WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 10, Issue 3, 1299-1312. Research Article ISSN 2277– 7105

PREPARATION & PHYSICO-CHEMICAL STANDARDIZATION OF KRIMIGHATINI VATI

Dr. Veena G. Kanthi*[1] M.D.(Ayu.), Dr. Subhedh S. Jadhav[2] M.D.(Ayu.), Dr. R. S. Sarashetti[3] M.D.(Ayu.) and Dr. Sudhir K. Yesane[4] MD.(Ayu.)

[1]Principal, Professor, Late Kedari Redekar Ayurvedic Mahavidyalaya, Gadhinglaj.

[2]Consultant, Ratnagiri.

[3]Ayush Chair, People's Friendship University, Moscow.

[4]Associate Professor, L. K. R. Ayurvedic Mahavidyalaya, Gadhinglaj.

Article Received on
30 Dec. 2020,

Revised on 19 Jan. 2021,
Accepted on 09 Feb. 2021

DOI: 10.20959/wjpr20213-19752

***Corresponding Author**
Dr. Veena G. Kanthi
M.D.(Ayu.), Principal, Professor, Late Kedari Redekar Ayurvedic Mahavidyalaya, Gadhinglaj.

ABSTRACT

Krimighatini Vati is prepared according to Rasendrachintamani Adhyaya 9, Krimorogadhikar 1-2. The process contains shodhana of Gandhaka, preparation of Ajmodachurna, Vidangachurna, shodhit Kuchalachurna & Palashbeejachurna, Kajjali preparation and vati preparation. The total time taken to prepare 2020 gms. vati is 29 days. In Analytical Study Assay for Mercury after Shodhana is 99.95% (In Ashodhit Mercury it was 98.53%), the Shodhit Gandhaka has 96.18% Sulphur. The results of analytical study of Krimighatini Vati are as follow. pH=4.83, Moisture content@110ºc=11.29, Total ash content=3.36%, Acid Insoluble Ash=Nill, Water Insoluble Ash=8.91%, Water Soluble Ash=38.28%, Average weight 250mg=253 mg, Average diameter =0.732 cm^2, Hardness=<2 kg/cm^2, Disintegration time=5 min.20 sec, friability=0.001%, Mercury AAS Hg=5.51%, Sulphur AAS S=33.4%.

KEYWORDS: Krimighatini Vati, preparation, standardization.

INTRODUCTION

AYURVEDA is a ancient science. History of 'Indian Alchemy' can be traced Pre-vedic period. The branch, which bring about pharmaceutical methodology with metals, minerals, harmful herbs and other herbo-mineral preparation is known as 'Rasashastra'. The formulations developed from this branch of medicine being herbo-mineral in nature are more effective than the herbal preparations and onset of action is also very fast. There are four

main types of pharmaceutical procedures of Paradiya (Mercurial) Aushadhi eg. Khalvi Kalpa, Parpati Kalpa, Kupipakva Kalpa and Pottali Kalpa.

Ayurveda is the source of harmless and therapeutically remedies. Ayurvedic techniques are formulated only after so many type of processes due to which they are nontoxic in nature. The herbo mineral formulations are effective in small dose and having long shelf life.

Many examples are stated in traditional preparations like Triphala Vati, Krimighatini Vati etc. Acco. To Rasendrachitamani Krinighatini Vati[1] contains Shodhit Parada, Shodhit Gandhak, Ajamoda Churna, Vidangachurna, Kuchalabeejachurna, Palashbeej churn. So the attempt is done to provide the standard parameters for this vati as there are not published standard parameters till today. Therefore the study 'Preparation and physicochemical standardization of Krimighatini Vati' was undertaken.

MATERIALS AND METHODS

MATERIALS

1. Sample of Raw Parada, Raw Gandhaka, Saidhavalavana, Sudha, Godugdha and Goghruta were collected from Late KedariRedekarAyurved College Pharmacy.
2. Sample of Rason, Kuchala, Ajamoda, Vidanga, Palashabeejwere collected from L.K.R. Ayurvedmedical College, Pharmacy.

