VOL- VII ISSUE- XI NOVEMBER 2020 PEER REVIEW e-JOURNAL IMPACT FACTOR 6.293 ISSN 2349-638x

Study of Physico-chemical properties of Ashudhha and Shodhit Shilajita-Rasadravya.

Dr. P.U.Shinde
B.A.M.S.,M.D.(RASASHASTRA).G.A.C.,Nanded

Abstract:

According to Acharya Aanandkanda, Shilajita drug is included in maharasa group and all the properties of Rasa, uprasa, parada, ratna, lauha etc. are found together in this single drug, which acts as rasayana which delay aging and even death. Shilajita has long been used for prevention and treatment of diabetes in Ayurvedic formulations. It comprehensively used in the cure of diabetes mellitus. Shilajita improves the longevity and quald quality of life. Shilajita is very potent drug and acts in various diseases.Our Acharyas have been already mentioned even minute aspects of science, All the things they presented were established facts. But in this modern world, we need to prove it in terms of modern science. For this, physico-chemical properties of Shilajita- with the help of modern parameters is of prime importance today / a need of time.After Mercury, the Maharasa group comes as important one, which is not only curing the ailments but also binding the mercury in this group. There are eight drugs in Maharasa group (R.R.S. 2/1) and the one which is supposed to be used in all diseases is Shilajita which is important member of this group.
Keywords:Ashphalltum punjabinum,analytical tests,tiphala,cow milk,shodhana.

Intoroduction:

There are several techniques mentioned for shodhana process of Shilajita in texts of Rasagranthas. It is need of time to filter out the best method of the several and to increase it's efficacy at every level of pharmacotherapeutically. For that establishment of standard operative procedures (SOP) and good manufacturing practice (GMP) of Ayurvedic medicine is required. In present study, Shilajita have been purified by cow's milk, Triphala Kwatha and Bhringraja swarasa according to Rasa Ratna Samucchaya (RRS). Now a days to prove Ayurveda in India as well as in world, there is very much need to maintain standard quality of medicines. So, it was decided to study on physic-chemical properties of Shilajita.' This study will help to increase the efficacy of Shilajita in prameha as well as a little contribution in preparation of Ayurveda.

Aims And Objectives:

1. study of physico-chemical properties of Shilajita.
2. To provide simple and effective drug for ayurvedic remedies.

Materials and Method: It includes steps:

1.Raw material and
2.practical study
3.Results and Observations (organoleptic and analytical studies)

1.Raw material:

Different Vernacular names of Shilajita as follows:

❖ Arebic - Hajar –Ul – Musa ❖ Bengali - Shilajita ❖ English - Mineral pitch ❖ Gujarathi - Shilajita ❖ Hindi - Shilajita ❖ Latin - Asphaltum punjabinum ❖ Marathi - Shilajita

In Rasarnava, here Lord Shiva narrated about the process of origin of the drug as during summer season the mountain gets heated up and as a result these releases the extract of the exudates of Dhatu called as Shilajita..

Swaroopa of Shilajita (Grahya Lakshana): According to Charaka Samhita, Shilajita is like Jatu (Laksha), soft, colour like earth matter, clean exudatory product from rocks of mountain. Also Charaka Samhita mentioned superior Shilajita. Shilajita which is like Guggula dravya having Tikta, Lavana Rasa, Vipaka Katu, Sheeta Virya and Gomutra odour is superior on.

Test: Genuineness of the drug supposed to be authentic when – 1. Shilajita put on fire it erects perpendicular and burn without smoke. 2. If pure Shilajita is put in water through the tip of a thin erect grass and it will come down slowly after spreading like fibres. 3. The pure Shilajita should have the smell of Cow's urine and Blackish in colour.

2.Practical study :

Necessity For Shodhana:

If shodhana of Shilajita was not done properly, it possess dosha in it and it produces following disorders Such impure Shilajita causes daha, murcha, bhrama, pittasra (raktpitta), shosh (kshaya) and also it causes agnimandya and vidgraha. Such impure Shilajita causes daha, murcha, bhrama, pittasra (raktpitta), shosh (kshaya) and also it causes agnimandya and vidgraha. According to Charaka Samhita, there is no any curable disease on earth which Shilajita can not perforce subdue when administered at right time, well prepared and in the right manner / way, it will secure for the healthy subject the optimum measure of vitality.

Three samples of Shilajita are procured from three different places.From these sample which fulfilled all the Grahya Lakshnas of Shilajita mentioned in Samhitas and Rasagranthas was choosen for study. Samples were subjected organoleptic and analytical tests to get genuine sample. Samples of Herbal ingredients were procured from local market. Authenticity of materials was confirmed by experts of respective fields. Their originality, purity was identified and selected as per standard mentioned in Ayurvedic pharmacopoeia of India (A.P.I.)

