ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Instrumental Standardization of the Herbo Mineral Drug – Abraga Parpam.

Shree Devi MS*, Kannan M, Sathiya Rajeswaran P, Natarajan S, Vasudevan R, and Muralidass SD.

[1]Siddha Central Research Institute, Chennai-106, Tamil Nadu, India.

ABSTRACT

Abraga Parpam (AP-S) is a herbo-mineral formulation which is prepared as per the Siddha classical text by the process of calcination. Apraga Bhasma (AP-A) is also available in the market. It has been decided to compare the standardization of the both the drugs available in the market. The present study focussed on standardization and quality control which are essential for the identification of drugs. So, that we can prevent adulteration and misidentification of herbo-mineral drugs. In this paper modern techniques such as SEM with EDAX were used to generate fingerprint for Abraga bhasma (AP-A). The SEM analysis showed the presence of nano and micro particles. Parallel standardization works are being carried out in AP-S. A comparative paper will be published in the near future.

Keywords: Abraga parpam, Herbo-mineral drug, SEM, EDAX, Ayurveda medicine.

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Siddha drugs are classified into three categories which include herbal, mineral and animal origin. Siddhars not only used herbal drugs to treat chronic and degenerative diseases. Their view was entirely different and used higher category of medicines which is mostly herbo-mineral and animal origin drugs. Siddha Herbo-mineral formulations are gaining popularity worldwide due to the presence of nano particles which have properties like increased bioavailability, minimal side effect, and longer shelf life period and need less therapeutic dosage. Parpam (Bhasma) is an ash obtained by calcinations of metals. It is a unique preparation of Siddha with extracts of herbs and metals in combination which functions best when converted from their original metals to metal oxide forms [1]. It is prepared by calcinations of Metals in a closed crucible in pits and with cow dung cakes (pudam). Parpams (Bhasma) are biologically produced Nano – particles and are taken along with milk, butter, honey or ghee which makes these elements easily assailable, eliminating their toxic effects and enhancing their biocompatibility [2]. Ayurvedic medicines have no exception in this regard. Hence it is the need of the hour to produce fingerprints for quality medicines. Many researchers are now analysing the metal and mineral-based individual Bhasmas. Hence it is required to develop fingerprints for Bhasmas.

In the both Siddha and Ayurveda practice, herbo-mineral formulations are said to be made biocompatible through specific processes like Sutti (Shodhana) and Marana, the western medical science on the contrary has raised the safety concerns of these formulations in the recent past. Since, Abraga bhasma (A) is used since ages for several purposes, almost attention has been made by the scientific community for the scientific validation of this formulation for biological efficacy and quality control aspects. Believing that standardization is a measurement for ensuring the quality and is used to describe all measures, which are taken during the manufacturing process and quality control leading to a reproducible quality[3], the present study was planned to investigate marketed formulation of Abraga bhasma (A) for physicochemical parameters through modern analytical procedures like SEM, EDAX for safety and efficacy. But till date no scientific work has been carried out on this formulation with respect to physicochemical characterization, which is essential for drug standardization.

MATERIALS AND METHODS

Marketed formulation of Abraga bhasma were procured from the IMPCOPS, Chennai market.

Instrumental analysis

Scanning Electron Microscope Analysis (SEM)

To evaluate the size of the particle in the test drug, surface topography SEM analysis was carried out using S-3400n SEM-Hitachi at a magnification range of 12 X to 1,00,000X at Anna University, Chennai [4].The sample was placed over the specimen stub, it was then placed inside the microscope's vacuum column evaporator. High-energy electron beam was focused through a probe towards the sample material. Variety of signals was produced on interaction with the surface of the sample. This result in the emission of electrons or photons was collected by an appropriate detector. The electrons were counted by the detector and the signals were sent to the amplifier. The resultant image was the number of electrons dispersed from each spot of the sample. The micrographs obtained from this analysis gave enough data about the topography of the sample.

