

## THE ROLE OF YANTRAS IN RASASHASTRA: A STUDY OF ANCIENT INDIAN LABORATORY EQUIPMENT

Tanu Dubey<sup>\*1</sup>, Dr. Amalendu V. M.<sup>2</sup>

<sup>\*1</sup>UG Scholar, Dept. of Rasashastra and Bhaishajya Kalpana, ITM Ayurvedic Medical College and Hospital, Maharajganj, Uttar Pradesh.

<sup>2</sup>Assistant Professor, Dept. of Rasashastra and Bhaishajya Kalpana, ITM Ayurvedic Medical College and Hospital, Maharajganj, Uttar Pradesh.

Article Received on 25 Nov. 2025,  
Article Revised on 05 Dec. 2025,  
Article Published on 16 Dec. 2025,  
<https://doi.org/10.5281/zenodo.17947898>

### \*Corresponding Author

Tanu Dubey

UG Scholar, Dept. of Rasashastra and Bhaishajya Kalpana, ITM Ayurvedic Medical College and Hospital, Maharajganj, Uttar Pradesh.



**How to cite this Article:** Tanu Dubey<sup>\*</sup> Dr. Amalendu. V. M. (2025) The Role of Yantras In Rasashastra: A Study of Ancient Indian Laboratory Equipment. "World Journal of Pharmaceutical Research, 14(24), 230–235. This work is licensed under Creative Commons Attribution 4.0 International license.

### ABSTRACT

*Rasashastra* is a key subject in *Ayurveda* which deals with metal and minerals, along with its pharmaceutical preparations. These metals and minerals are undergoing different procedures like *Shodhana*, *Marana*, *Jarana* etc for which there is need of instruments to transform them into a form to make it therapeutically effective as well as less adverse effects. For various processing of *Rasa Uprasadi Dravyas*, pharmaceutical preparations specific equipment are needed. The instruments by which we can ease the procedure of preparation in *Rasashastra* is known as *Yantra*. For understanding and exploring the actual knowledge, meaning of *Rasashastra*, a better understanding of *Yantra* are needed. Classical texts like *Rasatarangini*, *Rasaratna Samuchaya*, *Rasendra Choodamani* describe many *Yantras* like *Dola Yantra*, *Khalwa Yantra*, *Patna Yantra*, *Damaru Yantra* etc.

**KEYWORDS:** *Rasashastra*, *Yantra*, Equipment, Instrument, *Dola Yantra*.

### INTRODUCTION

Mainly the usage and preparation of *Ayurvedic* medicine comes under *Rasashastra* and *Bhaishajya Kalpana*. It deals with different types of drugs like metal, mineral and some are poisonous. In classical texts there are various methods and procedures explained to convert

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## Etymology of Yantra

### Definition of *Yantra*

**(R.R.S.9/2)**

[illegible]

**(R.T.4/1)**

**Table 1: Number of Yantras mentioned in various texts.**<sup>[4]</sup>

S.N	Classical Reference	Total Yantra
1	Rasa Jal Nidhi	37
2	Rasendra Choodamani (12th cent A.D)	30
3	Rasa Ratna Samuchaya (13th cent A.D)	32
4	Rasendra Sar Sangrah (16th cent A.D)	9
5	Rasa Tarangini	20

Table 2: Nomenclature of Yantra.<sup>[5]</sup>

Category	Yantra
Shape	<i>Dola Yantra, Bhudhara Yantra, Mrudanga Yantra, Kachchhapa Yantra, Damaru Yantra, Nadika Yantra, Darvika Yantra, Palika Yantra, Patala Yantra, Khalva Yantra, Ulukhala Yantra</i>
Function	<i>Patana (urdhva/adhah/tiryak), Swedani Yantra, Garana Yantra, Arka Yantra</i>
Material Used	<i>Baluka Yantra, Lavana Yantra, Bhasma Yantra</i>

Table 3: Procedures and Yantra used.<sup>[6]</sup>

S.N	Yantra Used	Name of the Procedures
1	<i>Dola Yantra</i>	<i>Shodhana, Swedana process of Rasaushadha</i>
2	<i>Putra Yantra</i>	Preparation of <i>Bhasma</i>
3	<i>Ghata Yantra</i>	For filling of any liquid material
4	<i>Swedani Yantra</i>	For purification and fomentation of <i>Aushadha</i>
5	<i>Swedana or Ushna Yantra</i>	<i>Swedana and Shodhana of Parada and other Rasaushadha</i>
6	<i>Urdhva Patana Yantra</i>	Upward sublimation of <i>Parada</i> from <i>Hingula</i> and for <i>Samskara</i> of <i>Parada</i>
7	<i>Adhah Patana Yantra</i>	Downward sublimation of <i>Parada</i>
8	<i>Tiryak Patana Yantra</i>	Transverse sublimation of <i>Parada</i>
9	<i>Vidhyadhara Yantra</i>	Sublimation of <i>Parada</i>
10	<i>Damaru Yantra</i>	Upper sublimation of <i>Parada</i> , arsenic etc drugs
11	<i>Sthali Yantra</i>	<i>Paka</i> of <i>Tamra</i> etc drugs
12	<i>Palika Yantra</i>	<i>Gandhaka Jarana, Rasa Parpati</i> preparation
13	<i>Valuka Yantra</i>	<i>Gandhaka Jarana</i> (sand), <i>Sindoor Kalpana</i>
14	<i>Lavana Yantra</i>	<i>Mringanka Rasa</i>
15	<i>Bhudhara Yantra</i>	Preparation of <i>Rasa Bhasma</i>
16	<i>Patala Yantra</i>	Oil extraction
17	<i>Khalva Yantra</i>	<i>Peshanadi Karma</i> (Pounding)
18	<i>Ardhachandrakara Khalva Yantra</i>	Pounding and trituration
19	<i>Tapta Khalva Yantra</i>	<i>Parada Shodhana and Samskara</i>
20	<i>Ulukhala Yantra</i>	For making <i>Churna</i>
21	<i>Kachchhapa Yantra</i>	<i>Gandhaka Jarana</i>
22	<i>Tula Yantra</i>	<i>Gandhaka Jarana</i>