Drugs Used For Shilajita Shodhana (Shodhana Dravya):

Shilajita Shodhana: Shilajita Shodhana was done in Godugdha, Triphala Kwatha and Bhringraja Swarasa very carefully as per possible method. (Agnitapi method i.e. heating on mild fire).

1) Godugdha(Cow's Milk): Godugdha used for the purpose of Shodhana of Shilajita was of standard Agmark grade company. Sufficient analytical tests were performed to assure quality of Godugdha. 2)Triphala: It includes Haritki, Amalaki, Bibhitak. Precautions:Precautions taken during practical of Shilajita Shodhana: 1. Utensils and vessels used should be neat and clean to avoid adulteration. 2. Raw Shilajata should be used in powdered form. 3. Shilajita dissolved in liquid should be filtered to remove impurities after soaking in liquid. 4. Hot water should be added to the mixture for easy sedimentation of solid mass (impurities) and easy filtration. It was decided on the basis of previously done pilot study. 5. Temperature should be maintained around 69°C to 80°C,contineous stirring should be done to avoid sticking. 6. Watery portion from mixture solution should be evapourated. Shodhita Shilajita was tested as per Reference mentioned in Rasagranthas.Sample was declared as satisfactory when it passesed the following Shuddha Shilajita pariksha.

Tests: 1. Became convex when put fire i.e. it erect perpendicular and became convex (round). (85) 2. It burnt without smoke. 3. When Shilajita was placed in water through a thin erect grass,it settled down slowly at bottom after spreading like fibrs. 4. Odour-Cow's urine; Colour –Black.

3.Observations And Results:

Raw Material S:

Shilajita: Organoleptic examination:

Table 1:

Ashuddha and Shodhita Lauha Shilajita: Observations

Pariksha	**Choosen Ashuddha Lauha Shilajita**	**Shodhita Lauha Shilajita**
Shabda (Sound)	Sound on breaking	Sound on breaking
Sparsha (Touch)	Smooth slight sticky	Smooth more sticky
Roopa(Appearance)	Brownish black	Black
II Rasa (Taste)	Kashaya	Kashaya, Tikta
Gandha (odour)	Slight cow's urine	Intense cow's urine

Table-2: Chemical analysis of Raw Ashuddha Shilajita –

Samples (in %): Elements Sample-II (S-II) Magnesium (Mg)1.160 ; Silicon SI-1.982; Sulphur (S) 2.281 ;Potassium (K) 36.332 ;Calcium (Ca) 22.102 Iron (Fe) 6.080; Phosphorous (P) - 2.075.

Table 3: Analytical tests of Ashuddha and Shodhita Shilajita

Tests Chosen	Ashuddha Shodhita Shilajita	Shodhita Lauha Shilajita
Loss on drying at 105°C	7.99 %w/w	10.20 %w/w
Total Ash	16.25 %w/w	12.18 %w/w
Acid insoluble Ash	0.77 %w/w	0.34 %w/w
Water Soluble extract	69.11 %w/w	80.65%w/w
pH	6.00	6.5
Benzoic acid	+ve	+ve

Ayurvedic Tests of Shodhita Shilajita (A.P.4/117):
1. Became convex (round) when Shuddha Shilajita put on fire. 2. It burnt without smoke. 3. When Shuddha Shilajita was placed in water through a thin erect grass, it settled down slowly with spreading like fibres. 4. Odour - intense cow's urine. 5. Colour - Black.

Table- 4: Chemical Analysis of Shodhita Shilajita (in unit - %):
Elements Value- Magnesium (Mg) 1.550: Silicon (SI) 3.662 :Sulphur (S) 1.185 :Potassium (K) 40.228; Calcium (Ca) 16.902; Iron (Fe) 10.163.

