



International Journal of Indian Medicine

www.ijim.co.in



IJIM

June 2020



International Journal of Indian Medicine

Access the article
online



Analytical Study of Pippalyadya Loha; A herbo-mineral preparation

Amit Kapila¹, Amnish Verma², Rajni Bhardwaj³, Amandeep Sharma⁴

1. Assistant Professor, Department of Rasashastra & Bhaishajyakalpana, Desh Bhagat Ayurvedic College & Hospital, Mandi Gobindgarh, Punjab. kapilaamit2@gmail.com
2. Reader, PG Department of Rasashastra & Bhaishajyakalpana, Desh Bhagat University, Mandigobindgarh, Punjab.
3. Assistant Professor, Department of Rasashastra & Bhaishajya Kalpana. Desh Bhagat Ayurvedic College & Hospital Desh Bhagat University, Mandi Gobindgarh (Punjab).
4. Assistant Professor, Department of Agad Tantra, Desh Bhagat Ayurvedic College & Hospital, Mandi Gobindgarh, Punjab.

Abstract: Analytical study used for the standard for the quality drug and helps to describe the pharmacokinetics and pharmacodynamics of a drug. The analytical study was carried out with a view to know the particular chemical configuration of the raw and final product and to point out the physico-chemical changes and effect of different Samaskaras (Shodhana, Marana etc.) during the pharmaceutical processing. Evaluation on classical analytical parameters. Organoleptic changes are observed and noted in each step during the preparation of Pippalyadya Loha. Qualitative analyses like LOD, Ash value, Specific gravity, Solubility test are carried for Pippalyadya Loha. Quantitative analysis of Grahya Loha, is carried before and after shodhana to rule out percentage of Iron, Manganese, Chromium, Carbon, Silicon, Nickel, Phosphorous, Sulphur, Molybdenum, Magnesium, Calcium, Potassium, Sodium etc.

Keywords: Pippalyadya Loha, Quantitative analysis, Lauha Bhasma

Corresponding Author:

Dr. Amit Kapila

Assistant Professor, Department of Rasashastra & Bhaishajyakalpana, Desh Bhagat Ayurvedic College & Hospital, Mandi Gobindgarh, Punjab.
kapilaamit2@gmail.com



How to cite this article: Amit Kapila et al. Analytical Study of Pippalyadya Loha; A herbo-mineral preparation. Int. J Ind. Med. 2020;1(3):108-116

INTRODUCTION:

Ayurveda is the science of life. The Ayurveda drugs are obtained from natural source only that is from plants, animals or minerals. Ayurvedic compounds formulations are divided into two groups which are Rasaausadhi (predominately metals and minerals are used for preparation and deals with Rasa shastra)¹ and kastausadhi (predominately plant drugs are used for preparation and mainly deals in Bhaisajaya Kalpans). The medication is an iron supplement market in India is presently worth around Rs. 900 crore and is increasing at 15% per annum.² Lauha Kalpas can be a better alternative from Ayurveda. Lauha Kalpas are the formulations which have Lauha Bhasma as the major constituent along with the other herbal ingredients.³ Ancient scholars of Rasashastra were so much wise that they have mentioned the analytical parameters for quality Bhasma.⁴ All these parameters are allocated with different stand points to test the excellence of Bhasma. Although most of these tests are created on organoleptic methods of examination but some tests indicate specific physical and chemical characters. In physico-chemical analysis of the different samples of different intermediate steps, right from the raw

materials to final product of Loha Bhasma evaluated. Although it is a difficult task to decide standards for metal and mineral drugs, yet, here a step has been made to lay down standards for quality of raw Loha and Bhasma and to compare the data with the available one. Since Rasashastra has physics and chemistry as its close ally, there is scope to seek laws of chemistry and physics for providing relationship for changes that take place in Samaskaras (Shodhana, Marana etc.). Biomedical science has undergone revolution in the past few years. Many of today's biological advances have their roots in chemistry and physics related techniques. In depth knowledge of imaging techniques and familiarity with the fundamental properties of matter are providing invaluable support for mapping the structure and function of biological systems at all levels.

Pippalyadya Loha is the classical formulation prepared according Bhaishajya Ratnavali Hikka Shwasa Rogadhikara,⁵ it contain Pippalyadya Loha like Pippali, Draksha, Amlaki, Kola, Madhu, Sharkara, Vidang, Pushkarmoola and Loha Bhasma.⁶ and it is mainly indicated for the treatment of Tamak Shwas. The physico-chemical analysis was carried to evaluate the qualitative and quantitative data.

Materials and Methods.

