


**Research Article**
**STANDARD OPERATING PROCEDURE OF JAHAR MOHRA PISHTI: A POTENT CARDIO TONIC**
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**ABSTRACT**

In the era of science and sagacity every sighting needs proofs and confirmations of its authenticity and when it comes to a medicinal preparation, the qualms are a step higher. Thus establishing pharmacopeial standards for a potent cardiotoxic like *Jahar Mohra Pishti* is the need of time. Till date no work has been performed on standard operating procedure or standardization of *Jahar Mohra*. So, various available data was collected for complete documentation in terms of chemical composition, crystal structure, physicochemical analysis, therapeutic activity and method of proper storage so as to draw a standard operating procedure for the formulation.

*Jahar Mohra* is named as *Naga Pashana* in most of the classical text of *Ayurveda*. Chemical formula for *Jahar Mohra* was evaluated through results of XRD and was Hydrous Magnesium Silicate i.e.  $Mg_{3-x}Si_2O_5(OH)_{4-2x}$  which is a basic formula for Serpentine group of minerals. Three samples of *Jahar Mohra Pishti* were prepared as per *Siddha Yoga Sangraha* to set the Standard Operating Procedure. Raw material was purified with lukewarm demineralised water. The *Pishti* was prepared by impregnating and triturating the powdered samples with *Gulab Arka* (Rose Water) for 14 times. Observations were recorded during each step and a conclusion was drawn.

**KEYWORDS:** *Jahar Mohra*, Serpentine, *Nagashma*, *Nagapashana*, *Pishti*, Standard Operating Procedure (SOP).

**INTRODUCTION**

In present day scenario of Ayurvedic pharmaceuticals getting a standard medicine is very difficult due to predominance of commercial attitude. Not only the gluttony of gaining more profit but also lack of proper guidelines regarding the formulation procedure and purity of an Ayurvedic medicine is a big lacuna. Thus every effective and potent medicine of *Ayurveda* needs to be standardized. Keeping this in mind, the author tried to propose some standard operating procedure for a very potent Ayurvedic formulation *Jahar Mohra Pishti*. Author has chosen *Jahar Mohra*, because it is very commonly used in practice, but now a day facing lack of credibility in terms of final product. *Jahar Mohra* is also famous with names like *Nagapashana*, *Nagashma* <sup>[1]</sup>, Serpentine, Ophite etc. These names suggest that the stone acts as antitoxin to the venom of snakes and scorpions. It is a soft bright stone which radiates the shades of green, yellow and white colour. It is usually 2- 4 inches long flat stone with blackish stripes<sup>[2]</sup>. It gives petrichor odour when dipped in water. It is also believed that smooth and light weight stones having grape like greenish tinge, are considered best in quality. Serpentine, a hydrous silicate of Magnesium  $[Mg_6(Si_4O_{10})X(OH)_8]$ , is also known as Green Marble in avocation. *Jahar Mohra* results from the alteration, either during metamorphism or by late-stage hydrothermal action at temperatures below 400°C, of rocks rich in magnesium containing olivine, pyroxene or amphibole<sup>[3]</sup>. Serpentine occurs as large rock masses generally referred to as Serpentinites. Their olive green colour and smooth or scaly appearance is the basis of the name from the Latin '*Serpentinus*'<sup>[4]</sup>, meaning "serpent rock," according to

Best (2003). Many types of Serpentine have been used for jewellery and hard stone, sometimes under the name false jade or Tetons jade.<sup>[5]</sup>

Although it was first mentioned in Ayurvedic texts in 20<sup>th</sup> century<sup>[6]</sup> but its existence as remedy dates back to 1<sup>st</sup>-2<sup>nd</sup> century AD in Unani literature where 'Gallen'<sup>[7]</sup>, the most famous physician after 'Hippocrates' has described it as an antidote against scorpion bite and beneficial in haemorrhoids. In later Unani texts *Jahar Mohra* got established as an emergency medicine as it was found to be effective in management of epidemics like plague, cholera etc.<sup>[8],[9],[10]</sup>