Table 4: Yantra used in different processes of Parada.<sup>[7]</sup>

Process	Yantra Used
<i>Swedana Karma</i>	<i>Dola Yantra, Kanduka Yantra, Swedana Yantra, Valabhi Yantra</i>

<i>Mardana Yantra</i>	<i>Various types of Khalva Yantra</i>
<i>Patana Karma</i>	<i>Urdhva Patana, Adhah Patana, Tiryak Patana, Damaru Yantra, Vidyadhara Yantra</i>
<i>Jarana Karma</i>	<i>Sthali Yantra, Kachchhapa Yantra, Hamsapaka Yantra, Somanala Yantra, Tula Yantra, Valuka Yantra</i>
<i>Taila Patana Karma</i>	<i>Patala Yantra, Akasha Yantra</i>

**Table 5: List of Procedures without Yantra names but matching descriptions.<sup>[8]</sup>**

S.N	Procedure Name	Matching Yantras
1	<i>Vanga Shodhana</i>	<i>Pithar Yantra</i>
2	<i>Gandhak Shodhana</i>	<i>Swedana Yantra</i>
3	<i>Gandhakdrav Nirmana</i> (Iron vessel Yantra)	
4	<i>Shankhadrav Nirmana</i> (Glass vessel Yantra)	
5	<i>Sorakdrav Nirmana</i> (Glass vessel Yantra)	
6	<i>Lavandrav Nirmana</i> (Glass vessel Yantra)	
7	<i>Navasadar Vashpadrav Nirmana</i> (Glass vessel Yantra)	<i>Dravan Yantra / Sravan / Ark Yantra</i>
8	<i>Tamra Marana</i>	
		<i>Urdhva Patana Yantra</i>

## DISCUSSION

The concept of *Yantra* in *Rasashastra* represents a unique blend of ancient science and they are closer to modern instruments. In *Rasashastra* there are lots of *Yantra* for different procedures. Through classical texts it is demonstrated that our *Acharyas* had an advanced knowledge of temperature, material transformation, pressure equations, condensation, sublimation, and distillation processes. *Acharyas* explained each *Yantra* with detailed descriptions like size, measurements etc. Nomenclature based on shape, material used, function is also mentioned. *Damaru Yantra* is used for artificial preparation of *Hartala* and *Manah-shila*. Some other special *Yantras* are also mentioned in other classical texts. *Yantras* are used to make *Ayurveda* pharmaceuticals. The use of various *Yantras* like *Dola Yantra*, *Swedani Yantra*, and *Baluka Yantra* shows the importance of gradual heating and uniform heat distribution.

In recent times, classical *Yantra* have been replaced with modern instruments. For instance, for *Churna* making, *Khalva Yantra* was used, but now Pulverizers, Edge Runner Mills, and Mortar-Pestle type compression machines are being used, which make the substance into coarse or fine powders, easily breaking hard substances. This significantly reduces preparation time and minimizes manual labor. Previously, *Vati* (Tablets) were prepared by

manual rolling, but now Tablet Making Machines and Tablet Coating Machines are used for manufacturing.

The concept of *Putra Yantra* and *Koshti* in *Rasashastra* and modern furnaces are kind of same. They both are source of heating for specific processes, despite in different manner. Traditional *Putra* systems used controlled heating with natural fuels, *Putra* size, the dimensions of the *Putra*, insulation layers and also *Acharya* knowledge of the required heat level. In contrast, modern furnaces utilize electricity or gas heating. Feature precise temperature regulation, sensors and automated functions. They warm up rapidly cool down swiftly and can sustain highly specific conditions like reducing, oxidizing or neutral, whenever required. While *Putra* systems relied on empirical knowledge and manual control. Both systems can operate in various atmospheres, including reducing or oxidizing environments.

The similarities between the two lie in their use of insulation for temperature regulation and ability to create specific atmospheres. Overall, modern furnaces are simply a more refined continuation of *Rasashastra Yantra*. Whereas traditional *Putra* systems paved the way for these advancements in controlled heating techniques, highlighting the ingenuity of ancient *Rasashastra* practitioners.

## CONCLUSION

*Rasashastra* is a subject in *Ayurveda* which is more inclined towards practical application. For this, *Yantras* are important. *Yantras* are used to make metals and minerals into forms which are therapeutically effective and have less side effects. Without *Yantras*, procedures like *Shodhana*, *Marana*, *Jarana* are not possible. References collected from *Rasa Tarangini* regarding *Yantra* show that all of them are perfect scientific arrangements. Even nowadays, in the industrialization era, the concept of classical *Yantras* is close to modern equipment or even more significant. That's why these classical *Yantras* should be incorporated in the present pharmaceutical industry to make drugs more therapeutically useful as well as reduce side effects. Further research and standardization can preserve these *Yantras* and also enhance their application in *Ayurveda*.

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