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ARTICLE

All that glitters may be Orpiment!

Vineet Sharma[1] · **Arul Selvan Selvaraj**[2] · **V. Ramanathan**[1,2]

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Abstract
Orpiment (*haritāla*), a golden-yellow mineral, has been widely known and used across cultures in art, cosmetics, metallurgy, alchemy, and medicine. Here, we discuss a detailed understanding of its therapeutic and toxic properties developed through observation and experimentation, evolving independently across regions. In India, references from the *Mahābhārata* to Ayurvedic and Siddha texts describe its role in medicine and in metallurgical processes that made base metals glitter like gold-hence, all that glitters may indeed be orpiment. Comparable applications appear in Chinese alchemical, artistic, architectural, and medical traditions, while in Europe, their use remained mainly artistic, alchemical, and metallurgical. Its application in Buddhist murals and illuminated manuscripts represents early developments in material science. The paper presents the geographical distribution, textual references, and cultural significance of orpiment in India, China, and Europe.

Keywords Orpiment · *Haritāla* · *Tālakam* · King's Yellow · Alchemy · Pigments · Traditional medicine

1 Introduction

Among the vast array of minerals utilized by ancient civilizations, orpiment (*haritāla*; As_2S_3), known for its striking golden-yellow color, possesses unique physical and chemical properties. This mineral has a complex history as both a valuable and a toxic substance (van Loon et al., 2017; Liu et al., 2008). This dual nature, that of being attractive and hazardous, has influenced its historical use in various fields. Over the centuries, it has been used by artisans, physicians, and alchemists, often in related contexts (Robinson, 1999) across various civilizations. Solid pieces of *haritāla* were recovered during excavations from Harappa, proving its long-standing use in human civilization (Vats, 1940, p. 468). Geologically, orpiment forms in hot underground veins, near thermal springs, and in volcanic areas, often together with realgar, another arsenic mineral. It usually occurs as layers or grains, but well-formed crystals are rare. It also occurs with other arsenic sulfides such as pararealgar, duranusite, alacranite, dimorphite, and uzonite (Eastaugh et al., 2004) and often occurs near minerals such as cinnabar and stibnite in arsenic-rich zones (Bancroft et al., 1991). Major occurrences have been documented in volcanic regions such as Vesuvius, the Phlegraean Fields near Naples, and the Aeolian Islands (Stromeyer, 1824; Eastaugh et al., 2004). The literature indicates a large-scale deposit formed in Europe (Romania, Hungary, Germany, France, Greece, Switzerland, Czech Republic, and Macedonia), in Asia (Turkey, Iran, China, and Japan), in North America (US), in South America (Peru) and also in Southeast Asia (Indonesia) (Fig. 2) (Mindat, 2025). Because of its widespread availability, orpiment has been used in many cultures for artistic, medicinal, and spiritual purposes. Numerous published studies have examined many aspects of orpiment in a historical context. The literature review showed its therapeutic role in Indian traditional medical systems (Wadnerwar et al., 2019; Parekh et al., 2020; Jani et al., 2022). Similarly, a published review indicated the role of orpiment in ancient Chinese medicine (Liu et al., 2008), traced the history of arsenic in healthcare (Paul et al., 2023), and investigated the use of arsenic-based pigments in historical artwork (Gliozzo and Burgio, 2022).

While these studies are valuable in their own right, most focus on specific regional uses or practices. A cross-cultural comprehensive survey which looks at the use of orpiment's role across the separate yet related fields of art, alchemy, and medicine in the ancient world of India, China, and Europe, has hitherto not been carried out, which is attempted in this

✉ V. Ramanathan
vraman.chy@iitbhu.ac.in

[1] IKS@IITBHU: Centre of Excellence in Indian Knowledge Systems, Indian Institute of Technology (BHU), Varanasi, Uttar Pradesh 221005, India

[2] Department of Chemistry, Indian Institute of Technology (BHU), Varanasi, Uttar Pradesh 221005, India

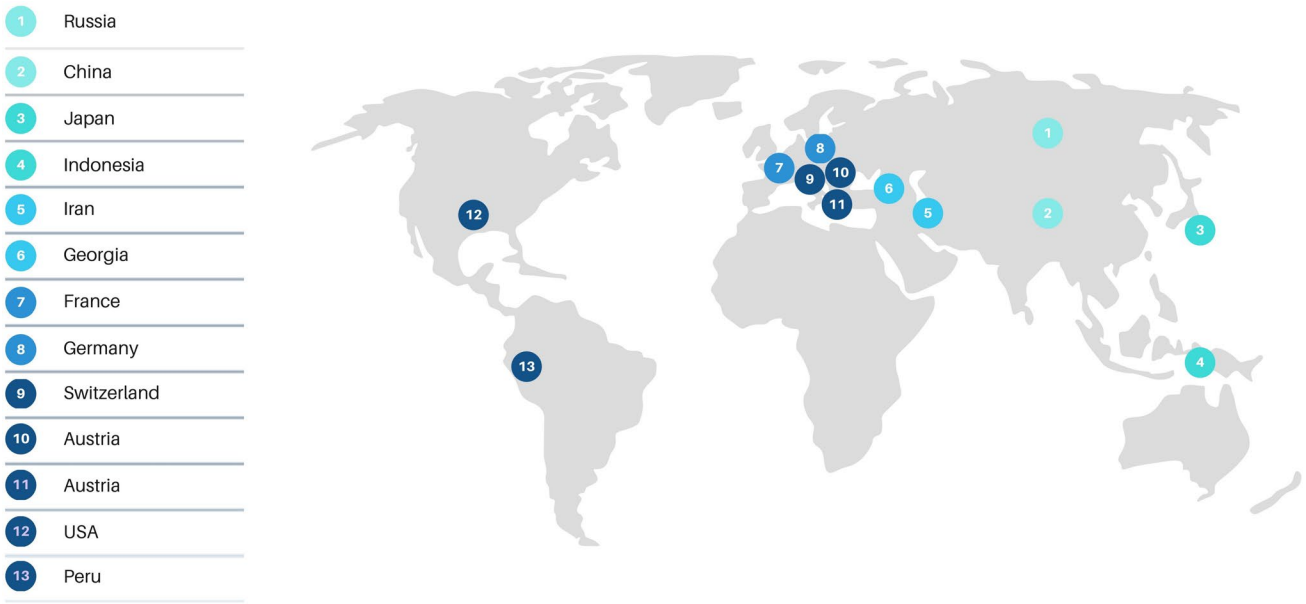

Fig. 1 Global distribution of significant orpiment deposits

work. It begins by examining the mineral's use in the Indian context, followed by the Chinese and European contexts. Orpiment's use in paints, pigments, cosmetics, and metallurgy across these geographies and cultures is presented. Paradoxically, its importance in the context of medicine, despite being a toxic element, is presented with special attention to the common methods of its preparation involving the removal of its toxicity across different civilizations. Particularly, its use in Ayurveda and Siddha traditional medicine systems is presented with significant details. Drawing on a wide body of published literature and historical sources, this study offers a consolidated and original perspective on orpiment's cross-cultural significance in ancient science.

2 Orpiment in India

2.1 Orpiment as a coloring agent

Haritāla played a central role in ancient India's visual and material culture. The earliest mention of *haritāla* in an Indian epic occurs in the *Mahābhārata*[1] where it is listed among the minerals adorning Mount *Gandhamādana*. This epic testifies to the advanced knowledge of natural substances and their classification, which included minerals such as cinnabar, red arsenic, and other brightly coloured compounds (Dutt, 2008). When early Buddhist monks began beautifying their monasteries, they looked to this golden yellow mineral. As mentioned in the *Vinaya Cullavagga* (first century BCE), Buddha himself allowed his followers to use the yellow *haritāla* to decorate the walls of their dwellings (Granoff, 2020). This use indicates the prominence of orpiment as a pigment and a culturally accepted medium for sacred expression (Fig. 1).

In texts such as the *Viṣṇudharmottara purāṇa*[2] (fifth century CE), *haritāla* is mentioned as one of the main colours used in sacred painting (Shah, 1958). In addition, medieval palm leaf manuscripts also indicate their use for both colouring and text correction (Nardi, 2007). The literature evidence suggests that ancient artists were familiar with two traditional types of orpiment, *dagdi* and *vargi*. These were often finely ground "to the consistency of wheat flour" and then mixed with gum arabic to make paint (Chandra, 1949). Similarly, *Śilparatna*,[3,4] (sixteenth century CE) also mentions the *śodhana* process (refining of the mineral) (Sastri, 1910). This involved grinding the mineral on a stone, repeatedly washing it in pure water, and filtering it until the impurities were completely removed. The resulting paste was sun-dried before use (Sastri, 1910; Nardi, 2007). This elaborate process highlights the great importance placed on the purity and stability of the pigment. The text also notes that combining yellow orpiment with deep green (*śyāma*) yields a

[1] *Vana Parva*, 158/92–96.

[2] Third *Khaṇḍa*, 40/25–26.

[3] *Śilparatna* (I.46.41–46) *pūrvabhāgaḥ citralakṣaṇam.*

[4] Ibid (I.46.139).

Fig. 2 *Haritāla* in murals of Buddhist monasteries. Image courtesy: Noor Jahan (social media page)

color resembling a parrot's wing (Sastri, 1910). In the *Mān asollasā*,[5,6,7] (twelfth century CE), *haritāla* is put forward as one of the four primary colours, along with white (from lime), red (which had three varieties of it), and black (from lampblack). The addition of conch-shell lime to orpiment creates a saffron-colored pigment, while a green color is produced by mixing orpiment with indigo (Nardi, 2007). In his collected recipes, *Muni Punyavijayaji* presents an in-depth study of colour theory in ancient India. He described mixtures that create complex colours:

> Orpiment and indigo make mango leaf green; zinc white, orpiment and indigo make elephant grey. Also, out of zinc white, red lead and orpiment came the same shade. From indigo, lampblack, red lead and orpiment comes the colour of peori. Wheat colour is achieved with orpiment, red lead and chalk. Similarly, orpiment and zinc white were used for the body colour of a woman (Chandra, 1949).

These formulations reflect an understanding of the perception of colors in classical Indian art. In addition, many regional methods show a greater variety of orpiment. The traditional painters from Puri of Odisha paint *haritāla* on black granite and use a technique called *haritāla phutaiba* (bursting of orpiment), which involves painting palm leaves vigorously to create texture (Mohanty, 1980). In Assam, *haritāla* was used in wall paintings in the 15th-century *Cihna-yatra*, a poetic visionary account attributed to the Vaishnava saint *Sri Sankardeva*. Ancient artists are known to have used varying proportions of a mixture of vermilion and *haritāla* to achieve brown color and vermilion, *haritāla,* and indigo to achieve black color (Neog, 1965; Dutta, 2019; Ali et al., 2023). In the dynamic *Kathakali* theatre of Kerala, artists prepared green colour from a base of *haritāla* powder mixed with coconut oil and a little indigo. In addition, they also added damar resin, which gave the mixture a special "shine" and which in turn gave the classic look that is a quintessential representation of this classical art form (Pandey, 1943). Apart from its visual value, *haritāla* played an important role in the preservation of manuscripts. *Pinda haritāla* was used as a vibrant coloring agent in paints and played a vital role in rendering robustness to the locally produced papers. Dutt and Sen (1989, p. 41) found that oiled paper was resistant to insect damage, which may have contributed to the survival of many medieval scripts. Although the presence of arsenic in orpiment poses health hazards and limits its use in some cases, its value lies in its visual appeal, regional adaptability, and preservative properties. Its many roles in art, literature, and science exemplify the deep knowledge of color in pre-modern India.

2.2 Orpiment in cosmetic practices

The role of *haritāla* in ancient beauty practices is interestingly found in Kalidasa's *Kumārasambhava.*[8] Per the text,

[5] *Mānasollasā* (III.1.157).
[6] Ibid (III.1.160).
[7] Ibid (III.1.162).
[8] Kumārasaṃbhava (7/23–24).

when *Pārvatī* visited *Hara* (Shiva), her mother applied wet *haritāla* and *manaḥśilā* (realgar) on her forehead, including ivory leaf ornaments to enhance *Pārvatī* 's beauty. The text mentions that *haritāla* was used as a cosmetic to bring about a very radiant appearance (Devadhar, 1984). Such literary evidence presents a lively picture of how orpiment featured in ancient India's everyday and ceremonial beauty rituals. This practice parallels Tibetan culture, where *haritāla* was prepared with cattle bile, which was traditionally used to mark the *tilaka* on the forehead (Dagyab, 1995). These cross-cultural examples showed the broader ritual symbolism and aesthetic value associated with *haritāla* in Himalayan and Indic traditions. Beyond adornment, orpiment also played a role in body care, as documented in *Anaṅga Raṅga*. One formulation for hair removal prescribes to combine calcined conch shell with banana or plantain tree juice and a small quantity of orpiment. Having kept for seven days this formulation was applied for hair removal. In another preparation, orpiment and the *palāśa kṣāra* (wood ash of *Butea monosperma* (Lam.) Taub.) were ground with plantain tree juice to permanently prevent hair regrowth (Kalyaṇamalla, 1885).

2.3 Orpiment in metallurgical practices

Early texts, such as *Rasārṇava*, report orpiment's use in the transformation of base metals (Ray, 1985). Metallurgists crafted intricate mixtures of silver, copper, lead, zinc, and mercury. Orpiment was then used to impart a yellow hue to these compacted alloys, aiming to produce a gold-like resemblance (Ray, 1909). While these techniques may seem obscure at first glance, these texts reveal a methodological approach to metal processing based on a logical and systematic understanding of material transformation. *Rasārṇavakalpa*[9] (eleventh century CE) gives a very systematic description of the processes involving the base metals, and their contemporary translation has characterized them as transmutation into gold, which must be best understood as gold-like metal. The method adopted was to heat mercury, sulphur and *haritāla* mixtures in a closed vessel. The objective of doing this was to bring metals like copper or silver to a state where they acquire the colour and shine like gold. One technique involves preparing a silver amalgam where the mercury is ground with sulfur and orpiment, followed by rubbing this mixture with *bīja* (pure gold or pure silver) and so on, resulting in silver attaining a golden hue (Roy & Subbarayappa, 1976).