METHODS

1) Pharmaceutical Study
2) Analytical Study

1. Pharmaceutical Study

a) Collection and authentication of raw material.
b) Parada Shodhan
i) Sudha Shodhan
ii) Parada Shodhan with Sudha
iii) Parada Shodhan with Rason and Saidhava Lavana.
c) GandhakShodhan
d) Kajjali Preparation
e) KuchalaShodhan
f) AjamodaChurna Preparation
g) Vidanga Churna Preparation

h) Palasha Churna Preparation

i) Krimighatini Vati Preparation

a. The collection of drugs were done from college pharmacy and authenticated from Rasashastra & BhaishajyaKalpana department and Dravyaguna department of L.K.R. Ayurved Medical College, Gadhinglaj.

b. Shodhan of Raw Materials

❖ Parada Shodhan

i) Sudha Churna Shodhan[1]

Reference: Rasatarangini 11/210.

Materials – Ashudha SudhaChurna = 500 gm.

Distilled water = 1.5 litre

Equipments: Tulayantra (weighing balance), khalvayantra, Moter & pestle, cloth plate, spoon, steel vessel, measuring jar, galass vessel etc.

Procedure

- Sudha was taken in morter and with pestle transformed in fine powder.
- The 1 liter water is added & mixed well and filtered with the help of cloth and the solution was kept steady for 7 hour.
- The precipitated paste like lime kept for drying in day light. Collected & stored in glass vessel.

ii) Parada Shodhan with Sudha, Rasona & Saidhava[1]

Reference: Rasatarangini 5/27-30.

- Parada Shodhana with Sudha.

Materials – Ashodhit Parada (Hg) – 200 gm.

Shodhit Sudha(Lime) [$Ca(OH)_2$] = 200 gm.

Equipments: Tulayantra (weighing balance), khalvayantra, morter & pestle, cloth plate, spoon, steel vessel, measuring jar, glass vessel etc.

- Weighed amount of Ashodhit (impure) Parada and Shodhit Sudha were taken in morter & pestel and triturated constantly daily 5-6 hrs for 7 days.
- On 8^{th}daySudha transformed to Gray in colour.
- The mixture was washed and filtered to get Parada.

➢ Parada Shodhana with Rasona & Saidhava Lavana.[1]

Materials – Ashodhit Parada (Hg) – 194 gm.

Saidhav Lavana (Salt) = 97 gm.

Nistush (uncovered)Lasun (Allium

Saivum) = 194 gms.

Equipments: Tulayantra (weighing balance), Khalvayantra, moter & pestle, cloth, plate, spoon, steel vessel, measuring jar, glass vessel etc.

METHOD

The equal quantity of Sudhashodhit Parada and uncovered Lasun (garlic) taken, the salt was added half of the Parada quantity. Triturated this mixture till it get blackish in colour.

Then it was washed with water and clear Parada is collected.

❖ Gandhak Shodhan.[1,3]

Reference: Rasatarangini(8/7-12).

Materials – Gandhaka (Sulphur) – 300gm

Goghrat (Cow ghee) – 600gm

Godugdha (Cow milk) – 1200ml

Equipments: Stove, cloth, pot, morter & pestle, water etc.

Procedure

Gandhak was powdered in Khalvayantra. Powdered Gandhaka liquified on mild fire with ghee in iron pot & poured in milk vessel with the help cloth, so that physical impurities remain on cloth.

The settled Gandhak in milk pot washed with water & dried under shade.

This process was repeated for 3 times.

❖ Preparation of Kajjali.[1,3]

Reference: Rasatarangini (2/27-28).

Materials – Sudha Parada – 100gm

Sudha Gandhaka –200gm

Equipments: Khalvayantra, spoon, glass container.

Method

Sudha Gandhaka powdered in Khalva. Equal amount of Shudha Parada added & triturated daily 8 hours for 7 days. Till shinigless, black colour comes to mixture trituration done. This is kajjali. Stored in glass container.

❖ Kuchala Shodhana.[1,4]

Reference: Rasatarangini (24/174,175).

Materials – Raw Kuchala – 600gm.

Goghrit (ghee) – as per need

Equipments: Khalvayantra, Iron cauldron, strirer, gas stove etc.

Procedure

The well developed seeds of Kuchala are fried in ghee in iron vessel till seeds get rosy yellow in colour. Then after cooling the outer cover of seeds are removed and powdered the seeds in khalvayantra till it get powdered.