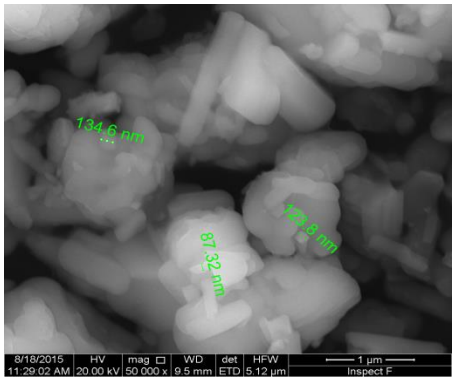
Energy Dispersive X-ray Analysis (EDAX)

The SEM instrument equipped with EDAX enabled the instrument to perform compositional analysis of the sample Abraga bhasma. The data produced by the EDX analysis consists of the spectra containing the elements present in the given sample which was being analysed.

ISSN: 0975-8585

RESULTS AND DISCUSSION

Instrumental Analysis : SEM: (Scanning Electron Microscope)



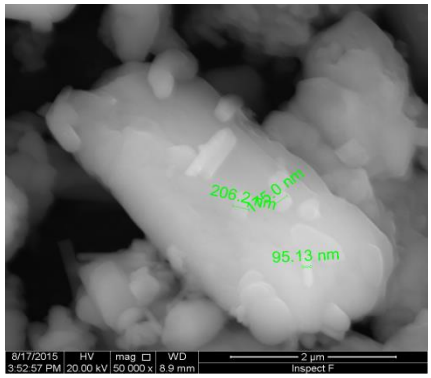
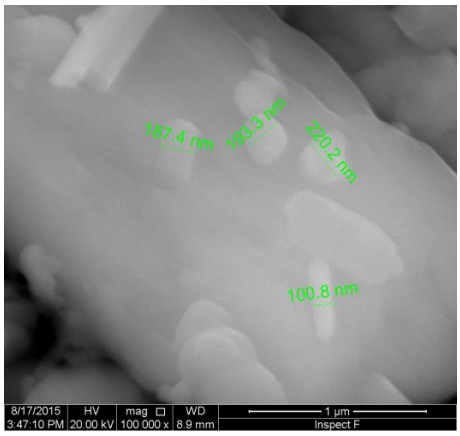


Figure 1, 2 : SEM picture showing micro particles



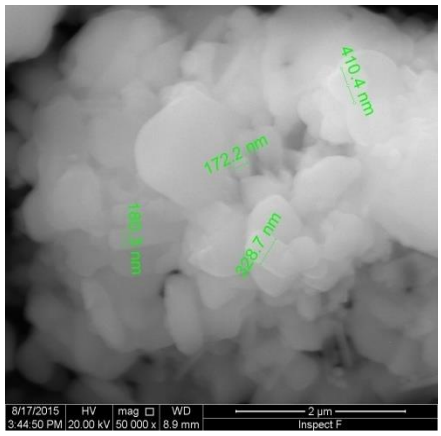


Figure 3, 4: SEM picture showing micro particles

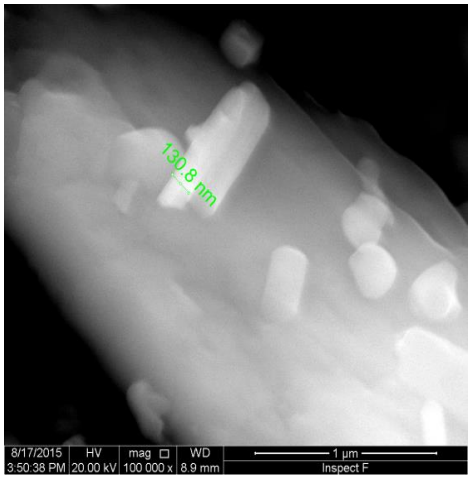


Figure 5: SEM picture showing micro particles

SEM images achieved from various surface regions of different magnifications 50,000X and 1,00,000X proved the presence of nano sized particles.

With a magnification of 1,00,000X the smaller particle size was between the ranges ~100 nm to ~ 130nm.