Table - 5: Identification of Sample – Harbal drugs:
Amalaki Fruit: Emblica officinalis Gaerth.
Haritaki Fruit :Terminalia Chebula Retz.
Behada Fruit :Terminalia belerica Roxb.
Bhringraja Whole plant Eclipta alba Hassk

Table - 6: Organoleptic examination:

SAMPLE	Shabda (Sound)	Sparsha (Touch)	Roopa(Appearance)	Rasa (Taste)	Gandha (odour)
Amalaki	Non-specific	Slight	Brownish	Amla	None
Haritaki	Non-specific	hard	pale green	Kashaya	None
	fic			Amla, Tikta	
Behada	Non-specific	hard	Brown	Kashaya	None
Bhringraja	Non-specific	Soft	Greenish Grey	Tikta	Slightly aromatic

Table - 7 : Analytical tests of Herbal drugs:

SAMPLE	Total Ash	Acid insoluble Ash	Water Soluble extract	Alcohol Soluble extract
Amalaki	3.19%	1.38%	53.28%	44.88%
Haritaki	2.88%	0.79%	72.22%	49.04%
Behada	5.02%	0.12%	44.23%	14.20%
Bhringraj	9.28%	0.18%	18.29%	5.12%

Drugs used during Shilajita Shodhana:

Table - 8 : Organoleptic examination and analytical tests of Godugdha, Triphala Kwatha, Bhringraja Swarasa:

Tests	Cow's milk	Triphala Kwatha	Bhringraja Swarasa
Shabda (Sound	Non–specific	Non– specific	Non–specific
Sparsh (Touch	Soft	Soft	Soft
Roopa (Appearance)	White	Brown	Blackish green
Rasa (Taste)	Slight sweet	Kashaya,Amla	Bitter
Gandha (odour)	Specific	Not significant	Mild henna like
pH	6	7 3.0	6.80
Specific gravity29°C	1.030	1.0434	1.0530

1. Godugdha: Godugdha used for study was of AGMARK Grade Company.
2. 2. Triphala Kwatha: Observations: It requires 98°C temperature to boil the Triphala containing water and required 42 minutes for heating to reduce the solution to 1/4th quantity. Results: ❖ Initial quantity of water taken – 2 liters ❖ Final quantity of Kwatha obtained – 500 ml ❖ Weight of Triphala

Yavkuta taken – 250 gm ❖ Weight of Residue – 209 gm 3. Bhringraja.

3. 3. Bhringraja Swarasa: Results: ❖ Weight of 'Bhringraja' whole plant taken – 2 kg ❖ Final quantity of Bhringraja Swarasa obtained – 400 ml ❖ Weight of Residue – 1.620 kg.

Discussion:

Shilajita which is basically a herbomineral drug. The present study was selected to prepare a standard formulation to increase the efficacy of Shilajitaa as well as a little contribution in propagation of Ayurveda. Standardization means the bringing a formulation to a specified standard of quality so as to assure quality of final product. The present study was carried out on the basis of Ayurvedic Panchabhautika Parikshana and analytical study.,it gives a good idea regarding the usage of Shilajita and it's varites since 2nd century A.D. probably the problem appeared in availability, collection and description of Shilajita would have left the confusion about it's source of origin. As per the modern literature and the physico-chemical study signifies that Shilajita available now a days in form of raw Shilajita (i.e. Shilajita pashana) is of vegetable origin.Three Samples of Shilajita were collected.They were short listed using above Ayurvedic criteria as well as co-relating modern analytical test. One sample which fulfilled these criteria was selected. Also, Ayurveda indicated that Shilajita which contain Lauha dhatu is the best type of Shilajita i.e. Lauha Shilajita having brown to black in colour and Tikta, Kashaya Rasa. So, we decided to choose Shilajita which was more blackish to brown in colour and containing Lauha i.e. Iron(Fe). Determination of Iron percentage in sample was done by X-RF method. Out of these 3 samples, the sample containing copper and other toxic elements were excluded. The chosen raw sample-II contains 6.080% Iron. Also, as per modern view, In Shilajita, Benzoic acid is responsible for various actions like antiseptic, parasecticidal, etc. So, identification test was carried out for Benzoic acid. It was found in chosen Shilajita.

Triphala: It includes drugs:

Amalaki: Dried drug of Amalaki consists of curled pieces of pericarp of dried fruit and bulk colour – grey to black. Pieces showing a broad, highly shriveled (112) and wrinkled external convex surface to somewhat concave. External surface shows a few whitish specks, it was amla (sour) and Kashaya (astringent) in taste.

Haritki: Dried fruit of Haritki was yellowish brown in colour, it was ovoid, wrinkled and ribbed longitudinally. It was kashaya (astringent) in taste.

Bibhitaka (Behada): Dried fruit of Bibhitaka was spherical to avoid in shape. It was kashaya (astringent) in taste.

These observations can help us to select good quality of drug. Authentification of drugs was done in Government reputed institute. Analytical tests of herbal drugs i.e. Total ash value, Acid insoluble ash value, Water soluble extract, Alcohol soluble extract were carried out for their identity, purity and strength. These observed values of herbal drugs are acceptable (within limit) according to standards given in Ayurvedic pharmacopoeia of India.Chemical analysis of any drug should be known well before experimental and clinical trials. Analytical study ensures not only chemical constituents but also tells us standards of any preparation. It not only gives the standards of product but indirectly gives suggestions for further advancement if required.

