

# A Critical Study on Conventional and Modern Aspect of Vyomasham

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**Abstract**—Vyomasham was initially described in the ayurvedic texts of 20<sup>th</sup> century as one of the Semiprecious stone (Upratna). It is supreme in curing cardiac ailments, also said to be memory enhancer and gives overall strength to the mind and body. As Vyomasham is a potent cardiotoxic and also a major ingredient of various formulations used in cardiac diseases, but till date no research work has done regarding its identification and chemical composition. Taking this into consideration three samples of Vyomasham were purchased from different gem dealers of Jaipur gem market and were analysed by Indian Institute of Gemmology through various analytical parameters of gemstone and then also verified through XRD analysis. From the analysis done they were found to be genuine samples of Green Aventurine or Indian Jade. Green Aventurine is also used to activate the heart chakra for emotional calmness and general well being. It also benefits the Thymus gland and nervous system, regulates blood pressure and stimulates metabolism. Vyomasham was earlier considered as “Jade” have chemical formula Sodium Aluminium Silicate as given in the classical texts of Rasashastra. But analytical study of raw samples show that it is Green Aventurine have chemical formula “SiO<sub>2</sub>” or Silica which is also called as Indian Jade.

**Keywords:** Vyomasham, cardiotoxic, Aventurine, Jade.

## 1. INTRODUCTION-

Gemstones have held our fascination for thousands of years and it will continue to captivate us. They are being used by all cultures of the world; their inherent beauty is second to none in the mineral world. Gemstones are minerals, which mean they are naturally occurring material, each with a particular chemical composition. Gemstones are collective term for all objects used with ornamental purposes that possesses beauty, durability & stability. Characteristics of gems include their optical properties such as lustre, luminescence, dispersion of light, refractive index and physical properties such as hardness, specific gravity and type of cleavage. Extensive use of these precious and semiprecious stones (ratna & upratna) in ayurveda started only with the development of Rasa shastra as an independent science of learning and therapy.

Vyomasham is one among the semiprecious stones mentioned in the various Rasashastra texts. It is a potent cardiotoxic and is a major ingredient of various cardiac drugs, but till date no research work has been done regarding its identification.

The description of its classification was first time mentioned in Rasendra Sambhava as Haritkam and Mayurupala, Haritkam having olive green colour whereas Mayurupala is greenish-white in colour, but its therapeutic application was first time mentioned by Acharya Yadavji Trikamji in Rasamritam. It is also known as Sangeyashab in Unani system of medicine. Synonyms of Vyomasham are Taksharyavarta<sup>1</sup>, Shilataksharya, Yasabshila, Haritasham<sup>2</sup> and Haritmani. Vyomasham resembles Emerald in colour and has got tremendous potential in the treatment of cardiac weakness, palpitation, burning micturition and urinary calculi.

## Therapeutic uses of Vyomasham-

- When administered in suitable dosage along with appropriate adjuvant, it acts as a good cardiotoxic (hridaya).
- It is highly effective in palpitation, stress, anxiety and depression.
- It is also beneficial in hypertension, insomnia and in intestinal wounds.
- It cures the functional and structural ailments of liver and stomach.
- Its Bhasma is tonic to vital organs.
- Its Bhasma when taken in a dose of 125 mg gives wisdom, intelligence and stability to mind.<sup>3</sup>
- Shuddha Bhasma or Pishti possesses ruksha, sheeta guna and sheeta virya. It mitigates vitiated pitta dosha.<sup>4</sup>
- It is lithotriptic<sup>5</sup> and useful in renal and bladder stones.

