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Review Article

" VETAL RASA: A COMPREHENSIVE REVIEW OF ITS CLASSICAL BACKGROUND, PREPARATION, PHARMACOLOGICAL PROPERTIES, AND CLINICAL APPLICATIONS"

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ABSTRACT

Background: Vetal Rasa (Betāla Rasa) is a classical Ayurvedic herbomineral formulation described in the *Rasendra Sara Sangraha*. Contrary to its frequent misclassification, it is a **Kharaliya (Khalviya) Rasayana** — prepared entirely by trituration on the stone slab (śilāyāṁ mardayet) — and is *not* a Kupipakwa preparation; it involves no sealed-bottle heating, no puṭa, and no prolonged bhāvanā schedule. It has been employed principally in the emergency management of severe Sannipātaja Jwara. **Objective:** To consolidate the authentic classical description — source reference, ingredient profile, śodhana and preparation protocol, pharmacological rationale, and clinical application — and to correct compositional and procedural errors that have propagated in secondary literature. **Methods:** The primary classical description in the Rasendra Sara Sangraha (śloka 168–171) was taken as the authoritative reference and cross-read with Rasa Tarangini (for the individual śodhana procedures of the constituents), the Parada Samhita, and modern pharmacological and analytical literature indexed in PubMed, Scopus, and Google Scholar. **Results:** Vetal Rasa is a five-ingredient formulation in which all constituents are taken in equal parts (samāṁśika): Shuddha Parada (purified mercury), Shuddha Gandhaka (purified sulphur), Shuddha Vatsanabha (*Aconitum ferox*), Shuddha Haratala (purified and incinerated orpiment, arsenic trisulphide), and Maricha (*Piper nigrum*). Parada and Gandhaka are first triturated to Kajjali, after which the remaining three fine powders are incorporated and triturated until the whole mass is uniformly black. Documented pharmacological activities of the actual constituents include analgesic, antipyretic, anti-inflammatory, cardioactive, and central-nervous-system activity. **Conclusion:** Vetal Rasa is a potent, narrow-indication Rasa formulation containing both mercurial and arsenical constituents alongside aconite. Faithful representation of its classical composition, correct pharmaceutical

classification, adequate śodhana, and modern standardization and pharmacovigilance are essential to its safe study and use.

Keywords: *Vetal Rasa; Rasendra Sara Sangraha; Rasa Shastra; Kharaliya Rasayana; Parada; Vatsanabha; Haratala; Sannipataja Jwara; Herbomineral; Traditional Medicine*

1. INTRODUCTION

Ayurveda, one of the world's oldest comprehensive systems of medicine, includes a highly evolved branch known as Rasa Shastra — the science of mercury- and mineral-based therapeutics. Systematically compiled between approximately the 8th and 15th centuries CE, this discipline combined metallurgical and alchemical processing with botanical adjuncts to produce potent remedies (rasauṣadhis) that act rapidly in minute doses and are considered especially valuable in acute, life-threatening conditions.

Among these preparations, Vetal Rasa occupies a distinct position on account of its potency and its specific application in critical fever. The name 'Vetāla' (Betāla) — a powerful spirit of Indian mythology — signals both the formulation's strength and its capacity to act where death appears imminent; the classical verse itself describes it as *yamadūta-nivāraka*, one that turns back the messengers of Yama. The authoritative description is found in the *Rasendra Sara Sangraha*, which fixes both its composition and its indication.

Crucially — and in correction of a common error in secondary and derivative literature — Vetal Rasa is a **Kharaliya (Khalviya) Rasayana**: it is prepared solely by trituration on the stone slab (śilāyāṁ mardayet) until a black Kajjali-like mass is obtained. It is not a Kupipakwa Rasayana; there is no sealed glass bottle (kupī), no controlled fire in stages (agni-krama within a kupī), and no puṭa. Its constituents are five, taken in equal parts: Shuddha Parada, Shuddha Gandhaka, Shuddha Vatsanabha, Shuddha Haratala, and Maricha. The present review restates the authentic classical account and provides the pharmacological and safety rationale relevant to these five constituents.