In another method, copper was heated with a mixture of *viṣodaka*[10] (poisonous water), sulfur, orpiment, and goat's urine. This process resulted in a change in colour and texture of copper, possibly due to surface chemical reaction. Similarly, mercury was processed with *haritāla* and lemon juice in another method. Later, it was heated with betel leaves. If the mixture obtained by this method is applied to copper leaves or lead through the *Puṭapāka* (heat treatment) technique, those metals will glitter like gold. *Rasārṇavakalpa* places significant emphasis on the systematic purification of *haritāla* (Roy & Subbarayappa, 1976). The text details precise methods, including washing it in rice water, pressing it with a special type of rice, and soaking it in earthen pots. It's generally understood that the goal of these purification methods was either to detoxify the harmful substances or to remove impurities. However, there is very little modern, systematic evidence that chemically explains how those ancient transformations actually worked. Beyond this, such processes may have been useful in increasing the chemical reactivity of orpiment. Small pellets were made by mixing pure *haritāla*[11] with mercury. These pellets were heated and then consumed as medicine to gain strength, radiance, and longevity. While their therapeutic activity and mechanism are yet to be understood in contemporary reductionist standards, this indicates a sophisticated approach to the combined medicinal use of mercury and *haritāla* in ancient times. Another purification step involves washing *haritāla*[12] with neem wood, cowshed soil, and water. In a special process, a mixture of mercury and orpiment was buried in a paddy heap for a month. The purpose of this technique was to make mercury *'agnisaha'* (which may be interpreted as 'thermally stable').[13] Further complex processes are also described. One such method involved initially roasting *haritāla* over a fire fuelled by cow and buffalo dung. Subsequently, it was thoroughly rubbed with curd and milk in an iron vessel, then transferred to an earthen vessel for further processing with the same substances. The resulting paste was mixed with *pañcagavya* (a mixture of milk, curd, ghee, urine, and dung) and heated until its distinct odor faded. Again, it was mixed with lemon juice and mercury and got solidified. Then, after steaming for three days, the modified mercury was applied to copper to make it glitter like gold.[14] Thus, *Rasārṇavakalpa* incorporates two perspectives: the chemical role of *haritāla* in transmutation and its possible medicinal and spiritual effects in the human body (Roy & Subbarayappa, 1976).

Similarly, a detailed description of the systematic processes for purifying *haritāla* and its various uses is also mentioned in the *Suvarṇatantra* (Shukla, 2013; Ray, 1909). The text states that pure *haritāla* should be rubbed with a special

[9] *Rasārṇavakalpa*, *Gandhaka-Kalpa* 357-358.

[10] Ibid, *Viṣodaka Kalpa* 744,745.

[11] *Tālaka Kalpa* 377,378.

[12] Ibid, 387,388.

[13] Ibid, 399,400.

[14] Ibid, 401–406.

oil for twenty days continuously to remove its impurities. When this process is completed, the molten *haritāla* is said to be capable of acting on and changing the physical form and properties of eight different metals. Later in the text, it is also mentioned that when *haritāla* is mixed with *tāmra* (copper) metal with the aid of a specially treated oil, copper is said to assume an extremely lustrous glitter. Experiments indicate that other metals such as *tāmra*, *loha* (iron), *kāṁsya* (bronze), and *rajata* (silver) can also be made to glitter (Ray, 1909).

Rasahṛdayatantra[15] (tenth century CE) describes a similar process by which *tāmra* is made to shine like silver (Bose et al., 1971). *Dhātumañjarī* describes another method in which *pārada* (mercury), molten *gandhaka* (sulfur), and *haritāla* are treated to make them volatile, allowing base metals to get the golden glitter (Bose et al., 1971). *Rasajalanidhi*[16] describes various methods of metal transformation using *haritāla*. In the simplest method, *haritāla* is mixed with *rudantī* juice (*Capparis moonii* Wight) and treated with *tāmra*, which is said to make copper shine like gold. In another method, a silver-copper alloy is taken, consisting of sixteen parts silver and twelve parts copper. This sheet is coated with a mixture of *haritāla*,[17] *mākṣika* (copper pyrite), *hiṅgula* (cinnabar), *manaḥśilā*, and *pārada*. These ingredients are mechanically ground for three days in the juice of *kākamācī* (*Solanum nigrum* Linn.). The coated metal is then baked at controlled heat, and the resultant formulation has a glitter of gold (Mookerjee, 1938). In a more complex method, *haritāla*[18] is mixed with an equivalent amount of *manaḥśilā* and ground in the juice of *devadālī* (*Luffa echinata* Roxb.) on the first day and in the juice of *śivaliṅgī* (*Bryonia laciniosa* Linn.) on the following day. *Sīsaka* (lead), *trapu* (tin), and *pārada* are taken separately in equal quantities (five *pala*) and powdered. This powder is mixed with *ghṛta* (ghee) and added to the *haritāla–manaḥśilā* mixture. The entire compound is mixed with *ghṛta* again and again and subjected to *puṭa* (calcination) sixty times. The text mentions that at the end of this process, *trapu* can shine like *rajata* (Mookerjee, 1938).

Haritāla is mentioned in historical texts as an important chemical and geographical indicator. In particular, Kautilya's *Arthaśāstra*[19] (fourth century BCE) lists it among the natural indicators that help identify gold-rich areas. The text describes that concentrated, heavy liquids or deposits seeping from cavities, holes, or pits of gold-bearing mountains usually have a *haritāla*-like colour. These colour characteristics are accompanied by the presence of other substances such as *haridra* (turmeric), *madhu* (honey), and *sindūra*. This suggests that orpiment was recognized not only as a mineral of visual interest but also as a marker for geological exploration (Sastry, 2014).

Arthaśāstra describes the use of *haritāla* as both a pigment and an agent for cleaning gold and silver. According to a process described in this text, "when after coating a piece of cloth with the powder of one of the following (viz.) yellow orpiment, red arsenic or vermilion, or with powder of kuruvinda (stone), they rub the article with it, that is rubbing off. By that articles of gold and silver lose in weight and yet no part of these (articles) gets bruised" (Kangle, 1972, p. 121). In addition, the mention of taxation on *haritāla* highlights its significance as an economic good and in trade. A description related to blindness is also mentioned in *Arthaśāstra*, in which a mixture of *haritāla*, *manaḥśilā*, *guñjā* seeds (*Abrus precatorius* Linn.), *pūtikarañja* leaves (*Pongamia pinnata* Linn.), and red cotton (*Bombax ceiba* Linn.) stems, juice of *Āsphota* (*Clitoria ternatea* Linn.), *Kāca* (*Senna occidentalis* Linn.), and cow dung is heated, producing smoke that causes blindness (Kangle, 1972, p. 495). Furthermore, when orpiment and realgar are mixed with the oils of *śakun* and *kangu* (*Callicarpa macrophylla* Vahl.) and heated, a kind of darkness is produced (Kangle, 1972, p. 500). These findings underscore the complexity of natural substances' use and interaction in ancient science and technology. Hence, the numerous references to *haritāla* in *Arthaśāstra* shed light on its versatile uses and underline its central role in ancient India's trade, chemistry, and economy.

2.4 Ayurvedic medical traditions

As a mineral that changed identities in many literary and cultural landscapes, orpiment received various names based on its perceived forms and properties. In the fifteenth century classical work *Rājanighaṇṭu*, it is referred to by names such as *haritāla*, *tāla*, *āla*, *māla*, *śailūṣabhūṣaṇa*, *piñjaka*, *romaharaṇa*, *tālaka,* and *pīta*. Besides, orpiment was given many poetic names like *tāla manoñjña*, *pītaka*, *piṅga*, *kāñcanaka*, *harivīja*, *pīta*, *citrāṅga*, *vaṁśapatraka*, and *gaurīlalita* (Tripathi, 1982). The multiplicity of names attests to the cultural importance of orpiment and its extensive role in medicine and metallurgy. This is not just a linguistic gimmick, but there is evidence of its use in a variety of contexts. Its role in medicine and metallurgy further strengthens its identity. In later *rasaśāstra* classics, which include *Rasārṇava* (tenth century CE) (Ray, 1985), *Rasaratnasamuccaya* (thirteenth century CE) (Shankar, 2019), *Rasendrasāra saṁgraha* (sixteenth century CE) (Prasad, 2019), *Āyurvedaprakāśa* (sixteenth century CE) (Mādhava, 1913), and others, *haritāla* was categorized as an *uparasa varga* (Secondary minerals). But works like *Śārṅgadhara Saṁhitā* (fourteenth century CE) (Tripathi, 2017) and *Yogaratnākara* (eighteenth century CE) (Sharma, 1907) placed it under *upadhātu*, which suggests its role in metallurgy. In the *Bhāvaprakāśa Nighaṇṭu* (sixteenth century CE) (*Dhātvādivarga*), orpiment is described in two

[15] *Rasahṛdayatantra* 18/66.
[16] *Rasajalanidhi II.haritalena vedhanakriyā.1*
[17] Ibid,2.
[18] Ibid,3.
[19] *Arthaśāstra*, 2.12.2

primary forms: *patra haritāla* (sheet-like) and *piṇḍa haritāla* (mass form). According to the texts, *patra haritāla* is considered superior. It is golden, heavy, smooth, and found in thin layers that resemble mica. Additionally, it is presented as a rasāyana (rejuvenative), whereas the *piṇḍa haritāla* is considered of inferior quality, with a bitter and astringent taste. It is mentioned to have a negative effect on female reproductive health (Pandey, 2002).

In both ancient China and India, medical systems emphasized the sensory perception of substances, particularly taste, as a crucial parameter in medicinal classification. Orpiment has been consistently described as having a pungent taste (*kaṭu rasa*). In the *Shennong Bencao Jing*, a foundational text of Chinese Materia medica, *Cihuang* (orpiment) is recorded as having a pungent (xin) taste. This classification contributed to its placement in specific therapeutic categories (Hsu, 2001). A similar understanding of the taste of this mineral is also revealed in Indian texts. Texts such as *Rasaratnasamuccaya*, *Āyurvedaprakāśa*, and *Rasaprakāśasudhākara* (eighteenth century CE) identify *haritāla* as having a bitter taste (a pungent taste) (Shankar, 2019; Madhava, 1913; Yashodhar, 1940).

In the *Caraka-saṃhitā* (second century BCE), which is one of the foundation texts in *Āyurveda*, *haritāla* is classified under '*pārthiva dravya'* (earthy substances).[20] The text mentions many therapeutic uses for various health issues. For instance, it is used externally in the treatment of *kuṣṭha* (skin and nerve diseases),[21][22] and is incorporated into fumigation preparations such as *dhūmapāna* for *śirovirechana*, a type of nasal therapy which is part of the *aprajitādi śirovirecchika dhūma*.[23] The text also documents its inclusion in medicated oils like *kanakākṣīrī tailam* for dermatological disorders[24] and in *añjanārtha varṭī* for mental disorders such as *unmāda*.[25] Further uses are described in the management of *arśa* (haemorrhoids) through topical applications (*lepā*),[26] in *dhūmavārthī* (fumigation wicks) for respiratory issues such as *hikka* and *śvāsa*,[27] and in *pītaka cūrṇa*[28] for *kaṇṭha* and *mukha roga* (oral diseases). This wide range presents us with a systematic and versatile understanding of orpiment's therapeutic potential (Shastri, 2013).

The *Suśruta saṃhitā* (sixth century BCE) classified *haritāla* as a *dhātuja viṣa,* providing detailed descriptions of its medicinal and surgical applications. It is recommended for wound cleansing (*vraṇa śodhana*) through preparations like *saṃśodhanī varṭī* and *śodhanān kalkān*[29]; and for *vraṇa śodhana cikitsā* (wound management).[30] It also finds use in *savarṇakaraṇa lepā* for restoring skin tone post-healing,[31] and in *lomaśātana lepā* (hair removal).[32] *Suśruta's* surgical uses also include those of many other conditions: *arśa* as a *lepā*[33]; *kuṣṭha* as *kuṣṭhahārī lepā*[34]; *śvitra* (vitiligo) as *śvitrahārī lepā*[35]; *upadaṃśa* (genital lesions) as *upadaṃśahara cūrṇa*.[36] Additional uses include treatment of *aruṇśikhā* (inflammatory scalp lesions)[37] and *ahipūtana cikitsā*[38] (snake bite treatment). The text also notes the inherent toxicity of *haritāla*, which it places in the group of *dhātuja viṣa*[39]; at the same time, its controlled application in cases like *lūṭādaṃśa cikitsā*[40] (spider bites treatment) (Shastri, 2010).

Another prominent foundational text of *Āyurveda*, namely *Aṣṭāṅga Hṛdaya* (sixth century CE), reports greater detail of orpiment's medical uses. The text documents its use as an ingredient in *tīkṣṇa dhūmpana*[41] (intense fumigation) therapy, and *kaphaja kāsa-roga*[42] (phlegm-based cough disorders). Additionally, it is part of *kāśīsādi taila*[43] used in *arśa cikitsā*. In addition, it is included in *dadru-nāśaka cūrṇa*[44] and *kuṣṭha-nāśaka lepā*[45] for different skin disorders. Orpiment also features in nasal treatments such as *ghrāṇa varṭī*[46] for *pūyarakta cikitsā* (nasal infections), and for wound-related conditions like *duṣṭa-vraṇa* and *nāḍī-vraṇa*[47] (sinus tracts). Other important formulations include *upadamśa cūrṇa-lepā*[48] for genital ulcers and *vṛścika daṃśa-nāśaka*[49] (scorpion sting antidote) (Tripathi, 2014).

