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Evaluation of Hinguleshwara Rasa by ICP AES Elemental Qualitative Analysis for Standardization

Research Article

Ajay Bapusaheb Sonawane[1*], Archana P Gharote[2]

1. Ph.D (Scholar), 2. Professor, Department of Rasashastra and Bhaishajya Kalpana School of Ayurveda, D Y Patil deemed to be University, Navi Mumbai. India.

Abstract

In *Ayurveda Shodhan* (purification) process plays a very significant role in purification of Herbal & Mineral drugs like *Hingul* (Cinnabar) & *Vatsanabh* (*Aconitum ferox*) for internal administration. *Hinguleshwar rasa* is one of the important Herbo-mineral formulation in *Ayurveda*. In this study we performed purification (*shodhan*) of *Hingul* (cinnabar) & *Vatsanabh* (*Aconitum ferox*) according to text and after using it in *Hinguleshwar rasa* we try to find out elemental changes during whole purification & trituration process. Because of the need of purification & standardisation in *Ayurveda* we do ICP AES Elemental qualitative analysis of drug and formulation. After doing ICP AES test of purified *Hingul* we found elements like Chromium, Sodium, Tungsten. but these element were not present in sample of raw *Hingul* (Cinnabar). In the sample of purified and un-purified *Vatsanabh* (*Aconitum ferox*) we not found any significant different element in this test. In *Hinguleshwar rasa* we not found elements which are present in purified *Hingul* (Cinnabar) & purified *Vatsanabh* (*Aconitum ferox*) like Chromium, Gallium, Nickel and Tungsten. Hence this study concludes that some elemental changes may happen after purification, trituration process and during preparation of any formulation. ICP AES elemental qualitative analysis helps to find out elemental changes in the given sample.

Key Words: *Hingul, Vatsanabh*, *Hinguleshwar rasa, Pippali,* ICP-AES.

Introduction

In *Ayurveda* many Herbo-mineral formulation was mentioned in texts of *Rasashastra. Hinguleshwar rasa* and its contents like *shodhit* (purified) *Hingul* (Cinnabar), *Vatsanabh* (*Aconitum ferox*) & *Pippali* (*Piper longum* L.) were used in different disease. Standardization of herbo-mineral formulation on the elemental level is a need of present era. ICP AES Elemental qualitative analysis of *Hinguleshwar rasa* , *Pippali* (*Piper longum), shodhit Ashodhit Hingul* (Cinnabar) and *Vatsanabh* (*Aconitum ferox)* were carried out in IIT Bombay for find out elemental changes after purification & during preparation process of formulation.

ICP AES was use for Precious metal estimation at low level, Heavy metal estimation at sub ppm level and in pharmaceutical industries(1). ICPAES study reveals various elements in the *Hinguleshwar rasa* and in *Hingul* before and after the purification process. In this present study ICP AES Elemental qualitative analysis helps to evaluate & standardize the process of *Hinguleshwar rasa* & its contents.

*** Corresponding Author:**

Ajay Bapusaheb Sonawane
Lig 2,f 24, sector 1,
kalamboli cidco colony,
Taluka Panvel, District Raigad,
Maharashtra. 410218, India.
Email Id: drajaysonawane03@gmail.com

Materials and methods

Material and method of preparation of *Hinguleshwar rasa*:

Preparation process of *Hinguleshwar rasa* was carried out at Department of Rasashastra and Bhaishajya kalpana in school of Ayurveda, D Y Patil deemed to be University Nerul, Navi Mumbai.

Identification of Drug: on the basis of physical properties and botanical parameters.

Method

***Hingul* (cinnabar) *Shodhan* (purification) by *kshalan* (washing) method (2,5,6)**

Equipment

- *Khalva yantra* (Mortar and pestle)
- Measuring cylinder
- Glass jar

Ingredients

- Ashudha Hingul (Raw Cinnabar)
- Nimbuk (Lime, *Citrus acida*) (7)
- Deionized (DI) water

Procedure

Raw *Hingul* (Cinnabar) powder was triturated with Lemon juice for seven times (seven *bhavana*) in *khalva yantra*. After completion of seven times trituration, *Hingul* turns crystallised to powder form and its pH was highly acidic. Then do seven times *kshalan* (washing) with DI water of this triturated *Hingul* (Cinnabar). After *kshalan*, *Hingul* (Cinnabar) become a very smooth dark red in colour, lustreless and pH comes near the neutral. The process was completed in 14 days and the final

product called shodhit (purified) *Hingul* (Cinnabar) obtained.

***Vatsanabh* (Aconitum ferox, monk's hood)(8) Shodhan (purification) in Gomutra(3,6) (Cow urine)**

Equipment
- Vessel

Ingredients
- Small Pieces of *Ashudha Vatsanabh* (*Aconitum ferox, monk's hood*)
- Gomutra (Cow urine)

Procedure
- Small pieces of *Ashudha* (unpurified) *Vatsanabh* (*Aconitum ferox,monk's hood*) immersed in *gomutra* (Cow urine) in the vessel for 3 days in sunlight. Daily replace *gomutra* (Cow urine) with fresh *gomutra* (Cow urine). After three days remove outer covering of *Vatsanabh* (*Aconitum ferox*) and then dried it in sunlight

Preparation of *Hinguleshwar Rasa* according to the *Rasatarangini*.(4,6)

Equipment
- Vessel
- Spoon
- Weighing machine
- Stone grinder

Ingredients of *Hinguleshwar rasa*
- Purified (*Shodhit*) *Hingul* (Cinnabar) powder: 100gm
- Purified (*Shodhit*) *Vatsanabh* (*Aconitum ferox,monk's hood*) powder: 100gm
- *Pippali (piper longum) churna* (powder): 100g

Procedure
- Take equal amount of *Shodhit* (purified) Hingul (Cinnabar) powder, *Shodhit* (purified) *Vatsanabh* (*Aconitum ferox) churna* (powder) and *Pippali churna* (*piper longum* powder) in stone grinder. Then triturate it well till formation of uniform mixture.