2. CLASSICAL SOURCE AND TEXTUAL REFERENCE

2.1 Primary Source

The authoritative description of Vetal Rasa is given in the *Rasendra Sara Sangraha*, śloka 168–171. The mūla verse specifies the formulation and its method concisely:

रसं गन्धं विषञ्चैव मरिचाऽऽल समांशिकम् ।
शिलायां मर्दयेद्यावत्तावज्जायेत कज्जलम् ॥ १६८ ॥

That is: mercury (rasa), sulphur (gandha), aconite (viṣa = Vatsanabha), black pepper (marica), and orpiment (āla = Haratala), each in **equal parts (samāṁśika)**, are to be triturated together on the stone slab until a Kajjali (jet-black, lustreless mass) is formed. The subsequent verses (169–171) state the dose as one guñjā (ratti), affirm its action in the twelve types of Sannipāta (dvādaśa sannipāta), and describe the clinical picture in which it is to be used — a subject taken up in Section 6.

2.2 Note on Secondary and Derivative References

Vetal Rasa should not be attributed to Rasa Tarangini (Taraṅga 17) or to Rasaratna Samuccaya as its primary source; those attributions, and the expanded twelve-ingredient composition sometimes circulated with them, do not correspond to the yoga described in the Rasendra Sara Sangraha. Rasa Tarangini is, however, correctly cited in this review as a *procedural* reference for the individual śodhana of Gandhaka, Vatsanabha, and Haratala, and the Parada Samhita for the śodhana of Parada, as detailed in Section 4.

2.3 Historical Context

Rasa Shastra matured within the broader medieval Indian tradition of Rasavidyā, whose therapeutic objective (dehasiddhi) was the perfection of the body against disease and decay. Formulations such as Vetal Rasa represent the applied, clinical end of this tradition: compact, potent, quick-acting Kharaliya preparations reserved for grave illness where ordinary herbal remedies were considered inadequate.

3. INGREDIENTS AND THEIR PHARMACOLOGICAL SIGNIFICANCE

3.1 Composition

Vetal Rasa comprises five ingredients, all in equal parts (samāṁśika). The corrected composition, faithful to the Rasendra Sara Sangraha, is given in Table 1. There are no metallic bhasmas (Tamra, Loha, Abhraka), no Tankana, no Trikatu triad, and no Dhattura or Bhringaraja bhāvanā in the authentic yoga.

S.No.	Sanskrit Name	Identity / Botanical Name	Part / Form Used	Quantity
1	Shuddha Parada	Purified mercury (Hg)	Purified liquid metal	1 part
2	Shuddha Gandhaka	Purified sulphur (S)	Purified mineral	1 part
3	Shuddha Vatsanabha	Aconitum ferox (Monkshood)	Purified tuberous root	1 part
4	Shuddha Haratala	Orpiment (As_2S_3), purified & incinerated	Śodhita–mārita mineral	1 part
5	Maricha	Piper nigrum (Black pepper)	Dried fruit, fine powder	1 part

Table 1: Corrected classical ingredient profile of Vetal Rasa (Rasendra Sara Sangraha, śloka 168) — five ingredients in equal parts.

3.2 Mineral and Metal Ingredients

3.2.1 Shuddha Parada (Purified Mercury)

Parada (Hg) is the principal ingredient and the foundational substance of Rasa Shastra. In its raw form it requires rigorous śodhana. Following purification, Parada is combined with Shuddha Gandhaka and triturated to a jet-black, lustreless mass — Kajjali — predominantly mercuric sulphide (HgS). Nanoparticulate characterization of Kajjali has demonstrated particle sizes broadly in the 50–200 nm range, with implications for altered bioavailability and reduced toxicity relative to inorganic mercury salts.

3.2.2 Shuddha Gandhaka (Purified Sulphur)

Gandhaka (sulphur) is both a processing agent and a therapeutic component. Purified sulphur possesses antimicrobial, antifungal, and keratolytic properties, and is essential to the formation of HgS in Kajjali.

3.2.3 Shuddha Haratala (Purified Orpiment, Arsenic Trisulphide)

Haratala (āla) is orpiment, **arsenic trisulphide (As_2S_3)** — an *arsenical* mineral, not a borate or a botanical. Its inclusion is a defining feature of Vetal Rasa and a primary determinant of its potency and its toxicological profile. Classical use mandates thorough śodhana followed by māraṇa (incineration) before incorporation. Processed arsenic sulphides have documented antimicrobial and, in the Rasa tradition, rasāyana and vyādhi-pratikāra applications; however, arsenic content makes correct processing and dosing non-negotiable. The presence of Haratala means the safety discussion for this yoga must address arsenic in addition to mercury and aconite (Section 7).