**MATERIAL AND METHODS**

The method of formulation was obtained from "*Siddha Yoga Sangraha*" written by Vaidya Yadav Ji Trikam Ji Acharya in 20<sup>th</sup> century<sup>[6]</sup>. In the reference text, there was no depiction of how much quantity of rose water should be taken and number of *Bhavanas* (impregnations) to be given. So as per the definition of *Bhavana* (impregnation)<sup>[11]</sup>, quantity of liquid media that made the sample turn into slurry was considered as *Bhavana Drava Parimana*. In the 240 g sample of *Jahar Mohra* 100ml rose water was sufficient to make the slurry easily movable. It is also advised that minimum 3 and maximum 7 impregnations should be given when the number of impregnations is not mentioned (as was the case). The procedure was started with the same assumption, considering 7 impregnations to be given in each sample. But the '*Varitara*'<sup>[12]</sup> property of samples was achieved completely after 14 impregnations during pilot study. So,

14 impregnations were decided for all samples. The whole operating procedure was divided in following steps.

- Step 1-** Procurement of raw material
- Step 2-** Identification of raw material
- Step 3-** Rose water distillation
- Step 4-** Purification of sample 1, 2 & 3
- Step 5-** Powdering of sample 1, 2 & 3
- Step 6-** Preparation of *Jahar Mohra Pishti*
- Step 7-** Organoleptic analysis of prepared samples

**Procurement of Raw Material**

The three samples of *Jahar Mohra* were purchased from three different places to evaluate the variation possible while collecting raw material for *Jahar Mohra Pishti* preparation. Two of these samples were collected from two different retailers from Jaipur, Rajasthan. While one was collected from Haridwar, Uttarakhand. As *Jahar Mohra* is considered as semi precious gem stone, one sample was purchased from a gem stone dealer of Jaipur, so as to have a complete view over the connotation and maleficent properties of different varieties of Serpentine stone available in the market. Roses used in the preparation of rose water (*Gulab Arka*) were purchased from the local market of Kankhal, Haridwar.

**Identification and Analysis**

All the raw samples were duly identified by Indian Institute of Gemmology, New Delhi through various analytical parameters of gem stone identification and were found to be genuine samples of *Jahar Mohra*/ Serpentine which were further verified through XRD<sup>[13]</sup> and SEM-

EDX<sup>[14]</sup> analytical techniques. The results showed that all the three samples belonged to serpentine group of minerals. XRD study of raw sample showed that sample 1 and sample 3 of *Jahar Mohra* were of Antigorite variety while Sample 2 was of Chrysotile variety of Serpentine with chemical formula  $Mg_{3-x}Si_2O_5(OH)_{4-2x}$ . SEM- EDX analysis showed that sample 1 was composed of Magnesium, Silicate, Iron, Carbon and Oxygen. Aluminium was additionally present in sample 2 while in sample 3 Calcium was also present along with all above components.

**Rose Water Distillation<sup>[15]</sup>**

**Procedure:** After reviewing the related literature for *Jahar Mohra Pishti* preparation, it was found that rose water was used as the impregnating media by many Acharyas. So, the same was used in the present study. To prepare the rose water, a basic distillation apparatus Aka *Arka Yantra* was used. Fresh rose flowers were collected and cleaned thoroughly in a stainless steel vessel. The dark pink petals were selected and soaked in water overnight. Next day these petals were poured into the distillation apparatus (*Arka Yantra*). The apparatus was then placed on gas stove on mild flame. Temperature of upper chamber of distillation apparatus was maintained by continuous in and outflow of chilled water in order to condense the vapours of the boiling mixture. A sterile glass bottle was used to collect the distillate. The mild heat was continuously given to the apparatus till whole of the distillate got collected in the glass bottle.

**Table 1: Essential equipment and their specification for rose water distillation-**

Sr. No.	Equipment used	Size	
		Upper Container	Lower Container
1	<i>Arka Yantra</i> / Distillation Apparatus	Length 14 inches Central Circumference- 32 inches Circumference of neck- 15 inches Diameter of mouth- 4.6 inches Capacity- 5 L	Height-11 inches Central Diameter- 14 inches Circumference of neck- 16 inches Diameter of mouth- 5 inches Capacity- 20 L
2	Gas Burner with L.P.G. Cylinder	Weight Gross- 29.6 Kg Net - 14.2 Kg	
3	Glass Bottles	Capacity- 1L Perimeter of neck - 4 inches Perimeter of base- 11 inches Height- 10.5 inches Requirement- 4	

**Observations**

- The first drop of distillate appeared after nearly 45 minutes of heating.
- The process of distillation was quite slow initially but paced up later. The distillate took 4 hours to ooze out of the nozzle completely.
- Rate of drop distillation was approximately 20 drops/minute during first half hour which changed to 100 drops/minute after 2 hours.
- The fragrance and taste of the *Arka* or the distillate was same as that of the drug (rose) used as the ingredient and was crystal clear.
- The total duration in the procedure of distillation was noted to be approximately 6 hours.