Chemical analysis of any drug should be known well before experimental and clinical trials. Analytical study ensures not only chemical constituents but also tells us standards of any preparation. It not only gives the standards of product but indirectly gives suggestions for further advancement if required.

Conclusions:

Now a day to prove Ayurveda in India as well as in the World wide there is very much needs to maintain standard quality of formulation. So, it was decided to study on Study of physic-chemical properties of Shilajita.The aim and objective of study was establishment of analytical standards of Shilajita to prepare a potent formulation in Prameha (diabetes mellitus), also, lying down validation standard operating procedure (S.O.P.) for preparation of

Shilajjita shodhanaShilajita has been used for prevention and treatment of diabetes in Ayurvedic formulation since long period. The main cause of prameha is increased dravaguna and kapha prakoapa. Contents of sshilajita are of kledshoshak and medopachaka activity that help to break samprapti of Prameha. Ayurveda has advised to use drug in specific state.. Shodhana is one of the fundamental principles in Rasashashtra. The meaning of shodhana along with aim is not only to purify drug but also it makes drug free from toxicity, regulates physico-chemical attributes.The word 'analyze' means the detailed examination which reveals the (129) minor but important aspects regarding the drug. While performing study analytical tests were performed, discussed and analytical data observed was noted down. Following analytical tests were carried out during the study. Tests applied for drugs used for Shilajita Shodhana (Cow's milk, Triphala Kwatha, Bhringaraja Swarasa) are organoleptic characteristics, pH, Specific gravity. Analytical parameters used for Ashudhha and Shodhita Shilajita are Loss on drying, Ash value, Acid insoluble ash, Benzoic acid identification test, Chemical analysis. Also, Ayurvedic tests of Shuddha Shilajita were carried out to verify it's purity as per specifications.The whole work is elaborately discussed along with reasoning in the section of discussion to draw some fruitful conclusions regarding the topic.

In present Research Work on basis of facts, observation and results of analytical studies, following conclusions can be drawn:

1. Selection of Shilajita and Herbal drugs should done on basis of authentic references and according to analytical study. So, we should select Shilajita of good quality i.e. sample which contains sufficient iron percentage and minimum impurities
2. During Shilajita Shodhana, as Shilajita melts at low temperature and liquefied early, low temperature (69°C to 80°C) should be maintained during Shodhana process depending upon it's variety.
3. Affter Shodhana, Shiljita becomes brittle and very soft in nature, it passes all the tests perfectly as specified in Rasagrantha that justify purity of Shilajita easily.
4. According to XRF method, we can conclude that Shodhana of Shilajita (131) increases Iron percentage in it.

Refferences:

1.'Anandkandam', edited with translation in Tamil and Introduction in Tamil and Sanskrit by Shri. S.V. Radhakrishna Shastri, Published by S.Gopalan, Hon. Secretary, T.M.S.S.M. Library, Tanjore, 1952.
2. 'Rasasara', Quoted in 'Ayurvediya Rasashastra' by Prof. Siddhinandan Mishra.
3. 'Yogaratnakara', with Hindi commentary by Vd. Lakshmipati Shastri, edited by Vd. Brahmashankar Shastri, Chaukhamba Sanskrit Sansthan, Varanasi, Edition-8, 2004.
4. Acharya Madhav, 'Ayurved Prakash' by Shri. Gularaj Sharma Mishra, Chaukhamba Bharati Academy, Varanasi-1, Edition-4, 1994.
5. Bhavmishra, 'Bhavprakash Nighantu', with Hindi commentary by Dr.Krishnachandra Chunekar, edited by G.S.Pandey, Chaukhambha Bharati Academy, Varanasi –1, Edition –8, 1988.
6. Bindu, 'Rasapaddhati', with 'Siddhiprada' Hindi commentary by Prof. Siddhinandan Mishra, Chaukhamba Orientalia, Varanasi-1, Edi.-2, 2005.
7. British Pharmacopoeia published by general medical council, pharmaceutical press, London, 1963 & 1958.
8. C.K. Parikh, 'Text Book of Medical Jurisprudence and Toxicology', Medical Publications. (134)
9. Chandrabhushan Zaa, 'Ayurvediya Rasashastra', Chaukhamba Surabharati Prakashan, Varanasi-1, Reprint, 2004.
10. Charakacharya, 'Charaka Samhita' with 'Ayurved Deepika' commentary by Chakrapanidatta, edited by Yadavji Trikamji Acharya, Chaukhamba Sanskrit Sansthan, Varanasi-1, Edition-5, 2001.
11. Clark's isolation and identification of drugs, second edition, senior consulting editor, A.C. Moffat; consulting editors. J.V. Jackson, M.S. Moss, B. Widdop, Assisted by E.S. Greenfield London, the pharmaceutical press, 1986.