3.2.4 Shuddha Vatsanabha (Aconitum ferox)

Vatsanabha is the most pharmacologically active botanical constituent. Aconitum ferox contains potent diester-diterpenoid alkaloids including aconitine and pseudoaconitine. In unpurified form it is acutely toxic. Classical śodhana (processing in gomūtra, and in milk in other traditions) hydrolyzes the ester alkaloids to less toxic but therapeutically active aconines and benzoylaconines. Properly processed Vatsanabha exhibits analgesic, anti-inflammatory, antipyretic, and cardioactive properties.

3.3 Botanical Ingredient

3.3.1 Maricha (Piper nigrum)

Maricha (black pepper) is the sole botanical adjunct. Its principal alkaloid, piperine, is a well-established bioavailability enhancer, acting through inhibition of drug-metabolizing enzymes (cytochrome P450) and efflux transporters (P-glycoprotein). Maricha additionally contributes digestive (dīpana–pācana), anti-inflammatory, and antipyretic activity, and in this yoga functions as a yogavāhi that assists the delivery of the mineral constituents. It is present as a single ingredient — not as part of the Trikatu triad, which does not belong to this formulation.

4. PREPARATION METHODOLOGY (NIRMANA VIDHI)

4.1 General Principle

All toxic mineral and botanical constituents are first subjected to śodhana (and, for Haratala, to māraṇa) before compounding. The finished preparation is achieved by trituration alone (kharaliya method); no kupīpāka and no puṭa are employed for the final yoga.

4.2 Śodhana and Māraṇa of Individual Ingredients

Śodhana of Parada: Prepared as a pishti of Parada with rasona (garlic) kalka, as described in the Parada Samhita.

Śodhana of Gandhaka: Aśuddha Gandhaka is melted with goghṛta (cow's ghee) and poured into godugdha (cow's milk), as per Rasa Tarangini.

Śodhana of Vatsanabha: Carried out using gomūtra (cow's urine), as per Rasa Tarangini.

Śodhana of Haratala: Performed by the dolāyantra method using tila-kṣāra-jala (alkaline water of sesame-stalk ash), as per Rasa Tarangini.

Māraṇa of Haratala: Carried out using Palāśa-mūla kwātha with bhāvanā of mahiṣa-mūtra (buffalo urine); agni-saṁskāra is given by kapota-puṭa, as per Rasa Tarangini.

4.3 Kajjali Preparation

Equal parts of Shuddha Parada and Shuddha Gandhaka are triturated continuously in a stone mortar (khalva) until a jet-black, lustreless, impalpable powder with no visible mercury globules is obtained — the Kajjali. Analytical characterization confirms mercuric sulphide (HgS) with nanoparticulate dimensions.

4.4 Compounding (Kharaliya Method)

To the prepared Kajjali are added — in equal quantity — fine powders of Shuddha Vatsanabha, Shodhita-mārita Haratala, and Maricha. The whole is triturated on the slab until the mixture turns uniformly black. **This completes the preparation.** There is no bhāvanā schedule with Dhattura or Bhringaraja swarasa, and no kupīpāka. Vetal Rasa is a Kharaliya Rasayana in its entirety.

4.5 Final Form and Dose

The finished product is a fine **powder (cūrṇa)**, not a vaṭī. The classical dose is **one guñjā / ratti, approximately 125 mg** (guñjāmātraṁ prayoktavyam). It is stored in an airtight glass or ceramic container and dispensed with a suitable anupāna (Section 6).

4.6 Quality Control Parameters

Because the yoga contains mercury, arsenic, and aconite, quality control must verify adequate processing of all three. Suggested parameters, aligned with Ayurvedic Pharmacopoeia of India and CCRAS approaches, are given in Table 2.