**Table 2: Details of rose water distillation**

Date of commencement	Date of completion	Amount of Rose Petals (in grams)	Water Quantity (L)	Temperature °C		Total yield (in L)	% Loss
				Room temp.	Peak temp.		
06/06/2015	06/06/2015	1000	10	28- 30 <sup>o</sup>	100 <sup>o</sup>	3.320	66.6

**Purification of Jahar Mohra**

**Procedure:** *Jahar Mohra* stone pieces were taken in a stainless steel vessel & water was added to them. After 5 minutes of soaking, stone pieces were taken out one by one and were brushed with a soft bristle brush to remove dust and other external impurities. This procedure was continued for 8 hours on each sample. For cleaning of samples 1 litre water was used during each washing. This

operation was repeatedly done until the sample was visibly clean. The criteria of changing the water was, increased turbidity initially and temperature fall later when water remained clean even after brushing the stones. After the completion of this process the samples were transferred to a stainless steel tray and were dried in shade. The same procedure was opted for the Purification of all the three samples.

**Table 3: Essential equipment and their specification for purification of *Jahar Mohra***

Sr. No.	Equipment used	Size
1	Stainless steel container	Capacity-2 L
2	Brush	Length- 10 inches Breadth- 1.5 inches (bristle portion)
3	Sterile trays	Length- 14 inches Breadth- 10 inches
4	Thermometer	Reading upto- 100°C

**Table 4: Details of purification of *Jahar Mohra* samples with their percentage loss**

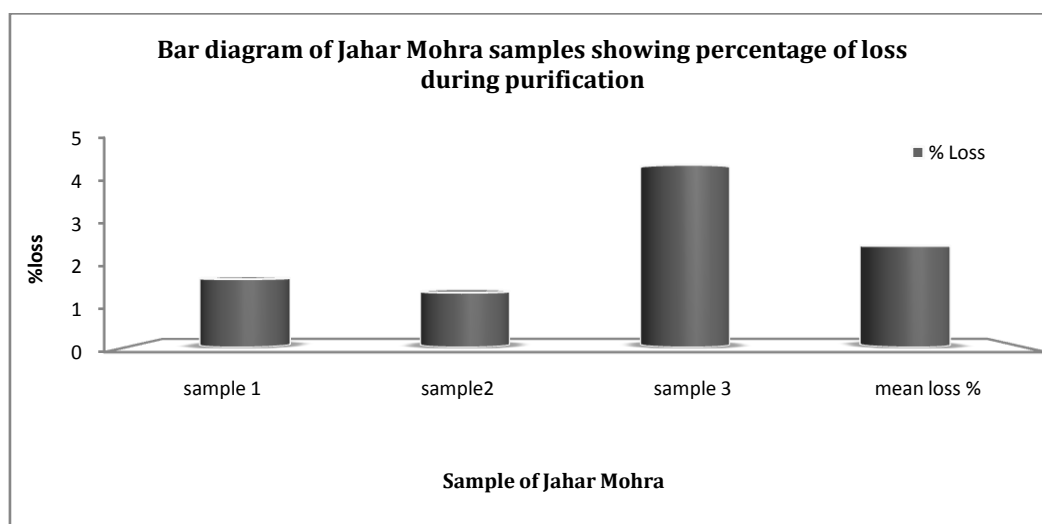
Sample no.	Date of Commencement	Date of Completion	Amount of <i>Jahar Mohra</i> (in grams)	Number of times water replaced	Temperature (°C)		Total yield in grams	% loss
					Room temp.	Peak temp.		
1	01/08/2015	01/08/2015	300g	12	28-30	30-35	295	1.67
2	02/08/2015	02/08/2015	297g	11	28-30	30-35	293	1.34
3	03/08/2015	03/08/2015	314g	15	28-30	30-35	300	4.45

**Observations**

The procedure was quite simple but remarkable observations were reported during the process e.g.