[20] *Caraka saṃhitā*, *śūtrasthāna*, 1/71.
[21] Ibid, 3/5.
[22] Ibid, 3/12.
[23] Ibid, 5/26.
[24] *Caraka saṃhitā*, *cikitsāsthāna*, 7/114.
[25] Ibid, 9/66–67.
[26] Ibid, 14/56.
[27] Ibid, 17/77.
[28] Ibid, 26/196.
[29] *Suśruta-saṃhitā*, *sūtrasthāna*, 37/15.
[30] Ibid, *cikitsāsthāna*, 1/60.
[31] Ibid, 1/97.
[32] Ibid, 1/105.
[33] Ibid, 6/12.
[34] Ibid, 9/10.
[35] Ibid, 9/27.
[36] Ibid, 19/ 40,46.
[37] Ibid, 20/28.
[38] Ibid, 20/59.
[39] Ibid, *kalpasthāna*, 2/5.
[40] Ibid, 8/112.
[41] *Aṣṭāṅgahṛdaya*, *sūtrasthāna*, 21/18.
[42] Ibid, *cikitsāsthāna*, 3/68.
[43] Ibid, 8/15.
[44] Ibid, 19/67.
[45] Ibid, 19/70.
[46] Ibid, *uttarasthāna*, 20/24.
[47] Ibid, 30/22–24.
[48] Ibid, 34/4.
[49] Ibid, 37/40.

Haritāla has played an important role in traditional Indian medicine. In *rasaśāstra* it is classified in the *uparasa varga* (secondary minerals), although it finds little mention in the early layers of classical Ayurvedic texts. Ancient literature in these systems consistently warns against the use of crude *haritāla*, as it can produce severe toxic effects. These adverse effects are detailed in canonical texts such as *Rasārṇava, Rasaratna-samuccaya,* and *Rasaratnākara*. These include damage to the nervous system, urinary diseases (*prameha*), burning sensations (*dāha*), and muscular contractions (*liṅgasaṅkoca* and *aṅgasaṅkoca*) (Shankar, 2019; Madhava, 1913; Yashodhar, 1940; Ray, 1909). The descriptions in these texts reflect traditional practitioners' practical and empirical understanding of arsenic poisoning, which is in close agreement with findings presented in modern toxicology today (Nurchi et al., 2020). Elaborate methods of detoxification have been codified in classical Ayurvedic texts to mitigate these risks. These include *Rasārṇava* (Ray, 1985), *Rasaratnasamuccaya* (Shankar, 2019), *Rasaratnākara* (Shaligram, 2018), *Śārṅgadhara-Saṁhitā Madhyama-Khaṇḍa* (Tripathi, 2017), *Rasamañjarī* (15th Century CE) (Shalinath, 1962), *Rasendrasārasaṅgraha* (16th Century CE) (Prasad, 2019), *Āyurvedaprakāśa* (Mādhava, 1913), *Yogaratnākara* (18th Century CE) (Sharma, 1907), *Rasaprakāśasudhākara* (18th Century CE) (Yaśodhar, 1940), *Rasataraṅgiṇī* (19th Century CE) (Sharma, 1978), *Rasajālanidhi* (20th Century CE) (Mookerjee, 1984), *Rasendrapurāṇa* (20th Century CE) (Prasad, 2019a), *Rasāyanasāra* (twentieth century CE) (Vaishya, 2023) also discuss these processes in detail (Table 1). The most comprehensive description of the *śodhana* (purification) process is mentioned in *Rasārṇava*. In this, high-quality *haritāla* is selected. It is then pulverized and immersed in a *dolāyantra* in mediums such as bottle gourd juice, lime water, or sesame alkali. In more intensive processes, *haritāla* was steamed in *kūśmāṇḍa svarasa*

Table 1 Systematic analysis of *śodhana* methods of *haritāla* in classical *rasaśāstra* texts

Method	Ingredients used for purification
Svedana[a]	*Kuṣmāṇḍa svarasa*
Svedana[a]	*Cūrṇodaka* (lime water), *Kuṣmāṇḍa svarasa*, *Tila-kṣāra-jala* (alkaline water)
Svedana[a]	*Kuṣmāṇḍa svarasa*, *Kṣārodaka* (alkaline liquid), *Cūrṇodaka*
Svedana[a]	*Cūrṇodaka*, *Kuṣmāṇḍa svarasa*, *Tila taila* (*Sesamum indicum* Linn. oil)
Svedana[a]	Lime mixed *Kāñjī*, *Kuṣmāṇḍa svarasa*, *Tila taila*, *Triphalā kvātha*
Svedana[a]	*Kāñjī* (sour gruel), *Kuṣmāṇḍa svarasa*, *Tila taila*, *Triphalā kvātha*
Svedana[a]	*Kāñjī*, *Kuṣmāṇḍa svarasa*, *Godugdha* (cow's milk), *Vaṭa* (*Ficus benghalensis* latex)
Svedana[a]	*Ṭaṅkaṇa*, *Jambīrī svarasa*, *Kāñjī*, *Śālmalī svarasa* (*Salmalia malabarica (DC.) Schott & End*)
Svedana[a]	*Ṭaṅkaṇa*, *Jambīrī svarasa* (*Citrus limon* (L.) Burm.f.), *Kāñjī*
Svedana[a]	*Kāñjī*, *Kuṣmāṇḍa svarasa*, *Tila taila*, *Triphalā*, *Cūrṇodaka*
Svedana[a]	*Nimbū svarasa* (lemon juice)
Svedana[a]	*Kuṣmāṇḍa svarasa*, *Cūrṇodaka*, *Triphalā kvātha* (decoction of Indian gooseberry, chebulic myrobalan, and belleric myrobalan)
Svedana[a]	*Tila-kṣāra-jala*
Svedana[a]	*Śālmalīmūla kvātha* (*S. malabarica* root decoction)
Bhāvanā[a]	*Śālmalīmūla kvātha*
Bhāvanā[a]	*Cūrṇodaka*

[a] *Rasārṇava*/7/74
[a] *Rasaratnasamuccaya*/3/69
[a] *Rasaprakāśasudhākara*/6/5
[a] *Rasendrasārasaṅgraha Pūrvakhaṇḍa*/172
[a] Ibid, 176
[a] *Āyurveda Prakāśa*/5/9,10
[a] *Rasendrapurāṇa*/8/18–19
[a] Ibid, 8/20
[a] *Ānandakanda Kriyākaraṇaviśrāntiḥ*/1/52,53
[a] Ibid, 1/57,58
[a] *Rasataraṅgiṇī*/11/16
[a] Ibid, 11/19–20
[a] Ibid, 11/21–22
[a] Ibid, 11/23
[a] Ibid, 11/24
[a] Ibid, 11/25

(*Benincasa hispida* (Thunb.) Cogn juice) for 100 cycles to eliminate its toxicity (Ray, 1909; Ray, 1985). *Rasārṇava* also provides mineral classification. It includes two types called *patala tāla* (sheet-like) and *piṇḍa tāla* (mass-like). It mentions that *patala tāla* variety was preferred for medicinal use. This classification was based on empirical and observational criteria. For more advanced applications, *sattvapātana* (essence extraction) is reported in the text as a process wherein *haritāla* is mixed with tila (*Sesamum indicum* Linn.), *sarṣapa* (*Brassica juncea* (L.) Czern.), *śigru* (*Moringa oleifera* Lam.), *lākṣā* (*Laccifer lacca* Kerr.), *guḍa* (jaggery), and *ṭaṅkaṇa* (borax). This mixture is placed in a crucible and subjected to heating within a *bhūdhara yantra* to extract its essence (Ray, 1985). It follows that even substances considered most dangerous in nature can be transformed into powerful medicine through proper understanding and sophisticated processing.

2.5 Siddha medical traditions

In Tamil Siddha medical literature, orpiment is known by a wide range of names, including *aritāram*, *tāḷakam*, *pītaki*, *ālampi*, *piñcaṉam*, *kālputti*, *poṉ varṇi*, *caram*, *mañcaḷ varṇi*, *laṭcumi*, *māltevi*, *māṉmaṉai*, *mālpākam*, *piṭālakam*, *celkaṇṇi*, *mukakkāṭci*, *aricatti*, *catti*, *mālkanti*, and *kotantam*[50] (Thiyagarajan, 1981, p. 242). These diverse names reflect not just a central role of the mineral but also reveal the complexity of the cultural and medicinal contexts of orpiment within the Siddha Materia medica. *Aritāram* is presented in a riddle in the *vaittiya kallāṭam*[51] (Iramattaevar, 1937, p. 3) and *vaittiya cintāmani* 700 (Iramattaevar, 1951, p. 133), which contains the phrase "*māldevi*", meaning "the goddess of *māl*" (*māl* being a Tamil word for *Viṣṇu*), which is a charade for *aritāram*. Solving this riddle involves a semantic transformation. "*māl*" is considered equivalent to "*ari*" (the Sanskrit name for *Vishnu*, *Hari*), and "*tevi*" (goddess) corresponds to "*tāram*" (wife); all these put together form the term "*aritāram*", which in the Tamil Siddha tradition is the term for orpiment (Sambasivam Pillai, 1931, p. 2641; Kedzia-Warrick, 2023). In the great Siddha compendium, *aritāram*[52] is classified in the group of *pāṣāṇam* (mineral poisons) (Bogar, 1975, pp. 102–103, 203), where orpiment is divided into 32 natural and 32 synthetic types (Thiyagarajan, 1981, pp. 10–11); *tāḷakam* is listed in both categories.

The Siddha texts classify orpiment into various forms based on morphology and visual characteristics. These include flaky (*civanta aritāram*), granular (*karaṭṭaritāram*), and lamellar (*takaṭṭaritāram*), as well as the highly prized king's yellow (*pon aritāram*).[53] It was used for medicinal and cosmetic applications such as hair removal (Agathiyar, 1897, p. 86; Municchīreṭṭarkaḷ, 1926, pp. 331–332; Cettiyar, 1927, p. 147; Madhavan, 2003, p. 10). In addition, a synthetic variety known as *vaippu aritāram* has also been documented. It was usually prepared through controlled precipitation techniques (Bogar, 1975, p. 156).

Before medicinal use, *tāḷakam* had to undergo purification processes called *cutti*. These processes were necessary to detoxify the mineral. Similarly, the *cutti* process is also part of the preparation of Siddha formulations, such as *tāḷakam parpam*, *veḷḷai tāḷakam paṟpam*, *ceṇṭūram*, *cuṇṇam*, *kaṭṭu*, and *pataṅkam* (Serfoji, 1922, p. 116; Sahib, 1975, p. 82–114). In terms of medicinal value, the literature indicates that within the orpiment group, *piṇṭa tāḷakam*[54] has less medicinal potential than *pattira tāḷakam*.

The therapeutic use of orpiment in Siddha medicine is attested in ancient sources, including early Tamil Sangam literature. As early as the third-seventh century BCE, the poet Iṭaikkaḻi Nāṭṭu Nallūr Nattattaṉār referred to *tāḷakam* as a remedy for *naḷircuram* , a condition marked by fever and cold symptoms.[55] This clearly underlines the long-standing presence of mineral-based treatments in traditional Siddha medicine. *Haritāla* is also mentioned in the *Tirumantiram* in the context of *vasiyam* experiments (Thirumoolar, 1942, p. 120), indicating its esoteric and tantric uses.

Orpiment in both *Āyurveda* and *Siddha* medical traditions is considered to be inherently toxic, but after the process of purification, it is deemed medicinally safe and useful. Both traditions use a repeated grinding and incineration process to ensure the raw mineral is converted into medicine. Although the objective is the same in both systems, there are differences in implementation and terminology. *Siddha* and *Āyurveda* texts have both mentioned four types of *haritāla*; however, most *Rasaśāstra* treatises commonly describe only two types (*patra* and *piṇḍa haritāla*). The purification methods are considered similar in both systems. Various Siddha formulations include *cūṟṇam*, *paṟpam*, *kaṭṭu*, *kaḻaṅku*, *kuḻikai*, *ceṇṭūram*, *maṭṭirai*, *meḻuku*, *kuḻampu*, *karuppu, veṇṇey* and *mai*. Orpiment is used for respiratory, digestive, and skin disorders, tuberculosis, cancer, fever, cough, hair removal, hiccups, fainting, and wound healing in both the traditional systems of medicine. This is a testimony to the fact that, in both these traditional medicine systems of India, calcination of orpiment was explored as a drug with wide medicinal possibilities after proper purification.

[50] Gunapadam Thathu Jeeva Vaguppu.

[51] *Vaittiya Kallāṭam.*

[52] Bogar 7000.

[53] Agathiyar Perunool Vaiththiya Kaaviyam.

[54] Bogar. (1975). Bogar 7000. Third Part. Ed. P. Gangadhara Thevar. Palani: Thandayuthapani Devasthanam Publications.

[55] See Thiyagarajan (1981: 248–249) for the reference to *Iṭaikkaḻi Nāṭṭu Nallūr Nattattaṉār* on *tāḷakam* as a remedy for *Nalirsuram.*

3 Chinese contexts

During the Han Dynasty, when China was expanding its territory and developing philosophical systems, orpiment emerged as an important mineral which was called *cíhuáng* in Chinese. This mineral not only became a popular pigment in painting, but was also used prominently in scientific, medical, artistic, and spiritual works (Schafer, 1955). This section presents an analysis of the various uses of orpiment in Chinese history. Orpiment occurs naturally near hot springs globally, and major mines have also been located in China (Zhang et al., 1993). By the nineteenth century, China had become a major exporter of orpiment to Western markets, where it was known as “Chinese yellow” (Harley, 1982). Its high value and resemblance to gold are reflected in a well-known Chinese proverb: “*Four taels of orpiment yield a thousand taels of gold*” (Yü, 1988).