The main raw materials required for are GrahyaLoha, Pushkarmoola, Pippali, Madhu, Draksha, Vidanga, Kola etc and these are easily available. GrahyaLoha Loha was collected from Patiala. (PUNJAB), after observing the grahyalakshana. Herbal Drugs. Pushkarmoola, Pippali, Madhu, Draksha, Vidanga, Kola were collected from local market and get authenticated from experts. For analytical study Pippalayadi Loha is prepared by three different methods.

Pippalayadi Loha I - all drugs churna was taken in Khalva Yantra mix it together and trituration was done upto 6-hrs.

Pippalayadi Loha II- Decoction of all coarse powder was prepared. then Bhavana was given to prepared already Pippalayadi Loha I. And process was repeated three time.

Pippalayadi Loha No.III- LohBhasma was wtaken in khalva yantra and bhavana was given by kwatha of herbal drug. Total three times bhavana given to LohBhasma.

Physicochemical analysis.

The samples analyzed were as follows:

1. Sample

- (a) Raw Loha
- (b) Shuddha Loha
- (c) Loha Bhasma
- (d) Pippalyadya Loha Prepared from three different methods

2. Methods: The samples were subjected for analysis by employing two different kinds of parameters.

(a)Evaluation on classical analytical parameters:

- (i) Organoleptic characters
- (ii) Varitara test
- (iii) Unam test
- (iv) Rekhapurnata test
- (v) Nishchandratwa test
- (vi) Apunarbhavata test
- (vii) Niruttha test

(b)Evaluation on modern analytical parameters

- (i) Loss on drying
- (ii) Ash value
- (iii) Acid insoluble ash
- (iv) Qualitative test for iron.
- (v) Estimation of iron content by visible spectrophotometry
- (vi) Particle size analysis

Observations and results.**Table no. 1 Classical parameter for analysis of Loha Bhasma**

Sr no.	Test	Results
1.	Varitara test	Positive
2.	Unam test	Positive
3.	Rekhapurnata test	Positive
4.	Nishchandrata test	Positive
5.	Apunarbhavata test	Positive
6.	Niruttha test	Positive

The analytical results obtained are presented in following tables

Table 2.- Analysis of Loha (Raw)

S. No.	Parameters Tested	Results
1	Iron	95.7% w/w
2	Manganese	1.20 % w/w
3	Chromium	2.08% w/w
4	Carbon	0.16% w/w
5	Silicon	0.10% w/w
6	Nickel	0.25% w/w
7	Phosphorous	0.02% w/w
8	Sulphur	0.06% w/w
9	Molybdenum	0.10% w/w
10	Magnesium	0.06% w/w
11	Calcium	0.04% w/w
12	Potassium	0.05% w/w
13	Sodium	0.09% w/w

Table No.3 - Showing Analysis of Loha (After Bhanu And Sthali Paka).

S. No.	Parameters tested	Results
1	Iron	95.60% w/w
2	Manganese	1.12% w/w
3	Chromium	2.19% w/w
4	Carbon	0.16% w/w

5	Silicon	0.18% w/w
6	Nickel	0.23% w/w
7	Phosphorous	0.02% w/w
8	Sulphur	0.07% w/w
9	Molybdenum	0.18% w/w
10	Magnesium	0.07% w/w
11	Calcium	0.05% w/w
12	Potassium	0.08% w/w
13	Sodium	0.04% w/w

Table No. 4 - Analysis of Shudh Loha

S.No.	Parameters Tested	Results
1	Iron	95.68% w/w
2	Manganese	1.10% w/w
3	Chromium	2.11% w/w
4	Carbon	0.15% w/w
5	Silicon	0.08% w/w
6	Nickel	0.22% w/w
7	Phosphorous	0.02% w/w
8	Sulphur	0.09% w/w
9	Molybdenum	0.16% w/w
10	Magnesium	0.08% w/w
11	Calcium	0.12% w/w
12	Potassium	0.04% w/w
13	Sodium	0.09% w/w

Table No. 5- Analysis of Prepared Loha Bhasma

S. No.	Parameters tested.	Results
1	Iron (as Fe ₂ O ₃)	87.80% w/w
2	Silicon (as SiO ₂)	8.56% w/w
3	Magnesium (as MgO)	0.77% w/w
4	Calcium (as CaO)	0.18% w/w
5	Potassium (as K ₂ O)	0.11% w/w
6	Sodium (as Na ₂ O)	1.22% w/w
7	Chloride (as Cl)	0.04% w/w