- Sample 1 was smooth in texture and produced very pleasant smell of wet earth i.e. petrichor.
- Sample 2 was also extremely smooth in touch and was having a glistening surface but during the purification procedure, white adhesions present over it started dissolving.
- In sample 3 the stone was found to be highly fragile and kept on breaking into smithereens, so due care was taken to prevent the loss.
- The pH of water was found to be 7 before heating.
- To maintain the temperature of the water used for washing was changed after every 40 minutes during the entire process of cleaning.

**Diagram: 1**



**Powdering of Purified Samples of *Jahar Mohra***

**Procedure-** The purified *Jahar Mohra* stones were taken into an iron mortar and pounded till it became a coarse powder. The powder thus prepared was sifted through the sieve of mesh size 80 µm and was collected on a butter paper.

**Table 5: Essential equipment and their specification for powdering of *Jahar Mohra***

S. No.	Equipments	Parameters	
1	Iron Mortar ( <i>Imam Dasta</i> )	Mortar	Pestle
		Depth- 5 inches Diameter- 5.4 inches Circumference-17 inches	Length- 12 inches Circumference- 3 inches
2	Sieve	Mesh size-80µm	
3	Paper	Length- 36 inches Breadth- 24 inches	

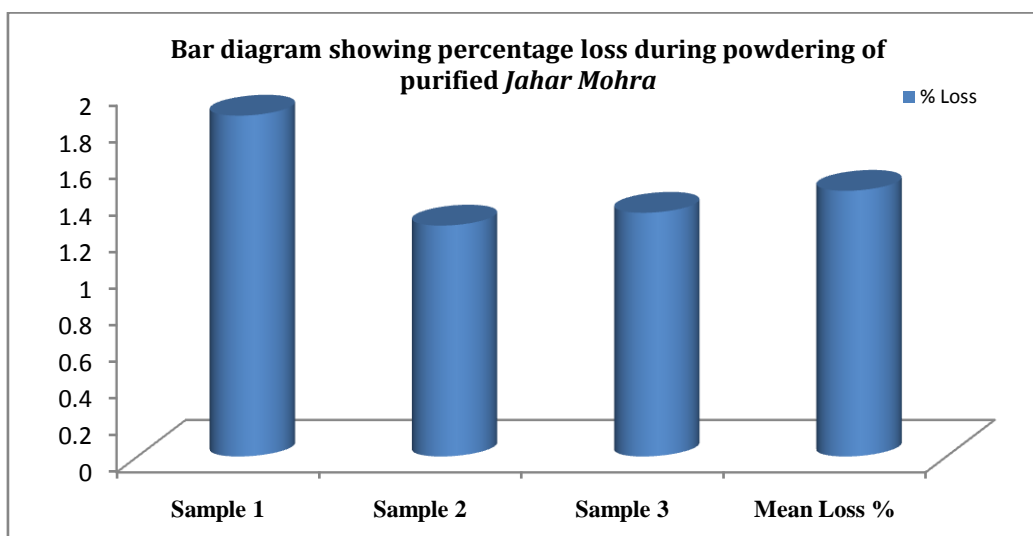
**Table 6: Details of powdering of *Jahar Mohra***

Sample No.	Date of Commencement	Date of Completion	Amount of <i>Jahar Mohra</i> in grams	Room Temperature °C	Total yield in grams	% Loss
1	04/08/2015	04/08/2015	295	28-30	240	1.86
2	27/08/2015	27/08/2015	293	28-30	256	1.26
3	15/08/2015	15/08/2015	300	28-30	260	1.33

**Observations**

- Sample 1 and 3 produced sparks during pounding.
- The total duration during powdering the three samples of *Jahar Mohra* was 2 hrs, 2½ hrs and 2 hrs for sample 1, 2 & 3 respectively.

**Diagram: 2**



**Preparation of *Jahar Mohra Pishti***

**Procedure:** The coarse powder obtained from above practical was then shifted into a mortar and pestle and impregnated with rose water in sufficient quantity (100 ml) that turned the powder into a thin paste. Trituration was performed until the paste got converted into dry powder. The same procedure was repeated for 14 times with every sample. Then each dried final product was preserved carefully in airtight glass container.