3.1 Alchemical texts

In the second century BCE, scholars of the Han Dynasty proposed a classificatory system for natural elements that included a unique gender-based identity for a pair of arsenic sulfides. The identity of Orpiment as "Female Yellow" was adopted, referencing its bright golden color, while Realgar was named the "Male Yellow" due to its orange-red appearance (Acker, 1954; Schafer, 1956). These minerals, which were often formed together in nature, fit well within China's framework of complementary forces. As Joseph Needham reports in his extensive work on the subject, gender classification was more commonly applied to plants than to minerals, which made the case of these arsenic sulfides stand out (Needham, 1974, p. 156). Also, by the early sixth century, the importance of orpiment was raised by the scholar T'ao Hung-ching, who described it as gold's "essence" or sperm (Schafer, 1955).

Chinese alchemists were particularly interested in the physical properties of orpiment and developed special tests to determine its quality. The lamellar structure of this mineral, i.e. its ease of division into thin layers, was analyzed in particular (Schafer, 1955). A notable fifth-century commentary states that "a mass of four taels may break into a thousand pieces", reflecting the keen observational abilities of scholars of the time and their fundamental understanding of orpiment's crystalline structure. As this knowledge developed over time, practical tests for assessing orpiment were devised by the Ming dynasty. These tests enriched laboratory methods and strengthened the scientific approach to the internal structure of minerals. In his classic Materia Medica, a simple but effective "streak test" was mentioned by *Lǐ Shízhen*, when the mineral was rubbed against the fingernail, a shiny golden mark would be left behind (Schafer, 1955). This experiment not only formed the link between the laboratory and medicine but also became a powerful means of connecting the academic knowledge acquired by scholars with practical experiments. In the T'ang dynasty, orpiment took on special symbolic names that also played a key role in alchemy. At that time, the mineral was known as "Blood of the Divine Woman", "Mid-month Moon at the Mystic Platform", "Blood of the Yellow Dragon," and "Yellow Security" (Schafer, 1955). These names, though symbolic, were not just decorative language. Deeply held beliefs about orpiment's ability to change forms and its sacred importance were expressed through them.

The mineral also became part of common expressions. Speakers with impressive skills were described as having "orpiment in the mouth," possibly due to its bright color or medicinal effects. The symbolic use of orpiment is also found in alchemical poetry:

> Behold, mother, when she has sons, she becomes a furnace and a vessel. At the time when the spirit of the sun and the essence of the moon are in a state of mutual influence, when one part sinks and the other part floats, the pearl will naturally fly. This black pearl will fly straight to the peak of Kun Lun (Maxwell-Stuart, 2008).

Through cosmological concepts, Chinese scholars explained the simultaneous presence of minerals such as orpiment and realgar in mines. Scholars believed that the "female" orpiment formed in areas with weaker solar (yang) energy, especially on slopes that lay in the shadow of mountains. Li Shízhen explained this natural pattern by suggesting that while both slopes received the male principle, it was more potent on the sunny side, leading to predominance of realgar there (Reed and Pak, 1938).

3.2 Alchemical practices

T'ao Hung-ching reported that, "*If gold-sperm is fumigated, it gives birth to Female Yellow*". This statement reflects the metaphorical depth of orpiment in Chinese alchemical philosophy. Li Shi-Chen later documented many applications of orpiment. Its use was described in gold-making, softening metals, drying mercury, transmuting sulfur, and neutralizing calomel. While he provided no detailed procedural descriptions, the central role of orpiment in both material experimentation and symbolic transmutation was suggested by the range of functions he attributed to it (Schafer, 1955; Needham, 1974, p. 254). In his comparative studies, Joseph Needham observed intriguing parallels between Chinese and Roman alchemical traditions. For instance, Pliny's report of Emperor Caligula's large-scale processing of orpiment for gold extraction is similar to Chinese alchemical procedures (Needham, 1974, p. 255). In both cultures, silver was known to acquire a golden appearance when coated

with orpiment and exposed to gentle heat. However, this process did not result in the actual conversion of metals. Instead, a thin sulfide film formed on the surface, creating the visual illusion of gold. Today, this phenomenon is scientifically understood as thin-film interference, a surface effect rather than a true metallurgical transformation (Needham, 1974, p. 255; Thornton, 2000). Additionally, alchemists of the Han dynasty experimented with arsenic-copper alloys, leading to the observation of a golden sheen. These alloys, likely applied in both practical and symbolic contexts, were regarded as promising materials for achieving artificial transmutation. The Pao Tsang Lun (c. 918 CE) described such procedures in more detail. When orpiment was heated under low-oxygen conditions, transformations such as silver into gold (*tien yin chhêng chin*) and copper into silver (*tien thung chhêng yin*) were allegedly achieved. This process, termed projection, has been interpreted by Needham as referring to surface-level changes, including sulfide film formation and the creation of silvery arsenical copper, rather than actual changes in elemental composition (Needham, 1974, pp. 256, 277). In both Chinese and Roman contexts, orpiment was perceived as more than just a material; it was also perceived as a conceptual bridge between illusion and transformation. Whether used to simulate the lustrous appearance of gold or as part of mystical processes claiming to achieve real transmutation, orpiment played a key role in the experimental traditions of early science.

3.3 Artistic and architectural uses

Important orpiment deposits were distributed across ancient China, including regions that correspond today to southeastern Gansu (formerly Wu-tu, Ch'ou-ch'ih, Chieh, and Ch'eng), northwestern Suzhou, Tz'u-li in Hunan, Menghua and Dali in Yunnan, Yeh-lang in Guizhou, Tzu in Shandong, and Hsin in Sichuan (Read & Pak, 1938). The mineral was embedded into various regional practices through this geographical spread while maintaining a shared symbolic and practical identity throughout the empire. While direct evidence of prehistoric orpiment use in China is lacking, textual records offer compelling clues. One account tells of a man whose house was painted using arsenic sulfide, a practice believed to have given rise to the term "Yellow Hall." This anecdote may also indicate early mining activity in the Tz'u-li region (Schafer, 1955). By the fifth and sixth centuries CE, artists began to select specific sources for pigments.

Tao Hung-Ching preferred orpiment imported from Champa and the Trans-Ganges region, confirming the existence of early long-distance trade networks for art materials. Subsequently, the famous Tun-Huang cave paintings were discovered by Sir Aurel Stein, confirming the artistic use of mineral pigments, especially orpiment, in this period (Waley, 1931). During the Song Dynasty (960–1279 CE), Chinese painters developed a deeper understanding of chromaticity, which led to warnings about combining colours. In particular, it was recommended to avoid mixing orpiment with lead-based colours, because chemical interactions had been identified that were later confirmed by modern science. Most contemporary orpiment pigment came mainly from Talifu in Yunnan province (Waley, 1931), which shows the persistence of certain mining traditions through different dynasties.

The orpiment's bright colour caught the eye of civilizations that did not include China. In ancient Egypt, this yellow pigment played a crucial role in sacred contexts. Its presence has been identified on the decorated sarcophagi of kings from the Eighteenth and Nineteenth Dynasties (Blom-Böer, 1994), where it played a role in the royal image. It has also been noted on the walls of Thutmose IV's tomb, which dates back to approximately 1400 BCE. Reports of its use have been found going as far back as the Twelfth Dynasty (Edwards et al., 2004). The presence of orpiment in Egyptian and Chinese tombs has demonstrated a connection between different cultures, where separate discoveries and uses of this remarkable mineral were made. In each culture, orpiment was placed into its own cosmological and practical systems, but underlying this was an interest in its golden brilliance and transformative potential, which was shared across geographical and temporal boundaries.

3.4 Medical applications and cultural beliefs

The dual character of orpiment, which is beautiful yet toxic, made it of great interest to Chinese medical practitioners. As early as the second century CE, the Shen-nung Pen-ts'ao Ching reported that orpiment was to be used for the treatment of ulcerations and, surprisingly, for baldness. Like its close relative realgar, orpiment was administered as an antidote to poisons, including venomous bites and harmful substances. This paradox, where a toxic compound is used to neutralize other toxins, reflects a foundational principle in early pharmacological logic (Schafer, 1955). It was proposed by Taoist researchers that orpiment should be used to "lightening the body" and prevent aging, which they viewed as connected to physical healing and spiritual transformation. Lei Hsiao set odd requirements for his pharmaceutical preparations in the fifth century. It was said that the mineral would become "black and deleterious" if contact was made with it by women, children, dogs, fornicators, cursed people, effeminate men, convicts, or unclean persons (Schafer, 1955). Medical applications of orpiment grew through time. In the fourth century, "female pills," which included orpiment, azurite, alum, and magnetite, which represented the cardinal colours, were prescribed by Ko Hung to go along with "male pills" for winter chills.

T'ao Hung-ching later documented its application in the treatment of nasal polyps, while Han Pao-sheng in the *Shu pen-ts'ao* (tenth century) prescribed it for spleen disorders, conditions linked at the time with the Earth element and the yellow color. By the time Li Shih-chen compiled his encyclopedic *Pen-ts'ao kang-mu*, orpiment had acquired numerous indications: epilepsy, abdominal pain, fevers, coughing, and blood disorders (Schafer, 1955). Beyond its general medicinal use, orpiment was believed to have aphrodisiac effects. Chinese pharmacological texts mention its role in treating impotence. The Tai-p'ing Hui Min Ho Chih Chu Fang (Standard Formularies of the Government Great Peace People's Welfare Pharmacies) included orpiment in a preparation known as Ssu Shen Tan ("Elixir of Four Magical Ingredients"), alongside realgar, cinnabar, and sulfur (Needham, 1974, p. 285). According to the Chêng Lei Pên Ts'ao, these ingredients were said to suppress appetite (pao chung pu chi), lighten the body (chhing shen), and prolong life (tsêng nien).

Needham also highlights the complex and often contradictory beliefs surrounding orpiment's toxicity. For instance, it was believed that gold found in locations where venomous snakes had shed their fangs or secreted venom was inherently poisonous. Such narratives placed natural gold within the same toxicological category as orpiment and realgar, especially in unrefined form. The Pen Ching even claimed that yellow gold was toxic, without distinguishing between refined and unrefined forms. In folk medicine, gold poisoning was considered analogous to snake venom poisoning and was thought to be curable through treatments derived from snakes themselves. These beliefs suggest a symbolic and material association between orpiment and reptilian toxins, where pharmacology and mythology coexisted (Needham, 1974, p. 62). In Chinese history, orpiment is not merely a pigment or poison; it is the journey of a substance across medicine, alchemy, spirituality, and culture.

4 European contexts

The term "Orpiment" comes from Latin *auripigmentum*, or "gold pigment". It is found in the writings of Roman authors Pliny (77 CE) and Vitruvius (first century BCE). They stated that the mineral was derived from the region of Pontus in northern Anatolia (Eastaugh et al., 2004; Merrifield, 1849). The Greek writer Theophrastus (c. 315 BCE) called it *arsenikon*, the source of the modern English word "arsenic" (Eastaugh et al., 2004). The pigment has been known by different names in different geographic regions and historical periods. Spanish sources call it *jalde* and *oropimente* (Merrifield, 1849). In the fifteenth-century French manuscript *Clarke MS 2790*, the names *Arzicon* or *Arsicon* were recorded. It was believed by Merrifield that these names were a distorted version of *arsenikon.* However, she also clarified that they must not be confused with the pigment *arzica*, which is remarkably different (Merrifield, 1849). By the eighteenth century, the pigment was popularized as "King's Yellow" (Dossie, 1764; Massoul, 1797). Weber (1923) classified it in the twentieth century under names such as *Koenigsgelb*, *Jaune royal*, and "Arsenic yellow". In the same context, "trisulfide of arsenic" was introduced as an alternative name by Terry (1893). He mentioned that its source was Hungary and the Harz Mountains, while Persia was known for the best quality "golden orpiment". In Arabic alchemical texts, orpiment and the related pigment realgar are referred to as "the two kings" or "king pigments," reflecting their chemical and artistic prestige (Crosland, 1962; Harley, 1982). Today, synthetic versions are known by such names as *Gelbe Arsenblende* and *Arsenic sulfuré jaune* (Fitzhugh, 1979).

The artistic importance of this pigment has historically been considered prominent. Its aesthetic qualities were highlighted by Roberts (1809), who called it "the most beautiful color we have" (Harley, 1982). The health effects of minerals and the pigments made from them were well known throughout European history (Eastaugh et al., 2004). In the famous European painting treatise *Il Libro dell'Arte*, a warning was issued that the ingestion of such pigments could cause harm to one's health. This simply meant that artists had to be cautious when using these substances. Orpiment chemically reacted with other pigments based on lead and copper (Weber, 1923; Fitzhugh, 1979). Nevertheless, it was used for some special purposes. One such example was heraldic designs in Europe, where it could be used alone and was less likely to cause reactions (Harley, 1982).

The use of orpiment was not confined to painting. It was also used in textile dyeing due to its sulfur content. In the nineteenth century, a new technique emerged in the form of "pencil blue". In traditional practices, orpiment was employed to dissolve indigo for dyeing purposes (Ure, 1840; Cardon, 2007; Lowengard, 2006). However, the development of dyeing techniques was hindered by practical difficulties. For example, Nicholson's 1856 Bookbinding Manual describes how indigo was boiled in sulfuric and hydrochloric acids to dye book borders blue (Nicholson, 1856). Today, sodium hydrosulfite is used in the chemical dyeing of indigo (Bektaş et al., 2016). It is possible that some of the earlier experiments with orpiment and indigo are examples of such early chemical methods. However, the method of directly dipping the borders of printed books into an indigo vat is not considered practical. No evidence is available that it was historically used. This makes it clear that both aesthetic and technical aspects had to be balanced in the use of substances such as orpiment.

