

Review Article

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INNOVATIONS IN *RASASHASTRA* AND *SHALAKYA TANTRA* AS UNIQUE APPROACHES TO HEALTH MANAGEMENT

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Abstract

Ayurveda science as holistic system focuses on overall well-being of human society in terms of physical, mental and spiritual aspects. Among the various branches of Ayurveda, *Rasashastra* and *Shalakyas Tantra* are two important streams of Ayurveda. The former one involving uses of metals and minerals, while later one dealing with the treatment of diseases of head, neck, ears, nose and throat. *Rasashastra* emphasizes alchemical processes for the preparation of medicinal compounds and *Shalakyas Tantra* focuses on the ENT and ophthalmological disorders. There are many *Rasa aushadhis* which utilizes in ENT disorders and these two branches complement each other significantly. This article explores the latest **innovations in *Rasashastra* and *Shalakyas Tantra***, examining how these two fields can be integrated to offer a comprehensive, dual approach to health management in the modern world.

Key-Words: *Ayurveda*, *Rasashastra*, *Parada*, *Shalakyas Tantra*

Introduction

The disciplines of *Rasashastra* and *Shalakya Tantra* play vital role in the management of many health ailments. By employing a dual approach to health management that leverages the benefits of both *Rasashastra* and *Shalakya*, practitioners can provide more effective treatments in the current healthcare environment. In *Shalakya Tantra* several *Rasa aushadhis* are used for their therapeutic benefits, which are as follows [1]:

- ✓ **Parada:** It is included in various formulations to support the function of nervous system.
- ✓ **Gandhaka:** It is effective in treating sinusitis due to its anti-inflammatory effect.
- ✓ **Tamra:** Helps in the treatment of ear and throat infections due to its antimicrobial characteristic.
- ✓ **Bhasmas:** *Sutradha* and *Swarna Bhasma* are utilized for their healing properties against and boost immune response against throat infections.
- ✓ **Shankha Bhasma:** This preparation addresses throat and oral cavity related conditions.
- ✓ **Rasanjana and Neeltuthak:** Can be used for *Anjan* in *Aklinnvartm*.
- ✓ **Kasis and Mainshil:** *Avchurnan* in *Bisvartm*

These two branches blended many innovations with their traditional Ayurvedic foundations. The newer innovation with integration to modern science not only enhance global acceptance of Ayurveda but also improves quality of ancient formulations and therapies.

TRADITION OF INNOVATION WITH CONTEXT OF RASASHASTRA:

Rasashastra focused on **rejuvenation and prolonging life by using formulations which prepared by transforming metals**. This branch has evolved from the ancient alchemical practices of India. This branch uses medicines prepared from various metals and minerals, including *Svarna*, *Rajata*, *Parada*, *Tamra* and *Lohas*. The fundamental principles

of **Shodhana**, **Marana** and **Bhasmikaarana** are integral to *Rasashastra*, which ensures the safety and efficacy of these medicines [2-5].

Recent advancements in *Rasashastra* have bridged the gap between this ancient science and modern pharmacology, resulting in innovations that boost the therapeutic efficacy of these traditional formulations [5-7]:

1. **Nanotechnology and Bioavailability:** *Bhasmas* created in *Rasashastra* now being studied using modern nanotechnology. *Bhasmas* frequently contain nano-particles, which greatly enhance their bioavailability and effectiveness. Their nano-sized particles enable deeper cellular absorption. The modern science of nanotechnology integrated with ancient science and exploring deeper concepts of nano sized *Bhasmas* formulations.
2. **Clinical Testing:** many clinical researches have validated the efficacy of *Rasa Aushadhis*; *Kansya Bhasma* and *Mandoor Bhasma* have been proven to improve hemoglobin levels and treat anemia. Furthermore, these compounds have gained scientific support for their use in managing autoimmune disorders, diabetes, and arthritis. The efficacy and safety of these herbo-mineral and metallic formulations have been confirmed through the various approaches of modern science including clinical trials.
3. **Standardization of *Bhasma*:** A key challenge in *Rasashastra* has been achieving standardization in the production of *Bhasmas*. Recent advancements have introduced protocols for chemical analysis, ensuring consistency and safety in their preparation. Techniques such as X-ray diffraction and scanning electron microscopy are now used to evaluate the quality of *Bhasma* formulations. Recently many studies have been published utilizing advance instruments for the quality standardization of ***Bhasma*** formulations. A modern approach of quality evaluation of herbo-metallic formulation is depicted in **Figure 1**.