ISSN: 0975-8585

With a magnification of 50,000X the smaller particle size was between the ranges ~ 87 nm to ~ 95nm. As an average the particle size ranges from 87 nm- 200 nm. Meanwhile it has nano sized particles can be attached to the cell surface and diffuse readily inside the cells. As particle size decreases, the absorption and bioavailability of the drug increases. As the particle is in nano size, a low dose of the drug is enough to treat diseases. The larger particles has numerous spherical protuberance, it may be formed through precipitation process leads to fusion of the smaller particles [5]. The smaller sized particles have larger surface area. The particle aggregation is due to the calcination process.

Energy Dispersive X-ray Analysis EDAX:

The EDAX results were summarized in the Table 1,2,3 and Figure 6,7,8,9 is used to find out the elements present in the sample qualitatively in a smaller area which is selected for analysis

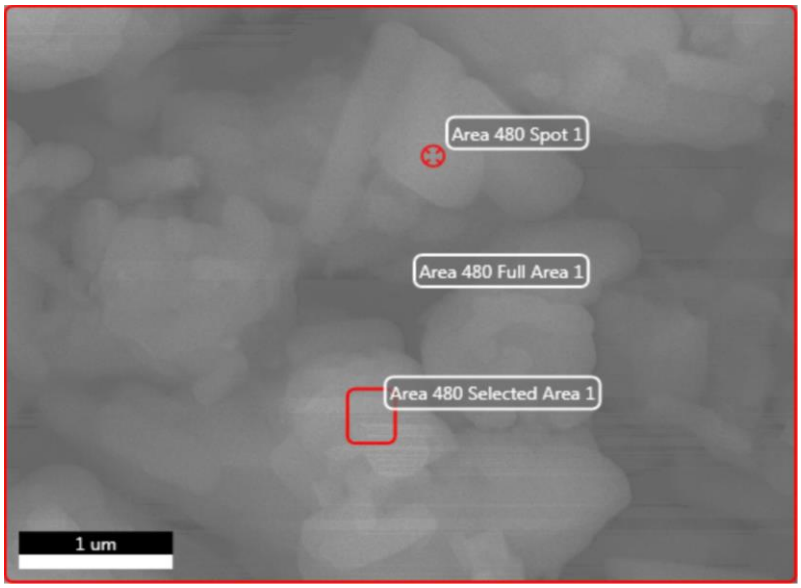


Figure 6: Area 480

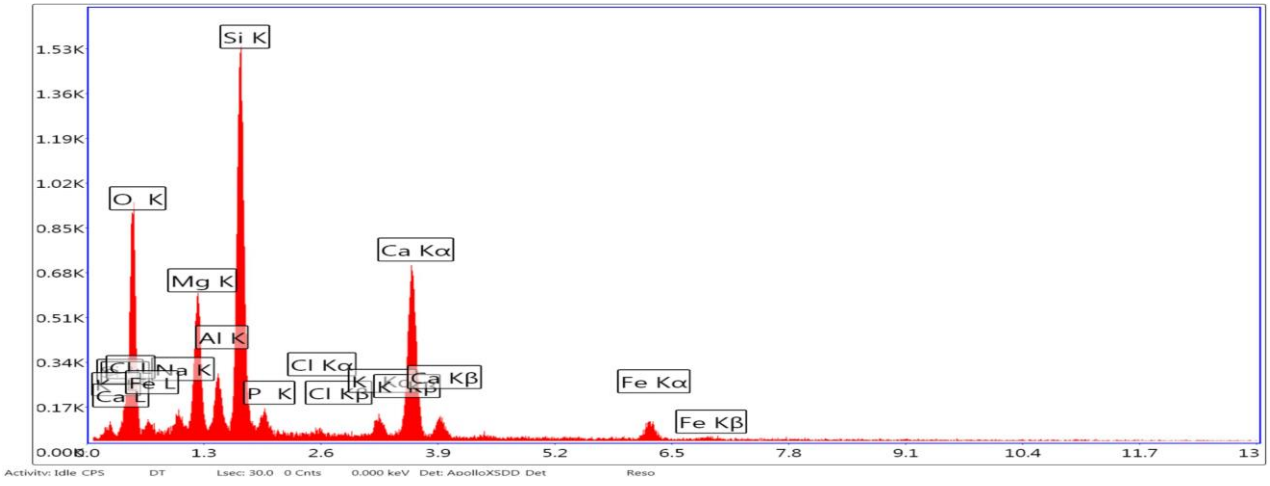


Figure 7: Area 480 spot 1

ISSN: 0975-8585

Table 1

Element	Weight %	Atomic %	Net Int.	Net Int. Error
O K	52.89	67.83	255.37	0.01
MgK	8.95	7.55	169.69	0.02
AlK	3.49	2.65	73.38	0.04
SiK	19.24	14.06	474.17	0.01
CaK	15.43	7.9	257.55	0.02

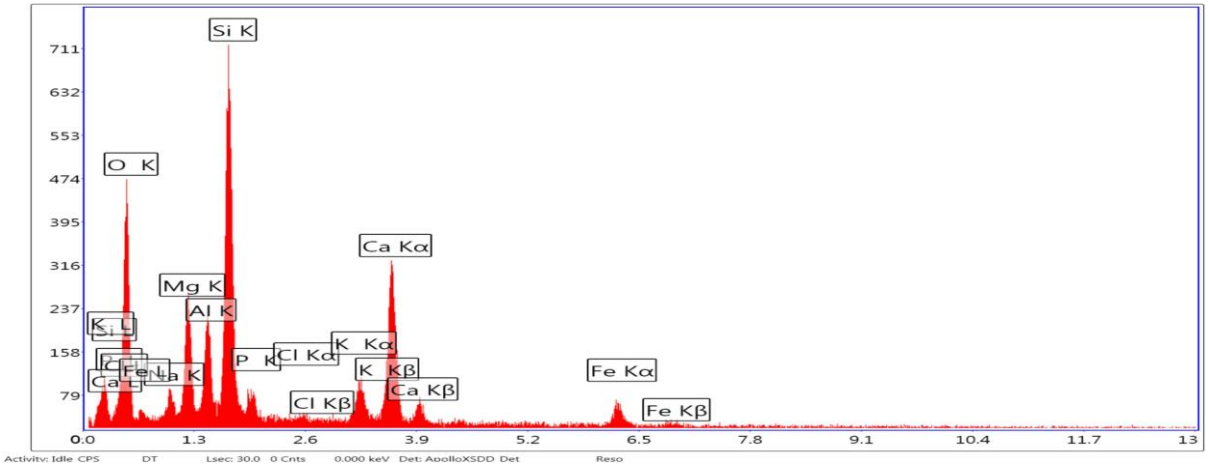


Figure 8 : Area 480 Full Area 1

Table 2

Element	Weight %	Atomic %	Net Int.	Net Int. Error
O K	46.09	62.18	121.85	0.02
NaK	3.57	3.35	19.11	0.07
MgK	7.12	6.32	69.39	0.03
AlK	5.31	4.25	59.98	0.04
SiK	16.25	12.49	212.19	0.02
P K	1.95	1.36	20.05	0.12
ClK	0.43	0.26	4.87	0.42
K K	2.86	1.58	30.97	0.11
CaK	12.27	6.61	111.48	0.03
FeK	4.16	1.61	18.36	0.15