❖ Preparation of Ajamoda Churna.[2,4]

Materials – Raw Ajamoda – 400gms

Equipments: Khalva Yantra, Grinder, Cloth, Weighing Machine.

Procedure

Physical impurities were cleaned present in Ajamoda, crushed in Khalva. Then powdered in Grinder, till it get fine in nature.

❖ Preparation of Vidanga Churna.[2,4]

Materials – Raw Vidanga – 500 gms

Equipments :KhalvaYantra, Grinder, Cloth, Weighing

Machine.

Procedure

Physical impurities were removed from raw Vidanga. Then crushed in Khalva & grinded well in grinder to get fine powder.

❖ Preparation of Palash Churna.[2,4]

Materials – Raw Palashbeej (seeds) = 650 gms

Equipments :KhalvaYantra, Grinder, Cloth, Weighing

Machine.

Procedure

Physical impurities of Palashbeej are removed. Then little pounded in Khalva & then powdered fine in grinder.

Preparation of Krimighatini Vati[5]

Reference: - ResendrachintamaniAdhyaya 9 - Krimirogadhikar 1-2.

Materials:-

ShodhitParad (Hg)	– 100 gm
ShodhitGandhaka (S)	- 200 gm
Ajamodachurna	– 300 gm
Vidanga Churna	- 400gm
Shodhit Kuchala beej churna	– 500 gm
Palashbeejachurna	– 600 gm

Equipments

Khalvayantra, Weighing Machine, Cloth, Spoon.

Procedure

Kajjali and all above churnas (powders) were taken in Khalvayantra and trichurated well for 3 hours and then with the help of honey tablets of 250 gm (2 Ratti) prepared and dried in shade.

RESULTS AND DISCUSSION

A. Shodhan of Raw materials
B. Preparation of Krimighatinivati
C. Final product standardization

A.Shodhan of Parada

(1) Sudha Shodhan

Starting weight of Sudha = 500gm,

Final weight of Sudhaafter shodhan =460gm,

Total loss = 40gm.

(ii) Parada shodhan with sudha.

Table 1: Table showing observation of Parada Shodhana with sudha.

Sr. No	No of days	Mardanhrs	color	
			Parada	Sudha
1.	1st day	6 hrs	Shiny silver	Shweta
2.	2nd day	6 hrs	Shiny silver	Shweta
3.	3rd day	6 hrs	Shiny silver +	Faint grey +
4.	4th day	6 hrs	Shiny silver++	Faint grey +
5.	5th day	6 hrs	Shiny silver++	Faint grey ++
6.	6th day	6 hrs	Shiny silver ++	grey +
7.	7th day	6 hrs	Shiny silver +++	grey

Quantity loss

Ashodhit Parada – 200 gm.

wt. of shodhit Parada with Sudha = 194 gms.

Total loss = 6 gms

Reason of loss – Due to jalagati of (Along water) and Hamsagati of Parada loss is seen.

iii)Parada shodhan with Rasona and Saidhav.

Table 2: Table showing observation of Parada Shodhan with Rasona.

Sr. No	No of days	Mardan.hrs	Color Parada	Rasona Kalka	Appearance Parada	Rasonakalka
1	1st day	5 hrs	Shiny silver	Yellowish	Intact Parada separate	Sthula
2	12th day	Total 60 hrs	Shiny silver +++	Blackish green +++	Parada completely mixed with Rasonakalka	Parada completely mixed with Rasonakalka

Loss of Parada

Wt. of shodhit Parada with Sudha = 194 gms.

Wt. of shodhit Parada with Rasona & Saindhav = 182 gms.

Total loss = 12 gm.

A-2.Shodhan of Gandhak.

Table No.3: Table showing observations of Shodhan of Gandhaka.

Sr. No.	No. of days	Weight				Observation
		Ashodhit Gandhak	Shodhit Gandhak	Goghrut	Godugdha	
1	Ist day	300 gm	292 gm	600 gm	1200 ml	Before Shodhanyellow. After shodhan lemon yellow.
2	3rd day	286 gm	275 gm	570 gm	1200 ml	Faint lemon yellow. Shine increased.

Weight Variation

Weight of Ashodhit Gandhaka =300 gms.