Orpiment was the subject of one of the earliest alchemical experiments, first mentioned by Pliny (Forbes, 1965; Healy,

2004). The mineral, which was mined in Syria for painters, had a gold-like lustre on its surface but was glassy in texture, like selenite (Healy, 2004). Its golden sheen attracted the emperor Gaius Caligula, driven by his immense greed for gold. He ordered an elaborate experiment on the mineral, subjecting large quantities of orpiment to roasting or melting. Although the experiment produced some actual gold of high quality, the quantity was disappointingly small. Despite the relatively low price of orpiment—only four denarii per pound—the emperor suffered financial loss in the experiment, an endeavour fuelled solely by his greed (Forbes, 1965). Historical evidence indicates that following this failed attempt, neither Caligula nor his contemporaries repeated the experiment. The small amount of gold obtained, along with the unsuccessful outcome, discouraged further investigation into its alchemical potential.

Additionally, it is possible that the sample provided to the emperor had been deliberately mixed with gold, which may have heightened his expectations regarding the experiment (Forbes, 1965; Healy, 2004). While natural mineral deposits were the initial source of orpiment and realgar, synthetic production methods gradually emerged. At the start of the Early Renaissance, Cennini reported that he was unaware of natural deposits of orpiment, suggesting that synthetic versions may have been more prevalent in his experience (Cennini, 1954; Cennini, 1960; Eastaugh et al., 2004). By the eighteenth century, distinctions between natural and artificial varieties of these pigments became clearer. Authors like Dossie (1764) and de Massoul (1797) provided detailed instructions for what they termed "pure orpiment," a process that involved mixing sulfur and arsenic through sublimation (Eastaugh et al., 2004).

Regarding historical manufacturing methods, Wallert (1984) described two general approaches: the "dry process," which entailed heating the ingredients, and the "wet process," which involved chemical precipitation. It was noted that synthetic versions of these pigments often included arsenolite, a substance used as a base material for making orpiment. According to Harley (1982), synthetic orpiment was likely used more widely than its natural counterpart. Historically, the use of orpiment as a pigment dates back to the Middle and New Kingdom of Egypt (16th to eleventh centuries BCE), where it adorned wood-paneled coffins and stelae and even served cosmetic purposes (Colinart, 2001). Its brilliant color made it highly valuable for illuminating medieval manuscripts, including its famous presence in the Book of Kells (Mehan, 1994). Through the Renaissance, as artistic techniques evolved, orpiment continued to play a significant role in various applications. Derbyshire and Withnall (1999) report its use in Elizabethan miniatures, while Fitzhugh (1979) comprehensively analyzes its extensive presence in both Western and Eastern art up until the late nineteenth century. The issues with orpiment extended beyond health concerns. Roman authors, and later Cennino Cennini in the early fifteenth century, reported its poor suitability for fresco painting, noting that it turned black upon exposure to air.

Additionally, its chemical instability affected its usability in certain artistic contexts (Cennini, 1954; Cennini, 1960). Orpiment had a range of applications beyond art. It was used to protect manuscripts from insects and found use in post-excavation treatment of Egyptian papyri (Olsson et al., 2001). Historical cultures reused materials, sometimes using their toxic parts to help preserve items. The history of orpiment shows that these pigments were important in art and science across different cultures. People valued these pigments for their bright colors but also feared their toxicity. Artists recognized their beauty but sought ways to reduce health risks. These pigments were significant in various times and places, from ancient Egyptian tombs to Renaissance paintings and Chinese art, influencing modern names in science and art. Today, synthetic alternatives have largely replaced these toxic minerals in art, but their historical significance remains considerable. The story of arsenic pigments shows the balance between beauty and health concerns. Today, people continue to seek safer options that still look appealing, underscoring the enduring connection between health and beauty in art materials throughout history.

5 Summary

This study presents the use and understanding of orpiment in Indian, Chinese, and European civilizations in a simple yet analytical manner. In India, references to it were mentioned in religious texts, such as the *Mahābhārata*, and later found applications in medicine, cosmetics, paintings, and metallurgy. The category of *Uparasa varga* was used to classify it, and it was utilized as a medicinal substance. It is colourful and attractive on the one hand, and toxic and harmful to health on the other. The Indian and Chinese contexts describe it as a toxic mineral but also suggest it for medicinal uses. In terms of its use in painting, all three civilizations adopted it as a major yellow pigment, but also recognized that it is chemically incompatible with lead and copper-based pigments. Through experimentation, this technical knowledge was acquired. It was tried out by painters in their own cultural contexts, and similar conclusions were arrived at. These differences also appear in terms of symbolism and nomenclature. Poetic names like "yellow dragon's blood" were given to it in China, and in Europe, it was referred to by practical names such as "King's Yellow." These differences are not just semantics; they also reflect the aesthetic and cultural

values of the society in question. Orpiment was used in the metallurgical and alchemical processes of metal transmutation in India and China.

In China, it became associated with the theory of "*yin-yang*" and was known as "Female Yellow." It was also considered the essence of gold. Similarly, techniques for refining and manufacturing orpiment evolved spontaneously. In India and China, detailed refining processes and standards have been described. The European tradition approached it differently by dividing it into various categories of chemistry. However, in Europe, it was never used as a medicine. It was found to be used only in paintings, textile dyeing, and the preservation of manuscripts. These differences depend on what the society's technical requirements were, and what other resources were available.

Although, from the medieval to the modern periods, it was considered a beautiful but dangerous pigment in the European context. Since the time of the Roman emperor Caligula, it was known as 'gold paint' or *auripigmentum* in Europe. In all these instances, a common mental tendency is being demonstrated, which is called "analogical reasoning" in cognitive science. This means that objects that look similar are assumed to have similar properties. The study showed that all three cultures recognized the dual nature and appealed to the golden color of this mineral in almost identical ways. This similarity is seen because the physical and chemical nature of orpiment remains the same for every human experience. Arsenic-induced poisoning causes effects that are observed to be almost identical for all. This can be called "material universals". It is also important to understand that similarities did not just come from the transfer of knowledge from one another, but also evolved independently. Both goods and knowledge moved from one culture to another along trade routes such as the Silk Road. For example, the fact that orpiment was known in Europe as 'Chinese Yellow' shows that some knowledge came from China. Yet, many similarities also arose because when people work with the same natural substance, they arrive at similar conclusions.

The chemical and physical limitations of orpiment are the same for every experimenter. Thus, physical and mental universality often leads to the development of similar technical understandings. It finally becomes clear that the development of knowledge is both universal and cultural at the same time. On the one hand, the basic properties of matter, human sensibility, cognitive tendencies, and practical needs are the same in all societies. Also, each society has its own philosophical framework, cultural symbols, technological resources, and value system, which shape that knowledge in a distinctive way.

6 Footnotes details:

1. नानाप्रस्रवणेभ्यश्च वारिधाराः पतन्ति च । भास्कराभप्रभा भीमाः शारदाभ्रघनोपमाः॥ शोभयन्ति महाशैलं नानारजतधातवः ॥ क्वचिदञ्जनवर्णाभाः क्वचित्काञ्चनसन्निभाः। धातवो हरितालस्य क्वचिद्धिङ्गुलकस्य च ॥ मनःशिलागुहाश्चैव संध्याभ्रनिकरोपमाः। शशलोहितवर्णाभाः क्वचिद्गैरिकधातवः ॥ सितासिताभ्रप्रतिमा बालसूर्यसमप्रभाः। एते बहुविधाः शैलं शोभयन्ति महाप्रभाः

   nānāprasravaṇebhyaśca vāridhārāḥ patanti ca । Bhāskarābhaprabhā bhīmāḥ śāradābhraghanopamāḥ । śobhayanti mahāśailaṁ nānārajatadhātavaḥ ॥ kvacid añjanavarṇābhāḥ kvacit kāñcanasannibhāḥ । dhātavo haritālasya kvacid dhiṅgulakasya ca ॥ manaḥśilāguhāś caiva saṁdhyābhranikaropamāḥ । śaśalohitavarṇābhāḥ kvacid gairikadhātavaḥ ॥ sitāsitābhrapratimā bālasūryasamaprabhāḥ । ete bahuvidhāḥ śailaṁ śobhayanti mahāprabhāḥ ॥

2. रङ्गद्रव्याणि कनकं रजतं ताम्रमेव च ॥

   अभ्रकं गजवन्तं च सिन्दूरं त्रपुरेव च ॥
   हरितालं सुधा लाक्षा तथा हिङ्गुलकं नृप ॥
   नीलं च मनुजश्रेष्ठ तथान्ये सन्त्यनेकशः ॥

   raṅgadravyāṇi kanakaṁ rajataṁ tāmrameva ca ॥ abhrakaṁ gajavantaṁ ca sindūraṁ trapureva ca ॥ haritālaṁ sudhā lākṣā tathā hiṅgulakaṁ nṛpa ॥ nīlaṁ ca manujaśreṣṭha tathānye santyanekaśaḥ ॥

3. अथ दारू पीतवर्णान् गिरिनद्यादिसम्भवान् ।

   आदाय शुद्धतोयेन संक्षाल्यादौ विचूर्णयेत् ॥
   शुद्धतोयैर्महापात्रे मुहूर्त प्रतिपालयेत् ॥
   तदूर्ध्वांशं सारतोयमधः पङ्कविवर्जितम् ।
   पात्रान्तरे विनिक्षिप्य पुनः कुर्यादमुं विधिम् ॥
   एवं पुनः पुनः कृत्वा यावन्निर्मलता भवेत् ।
   तत्सारं नवमृद्भाण्डे मन्दमालिप्य शोषयेत् ॥
   ग्रीष्मातपेषु विधिवद् भूयो भूयो महामतिः ।
   आलोड्य शुद्धतोयेषु शोषयेच्छुद्धिमच्छिक ॥
   एवमेव समानीय रक्ते धातूनपि क्रमात् ।
   निर्मलत्वे समुत्पन्ने शोषयेदेवमेव हि ॥

   atha dārū pītavarṇān girinadyādisambhavān । ādāya śuddhatoyena saṁkṣālyādau vicūrṇayet ॥ mandaṁ kiñcic chilāpṛṣṭhe peṣayitvā viloḍya ca । śuddhatoyair mahāpātre muhūrta pratipālayet ॥ tad ūrdhvāśaṁ sāratoyam adhaḥ paṅkavivarjitam । pātrāntare vinikṣipya punaḥ kuryādamuṁ vidhim ॥ evaṁ punaḥ punaḥ kṛtvā yāvan nirmalatā bhavet । tatsāraṁ navamṛdbhāṇḍe mandam ālipya śoṣayet ॥ grīṣmātapeṣu vidhivad bhūyo bhūyo mahāmatiḥ । āloḍya śuddhatoyeṣu śoṣayec chuddhimacchikaḥ ॥ evameva samānīya rakte dhātūn api kramāt । nirmalatve samutpanne śoṣayed evam eva hi ॥

4. तदेव नृणां वर्णः स्यात् कृष्णं पीतसमं तु वा ।

हरितालं श्यामयुतं शुकपक्षनिभं भवेत् ॥
tadeva nṛṇāṁ varṇaḥ syāt kṛṣṇaṁ pītasamaṁ tu vā |
haritālaṁ śyāmayutaṁ śukapakṣanibhaṁ bhavet ‖

5. पीतेषु हरितालं स्यात् कृष्ण कज्जलमिष्यते|

शुद्धा वर्णा इमे प्रोक्ताश्चत्वारश्चित्रसंश्रयाः॥
pīteṣu haritālaṁ syāt kṛṣṇa kajjalam iṣyate |
śuddhā varṇā ime proktāś catvāraś citrasaṁśrayāḥ ‖

6. हरितालं शवयुत चोरेश्च सदृशप्रभम् ।

कज्जलं शवसम्मिश्रं धूम्रच्छायं निरूपितम् ॥
haritālaṁ śavayutaṁ coreśva sadṛśaprabham |
kajjalaṁ śavasammiśraṁ dhūmracchāyaṁ nirūpitam ‖

7. केवलैव हि या नीली भवेदिन्दीवरप्रभा ।

हरितालेन मिश्रा चेजायते हरितच्छविः ॥
kevalaiva hi yā nīlī bhaved indīvaraprabhā |
haritālena miśrā ce jāyate haritacchaviḥ ‖

8. अथाङ्गुलिभ्यां हरितालमाद्रं माङ्गल्यमादाय मनःशिलां च ।

कर्णावसक्तामलदन्तपत्त्रं माता तदीयं मुखमुन्नमय्य ॥
उमास्तनोद्भेदमनुप्रवृद्धो मनोरथो यः प्रथमं बभूव ।
तमेव मेना दुहितुः कथञ्चिद्विवाहदीक्षातिलकं चकार ॥
athāṅgulibhyāṁ haritālam ādraṁ māṅgalyam ādāya manaḥśilāṁ ca |
karṇāvasaktāmaladantapatraṁ mātā tadīyaṁ mukham unnamayya ‖
umāstanodbhedam anupravṛddho manoratho yaḥ prathamaṁ babhūva |
tameva menā duhituḥ kathañcid vivāhadīkṣātilakaṁ cakāra ‖