Parameter	Classical Criterion	Modern Analytical Method
Appearance	Jet-black, lustreless powder	Visual inspection
Free mercury	No visible globules	AAS / ICP-MS
Particle size	Impalpable (rekhāpūrṇa/varitara)	Laser diffraction, SEM
Mercury speciation	Adequate Kajjali (HgS)	XRD, ICP-MS
Arsenic (from Haratala)	Adequate śodhana & māraṇa	ICP-MS (speciated As)
Aconite alkaloids	Organoleptic (pungency)	HPLC for aconitine/aconines
Loss on drying	Not specified	< 2% at 105 °C
Microbial limit	Not specified	USP microbial limit test

Table 2: Quality control parameters for Vetal Rasa. Note the mandatory speciated arsenic assay reflecting the Haratala content.

5. PHARMACOLOGICAL PROPERTIES

The following account attributes activity only to the five constituents of the authentic yoga: the Kajjali (HgS) matrix, Shuddha Vatsanabha, Shodhita-mārita Haratala, and Maricha. Claims previously ascribed to Tamra/Loha/Abhraka Bhasma, Tankana, Dhattura, or Bhringaraja are not applicable, as these substances are not present.

5.1 Ayurvedic Pharmacodynamics

Vetal Rasa is characterized as Uṣṇa-vīrya, Tīkṣṇa, and rapidly acting, with predominant Kapha–Vata pacifying action appropriate to severe sannipātaja states. The tīkṣṇa and vyavāyi–vikāśi qualities of its constituents underlie the rapid onset attributed to it in the classical verse.

5.2 Analgesic and Anti-inflammatory Activity

Analgesic and anti-inflammatory activity is primarily attributable to Shuddha Vatsanabha and the Kajjali matrix. Processing-derived aconine and benzoylaconine modulate voltage-gated sodium channels and suppress prostaglandin synthesis, producing analgesia in standard rodent models. Piperine from Maricha contributes additional anti-inflammatory activity through COX/LOX pathway modulation and enhances the systemic availability of co-administered constituents.

5.3 Antipyretic Activity

The formulation's central classical use is in fever. Antipyretic activity derives from central thermoregulatory modulation by processed Vatsanabha alkaloids and from prostaglandin-E2 reduction by piperine, complemented by the tīkṣṇa–uṣṇa action of the mineral matrix. This pharmacological profile is consistent with the verse's emphasis on rapid resolution of severe sannipātaja jwara.

5.4 Cardioactive and CNS Effects

Aconitum alkaloids at sub-toxic levels modulate cardiac sodium and calcium channels and central neuronal excitability. In the specific critical presentation for which Vetal Rasa is indicated — collapse of the sensory faculties and impending death — these actions are relevant, but they also define the narrow therapeutic window and the necessity of exact śodhana and dosing.

5.5 Antimicrobial Activity

Antimicrobial potential is contributed by Shuddha Gandhaka (disruption of microbial thiol chemistry), by processed mercury-sulphide species, and by the arsenic-sulphide (Haratala) fraction, alongside the antibacterial and antiparasitic activity of Maricha constituents. These converge to support classical use in severe febrile (often infective) sannipāta states.

6. CLINICAL APPLICATION AND THERAPEUTIC INDICATION

6.1 The Classical Indication: Sannipātaja Jwara

The Rasendra Sara Sangraha restricts Vetal Rasa to **Sannipātaja Jwara** — specifically the twelve types of sannipāta (dvādaśa sannipāta), including states classified as sādhya as well as those bordering on asādhya. The verse (170–171) describes a precise, grave clinical picture in which the medicine is to be used:

- clenched, locked teeth (*dantapaṅktir dṛḍhā*);
- rolling, wandering pupils (*locane bhrānta-tārake*);
- failure and derangement of all the senses (*calite ca indriya-grāme*); and
- a stuporous, near-moribund patient, to whom Vetal Rasa may be given even as it wards off the messengers of death (*yamadūta-nivāraka*).

This is an emergency indication for critical, tridoṣic fever with sensory collapse — not a broad, multi-system therapeutic range. Indications such as Shwasa-Kasa, Hridaya Roga, Vatavyadhi, Krimi Roga, Arsha, Pandu, or Gulma are not supported by this source and have been removed from the corrected account.

6.2 Dose, Anupana, and Administration

Dose: one guñjā / ratti, approximately 125 mg, as cūrṇa, administered under close supervision. Given the mercurial, arsenical, and aconite content and the critical clinical setting, the anupāna is selected by the treating vaidya to the state of the patient; suitable jvaraghna vehicles (for example, honey with an appropriate kaṣāya) are used. Because of the grave presentation and the narrow therapeutic window, administration must be by an experienced practitioner with continuous monitoring.

