha*)



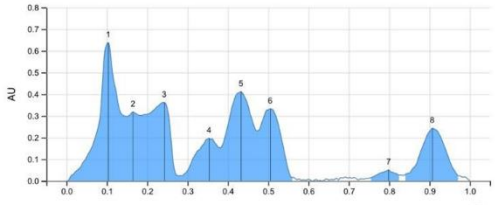
Peak #	Start R_F	Start H	Max R_F	Max H	Max %	End R_F	End H	Area A	Area %
1	0.052	0.0141	0.087	0.3955	67.63	0.121	0.0707	0.01021	62.03
2	0.166	0.0207	0.198	0.0816	13.96	0.232	0.0023	0.00280	17.03
3	0.308	0.0099	0.334	0.0446	7.62	0.361	0.0009	0.00134	8.14
4	0.419	0.0015	0.456	0.0125	2.14	0.479	0.0017	0.00045	2.74
5	0.556	0.0000	0.579	0.0109	1.87	0.590	0.0000	0.00021	1.27
6	0.702	0.0035	0.721	0.0135	2.32	0.727	0.0026	0.00019	1.17
7	0.853	0.0044	0.918	0.0261	4.47	0.937	0.0096	0.00125	7.62

TRACK 3 (*Pratapa Martanda Ras*)



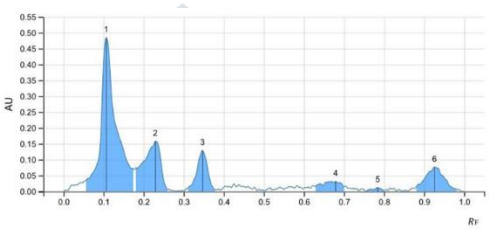
Peak #	Start R_F	Start H	Max R_F	Max H	Max %	End R_F	End H	Area A	Area %
1	0.021	0.0282	0.090	0.6788	39.38	0.127	0.2705	0.02830	32.82
2	0.179	0.2759	0.216	0.3286	19.06	0.260	0.0000	0.01727	20.03
3	0.316	0.0549	0.348	0.0977	5.66	0.374	0.0643	0.00453	5.26
4	0.374	0.0643	0.426	0.2861	16.59	0.463	0.1197	0.01717	19.92
5	0.463	0.1197	0.495	0.2157	12.51	0.550	0.0143	0.01194	13.85
6	0.563	0.0000	0.585	0.0118	0.68	0.610	0.0000	0.00031	0.35
7	0.653	0.0020	0.687	0.0122	0.70	0.713	0.0004	0.00030	0.35
8	0.827	0.0081	0.894	0.0933	5.41	0.947	0.0197	0.00640	7.42

TRACK 4 (Pratapa Martanda Rasa)



Peak #	Start R_F	Start H	Max R_F	Max H	Max %	End R_F	End H	Area A	Area %
1	0.000	0.0000	0.103	0.6383	24.99	0.148	0.2980	0.03770	24.42
2	0.150	0.2972	0.165	0.3184	12.46	0.185	0.3021	0.01092	7.07
3	0.185	0.3021	0.242	0.3620	14.17	0.277	0.0238	0.02506	16.23
4	0.279	0.0234	0.353	0.1965	7.69	0.379	0.1530	0.01245	8.06
5	0.379	0.1530	0.432	0.4120	16.13	0.473	0.2309	0.02875	18.62
6	0.473	0.2309	0.505	0.3329	13.03	0.560	0.0151	0.01964	12.72
7	0.755	0.0146	0.798	0.0515	2.01	0.824	0.0267	0.00245	1.58
8	0.840	0.0309	0.906	0.2431	9.52	0.973	0.0239	0.01742	11.28

TRACK 5 (V*atsanabha*)



Peak #	Start R_F	Start H	Max R_F	Max H	Max %	End R_F	End H	Area A	Area %
1	0.055	0.0343	0.106	0.4851	54.25	0.174	0.0716	0.02132	53.63
2	0.177	0.0700	0.229	0.1585	17.73	0.260	0.0062	0.00801	20.16
3	0.310	0.0083	0.347	0.1294	14.47	0.379	0.0052	0.00404	10.16
4	0.629	0.0153	0.679	0.0319	3.57	0.700	0.0147	0.00183	4.61
5	0.755	0.0000	0.784	0.0124	1.39	0.800	0.0015	0.00032	0.80
6	0.879	0.0122	0.926	0.0768	8.59	0.981	0.0062	0.00423	10.64

Discussion:

Pratapa Martanda Rasa was prepared as per the classical method indicated by Rasendra Sarasangraha. This formulation consists of four ingredients which were collected and authenticated properly. The drug was prepared according to the classical Khalviya Rasayana method after which one ratti of tablet was made. The average loss during the process of vati Nirmana was 3.75% of PMR mainly due to handling. The process of Mardana helped with proper reduction of particle size and increases the rate of absorption. The final product was analyzed for organoleptic characters, physiochemical parameters, assay, test for heavy metals, Microbial counts Disintegration time, Uniformity of weight and quality checks of standardization as per Ayurveda Pharmacopeia of India. The characteristic smell of final product was because of the Jayapala and use of Gomutra during Shodhana Procedure. The Katu taste of final product was as a result of presence of Vatsanabha and Jayapala in formulation. The less % of moisture indicated towards reduced chances of microbial contamination. The 44.26% of water-soluble extractive showed PMR has good solubility in aqueous media. The 3.8% of acid insoluble ash is very low and hence the formulation is easily and safely absorbable in acidic media of stomach. 7.6 PH values are nearly neutral, showed the neutral nature of the final product. Assay revealed the presence i.e. Tannins, Phenols, Alkaloids, Glycosides which explains that the related benefits of such active principles. The test for heavy metals were within the acceptable limit by API making it safe for consumption. HPTLC analysis of Vatsanabha and PMR was carried out under 366nm and 540 nm wavelength using Camag HPTLC system it showed presence of active ingredients in the final product.

Conclusion:

This study focuses on the Pharmaceutical and Analytical evaluation, along with the standardization of the formulation **Pratapa Martanda Rasa**. The Pharmaceutical analysis offered critical insights into the material losses and physicochemical transformations occurring throughout the formulation process. The Analytical evaluation was need, as no prior standard analytical profile of **Pratapa Martanda Rasa** is available in the pharmacopeia. Therefore, the data obtained from this study can serve as a reference standard for verifying the identity, purity, and preparation of **Pratapa Martanda Rasa**.

Summary : The preparation of Pratapa Martanda Rasa was conducted with meticulous adherence to established safety protocols and standard operating procedures (SOPs). The combined actions of this formulation will be Deepana, Pachana and Sroto Vishodhana resulting into perfect correction of the equilibrium of the body components and can cause eradication of Jwara. Further studies are recommended to explore its broader therapeutic potential and to confirm its clinical efficacy.

Conflicts of Interest: There are no conflicts of interest.

Previous work done: No any previous research work has been done on Pratapa Martanda Rasa.

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