8	Sulphate (as SO ₄)	0.02% w/w
9	Ash Value	97.54%
10	Water soluble Extractive	1.26%
11	Acid Soluble Value	98.78%

Table No. 6 – Showing Analysis of Prepared Pippalyadya Loha I

S.No.	Parameters tested.	Results
1	Form	Choorna
2	Colour	Brownish
3	Taste	Tasteless
4	Odour	Aromatic
Physico Chemical Standards		
5	Loss on Drying	4.786%
6	Ash Value	53.571%
7	Acid Insoluble Ash	50.049%
8	Water soluble Extractive	43.090%
9	Alcohol soluble Extractive	20.840%
10	Particle Size	7.9 micron

Table No 7 – Showing Analysis of Prepared Pippalyadya Loha II

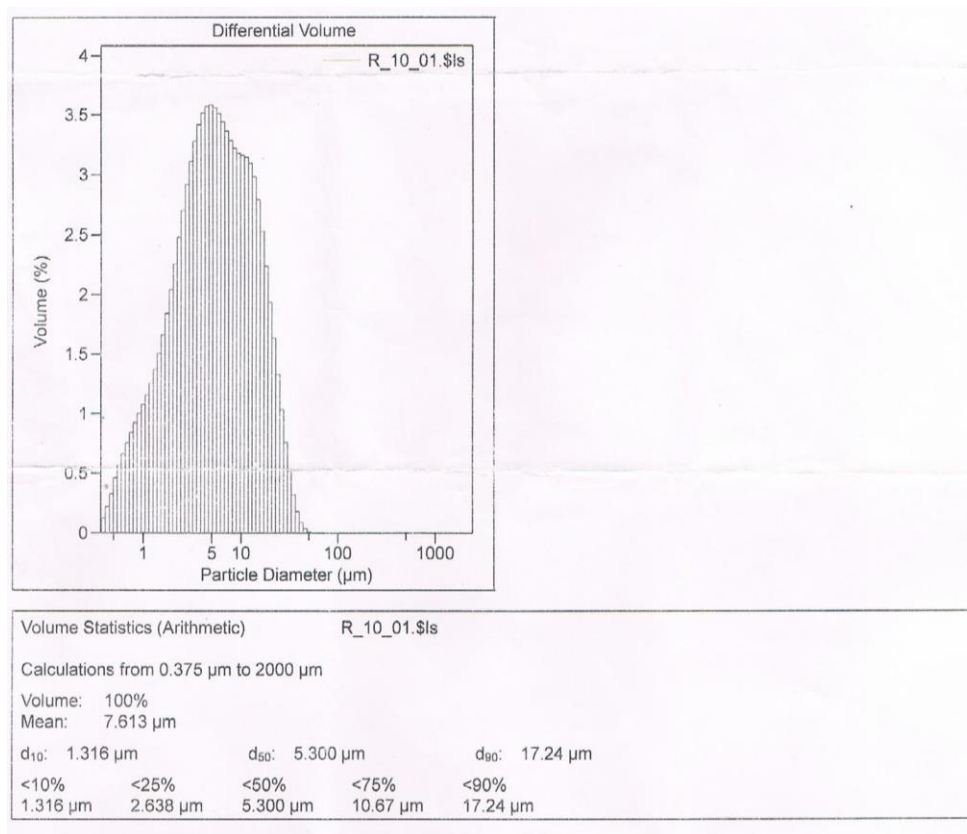
S No.	Parameters tested.	Results
1	Form	Choorna
2	Colour	Brownish
3	Taste	Tasteless
4	Odour	Aromatic
Physico Chemical Standards		
5	Loss on Drying	6.165%
6	Ash Value	48.441%
7	Acid Insoluble Ash	44.730%
8	Water soluble Extractive	40.445%
9	Alcohol soluble Extractive	25.896%
10	Particle Size	8.1 micron

Table No. 8 Showing Analysis of Prepared Pippalyadya Loha III

S. No.	Parameters Tested	Results
1	Form	Choorna
2	Colour	Brownish

3	Taste	Tasteless
4	Odour	Aromatic
Physico Chemical Standards		
5	Loss on Drying	2.267%
6	Ash Value	78.354%
7	Acid Insoluble Ash	74.114%
8	Water soluble Extractive	24.819%
9	Alcohol soluble Extractive	11.949%
10	Particle Size	7.6 micron

Fig. 1. particle size of Pippalyadya Loha



Discussion

During Varitara test it was observed that maximum particles of Loha Bhasma and. In Unam test all the grains of rice were floating on the surface of floated Loha Bhasma. In