Weight of Shodhit Gandhaka = 275 gms.

Total loss =25 gms.

A-3.Preparation of Dwiguna Kajjali preparation.

Table No.4: Table showing observations of Kajjali.

Sr. No.	Mardana Time	Colour Change
1	After 10 min.	Mixture yellowish gray
2	After 1 hour	Dark gray colour
3	After $1\frac{1}{2}$ hour	Black with shining particles
4	After 55 hours	Nischandrik – Black colour

Weight Variation

Weight of Shuddha Parada = 100 gms.

Weight of Shuddha Gandhaka = 200gms.

Weight of Prepared Kajjali = 294 gms.

Total loss = 6gms.

A-4.Kuchala Shodhana

Raw Kuchala = 600 gms.

Shuddha Kuchala = 580 gms.

Total loss = 20gm (3.33%)

A-5.AjamodaChurna Preparation

Raw Ajamoda = 400 gms.

Obtained = 384gms.

Total loss = 16gm (4%)

A-6. Vidanga Churna Preparation

Total raw Vidangataken=500 gms.

Obtained Vidanga Churna = 480gms.

Total loss = 20gms. (4%)

A-7.Palashbeejchurna preparation

Total raw Palash beejtaken =650gms.

Obtained Palash beejchurna = 630gms.

Total loss = 20 gms. (3.07%)

B. KrimighatiniVati

Weight Variation –

Total quantity taken = 2100 gms.

Total quantity obtained = 2020 gms.

Total Weight loss = 80gms.(3.8%)

C. AnalyticalStudy

1. Analytical study of Parada.[6]

AyurvedicParikshana of Parada.[6,7]

Table No. 5: Table showing organoleptic characters of Parada.

Sr. No.	Name of Test	Ashodhit Parada	Shodhit Parada
1	Shabda	-	-
2	Sparsha	Shit (cold)	Shit (cold)
3	Roopa	Silvery colour	Shiny silver colour
4	Rasa	-	-
5	Gandh	-	-
6	Weight	200 gm	182 gm

2. Physico-chemical Analytical study of Ashuddha & Shuddha Parada.

Table No.6: Table showing physico- chemical analysis of Parada.

Sr. No.	Parameters	Ashodhit Parada	Shodhit Parada
1	Moisture content	Not detected	Not detected
2	Assay for Mercury	98.53%	99.95%

C3.Analytical study of Gandhak (Sulphur).[6,7]

i)TableNo.7: Showing organoleptic characters of Ashodhit & Shodhit Gandhak.

Sr. No.	Parameters	AshodhitGandhak	ShodhitGandhak
1	Colour	Shining Yellowish crystalline	Yellowish crystalline powder
2	Taste	-	Taste less
3	Odour	SulphurOdour	Odourless
4	Touch	Layaree, rough	Layaree, soft
5	Structure	Crystalline	Powder

ii) Table No.8: Showing physic-chemical analysis of Ashodhit & Shodhit Gandhak.

Sr. No.	Name of Test	AshodhitGandhak	ShodhitGandhaka
1	Nature	Crystalline lumps	Crystalline lumps
2	Transparency	Translucent	Translucent
3	Chemical analysis	95.23%	96.18%
4	Solubility	Carbon di sulfide	Carben di Sulfide
5	Effect of heat	Evaluation So_2 fumes	Evaluation So_2 fumes
6	Chemical reaction with metal & gases	Mostly metal sulfide forms	Mostly metal sulfide forms

C4. Analytical of Dwiguna Kajjali

Table No.9: Showing organoleptic characters according Ayurveda.

Sr. No.	Name of Test	Ashodhit Parada
1	Shabda	-
2	Sparsha	Shlaksha
3	Roopa	Black colour powder
4	Rasa	-
5	Gandh	Typical odour
6	Rekhapurnatva	Yes
7	Nischandratva	Yes
8	Weight	294 gms

Table No. 10: Table showing analytical obesrvations of Dwiguna Kajjali.

Sr.No.	Parameters	Dwiguna
1	Mercury content	35.91 %
2	Sulphur content	47.8%

C.5. Analysis of Ashodhit and Shodhit Kuchala.

Table No.11: Table showing organoleptic characters of Ashodhit and Shodhit Kuchala.