**Adjuvant-** It is administered along with honey, Arjun twak kwath & rose water.

**Dose<sup>6</sup>-** Bhasma (250-500mg)

Pishti (250-1000mg)

## Ayurvedic and Unani formulations of Vyomasham (Sangeyashab)-

S. No.	Ayurvedic formulations <sup>7</sup>	Unani formulations <sup>8</sup>
1	Jawaharmohra vati	Khamira Abresham Hakeem Arshad wala
2	Brahmi vati	Mufarreh kabeer
3	Vyomasham bhasma	Mufarreh Shaahi
4	Vyomasham pishti	Kushta yashab
5	Hridvepnari churna	Muffareh dilkhusa
6	Raktpittari vati	Muffareh abresham

## 2. MATERIALS AND METHODS-

Vyomasham is a stone of green colour and its originality is always doubted. So, to ease the identification of Vyomasham samples, chemical composition of Vyomasham is studied by peak analysis of the diffracted Xrays through XRD. As Vyomasham is also a semiprecious gemstone, so the three samples of Vyomasham were tested on gemmological parameters as well.

### 2.1- Gemmological Identification-

Various parameters of gem stone identification were used to analyse the authenticity of all three samples of Vyomasham. The points under observation were cut, colour, mounted, measurement, weight, refractive index, optical characteristics, microscopic evaluation and specific gravity.

**Colour-** the colour of the gem is determined by selective absorption of some of the wavelengths of light. With regard to their source of colour, gems fall into two categories: idiochromatic and allochromatic. Idiochromatic gems derive their colour from their basic formula while allochromatic gems derive their colour from the impurities present in the stone. It is calculated with the help of spectroscope which splits light into its component colours after it passes through the material to be tested. Light entered the pavilion of gem stone at an angle of  $45^{\circ}$  while the spectroscope was placed at the opposite side at the same angle. The light bounced from the opposite side and the certain type of light absorbed by the stone is noted down.

### Refractive index and optic character evaluation-

The refractive index of gem stone is identified by refractometer. To evaluate the refractive index of Vyomasham, the stone sample was cleaned and a drop of contact liquid was put on the glass prism. Half light half dark surface of specimen was selected for analysis. Polaroid filter was placed over the eye piece and the reaction of the lightest spot was noticed.

### Microscopic evaluation-

The sample was placed and observed under 10x microscope including fully corrected triplet loupe and binocular stereo zoom microscope and the observations were recorded.

## Specific gravity evaluation-

The sample was measured with hydrostatic balance method. The specimen were weighed in air and then weighed when fully merged in water and the respective gravitational values were compared. The result thus obtained was calculated as specific gravity of Vyomasham samples.

### 2.2- X-ray Diffraction (XRD) <sup>9,10</sup>

X-ray powder diffraction method is an analytical technique primarily used for phase identification of a crystalline material and can provide information on unit cell dimensions. The analyzed material is finely ground, homogenized.

## 3. METHODOLOGY

The three-dimensional structure of crystalline materials, such as minerals, is defined by regular, repeating planes of atoms that form a crystal lattice. When a focused X-ray beam interacts with these planes of atoms, part of the beam is transmitted, part is absorbed by the sample, part is refracted and scattered, and part is diffracted. X-rays are diffracted by each mineral differently, depending on what atoms make up the crystal lattice and how these atoms are arranged. When an X-ray beam hits a sample and is diffracted, we can measure the distances between the planes of the atoms that constitute the sample by applying Bragg's Law, named after William Lawrence Bragg, who first proposed it in 1921. Bragg's Law is:  $n\lambda = 2d \sin\theta$ , where the integer  $n$  is the order of the diffracted beam,  $\lambda$  is the wavelength of the incident X-ray beam,  $d$  is the distance between adjacent planes of atoms (the  $d$ -spacings), and  $\theta$  is the angle of incidence of the X-ray beam.

## 4. RESULTS & OBSERVATIONS-

The results obtained through various gemmological parameters and XRD analysis are shown in table 3.1 and 3.2 respectively.

## 5. DISCUSSION-

XRD interpretation of three raw samples of Vyomasham showed that maximum peaks were of  $\text{SiO}_2$  (Silica) with hexagonal crystal structure and through various analytical parameters of gemstone it has been also confirmed that Vyomasham is Green Aventurine having chemical composition  $\text{SiO}_2$ . Green Aventurine is a type of Quartz, which is in turn a Silicate mineral. Silicate mineral form the largest family of minerals including more than 25% of all known minerals and 40% of all common minerals.