Contraindications and cautions: pregnancy and lactation; paediatric use without expert guidance; renal or hepatic impairment; and any use where the śodhana and māraṇa of the constituents have not been verified. The presence of arsenic (Haratala) alongside mercury and aconite makes correct processing and dosing an absolute prerequisite.

7. SAFETY, TOXICOLOGY, AND PHARMACOVIGILANCE

7.1 Three Toxicologically Significant Constituents

The safety assessment of Vetal Rasa is distinctive because it contains **three** toxicologically significant constituents — mercury (from Kajjali/HgS), arsenic (from Haratala/As_2S_3), and aconite alkaloids (from Vatsanabha). In classical Rasa Shastra, the safety of each is held to depend on the adequacy of its śodhana (and, for Haratala, māraṇa). Inadequately processed constituents are explicitly recognized as causes of adverse effects.

7.2 Mercury (Kajjali)

Studies on Kajjali indicate substantially lower systemic mercury bioavailability than equimolar inorganic mercury salts, attributed to its HgS (sulphide-bound, nanoparticulate) form. The evidence base is nonetheless limited by small samples, preparation variability, and a near-absence of controlled human pharmacokinetic data.

7.3 Arsenic (Haratala)

The arsenical component is specific to this yoga and is often overlooked in generic Rasa-formulation reviews. Orpiment (As_2S_3) requires validated śodhana and māraṇa to be rendered fit for internal use; residual or inadequately processed arsenic species carry recognized nephro-, hepato-, dermato-, and neurotoxic potential and long-term carcinogenic risk. Speciated arsenic analysis (distinguishing sulphide-bound from inorganic arsenic) is therefore essential to any modern quality and safety assessment of Vetal Rasa.

7.4 Aconite (Vatsanabha)

Even after śodhana, residual aconite alkaloids can produce cardiac arrhythmias, paraesthesiae, and hypotension — classical signs of aconitine toxicity. This narrow margin, in a formulation used for the gravely ill, reinforces the need for precise processing, dosing, and monitoring.

7.5 Regulatory Status

In India, Parada- (and Haratala-) containing formulations are prescription products to be dispensed by registered Ayurvedic practitioners under the Drugs and Cosmetics Act (1940) and its Ayurvedic provisions. A dedicated Ayurvedic Pharmacopoeia of India monograph specifying heavy-metal (Hg and As) speciation limits and alkaloid profiles for Vetal Rasa is required.

8. RESEARCH GAPS AND FUTURE DIRECTIONS

- **Standardization:** a validated monograph specifying Hg and speciated As limits, aconite-alkaloid profiles, and physicochemical parameters for the five-ingredient yoga.
- **Finished-product pharmacology:** studies on the composite Kharaliya product rather than isolated constituents, including bioavailability and constituent interactions.
- **Toxicology and pharmacovigilance:** dedicated sub-acute and chronic toxicity studies addressing the combined mercury–arsenic–aconite exposure, followed by prospective pharmacovigilance.
- **Clinical evaluation:** carefully designed studies in the specific classical indication (severe sannipātaja jwara), with rigorous safety monitoring, rather than broad multi-indication claims.
- **Process characterization:** ICP-MS, HPLC, XRD, and SEM-EDX mapping of the śodhana–māraṇa steps, especially the Haratala māraṇa, to define reproducible endpoints.

9. CONCLUSION

Vetal Rasa is a compact, potent Kharaliya Rasayana of the Rasendra Sara Sangraha, composed of five constituents in equal parts — Shuddha Parada, Shuddha Gandhaka, Shuddha Vatsanabha, Shuddha Haratala, and Maricha — prepared entirely by trituration to a black powder and dosed at one ratti (~125 mg). Its authentic indication is narrow and grave: the emergency management of severe Sannipātaja Jwara with sensory collapse. Correct representation of its composition, its Kharaliya classification, its śodhana–māraṇa protocol, and its powder dose form is essential; equally essential is a safety framework that addresses all three toxicologically significant constituents — mercury, arsenic, and aconite. With faithful classical practice supported by modern standardization, speciated heavy-metal analysis, and pharmacovigilance, Vetal Rasa can be studied and applied responsibly within its intended clinical scope.

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