**Table 7: Essential equipment and their specification for preparation of *Jahar Mohra Pishti***

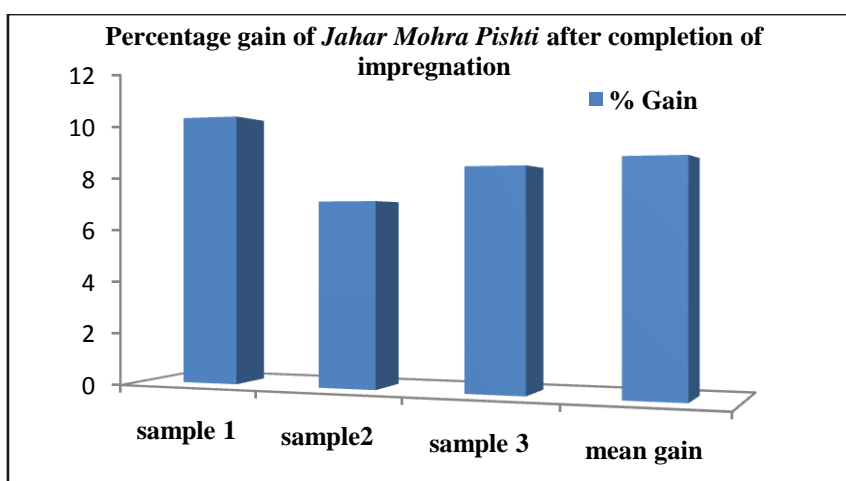
Sr. No.	Equipment used	Parameters	
1	Stone Mortar and Pestle	Mortar	Pestle
		Outer length-15" Inner length -11" Outer breadth-8.5" Inner breadth-6.7" Depth-4"	Length- 7.6" Diameter of base- 2" Circumference of base-7.2"
2	Measuring Flask/ Syringe	Capacity- 60ml	
3	Sieve	Mesh size- 125 µm	
4	Air tight bags	Minimum 21 in number	
5	Air tight glass jars	Capacity- 500g	

**Table 8: Details of *Jahar Mohra Pishti* formation**

Sample no.	Date of commencement	Date of completion	Amount of <i>Jahar Mohra</i> (in grams)	Quantity of rose water instilled per <i>Bhavana</i> (in ml)	Total yield	% gain	Total duration (in hrs)	Mean % gain
1	05/08/2015	25/08/2015	240g	100	265g	10.41	105 hr	.60
2	28/08/2015	12/09/2015	240g	100	257g	7.08	120 hr	
3	16/09/2015	03/10/2015	240g	100	260g	8.33	90 hr	

**Observations**

- The total duration of trituration in sample 1, 2 & 3 was 105, 120 and 90 hours.
- Sample no.1 showed anomalous behaviour, just after adding desired amount of rose water, it absorbed whole rose water completely and after some time of trituration it released water, so the paste became very loose in consistency.
- Sample no.2 was also hygroscopic and behaved almost similarly to the first sample except that it was harder than the sample 1 and required more efforts.
- Sample no.3 was found to be relatively dry in nature and didn't release any watery discharge during trituration process. It also showed hygroscopic features but was comparatively easy to manage.



**Organoleptic analysis**

**Procedure<sup>[16]</sup>**

**For Appearance:** 1gm of prepared *Jahar Mohra Pishti* was taken into watch glass and placed to watch through naked eye to observe the colour into white light.

**For Odour:** 2g sample was smelled for odour.

**For Taste:** Pinch of subject formulation was taken and its taste was estimated on taste buds of tongue.

**For Touch:** 2g sample was taken and rubbed against thumb, index finger and middle finger gently.

**Table 9: Organoleptic Analysis**

Tests	Colour	Odour	Taste	Touch	Appearance
Sample 1	Greyish	Specific	Specific	Smooth	Fine powder
Sample 2	Greyish	Specific	Specific	Smooth	Fine powder
Sample 3	Greyish	Specific	Specific	Smooth	Fine powder

**RESULTS AND DISCUSSION**

During preparation of rose water, it was observed that maximum 33% yield can be obtained through distillation process as proved by previous studies and current study over the subject. During impregnation, it was observed that the total yield was inversely proportional to the solidity of sample chosen for the study and time consumed in the process. Demineralised water was used for the purification purpose as no specification was given regarding the purification method of *Jahar Mohra* in the reference book and the study was oriented towards a standard operating procedure which could extract maximum potential of the drug along with an approach towards the cost effectiveness of drug.