Rekhapurnata test, it was observed that the Bhasma fill the furrows of the finger tips. During Nishchandrata test, no shining particles in pellets and Bhasmas of both was observed. In Apunarbhavata test, no lusted

particles was observed and no accumulated hard mass was felt after self cooling in Loha Bhasma. After Nirutta test weight of the silver pieces were remained almost same, in Loha Bhasma, it was 0.3952g weight of silver pieces were not increased. The observations indicate that Loha Bhasma samples pass the classical tests mentioned for evaluation of the quality of Bhasma preparations. Physico chemical tests of Loha Bhasma reveal that the Bhasmas contain very high ash value and very low loss on drying value. Very minute loss on drying of the Bhasma are indicative of presence of very little amount of moisture. Ash value shows presence of inorganic contents of Bhasma. Very high total ash values of the Bhasm are indicative of presence of very high inorganic content. Physico chemical changes of media during Shodhana. Specific gravity of Taila was increased after Shodhana of Loha, but refractive index remained same. Total solid content of all the medias were increased after Loha Shodhana pH of Takra and Gomutra were increased after Shodhana of Loha while pH of Kanji was increased after Loha Shodhana. pH of the other medias remained unchanged after Shodhana. Increase in total solid content indicates transformation of some parts from Loha to the medias. During Shodhana some

parts of Loha may be transformed to ferrous-ferrous oxide (Fe_3O_4), So during Shodhana, these basic oxides may react with the acidic medias and cause increase in pH of Takra and Kanji.

Discussion on Analytical Results

1. On qualitative test, the Loha before Shodhana samples showed the presence of Iron 95.7% while Manganese 1.20%, Chromium 2.08%, Carbon 0.16%, Silicon 0.10%, Nickel 0.25%, Phosphorous 0.02%, Sulphur 0.06%, Molybdenum 0.10%, Magnesium 0.06%, Calcium 0.04%, Potassium 0.05% Sodium 0.09%.

2. And after the samanya shodhan of Loha with Taila, Takra Gomutra, Kultha Kwath and Kanji again analytical study was carried out and reveals the changes after shodhana as follows:

3. Presence of iron 95.60% while Manganese 1.12%, Chromium 2.19% Carbon 0.16%, Silicon 0.18%, Nickel 0.23%, Phosphorous 0.02%, Sulphur 0.07%, Molybdenum 0.18%, Magnesium 0.07%, Calcium 0.07%, Potassium 0.08%, Sodium 0.04%.

4. Final product as lohabhasma prepared by Bhanu, sthalai and putapaka reveals the following details:

5. presence of iron 87.80% while Silicon 8.56%, Magnesium 0.07%, Calcium 0.18%, Potassium 0.11% Sodium 1.22%, Chloride 0.04%,

Sulphate 0.02%,with Ash Value 97.54% and acid soluble ash 98.78%

Conclusion

Physico-chemical analysis provides standards for quality control of raw drugs as well as finished products. Analytical study of a drug also helps to interpret the movement of drug into, through and out of the body also gives idea about absorption and excretion of the same. Qualitative analyses like LOD, Ash value, Specific gravity, Solubility test are carried for Pippalyadya Loha. Quantitative analysis of Grahya Loha, is carried before and after shodhana to rule out percentage of Iron, Manganese, Chromium, Carbon, Silicon, Nickel, Phosphorous, Sulphur, Molybdenum, Magnesium, Calcium, Potassium, Sodium etc.

References

1. Joshi, Vinod Kumar, et al . "The Ayurvedic Pharmacopoeia of India, development and perspectives." *Journal of ethnopharmacology* 197 (2017): pg 32-38.
2. Karelia, B. N., et al "Analysis of hematinic formulations available in the Indian market." *Journal of Pharmacology & Pharmacotherapeutics* 3.1 (2012): pg 35.
3. Amit, Kapila, Saroch Vikas, and Johar Smita. "Conceptual Review of Iron in Ayurveda."
4. Pal, Dilipkumar, Chandan Kumar Sahu, and Arindam Haldar. "Bhasma: the ancient Indian nanomedicine." *Journal of advanced pharmaceutical technology & research* 5.1 (2014): 4.
5. Govindadas, BhaishajyaRatnavali, 13th Edition, 1999. Editor Shashri R.D., hikka swasa adhikar 61-62 Chaukamba Sanskrit Bhavana, Varanasi, pp. 329 to 339.
6. The Ayurvedic Formulary of India: Part 3, Second edition 2003, Publisher:Government of India, Ministry of Health and Family Welfare, Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy, New Delhi; page no. 386

Financial support and sponsorship

Nil.

Conflicts of interest

Nil.

© 2020 IJIM (An International Journal of Indian Medicine | Official publication of Ayurveda Research & Career Academy. (ARCA)