Aventurine is known to be a 'stone of luck'. It is known to promote feelings of well being and gives its wearer a positive outlook on life. Aventurine symbolizes tranquillity, patience and creativity. It is an ideal stone for treating heart & respiratory disorders<sup>11</sup>. It is also believed to help improve vision. Green Aventurine is used to loosen and release

negativity. Its calming effect on mind also makes it a valuable sleep-aid.

Vyomasham is also known as Sangeyashab in Unani system of medicine and classified under Muqawqr-Qalb drugs which mean the drugs which work as potent cardiogenic. In unani system of medicine it is used in the form of bhasma, pishti, tablet, semi solid dosage forms and syrup.<sup>12</sup> It is also used externally for wearing around body parts.

Earlier Vyomasham was considered as “Jade” as given in the various classical texts of Rasa shastra having chemical formula Sodium Aluminium Silicate. But analytical study of raw samples show that it is Green Aventurine having chemical formula “SiO<sub>2</sub>” which is also called as Indian Jade.

### 6. CONCLUSION-

In Ayurvedic texts Vyomasham has been described as Jade but the present study showed that all the samples purchased from the Indian market with the name Jade (having formula Sodium Aluminium Silicate) was Aventurine which is also famous with the name Indian Jade having formula SiO<sub>2</sub> or Silica. All the samples were duly tested and analysed and it was concluded that Vyomasham is also known as “Aventurine” or Indian Jade. Although more work is required to confirm the subject.

**Table 3.1: Identification parameters of samples of Vyomasham and their comparative analysis through Indian Institute of Gemmology:-**

S. No.	Test	Sample 1	Sample 2	Sample 3
1	Cut	Rough specimen	Rough specimen	Rough specimen
2	Colour	Green	Green	Green
3	Mounted	Loose stone	Loose stone	Loose stone
4	Measurement	11.98 X 7.72 X 4.5 mm	N.A X N.A X N.A mm	N.A X N.A X N.A mm
5	Weight	3.76 Ct/s	1756 gm	125 gm
6	R.I	1.55	N.A	N.A
7	Optic ch	DR	DR	DR
8	Microscope	Chrome mica platelets	Chrome mica platelets	Chrome mica platelets
9	Fluorescence	N.A	N.A	N.A
10	Specific gravity	2.66	2.66	2.65

**Table 3.2: XRD-Analysis of raw sample of Vyomasham**

Sample	2-theta	d-value		Miller planes (h k l)	Component	Phase
		Std.	Obs.			
Raw sample	20.76	4.26000	4.27405	100	SiO <sub>2</sub>	Hexagonal
	26.56	3.34300	3.35219	101	SiO <sub>2</sub>	Hexagonal
	36.48	2.45800	2.46058	110	SiO <sub>2</sub>	Hexagonal
	39.41	2.28200	2.28446	102	SiO <sub>2</sub>	Hexagonal
	42.38	2.12800	2.13093	200	SiO <sub>2</sub>	Hexagonal

45.73	1.98000	1.98239	201	SiO <sub>2</sub>	Hexagonal
50.07	1.81700	1.82004	112	SiO <sub>2</sub>	Hexagonal
54.78	1.67200	1.63209	202	SiO <sub>2</sub>	Hexagonal
59.89	1.54100	1.54316	211	SiO <sub>2</sub>	Hexagonal
68.14	1.37500	1.37487	203	SiO <sub>2</sub>	Hexagonal
79.81	1.19970	1.20068	213	SiO <sub>2</sub>	Hexagonal
81.38	1.18380	1.18141	114	SiO <sub>2</sub>	Hexagonal
40.30	2.23700	2.23819	111	SiO <sub>2</sub>	Hexagonal
90.90	1.08160	1.08833	312	SiO <sub>2</sub>	Hexagonal

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