9. अन्धमूषागतं ध्मातं जरादारिद्र्यनाशनम् ।

गन्धकं तालपिष्टं च रसं बीजेन मर्दयेत् ॥
भूमिस्थं मासमेकेन धारयेत्तद्विचक्षणः ।
अन्धमूषागतं ध्मातं तारलेपेन काञ्चनम् ॥
andhamūṣāgataṁ dhmātaṁ jarādāridryanāśanam |
gandhakaṁ tālapiṣṭaṁ ca rasaṁ bījena mardayet ‖
bhūmisthaṁ māsam ekena dhārayet tad vicakṣaṇaḥ |
andhamūṣāgataṁ dhmātaṁ tāralepena kāñcanam ‖

10. विषोदकं गन्धकञ्च हरिबीजञ्च तत्सम्म् ।

अजामूत्रे तु संश्लिष्टं शुल्वपत्राणि लेपयेत् ॥
पुटपाकेन देवेशि दिव्यं भवति काञ्चनम् ।
अनेनैव विधानेन नागपत्राणि लेपयेत् ।
पुटेन जायते स्वर्णमिन्द्रगोपकसन्निभम् ॥
viṣodakaṁ gandhakaṁ ca haribījaṁ ca tatsamam |
ajāmūtre tu saṁśliṣṭaṁ śulvapatrāṇi lepayet |
puṭapākena deveśi divyaṁ bhavati kāñcanam |
anenaiva vidhānena nāgapatrāṇi lepayet ‖
puṭena jāyate svarṇam indragopakasannibham ‖

11. तालक चोतमं प्राप्य त्रिषु लोकेषु दुर्लभम् ।

तालं संगृह्य मेधावी प्रक्षाल्य तण्डुलाम्भसा ॥
एवं संसाध्य यत्नेन पिष्ट्वा तण्डुलषष्टिभिः ।
प्रक्षिप्योदकभाण्डेषु सुश्लिष्टमवतारयेत् ॥
tālaka cotamaṁ prāpya triṣu lokeṣu durlabham |
tālaṁ saṁgṛhya medhāvī prakṣālya taṇḍulāmbhasā ‖
evaṁ saṁsādhya yatnena piṣṭvā taṇḍulaṣaṣṭibhiḥ |
prakṣipyo dakabhāṇḍeṣu suśliṣṭam avatārayet ‖

12. निम्बकाष्ठं समुद्दत्य सच्छिद्रं कारयेद्भधः ।

तालं संस्थाप्य तन्मध्ये गोष्ठे च निखनेत्त्विदम ॥
मासादूर्ध्वं समुद्धत्य सूतेन सह मर्दयेत् ।
ताम्बूलैर्मासमेकैकं भक्षयेत्तु दिने दिने ॥
nimbakāṣṭhaṁ samudṛtya sacchidraṁ kārayed vadhaḥ |
tālaṁ saṁsthāpya tanmadhye goṣṭhe ca nikhanet tv idam ‖
māsād ūrdhvaṁ samuddhṛtya sūtena saha mardayet |
tāmbūlair māsam ekaikaṁ bhakṣayet tu dine dine ‖

13. तालकं सूतकञ्चैव एकीकृत्य विमर्दयेत् ।

धान्यराशौ विनिक्षिप्य मासेनाग्निसहो भवेत् ॥
तत उद्धृते मुखे क्षिप्रं सद्यः खेचरतां नयेत् ।
तालकं पाचयेद्यस्तु गोमयं च समाहिषम् ॥
tālakaṁ sūtakaṁ caiva ekīkṛtya vimardayet |
dhānyarāśau vinikṣipya māsenāgnisaho bhavet ‖
tata uddhṛte mukhe kṣipraṁ sadyaḥ khecaratāṁ nayet ‖
tālakaṁ pācayed yastu gomayaṁ ca samāhiṣam |

14. यस्तु दधिपयोयुक्तं मर्दतिं लोहभाजने ।

तालकं सुरसेकेन दत्वा च खर्परे पुनः ॥
छगणेनाग्निं संधुक्ष्य पञ्चमाहिषसंयुतम् ।
तालकं पाचवेत्तावद्यावनिर्गन्धतां व्रजेत॥
तत उद्धृत्य पुनर्बद्धं बीजपूररसेन तत् ।
पारदेनैव संयुक्तमेकं कृत्वा विमर्दयेत् ॥
नष्टपिष्टं भवेत्तावद्यावत्स्वेद्यं दिनत्रयम् ।
तेनैव चाष्टमांशेन शुल्वं वेधेन वेधयेत् ॥
नरेन्द्र सुरया सिक्तं शुल्वं तारं करोति च ।
तालकेन रसं बद्धं मातुलुङ्ग पचेद्भधः ॥
प्रस्थं तु भक्षयेत्प्राज्ञो मासैकेन सुमन्त्रितम् ।
ताम्बूलं पीतया युक्तं सीसके शुल्वकेऽपि च ।
काञ्चनं कुरुते दिव्यं पुटेन तु न संशयः ॥
yastu dadhipayoyuktaṁ marditaṁ lohabhājane ‖
tālakaṁ surasekena datvā ca kharpare punaḥ ‖
chagaṇenāgniṁ saṁdhukṣya pañcamāhiṣasaṁyutam |

tālakaṁ pācavettāvad yāvan nirgandhatāṁ vrajet ‖
tata uddhṛtya punar baddhaṁ bījapūrarasena tat |
pāradenaiva saṁyuktam ekaṁ kṛtvā vimardayet ‖
naṣṭapiṣṭaṁ bhavet tāvad yāvat svedyaṁ dinatrayam |
tenaiva cāṣṭamāṁśena śulvaṁ vedhena vedhayet ‖
narendra surayā siktaṁ śulvaṁ tāraṁ karoti ca |
tālakena rasaṁ baddhaṁ mātuluṅga paced vadhaḥ ‖
prasthaṁ tu bhakṣayet prājño māsaikena sumantritam |
tāmbūlaṁ pītayā yuktaṁ sīsake śulvake'pi ca ‖
kāñcanaṁ kurute divyaṁ puṭena tu na saṁśayaḥ ‖

15. ताराकृष्टिं वक्ष्ये मृतवङ्गं तालकेन तुल्यांशम्।

लम्बितमथ निर्ध्मातं ताम्रं तारच्छविं वहति॥
tārākṛṣṭiṁ vakṣye mṛtavaṅgaṁ tālakena tulyāṁśam |
lambitam atha nirdhmātaṁ tāmraṁ tāracchaviṁ vahati ‖

16. रुदन्तीस्वरसेनैव मर्दयेद्धरितालकम् ।

ताम्रपत्रं प्रलेपेन दिव्यं भवति काञ्चनम्॥
rudantīsvarasenaiva mardayed haritālakam |
tāmrapatraṁ pralepena divyaṁ bhavati kāñcanam ‖

17. तालं ताप्यं दरदकुनटी सूतकं सार्द्धभागं ।

खल्वे कृत्वा त्रिदिनमथितं काकमाचीद्रवेण॥
तेनालेप्यं रविशशिदलं खर्परे वह्नितप्तम् ।
शुल्वातीतं भवति कनकं सम्वलं पाथिकानाम्॥
tālaṁ tāpyaṁ daradakunaṭī sūtakaṁ sārdhabhāgaṁ |
khalve kṛtvā tridinam athitaṁ kākamācīdraveṇa ‖
tenālepyam raviśaśidalaṁ kharpare vahnitaptam |
śulvātītaṁ bhavati kanakaṁ saṁvalaṁ pāthikānām ‖

18. तालं तुल्यां शिलां पिष्ट्वा देवदालीद्रवैर्दिनम्।

द्रावैरीश्वरलिंग्याश्च दिनमेकं विमर्दयेत्॥
नागं वङ्गं रसं तुल्यं चूर्णितं पलपञ्चकम्।
पूर्वकल्केन संयुक्तं समालोड्य घृते पुटेत्॥
एवं पुनः पुनः पाच्यं पूर्वकल्केन संयुतम्।
भवेत् षष्टिपुटैः शीघ्रं वङ्गस्तम्भकरं परम्॥
शतभागेन दातव्यं वङ्गं तारं करोत्ययम्॥
tālaṁ tulyāṁ śilāṁ piṣṭvā devadālīdravair dinam |
drāvair īśvaraliṅgyāś ca dinam ekaṁ vimardayet ‖
nāgaṁ vaṅgaṁ rasaṁ tulyaṁ cūrṇitaṁ palapañcakam |
pūrvakalkena saṁyuktaṁ samāloḍya ghṛte puṭet ‖
evaṁ punaḥ punaḥ pācyaṁ pūrvakalkena saṁyutam |
bhavet ṣaṣṭipuṭaiḥ śīghraṁ vaṅgastambhakaraṁ param ‖
śatabhāgena dātavyaṁ vaṅgaṁ tāraṁ karotyayam ‖

19. पर्वतानां अभिज्ञात उद्देशानां बिलगुह उपत्यकालयनगूढखातेष्वन्तः प्रस्यन्दिनो जम्बूचूततालफलपक्वहरिद्राभेदगुड हरितालमनःशिला क्षौ द्र हि ङ्गु लु क पु ण्ड री क शु क म यू र प त्र व र्णाः स व र्ण उदकोषधिपर्यन्ताश्चिक्कणा विशदा भारिकाश्च रसाः काञ्चनिकाः ॥
parvatānāṁ abhijñāta uddeśānāṁ bilaguha upatyakālaya-nagūḍa-khāteṣv antaḥ prasyandino jambū-cūta-tāla-phalapakva-haridrā-bheda-guḍa-haritāla-manaḥśilākṣaudra-hiṅguluka-puṇḍarīka-śuka-mayūra-pattra-varṇāḥ savarṇa udakoṣadhi-paryantāś cikkaṇā viśadā bhārikāś ca rasāḥ kāñcanikāḥ|

20. सुवर्णं समलाः पञ्च लोहाः ससिकताः सुधा।

मनःशिलाले मणयो लवणं गैरिकाञ्जने॥
suvarṇaṁ samalāḥ pañca lohāḥ sasikatāḥ sudhā |
manaḥśilāle maṇayo lavaṇaṁ gairikāñjane ‖

21. वचा हरेणुस्त्रिवृता निकुम्भो भल्लातकं गैरिकमञ्जनं च।

मनःशिलाले गृहधूम एला काशीसलोध्रार्जुनमुस्तसर्जाः॥
vacā hareṇus trivṛtā nikumbho bhallātakaṁ gairika-mañjanaṁ ca |
manaḥśilāle gṛhadhūma elā kāśī-salodhrārjunamustasarjāḥ ‖

22. मनःशिलाले मरिचानि तैलमार्कं पयः कुष्ठहरः प्रदेहः।

तुत्थं विडङ्गं मरिचानि कुष्ठं लोध्रं च तद्वत् समनःशिलं स्यात् ॥
manaḥśilāle maricāni tailam ārkaṁ payaḥ kuṣṭhaharaḥ pradehaḥ |
tutthaṁ viḍaṅgaṁ maricāni kuṣṭhaṁ lodhraṁ ca tadvat samanāḥśilaṁ syāt ‖

23. श्वेता ज्योतिष्मती चैव हरितालं मनःशिला॥

गन्धाश्चागुरुपत्राद्या धूमं मूर्धविरेचने ॥
śvetā jyotiṣmatī caiva haritālaṁ manaḥśilā |
gandhāś cāgurupatrādyā dhūmaṁ mūrdhavirecane ‖

24. हरितालमवाक्पुष्पी तुत्थं कम्पिल्लकोऽमृतासञ्ज्ञः।

सौराष्ट्री कासीसं दार्वीत्वक् सर्जिकालवणम्॥
haritālam avākpuṣpī tutthaṁ kampillako'mṛtāsaṁjñaḥ |
saurāṣṭrī kāsīsaṁ dārvītvak sarjikālavaṇam ‖

25. शिरीषबीजं चोन्मादग्रहापस्मारनाशनम् ।

पिष्ट्वा तुल्यमपामार्गं हिङ्ग्वालं हिङ्गुपत्रिकाम्॥
वार्तिः स्यान्मरिचार्धांशा पित्ताभ्यां गोशृगालयोः।
तयाऽञ्जयेदपस्मारभूतोन्मादज्वरार्दितान्॥
śirīṣabījaṁ conmāda-grahāpasmāra-nāśanam |
piṣṭvā tulyam apāmārgaṁ hiṅgvālaṁ hiṅgupatrikām ‖
vārtiḥ syān maricārdhāṁśā pittābhyāṁ gośṛgālayoḥ |
tayā 'ñjayed apasmārabhūto unmādajvarārditān ‖

26. प्रलेपः स्यादलं कोष्णं वासन्तकवसायुतम्।

शूलश्वयथुहृद्युक्तं चुलूकीवसयाऽथवा॥
pralepaḥ syād alaṁ koṣṇaṁ vāsantaka-vasāyutam |
śūla-śvayathu-hṛdyuktaṁ culūkī-vasayā 'thavā ‖

27. लीनश्चेद्दोषशेषः स्याद्धूमैस्तं निर्हरेद्बुधः।

हरिद्रां पत्रमेरण्डमूलं लाक्षां मनःशिलाम्॥
सदेवदार्वलंमांसीं पिष्ट्वा वर्तिं प्रकल्पयेत् ।
तां घृताक्तां पिबेद्धूमं यवैर्वा घृतसंयुतैः॥
līnaśceddoṣaśeṣaḥ syāddhūmaistaṁ nirharedbudhaḥ |
haridrāṁ patram eraṇḍa-mūlaṁ lākṣāṁ manaḥśilām ‖
sa-devadāru-valmāṁsīṁ piṣṭvā vartiṁ prakalpayet |
tāṁ ghṛtāktāṁ pibed dhūmaṁ yavair vā ghṛtasaṁyutaiḥ ‖