From Unani literature, it was speculated that on high temperature treatment the *Jahar Mohra* exudates, therefore to prevent it, the temperature of water used in purification procedure was maintained at 30<sup>0</sup>-35<sup>0</sup> C and the purified sample was dried in shade.

*Pishti* was prepared by 14 impregnations of rose water in each sample. During each triturations the samples showed various behaviour which can be attributed to the secreting property of stone.

The prepared samples were stored in air tight glass jars as the finished product was hygroscopic in nature. The average time taken during whole procedure of *Pishti* formulation was 115 hours. From the above procedure it was quite evident that like any other *Pishti*

formulation *Jahar Mohra Pishti* also gains weight after the trituration process. This weight gain is more than the quantity of *Jahar Mohra* powder lost during the process; hence the finished product shows gain percents.

#### CONCLUSION

From the present study it can be concluded that basic criteria for procurement of raw material are SEM EDX, X-ray Diffraction analysis. XRD study of raw samples showed that sample 1 and sample 3 of *Jahar Mohra* were mainly of Antigorite variety while Sample 2 was of Chrysotile variety of Serpentine. *Jahar Mohra* was purified by lukewarm water during purification. The mean percentage loss during the purification process was 2.48%. Sparks were seen while hammering and average percentage loss of 1.45% was observed during this process. The distilled rose water used for impregnation procedure was prepared from *Rosa damascena* species of rose. The pH of distilled rose water was 6.4 having 0.3% of volatile oil. The pharmaceuticals procedure, *Pishti Kalpana* was adopted to attain the nano sized powder of *Jahar Mohra*.

#### REFERENCES

1. Dr. Chandra Bhushan Jha, Ayurvediya Rasa Shastra, Chaukhamba Surbharti Prakashan, 2011, 448.
2. Dr. Siddhi Nandan Mishra, Ayurvediya Rasa Shastra, Chaukhamba Orientalia, 2011, 559.
3. "The Serpentine Multisystem Revisited", Evans, Bernard W., International Geology review vol. 46, p.-479-506.
4. Serpentine Encyclopedia Britannica, 1911
5. Hunter Sir William Wilson and Burn, Sir Richard, The Imperial Gazetteer of India vol. 3, Oxford, England, Henry Frowde Publishers, 1907, 242.
6. Vaidya Yadav Ji Trikam Ji Acharya, Siddha Yoga Sangraha, Baidyanath Ayurveda Bhavan Ltd, 2007, 2-3.
7. Ibnibaitar, Al Jame Limufradaat Al Adwiya Wal Aghzia, urdu translation published by CCRUM, Ministry of Ayush, New Delhi, 1197-1248.
8. Dawood Al Zareer Al Antaki, Tazkerah Ull Albab Wal Jame'lil Ajab Al Ajaab vol. 1, Maktaba Mul Tazima, Egypt, 14<sup>th</sup> C, 52-53.
9. Maulvi Mohammad Noor Kareem, Makhzan Al Adwiya Va Tas Kera Ul In Neha vol. 1, Matba Munshi Nawal Kishore, Lucknow, 1927, 151-152.
10. Hakeem Sayyad Mohammad Hussain Alvi Shirazi, Makh Zamul Adwiya (Persian), Matba Naami Munshi Nawal Kishore, 1913, 129-130.
11. Pranacharya Sadanand Sharma, Rasa Tarangini, Motilal Banarsidas Publications, 2012, 21.
12. Pranacharya Sadanand Sharma, Rasa Tarangini, Motilal Banarsidas Publications, 2012, 22.
13. Barbara L Durtow, Louisiana State University, Christine M Clark, Eastern, Michigan university
14. Joseph Goldstein, Scanning Electron Microscopy and X-ray Microanalysis, 2003 (retrieved on may,26,2012).
15. Vaidya Ravana, Arka Prakash, commentary by Indradev Tripathi,2/2.
16. AOAC. Official Methods of Analysis, 15th ed. Association of Official Analytical Chemists, Washington D.C., 1990.

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