12. Dattaram Chaube, 'Brihad-Rasa-Raj-Sundar', Chaukhamba Orientalia, Varanasi-1, Edition-6, 1981.
13. Dhamankar and Puranik, 'Ayurvediya Aushadhikaran', Part I and II, Shri Dhootpapeshwar Ayurved Pvt. Ltd, Panvel, Raigad (M.S.)
14. Dr. Rama Reddy, 'Bhaishajya Kalpana Vignanam', Chaukhamba Sanskrit Bhavan, Varanasi, 1st edition.
15. Gopalkrishna Bhatta, 'Rasendrasarasangraha' with Savimarsha 'Rasavidyotini' Hindi commentary by Dr. Indradev Tripathi, Chaukhamba Orientalia, Varanasi-1, Edition-2, 1998.
16. Govind Bhagwatpadacharya, 'Rasahridayatantram' with 'Mugdhavbodhini' commentary by Chaturbhuja Mishra, Translated into Hindi by Acharya Daulatram Rasashastri, Chaukhamba Orientalia, Varanasi1, Edition-1, 1989.
17. Govindadas, 'Bhaishajyaratnavali' with 'Vidyotini' Hindi commentary by Ambikadatta Shastri, edited by Shri. Rajeshwardatta Shastri, Chaukhamba Sanskrit Sansthan, Varanasi-1, Edition-18, 2005. (135)
18. Gurudeep Chatwal and Sham Anand, 'Instrumental Methods of Chemical Analysis (Analytical Chemistry)', edited by Mrs.M.Arora and Mrs. S.Puri, Himalaya Publishing House, Mumbai –4, Edition – June 1995.
19. K.M. Nadkarni, 'India Materia Medica', Volume –I and II, Bombay Popular Prakashan, Bombay, Revised Edition-1976.
20. M.N. Ghosh, 'Fundamentals of Experimental Pharmacology', published by Hilton and Company, Kolkata-12, Edition-3, 2005.
21. M.S. Baghel, 'Research in Ayurveda', by Mridu Ayurved Publication, Jamnagar, Gujarat, 2005.
22. Pandit Bhudev Mookerjee, 'Rasajalanidhi', Kashi Ayurveda series,Chaukhamba Publishers 4th edition 2004. Varanasi (India).
23. Pharmacopoeia of India, Part I, Vol. II the controller of publication, Delhi, 1 st edition.
24. Sadanand Sharma, 'Rasatarangini' by Pandit Kashinath Shastri, Motilal Banarasida Prakashan, Delhi-7, Reprint, 2000.
25. Shalinath, 'Rasamanjari' by Pandit Narayan Prasad Mukundaram, Chaukhamba Sanskrit Pratishthan, Varanasi-1, 2004.
26. Sharangdharacharya, 'Sharangdhar Samhita', with Deepika commentary by Shri. Adhamalla and Gudharthadeepika commentary by Shri. Kashiram, Chaukhamba Orientalia, Varanasi-1.
27. Shri. Chudamani Mishra, 'Rasa Kamdheni', Published by Y.T. Acharya, 1925.
28. Shyamrao Dhondopant Kulkarni, 'Ayurvediya Rasaushadhi Nirman', Continental Prakashan,Pune-30, Edition-1, 1981. (136)
29. Shyamsundaracharya Vaishya, 'Rasayansara', Shyamsundar Rasayanshala Prakashan, Varanasi.
30. Siddha Nityanatha, 'Rasa Ratnakar', Published by Khemraj, Shri Krishnadas, Shri Venkatershwara Press, Bombay, 1966. 31. Siddhinandan Mishra, 'Ayurvediya Rasashastra',Chaukhamba Orientalia, Varanasi-1, Edition-13, 2003.

31.References of Journals:

1. Chopra R.N. I.C. Handa, K.L. Kapoor, Indigenous Drug of India, Dhar and Sons Pvt. Ltd., Calcutta, 2nd edition, 1958.
2. Lal VK and Joshi P, Shilajatu a vegetable product, JRIMYH, 13, 3 28- 37, 1978.
3. Singh RM and Sharma TN, Shilajatu, Nagarjuna XIII, 9, P.36, May 1970.