28. मनःशिला यवक्षारो हरितालं ससैन्धवम् ।

दार्वीत्वक् चेति तच्चूर्णं माक्षिकेण समायुतम्॥
मूर्च्छितं घृतमण्डेन कण्ठरोगेषु धारयेत् ।
मुखरोगेषु च श्रेष्ठं पीतकं नाम कीर्तितम् ।
इति पीतकचूर्णम् ॥
manaḥśilā yavakṣāro haritālaṁ sa-saindhavam |
dārvītvak ceti taccūrṇaṁ mākṣikeṇa samāyutam ‖
mūrcchitaṁ ghṛtamaṇḍena kaṇṭharogeṣu dhārayet |
mukharogeṣu ca śreṣṭhaṁ pītakaṁ nāma kīrtitam ‖
iti pītakacūrṇam ‖

29. अजगन्धाऽजशृङ्गी च गवाक्षी लाङ्गलाह्वया ।

पूतीकश्चित्रकः पाठा विडङ्गैलाहरेणवः ॥
कटुत्रिकं यवक्षारो लवणानि मनःशिला ।
कासीसं त्रिवृता दन्ती हरितालं सुराष्ट्रजा ॥
संशोधनीनां वर्तीनां द्रव्याण्येतानि निर्दिशेत् ।
ajagandhā'jaśṛṅgī ca gavākṣī lāṅgalāhvayā |
pūtīkaś citrakaḥ pāṭhā viḍaṅgailā-hareṇavaḥ ‖
kaṭutrikaṁ yavakṣāro lavaṇāni manaḥśilā |
kāsīsaṁ trivṛtā dantī haritālaṁ saurāṣṭrajā ‖
saṁśodhanīnāṁ vartīnām dravyāṇyetāni nirdiśet ‖

30. तैलेनाशुध्यमानानां शोधनीयां रसक्रियाम् ॥

व्रणानां स्थिरमांसानां कुर्याद्द्रव्यैरुदीरितैः ।
कषाये विधिवत्तेषां कृते चाधिश्रयेत् पुनः ॥
सुराष्ट्रजां सकासीसां दद्याच्चापि मनःशिलाम् ।
हरितालं च मतिमांस्ततस्तामवचारयेत् ॥
tailenāśudhyamānānāṁ śodhanīyāṁ rasakriyām ‖
vraṇānāṁ sthiramāṁsānāṁ kuryād dravyair udīritaiḥ |
kaṣāye vidhivat teṣāṁ kṛte cādhiśrayet punaḥ ‖
saurāṣṭrajāṁ sa-kāsīsāṁ dadyāc cāpi manaḥśilām |
haritālaṁ ca matimāṁs tataḥ tām avacārayet ‖

31. कपित्थमुद्धृते मांसे मूत्रेणाजेन पूरयेत् ।

कासीसं रोचनां तुत्थं हरितालं मनःशिलाम् ॥

kapittham uddhṛte māṁse mūtreṇājena pūrayet |
kāsīsaṁ rocanāṁ tutthaṁ haritālaṁ manaḥśilām ‖

32. शङ्खचूर्णस्य भागौ द्वौ हरितालं च भागिकम् ।

शुक्तेन सह पिष्टानि लोमशातनमुत्तमम्॥
śaṅkhacūrṇasya bhāgau dvau haritālaṁ ca bhāgikam |
śuktena saha piṣṭāni lomaśātanam uttamam ‖

33. अ त ऊ र्ध्व म र्श सा मा ले पा न् व क्ष्या मः - स्नुहीक्षीरयुक्तं

हरिद्राचूर्णमालेपः प्रथमः, कुक्कुटपुरीषगुञ्जाहरिद्रापिप्पलीचूर्ण मिति गोमूत्रपित्तपिष्टो द्वितीयः, दन्तीचित्रकसुवर्चिकालाङ्गलीक ल्को वा गोपित्तपिष्टस्तृतीयः, पिप्पलीसैन्धवकुष्ठशिरीषफलकल् कः स्नुहीक्षीरपिष्टोऽर्कक्षी

रपिष्टो वा चतुर्थः, कासीसहरितालसैन्धवाश्वमारकविडङ्गपूतीक कृतवेधनजम्ब्वर्कोत्तमारणीदन्तीचित्रकालर्कस्नुहीपयःसु

तैलं विपक्वमभ्यञ्जनेनार्शः शातयति ॥

ata ūrdhvam arśasām ālepān vakṣyāmaḥ snuhīkṣīra-yuktaṁ haridrācūrṇam ālepaḥ prathamaḥ,

Kukkuṭapurīṣa-guñjā-haridrā-pippalīcūrṇam iti gomūtra-pitta-piṣṭo dvitīyaḥ, dantī-citraka-suvarcikā-lāṅgalī-kalko vā gopitta-piṣṭas tṛtīyaḥ, pippalī-saindhava-kuṣṭha-śirīṣaphala-kalkaḥ snuhīkṣīra-piṣṭo 'rka-kṣīra-piṣṭo vā caturthaḥ, kāsīsa-haritāla-saindhava-aśvamāraka-viḍaṅga-pūtīka-kṛtavedhana-jambū-arka-uttamāraṇī-dantī-citraka-ālarka-snuhī-payaḥsu tailaṁ vipakvam abhyañjanena arśaḥ śātayati ‖

34. स्वर्जिकातुत्थकासीसविडङ्गागारधूमचित्रककटुकसुधाहरिद्रासैन् धवकल्कै

र्वा, एतान्येवावाप्य क्षारकल्पेन निःस्रुते पालाशे क्षारे

ततो विपाच्य

फाणीतमिव सञ्जातमवतार्य

ले प ये त्, ज्यो ति ष्क फ ल ला क्षा म रि च पि प्प ली सु म नः प त्रै र्वा, हरितालमनःशिलार्कक्षी

रतिलशिग्रुमरिचकल्कैर्वा, स्वर्जिकाकुष्ठत

ुत्थकुटजचित्रकविडङ्गमरिचरोध्रमनःशिलाकल्कैर्वा, हरीतकीकर ञ्जिकाविडङ्गसिद्धार्थकलवणरोचनावल्गुजहरिद्राकल्कैर्वा ॥

svarjikā-tuttha-kāsīsa-viḍaṅga-āgāra-dhūma-citraka-kaṭuka-sudhā-haridrā-saindhava-kalkair vā |

Etānyevāvāpya kṣārakalpena niḥsrute pālāśe kṣāre tato vipācya phāṇītam iva sañjātam avatārya lepayet | jyotiṣkaphala-lākṣā-marica-pippalī-sumanaḥpatrair vā | haritāla-manaḥśilā-arka-kṣīra-tila-śigru-marica-kalkair vā | svarjikā-kuṣṭha-tuttha-kuṭaja-citraka-viḍaṅga-marica-rodhra-manaḥśilā-kalkair vā | harītakī-karañjaka-viḍaṅga-siddhārtha-kalavaṇa-rocanā-valguja-haridrā-kalkair vā ‖

35. तुत्थालकटुकाव्योषसिंहार्कहयमारकाः ।

कुष्ठावल्गुजभल्लातक्षीरिणीसर्षपाः स्नुही ॥
तिल्वकारिष्टपीलूनां पत्राण्यारग्वधस्य च ।
बीजं विडङ्गाश्वहन्त्रोर्हरिद्रे बृहतीद्वयम् ॥
आभ्यां श्वित्राणि योगाभ्यां लेपान्नश्यन्त्यशेषतः ॥
tutthāla-kaṭuka-āvyosha-siṁhārka-hayamārakāḥ |
kuṣṭha-valguja-bhallātaka-kṣīriṇī-sarṣapāḥ snuhī ‖
tilvaka-āriṣṭa-pīlūnāṁ patrāṇy aragvadhāsya ca |
bījaṁ viḍaṅgāśvahantror haridre bṛhatī-dvayam ‖
ābhyāṁ śvitraṇi yogābhyāṁ lepān naśyanty aśeṣataḥ ‖

36. सौराष्ट्रीं गैरिकं तुत्थं पुष्पकासीससैन्धवम् ।

रोध्रं रसाञ्जनं दार्वीं हरितालं मनःशिलाम् ॥
गुन्द्रां दग्ध्वा कृतं भस्म हरितालं मनःशिला ॥
उपदंशबिसर्पाणामेतच्छान्तिकरं परम् ॥
saurāṣṭrīṁ gairikaṁ tutthaṁ puṣpa-kāsīsa-saindhavam |
rodhraṁ rasāñjanaṁ dārvīṁ haritālaṁ manaḥśilām ‖
gundrāṁ dagdhvā kṛtaṁ bhasma haritālaṁ manaḥśilā |
upadaṁśa-bisarpāṇāmetacchāntikaraṁ param ‖

37. हरितालनिशानिम्बकल्कैर्वा सपटोलजैः ॥

यष्टीनीलोत्पलैरण्डमार्कवैर्वा प्रलेपयेत् ।
इन्द्रलुप्तापहं तैलमभ्यङ्गे च प्रशस्यते ॥
haritāla-niśā-nimba-kalkair vā sa-paṭolajaiḥ |
yaṣṭī-nīlotpalaiḥ eraṇḍa-mārkavair vā pralepayet |
indraluptāpahaṁ tailam abhyaṅge ca praśasyate ‖

38. कासीसरोचनातुत्थहरितालरसाञ्जनैः ।

लेपोऽम्लपिष्टो बदरीत्वग्वा सैन्धवसंयुता ॥
kāsīsa-rocanā-tuttha-haritāla-rasāñjanaiḥ |
lepomla-piṣṭo badarītvag vā saindhava-saṁyutā ‖

39. फेनाश्म(भस्म) हरितालं च द्वे धातुविषे; कालकूटवत्सनाभस र्षपपालककर्दमकवैराटकमुस्तकशृङ्गीविषप्रपुण्डरीकमूलकहाला ह ल म हा वि ष क र्क ट का नी ति त्र यो द श क न्द वि षा णि; इत्येवं पञ्चपञ्चाशत् स्थावरविषाणि भवन्ति ॥

phenāśma (bhasma) haritālaṁ ca dve dhātuviṣe | kālakūṭa-vatsanābha-sarṣapa-pālaka-kardama-kavairāṭaka-mustaka-śṛṅgī-viṣa-puṇḍarīka-mūlaka-hālāhala-mahāviṣa-karkaṭakā nīti trayodaśa kandaviṣāṇi | ity evaṁ pañca-pañcāśat sthāvara-viṣāṇi bhavanti ‖

40. मनःशिलालमधुककुष्ठचन्दनपद्मकैः ।

मधुमिश्रैः सलामज्जैरगदस्तत्र कीर्तितः ॥
manaḥśilāla-madhuka-kuṣṭha-candana-padmakaiḥ |
madhu-miśraiḥ sa-lāmajjair agadas tatra kīrtitaḥ ‖

41. दशमूलमनोह्वालं लाक्षा श्वेता फलत्रयम् ।

गन्धद्रव्याणि तीक्ष्णानि गणो मूर्द्धविरेचनः॥
daśamūla-manohvālaṁ lākṣā śvetā phalatrayam |
gandhadravyāṇi tīkṣṇāni gaṇo mūrdhavirecanaḥ ‖

42. मनःशिलालमधुकमांसीमुस्तेङ्गुदीत्वचः ।

धूमं कासघ्नविधिना पीत्वा क्षीरं पिबेदनु॥
निष्ठ्यूतान्ते गुडयुतं कोष्णं धूमो निहन्ति सः|
वातश्लेष्मोत्तरान् कासानचिरेण चिरन्तनान्॥
manaḥśilāla-madhuka-māṁsī-musteṅgudītvacaḥ |
dhūmaṁ kāsaghnavidhinā pītvā kṣīraṁ pibed anu ‖
niṣṭhyūtānte guḍayutaṁ koṣṇaṁ dhūmo nihanti saḥ |
vātaśleṣmottarān kāsān acireṇa cirantanān ‖

43. कासीसं सैन्धवं रास्ना शुण्ठी कुष्ठं च लाङ्गली ।

शिलाभ्रकाश्वमारं च जन्तुहृद्दन्तिचित्रकौ॥
हरितालं तथा स्वर्णक्षीरी तैश्च पचेत्समैः ।
तैलं सुधार्कपयसी गवां मूत्रे चतुर्गुणे॥
kāsīsaṁ saindhavaṁ rāsnā śuṇṭhī kuṣṭhaṁ ca lāṅgalī |
śilābhra-kāśvamāraṁ ca jantu-hṛd-danti-citrakau ‖
haritālaṁ tathā svarṇa-kṣīrī taiś ca pacet samaiḥ |
tailaṁ sudhārka-payasī gavāṁ mūtre caturguṇe ‖

44. मुस्तामृतासङ्गकटङ्कटेरी-कासीसकम्पिल्लककुष्ठरोध्राः ।

गन्धोपलः सर्जरसो विडङ्गं मनःशिलाले करवीरकत्वक्॥
mustāmṛtāsaṅga-kaṭaṅkaṭerī-kāsīsa-kampillaka-kuṣṭha-rodhrāḥ |
gandhopalaḥ sarjaraso viḍaṅgaṁ manaḥśilāle karavīrakatvak ‖

45. मनःशिलाले मरिचानि तैल-मार्कं पयः कुष्ठहरः प्रदेहः ।

तथा करञ्जप्रपुनाटबीजं कुष्ठान्वितं गोसलिलेन पिष्टम्॥
manaḥśilāle maricāni tailam ārkaṁ payaḥ |
kuṣṭhaharaḥ pradehaḥ | tathā karañja-prapunāṭa-bījaṁ kuṣṭhānvitaṁ gosalilena piṣṭam ‖