Images of *Hinguleshwar rasa*

Fig.1. Unpurified *Hingul*

Fig.2. lemon juice and *Hingul* powder

Fig.3. Purified *Hingul* powder

Fig.4. Unpurified *Vatsanabh*

Fig.5. *Vatsanabh shodhan* in cow urine

Fig.6. Purified *Vatsanabh* powder

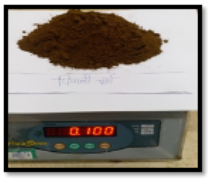

Fig.7. *Pippali* powder

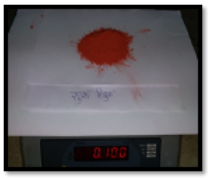

Fig.8. Purified *Hingul*

Fig.9. *Hinguleshwar rasa*

Modern parameters for analysis of drugs(1):
ICP AES test was performed in IIT Bombay for obtaining the elemental qualitative analysis.

Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP- AES) is an emission spectrophotometric technique. In this test analyst can qualitatively and quantitatively find the elements from the given sample relative to a reference standard.

Procedure
- Sample was prepared in ANTON PARR MICROWAVE go system (Temperature 190ºc, RAMP 15)
- Taken 0.1 gm of sample in to the digestion vessel + 5 ml of concentrated HNO_3
- Swirl the mixture & hold for 25 min.
- Final solution was made upto 50ml with distilled water.
- Then this prepared sample was introduced in ICP-AES machine for analysis.

There are six samples for full scan
1. First sample: Raw *Hingul* (Cinnabar). (A)
2. Second sample: *Shodhit* (purified) *Hingul* (Cinnabar). (A1)
3. Third sample: *Ashudha* (unpurified) *vatsanabh* (Aconitum ferox) (B)
4. Fourth sample: *Shodhit* (purified) *vatsanabh* (Aconitum ferox) (B1)
5. Fifth sample: *Pippali* (Piper longum) (C)
6. Sixth sample: *Hinguleshwar rasa* (D)

Table 1

Sr. no	Name of the sample	Detected elements	Number of detected elements
1	Raw *Hingul.* (A)	Ag, Al, As, Ba, Bi, Ca, Cu, Fe, Ga, Hg, Mg, Mn, Mo, Pb, S, Si, Sr, Ti, Zn	19
2	*Shodhit Hingul.* (A1)	Al, As, Ba, Bi, Ca, Cr, Cu, Fe, Ga, Hg, Mg, Mn, Mo, Na, Pb, S, Si, Sr, Ti, W, Zn	21
3	*Ashudha vatsanabh* (B)	Al, B, Ba, Ca, Cl, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, P, S, Si, Sr, Ti, Zn	19
4	*Shodhit vatsanabh* (B1)	Al, B, Ba, Ca, Cl, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, P, S, Si, Sr, Ti, Zn	19
5	*Pippali* (C)	Al, B, Ba, Ca, Cl, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, P, S, Si, Sr, Ti, Zn	19
6	*Hinguleshwar rasa* (D)	Al, As, B, Ba, Ca, Cl, Cu, Fe, Hg, K, Mg, Mn, Na, P, S, Si, Sr, Ti, Zn	19

Observations & Results

In ICP AES qualitative analysis report found some element in the samples.

1. In the sample of *shodhit Hingul* (purified Cinnabar) we found elements like Chromium (CR), Sodium (NA), Tungsten (W). but these element were not present in sample of unpurified raw *Hingul*.
2. In the sample of *shodhit and ashudha Vatsanabh* (purified & un-purified *Aconitum ferox*) we not found any different significant element in this test.
3. In sample of *Hinguleshwar rasa* we not found elements which are present in *shodhit Hingul* (purified Cinnabar) & shodhit Vatsanabh (purified *Aconitum ferox*) like Chromium (CR), Gallium (GA), Molybdenum (MO), Nickel (NI), Lead (PB), Tungsten (W).

Discussion

ICP AES elemental qualitative analysis test used for standardization of drug on the elemental level. It helps to know the elemental changes after carried out different procedures which are mentioned in Ayurveda like *Shodhan* (purification), *Mardan*(trituration) etc. In this study ICP AES test of purified (*shodhit*) *Hingul* (Cinnabar) we found elements like Chromium (CR), Sodium (NA), Tungsten (W). but these element were not present in sample of raw *Hingul*. In the sample of purified (*shodhit*) and un-purified (*Ashodhit*) *Vatsanabh* (*Aconitum ferox, monk's hood*) we not found any different significant element in this test. In *Hinguleshwar rasa* we not found elements which are present in *shodhit Hingul* (purified Cinnabar) & *shodhit Vatsanabh* (purified *Aconitum ferox, monk's hood*) like Chromium (CR), Gallium (GA), Molybdenum (MO), Nickel (NI), Lead (PB), Tungsten (W).. Hence we conclude that some elemental changes happened after purification and trituration process during preparation of any formulation.

Conclusion

Hence this study concluded that ICP AES elemental qualitative analysis test helps to standardized & find out elemental changes in the *Hinguleshwar rasa* and its contents. There is no significant specific element was found in the *Hinguleshwar rasa*.

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