Sr. No.	Organoleptic characters	Ashodhit Kuchala	Shodhit Kuchala
1	Colour	Reddish yellow	Yellowish
2	Odour	Pungent	Amlagandhi
3	Taste	Katu-Tikta	Katu-Tikta
4	Touch	Smooth	Khara(rough)

Table No.12: Table showing Chemical analysis of Ashodhit and Shodhit Kuchala.

Sr.No.	Parameters	Ashodhit Kuchala	Shodhit Kuchala
1	Loss on drying at 110°C	3.64%	4.519%
2	Total Ash Content	5.48%	3.59%
3	Water soluble extractive	29.60%	26.78%

C.6.Analysis of Ajamoda choorna.

Table No.13: Table showing analytical results of Ajamodachoorna.

Sr.no.	Parameters	Ajamodachoorna
1	Appearance	Faint yellowish brown colour
2	Odour/Taste	Pungent / Bitter
3	Loss on drying at 110°C	5.019 %
4	Total Ash content	10.10 %
5	Acid insoluble Ash	1.43%
6	Water soluble Extractive	25.67%

C7.Analysis of Vidangchoorna.[4,6,7]

Table No.14.-Table showing Analytical results of Vidanga choorna.

Sr.No.	Parameters	Vidangachoona
1	Appearance	Dark Brownish colour
2	Odour/Taste	Astrigent/Bitter
3	Total Ash Content	4.72 %
4	Acid insoluble Ash	0.30 %
5	Water soluble extractive	8.14 %

C8.Analysis of Palash choorna.[4,6,7]

Table No.15: Table showing analytical results of Palashchoorna.

Sr.No.	Parameters	PalashChoorna
1	Appearance	Creamishcolour
2	Odour/Taste	Pungent /Bitter
3	Loss on drying at 110 °C.	5.76 %
4	Total Ash content	7.118 %
5	Water soluble extractive	35.01 %

C9.-Analysis of Madhu[4]

Table No.16: Table showing Analytical results of Madhu.

Sr.No.	Parameters	Madhu
1	Appearance	Golden yellow coloured.
2	Odour/Taste	Sweet rich/Sweet.
3	Loss on drying at 110 °C.	5.76 %
4	Total Ash content	7.118 %
5	Water soluble extractive	35.01 %
6	pH	4.22

C10.-Analysis of Krimighatini Vati.[6,7]

Table No.17: Table showing Organoleptic Characters of Krimighatini Vati.

Sr.No.	Parameters	KrimighatiniVati.
1	Colour	Dark Brownish colour
2	Odour	Pungent
3	Taste	Bitter and Sweet

4	Touch	Smooth, round in shape Vati.

Table No.18-Table showing Analytical results of Krimighatini Vati.[6,7]

Sr.No.	Parameters	Results
1	Description	Dark Brownish, Rounded Vati, odoursweet, taste bitter and sweet.
2	pH	4.83
3	Moisture content	11.29
4	Total Ash Content	3.36 %
5	Acid insoluble Ash	Nill.
6	Water insoluble Ash	8.91 %
7	Water soluble Ash	38.28 %
8	Average Weight 250 mg.	253mg.
9	Average diameter	0.732 cm2
10	Hardness	<2kg/cm2
11	Disintegration time	5 min.20 sec.
12	Friability	0.001%
13	Mercury AAS Hg	5.51%
14	Sulphur AAS S	33.4%

DISCUSSION

Pharmaceutical study

For Sudha Shodhan 7 hours were required for sedimentation of Sudha. For Parada Shodhan with Sudha 36 hours were required. In Parada shodhan with Rasona and Saindhava lavana after 60 hours Rasonakalka get blackish green in colour. While washing Parada, due to Jalagati and Hansagati the loss of Mercury is seen 12gm.For Kajjali preparation took 55 hours time to get confirmatory test of Kajjali i.e. Nischandratwa(shiningless). For total preparation time to prepare KrimighatiniVati is 29 days.