ISSN: 0975-8585

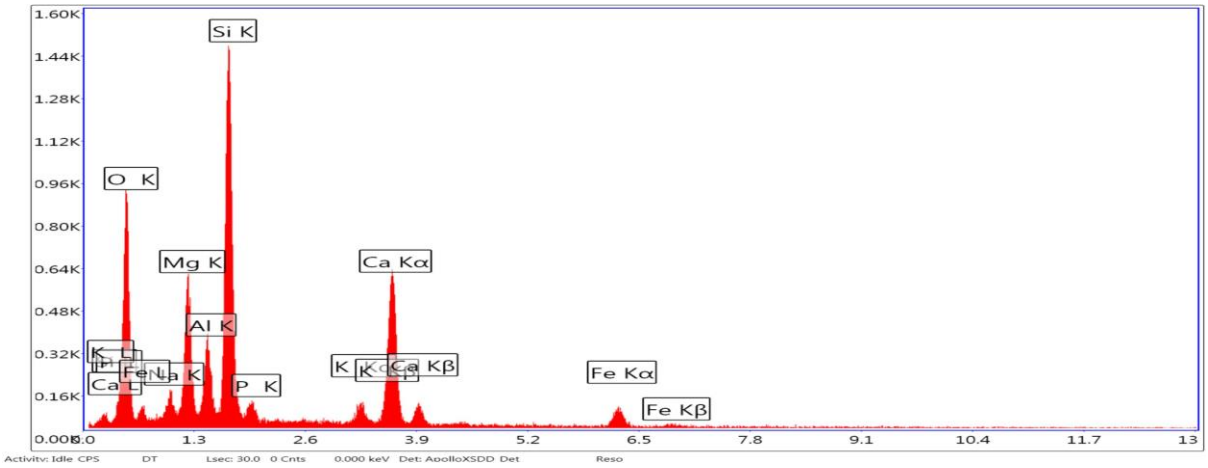


Figure 9: Area 480 Selected Area 1

Table 3

Element	Weight %	Atomic %	Net Int.	Net Int. Error
O K	46.34	61.92	258.04	0.01
NaK	3.91	3.64	43.42	0.05
MgK	8.74	7.69	174.75	0.02
AlK	4.52	3.58	101.74	0.03
SiK	17.57	13.38	463.82	0.01
P K	1.39	0.96	28.62	0.1
K K	1.37	0.75	30.08	0.1
CaK	12.62	6.73	234.08	0.02
FeK	3.54	1.36	31.73	0.11

The EDAX analysis showed the presence of O 46%, Ca 6%, Na, Mg, Al, Si, Fe.

CONCLUSION

The Ayurveda herbo-mineral drug Abraga bhasma had been subjected to various studies to establish the works. The experimental analysis was done to standardize the Abraga bhasma by its chemical compounds and particle size. Based on the results, Abraga bhasma is preferably non-toxic to human in its therapeutic dose. The standardization of the drug was evaluated by chemical characterization SEM and EDAX respectively. The SEM picture had shown the presence of nanoparticle of size 87 – 95 nm in the drug Abraga bhasma. The EDAX results gives the active elements present in the drug like Carbon, Oxygen, Zinc, Magnesium, Calcium, Potassium, Iron which is necessary for its therapeutic effect against the diseases. Hence, it was concluded that Abraga bhasma is a kind of nano medicine which favours the advantages like, increased bio availability, better absorption, nontoxic in nature and attainment of maximum therapeutic effect even at minimum dose level. In future this studies will carried out in Siddha herbo-mineral drug Abraga parpam and the comparison paper will be published.

Thus this drug can be taken to the next level of preclinical and clinical studies to validate the pharmacological activities and its therapeutic efficacy.

ISSN: 0975-8585

REFERENCES

[1] Sheikh Raisuddi. Ayurvedic Bhasma, In: Scientific basis for Ayurvedic therapies, Edited by Lakshmi Chandra Mishra. CRC Press LLC. 2004; 83 - 100.
[2] The Ayurvedic formulary of India. Part – II. The controller of Publications. Civil lines. Delhi. 2000; 205 – 206.
[3] Rasheed A, Marri A, Naik MM. J Pharm Res 2011; 4: 1931–3.
[4] Goldstein J, Newbury DE, Joy DC. SEM and X-Ray microanalysis. 3rd ed. New York: Springer Science, 2003; 690.
[5] Sharon Sagnella. Australian Biochemist 2012; 43 (3): 5-20.