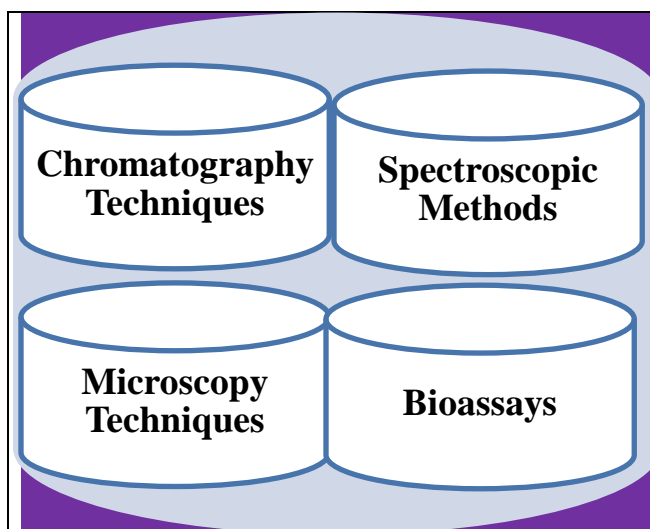


Figure 1: Modern approaches of quality evolution of *Rasa Aushadhis*

4. **In process quality control:** Modern testing methods have been integrated into each step of the preparation of metallic formulations to ensure safety, quality, and therapeutic effectiveness. In the initial stages, raw materials undergo chemical analysis and contaminant testing to confirm purity. During the incineration process, techniques like thermo-gravimetric analysis monitor transformation. Scanning Electron Microscopy and other tools assess particle morphology and nano-size for enhanced bioavailability. Final assessments include toxicity screening, biocompatibility studies, and pharmacological testing to verify safety and therapeutic efficacy.

Despite recent advancements, *Rasashastra* still encounters challenges, including the need for stricter regulation of *Bhasma* preparation, ensuring the safety of metallic formulations, and the lack of large-scale clinical trials. Future research could explore the use of bio-enhancers and improved purification methods to further enhance the efficacy of *Rasashastra* and increase its acceptance within the global healthcare system [6, 7].

MODERN INNOVATIONS IN SHALAKYA TANTRA:

Shalakya Tantra is one of the ***Ashtanga Ayurveda*** deals with the diagnosis and treatment of diseases affecting neck and head region, which may includes ***Netra Roga***, ***Karna Roga***, ***Nasa Roga*** and ***Kantha Roga***. ***Sushruta Samhita*** and ***Ashtanga Hridaya***

provided surgical techniques to treat conditions such as **sinusitis** and **tonsillitis**. Incorporating modern diagnostic tools and surgical methods into *Shalaky Tantra* has opened new avenues for treating ENT disorders with greater efficacy [8-11]:

1. **Nasya Karma in ENT Disorders:** Nasal administration of herbal medications as *Nasya* has advanced through the introduction of nebulizers and atomized sprays. This effectively treating conditions like allergic rhinitis and sinusitis. These modernized *Nasya* techniques facilitate deeper penetration of medications into the nasal sinuses, offering relief from chronic ENT disorders.
2. **Minimally Invasive Surgical Techniques:** Surgical procedures in *Shalaky Tantra*, including endoscopic sinus surgery and ear microsurgery, have been enhanced with the use of advanced instruments. When paired with post-operative Ayurvedic treatments, such as gargling with herbal decoctions and steam inhalation, these techniques promote quicker recovery and improved outcomes.
3. **Ayurvedic Management of Vocal Cord Disorders:** The approach to treating vocal cord disorders in *Shalaky Tantra* has been enhanced by modern technologies, including radiofrequency ablation and CPAP devices. These contemporary methods are integrated with traditional therapies, such as medicated steam inhalation and *Kavala Gandusha*.
4. **Instrumental Advancement: Modern techniques witnessed uses of many instruments in ENT disorders which also utilizes in Shalaky Tantra** as depicted in **Table 1**.

Innovations in *Rasashastra* and *Shalaky Tantra* highlight a growing trend to integrate ancient Ayurvedic wisdom with modern medical science, creating comprehensive healthcare solutions. The application of herbo-mineral compounds from *Rasashastra* in managing ENT disorders has demonstrated promising outcomes for conditions like sinusitis and chronic rhinitis. Furthermore, *Bhasmas* are increasingly being investigated for their potential in treating ENT disorders. Pharmacological advancements in *Rasashastra* can also improve post-surgical recovery and decrease the risk of infection when applied to ENT and

ophthalmological conditions. By combining the potent *Rasa Aushadhis* of *Rasashastra* with the advanced surgical techniques of *Shalakya*, an approach to treating complex health issues can be achieved [1, 7, 8].

Table 1: Instrument used in ENT and Modern approaches of Shalakya Tantra

Category	Instrument	Purpose
Ear	Otoscope	For viewing the external ear canal and eardrum.
	Tympanometer	For assessing middle ear function.
	Audiometer	To test hearing acuity and thresholds.
Nose	Nasal Speculum	For widening the nostrils.
	Rhinomanometer	To measure nasal airflow and resistance.
	Balloon Sinuplasty Catheter	For opening sinus passageways.
	Septoplasty Forceps	For correcting deviated nasal septum.
Throat	Laryngoscope	For viewing the vocal cords and larynx.
	Fiberoptic Endoscope	For examination of the throat and airway.
	Radiofrequency Ablation Tools	For tonsil and adenoid reduction.

Conclusion

Both *Rasashastra* and *Shalakya Tantra* have embraced innovation while remaining grounded in their Ayurvedic traditions. The fusion of modern technology with ancient principles has created new opportunities for addressing a variety of disorders, including chronic ENT conditions. By utilizing a dual approach to health management that combines the strengths of both *Rasashastra* and *Shalakya*, practitioners can provide more comprehensive and effective treatments in today's healthcare environment. Future

advancements in research, clinical trials, and interdisciplinary collaboration will further enhance the potential of these fields.

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