Analytical study

In shodhan of Parada purity % of Parada get increased 99.95% from 98.53% (Ashodhit Parada). Also % purity of Gandhaka after shodhan was observed 96.18 %, where Ashodhit Gandhak has 95.23% purity. Purity is increased due to Dhalana, Galana i.e. liquification and filteration. In Dwiguna Kajjali Mercury content 35.91%and Sulphur content 47.8%. The Krimighatini Vati is standard as it's hardness <2kg/Cm2, Disintegration time 5 min.20 seconds, Friability 0.001% are in normal limit.It has Hg 5.51% and Sulphur 33.4 %.

CONCLUSION

Pharmaceutical study

Parada shodhana process is very tedious and time taking (67 hours total.). For Gandhak shodhana the important thing to get pure Gandhak is repeatation of process 3 times and to change Goghruta (ghee) and Godugdha (cow milk) for each cycle. Dwiguna Kajjali show Nischandratwa (shiningless) property after 50 hours. In Kuchala shodhana, the pH of Kuchala was 6.14 and of Ashodhit Kuchala pH was 5.89, so it is increased due to Shodhana i.e. purification. Totally the time duration for Krimighatini Vati was 29 days.

Analytical Study

By Parada shodhana% of Mercury increased and shining also increased.

In Gandhaka shodhan % of Sulphur, mass thickness and M.P. was increased.

Krimighatini Vati has ash content 3.36%, no acid insoluble ash and water soluble ash is 38.28%. Kalpa has free Sulphur content 33.4%. In AAS of Krimighatini Vati is 5.55%. PH of vati is 4.83.

REFERENCES

1. Pandit Kashinath Shastri: Sanskrit Commentary Prasadini Rasa Tarangini Pranacharya Shri. Sadanand Sharma Virachit. Motilal Banarasidas Shree Jainedra Publication: 11th Edn1979, Reprint Edin 2009: Tarang 5, Shloka No. 21, Page No.78; Taranga 8, Shloka No.7-12, Page No.176; Taranga 24, Shloka No.174-175, Page no.678.
2. Siddhinandan Mishra: Bhaishajya Ratnavali of Kaviraj Govind Das sen edited with" Siddhhiprada"-Hindi commentary: Krimirogadhikar. Choukhamba Surbharati Prakashan, Varanasi. Edn 2012: Adhyaya 11, Shloka 40-41, page no.370.
3. ChandrabhushanaJha: Ayurvediya Rasa shastra, Choukhamba Publication: 2nd Edn 1999, Chapter 13.
4. Priyavat Sharma: Dravyaguna Vidnyana. Publication Choukhamba Bharati, Varanasi, Reprint 2006, Vol. II: Page 83, 497, 503,506.
5. Siddhinandan Mishra: Rasendrachintamani by Acharya Dhunduknath Nath with "Siddhiprada"- Hindi translation: Krimirogadhikar. Choukhamba Orientalia Publication, Varanasi. Reprint Edition 2011: Adhyaya 9: Shloka1, 2; Page no. 226.
6. Pharmacopoeial standards for Ayurvedic formulations: Central Council for Research in Ayurveda and Siddha.

7. The Ayurvedic formulany of India: Govt. of India, Ministry of Health and Family Welfare Department of Indian System of Medicine and Homeopath. Published by the controller of publications Civil Liens Delhi. IInd Ed^{n}.
8. Niranjana Prasad Gupta: ParadaSamhita. Publication Khemarja Shrikrushnadasa Shri Vaikateshevar Press. Mumbai Ed^{n}, 1932; Chapter 1,2,30.
9. Sadanda Sharma with Prasadini Samskrit Commentary by Ayurvedacharya Shri. Haridatta Shastri; Publication Motilal Banarasidas, Delhi: 11th Ed^{n}: Chapter 2,5,8.
10. Siddhinandan Mishra: Rasendra Chitamani, Kushtharogadhikar; Chaukhamba Publication. 1st Ed^{n} 2000; Chapter 3,5 and 9.
11. Pandit Kashinath Shastri Rasatarangini Sanskrit Commentary Prasadini: Tanang 6, Murcchanavidnyaniyam. Motilal Banarasidas Shree Jainedra Publication, 11th Ed^{n}: page no.287-288.
12. Pankaj K. Kolambe: "Physico-chemical analysis and evaluation of antibacterial and Antifungal activity of Kajjali." Dissertation L.K.R.A.C. and P.G.R.C. Gadhinglaj, Dist-Kolhapur, 2013.