46. दग्धेष्वर्शोर्बुदेषु च ।

निकुम्भकुम्भसिन्धूत्थमनोह्वालकणाग्निकैः|

dagdheṣv arśor budeṣu ca |
nikumbha-kumbha-sindhūttha-manohvāla-kaṇāgnikaiḥ ‖

47. भद्रश्रीदारुमरिचद्विहरिद्रात्रिवृद्धनैः ।

मनः शिलालनलदविशालाकरवीरकैः॥
गोमूत्रपिष्टैः पलिकैर्विषस्यार्धपलेन च ।
ब्राह्मीरसार्कजक्षीरगोशकृद्रससंयुतम्॥
प्रस्थं सर्षपतैलस्य सिद्धमाशु व्यपोहति ।
पानाद्यैः शीलितं कुष्ठदुष्टनाडीव्रणापचीः॥

bhadraśrī-dāru-marica-dvi-haridrā-trivṛt-dhanaiḥ |
manaḥśīlāla-nalada-viśālā-karavīrakaiḥ ‖
gomūtra-piṣṭaiḥ palikaiḥ viṣasyārdhapalena ca |
brāhmī-rasārka-jakṣīra-gośakṛd-rasa-saṁyutam ‖
prastham sarṣapatailasya siddham āśu vyapohati |
pānādibhiḥ śīlitaṁ kuṣṭha-duṣṭa-nāḍī-vraṇāpacīḥ ‖

48. तुत्थगैरिकलोध्रैलामनोह्वालरसाञ्जनैः॥

tutthagairikalodhrailāmanohvālarasāñjanaiḥ ‖

49. नागरं गृहकपोतपुरीषं बीजपूरकरसो हरितालम् ।

सैन्धवं च विनिहन्त्यगदोऽयं लेपतोऽलिकुलजं विषमाशु॥
nāgaraṁ gṛhakapota-purīṣaṁ bījapūra-raso haritālam |
saindhavaṁ ca vinihanty agado yaṁ lepato likulajaṁ viṣam āśu ‖

50. तालकः पटलः पिण्डो द्विधा तत्राद्य उत्तमः ।

कूष्माण्डे तु शतं वारान् तालकं स्वेदयेद्बुधः ॥
tālakaḥ paṭalaḥ piṇḍo dvidhā tatrādya uttamaḥ |
kuṣmāṇḍe tu śataṁ vārān tālakaṁ svedayed budhaḥ ‖

51. स्विन्नं कूष्मांडतोये वा तिलक्षारजलेऽपि वा ।

तोये वा चूर्णसंयुक्ते दोलायंत्रेण शुद्धयति॥
svinnaṁ kūṣmāṇḍa-toye vā tila-kṣāra-jalena vā |
toye vā cūrṇasaṁyukte dolāyantreṇa śuddhyati ‖

52. कूष्माण्डतोयसंस्विन्नं ततः क्षारजलेन वा ।

चूर्णतोयेन वा स्विन्नं दोलायंत्रेण शुद्धयति॥
kuṣmāṇḍa-toya-saṁsvinnaṁ tataḥ kṣāra-jalena vā |
cūrṇa-toyena vā svinnaṁ dolāyantreṇa śuddhyati ‖

53. शुद्धं स्यात्तालकं स्विन्नं कूष्माण्डसलिले ततः ।

चूर्णोदके पृथक् तैलें तस्मिन् पूते न दोषकृत् ॥
śuddhaṁ syāt tālakaṁ svinnaṁ kūṣmāṇḍa-salile tataḥ |
cūrṇodake pṛthak taile tasmin pūte na doṣakṛt ‖

54. तिलतैले पचेद्यामं यामं च त्रिफलाजलैः एवं यन्त्रे चतुर्यामं पाच्यं शुद्धयति तालकम् ॥

tilataile pacedyāmaṁ yāmaṁ ca triphalājalaiḥ evaṁ yantre caturyāmaṁ pācyaṁ śuddhyati tālakam ‖

55. तालकं कणशः कृत्वा बद्धा पोटलिकां ततः ।

दोलायन्त्रेण यामैकं सचूर्णे काञ्जिके पचेत् ॥
यामैकं दोलया तद्वत्कूष्माण्डस्वरसे ततः ।
तिलतैले पचेद्यामं यामं च त्रैफले जले ।।
दोलायन्त्रे चतुर्यामं पक्वं शुध्यति तालकम् ॥
tālakaṁ kaṇaśaḥ kṛtvā baddhvā poṭalikāṁ tataḥ|
dolāyantreṇa yāmaikaṁ sacūrṇe kāñjike pacet‖
yāmaikaṁ dolayā tadvat kūṣmāṇḍasvarase tataḥ|
tilataile paced yāmaṁ yāmaṁ ca traiphale jale‖
dolāyantre caturyāmaṁ pakvaṁ śudhyati tālakam‖

56. शोधयेत्परया युक्त्या एतत्पत्रीकृतं शुभम् ।

वस्त्रेण पोटलीं बद्धा काञ्जिकैः शोधयेत्र्यहम् ॥
कूष्मांडरसमध्ये तु त्र्यहं दुग्धेन शोधयेत् ।
वटदुग्धे त्र्यहं शोध्यं तालकं शुद्धिमाप्नुयात् ॥
śodhayet parayā yuktyā etat patrīkṛtaṁ śubham |
vastreṇa poṭalīṁ baddhā kāñjike śodhayet tryaham ‖
kūṣmāṇḍa-rasamadhye tu tryahaṁ dugdhena śodhayet |
vaṭa-dugdhe tryahaṁ śodhyaṁ tālakaṁ śuddhim āpnuyāt ‖

57. तालकं कणशः कृत्वा दशांशेन च टङ्कणम् ।
जम्बीरोत्थद्रवैः क्षाल्यं काञ्जिकैः क्षालयेत्पुनः ॥
स्वेद्यं वा शाल्मलीतोयैस्तालकं शुद्धिमाप्नुयात्॥

tālakaṁ kaṇaśaḥ kṛtvā daśāṁśena ca ṭakaṇam |
jaṁbīrottha-dravaiḥ kṣālyaṁ kāñjikaiḥ kṣālayet punaḥ ‖
svedyaṁ vā śālmalī-toyais tālakaṁ śuddhim āpnuyāt ‖

58. तालकं कणशः कृत्वा दशांशेन तु टङ्कणम् ॥

जम्बीरोत्थद्रवैः क्षाल्यं काञ्जिकैः क्षालयेत्पुनः ।
वस्त्रे चतुर्गुणे बध्वा डोलायन्त्रे दिनं पवेत् ॥
सचूर्णेनारनालेन दिनं कूष्माण्डजे रसैः ।
स्वेद्यं वा शाल्मलीतोयैस्तालकं शुद्धिमाप्नुयात् ॥
tālakaṁ kaṇaśaḥ kṛtvā daśāṁśena tu ṭaṅkaṇam |
jambīrottha-dravaiḥ kṣālyaṁ kāñjikaiḥ kṣālayet punaḥ ‖
vastre caturguṇe badhvā ḍolāyantre dinaṁ pavet |
sa-cūrṇenāranālena dinaṁ kūṣmāṇḍaje rasaiḥ |
svedyaṁ vā śālmalī-toyais tālakaṁ śuddhim āpnuyāt ‖

59. तालकं पोट्टलं बध्वा सचूर्णे काञ्जिके पचेत् ।

दोलायन्त्रेण यामैकं ततः कूष्माण्डजे रसे ॥
तिलतैले पचेद्यामं यामं च त्रिफलाजले ।
एवं यन्त्रे चतुर्यामं पाच्यं शुध्यति तालकम् ॥

tālakaṁ poṭṭalaṁ badhvā sa-cūrṇe kāñjike paced |
dolāyantreṇa yāmaikaṁ tataḥ kūṣmāṇḍaje rase ‖
tila-taile paced yāmaṁ yāmaṁ ca triphalā-jale |
evaṁ yantre caturyāmaṁ pācyaṁ śudhyati tālakam ‖

60. सुविचूर्णितं तु तालं खलु पोट्टलोगृहस्थम् ।

नवनिम्बूकोत्थवारा त्विह दोलिकाख्ययन्त्रे ॥
suvicūrṇitaṁ tu tālaṁ khalu poṭṭalogṛhastham |
navanimbūkotthavārā tviha dolikākhyayantre ‖

61. तालकं चूर्णयित्वा तु पोट्टल्यां विनिधाय च ।

दोलायन्त्रे पचेद्यामं कूष्माण्डसलिले भिषक् ॥
यामैकं चूर्णतोयेन त्रैफलेन जलेन वा ।
इत्थं यामद्वयेनैव शुद्धिमायात्यनुत्तमाम् ॥
tālakaṁ cūrṇayitvā tu poṭṭalyāṁ vinidhāya ca |
dolāyantre paced yāmaṁ kūṣmāṇḍa-salile bhiṣak ‖
yāmaikaṁ cūrṇa-toyena traiphala-jalena vā |
itthaṁ yāma-dvayenaiva śuddhim āyāty anuttamām ‖

62. तालचूर्णन्तु पोट्टल्यां न्यस्य दोलागतं पचेत् ।

तिलक्षारजलेनैव याममात्र भिषग्वरः ॥
यामैकं स्वेदनादेवं तालं शुद्धिमवाप्नुयात् ।
इत्थं विशोधितं तालं वीतशङ्कः प्रयोजयेत् ॥
tāla-cūrṇaṁ tu poṭṭalyāṁ nyasya dolāgataṁ paced |
tila-kṣāra-jalenai'va yāma-mātraṁ bhiṣag-varaḥ ‖
yāmaikaṁ svedanād evaṁ tālaṁ śuddhim avāpnuyāt |
itthaṁ viśodhitaṁ tālaṁ vītaśaṅkaḥ prayojayet ‖

63. पोट्टल्यां निहितं तालचूर्ण' दोलागतं पचेत् ।

शाल्मलीमूलतोयेन याममेकं भिषग्वरः ॥
poṭṭalyāṁ nihitaṁ tāla-cūrṇaṁ dolāgataṁ paced |
śālmalī-mūla-toyena yāma-mekaṁ bhiṣag-varaḥ ‖

64. यामैकं स्वेदनादेव तालकं शुद्धिमाप्नुयात् ।

अथवा तद्रवेणैव दिनसप्तकभावनात् ॥
yāmaikaṁ svedanād eva tālakaṁ śuddhim āpnuyāt |
athavā tad draveṇaiva dina-saptaka-bhāvanāt ‖

65. चूर्णीकृतं पत्रतालं चूर्णनीरेण भावयेत् ।

सप्तवारं प्रयत्नेन शुद्धिमायात्यनुत्तमाम् ॥
cūrṇīkṛtaṁ patra-tālaṁ cūrṇa-nīreṇa bhāvayet |
saptavāraṁ prayatnena śuddhim āyāty anuttamām ‖

66. அரிதாரப் பெயர்தனையே அறையக்கேளு
ஆதியா மால்பாக மருவுலட்சுமிதான்
பெரிதான கோனந்தி பீதகந்தானாகும்
பின்சாமா மிச்சிரகெந் தகமுமாகும்
தெரி தான நட மண்ட னம் பிடா
லகமுமாகும் சேல்கண்ணிச் சிறியமுகக்
காட்சியாகும் வரிதான ஆல்கொடிச்சி
யரிதன்சத்தி வளமான கெவுரமர
மரிதாரப்பேரே

Aritārap pêyartaṉaiye aṟaiyakkeḷu ātiyā mālpāka maruvalattu mitāṉ pêritāṉa koṉanti pītakantāṉukum piṉcāmā micciraken takamumākum teritāṉa naṭamaṇṭaṉampidā lakamumākum celkaṇṇic ciṟiyamukak kāṭciyāṉum varitāṉa ālkôṭicci yaritaṉcatti vaḷamāṉa kevuramara maritārappere.

67. காரியதைச்சுத்திபண்ணிக்குகையிலிட்டுக்
கனமாக உருக்கியெடை நறும்பூவிட்டுஊ

வீரியமாய்ப் பார்த்திடவே கரித்தூள்
போலாம் மிகநலமாம் அன்னத்தி
னீராலாட்டி

ஆரியபின் விஷ்ணுவின் மனைவிகூட்டி
அ ரைத்து வில்லை கதிரவன்முன்
காயவைத்து ஊரிலுப்பு சுண்ணமும்
நே ரிடித்துக்கட்டி உறவாகப் புடமிட்டு
யெடுத்துவாங்கே

Kāriyattaic cuttipṇṇik kukaiyiliṭṭuk kaṉamāka urukkiyêṭai naṟumpūviṭṭu Vīriyamāyp pārtṭiṭave karittūḷpolām mikanalamām aṉṉatti ṉīrālāṭṭi Āriyapiṉ viṣṇuviṉ maṉaivikūṭṭi araittuvillai katiravaṉmuṉ kāyavaittu ūriluppu cuṇṇamumṭine riṭittukkaṭṭi uṟavākap puṭamiṭṭu yêṭuttuvāṅke.

68. ஆமென்ற தாளக்கத்தின் பிறவி கேளு
ஆத்தாள்தான் தேவகங்கை தன்னில்
தானும் வாமென்ற மண்ணெடுத்து தாளம்
போலே வகையாகப் பிடித்துமேதான்
தாளங் கொட்டி ஓமென்ற புவர்லோகம்த்
தெறிந்து போட உருண்டுமே லே
கந்தகந்தான் விளையும் பூமி தானென்ற
தனுக்குள்ளே விழ்கத் தானும்
தாளக்கந்தான் உருபத்தி யான வாறே

Āmêṉṟa tāḷakattiṉ piṟavi keḷu āttāḷtāṉ tevakaṅkai taṉṉil tāṉum Vāmêṉṟa maṇṇêṭuttu tāḷam pole vakaiyākap piṭittumetāṉ tāḷṅ kôṭṭi Omeṉṟa puvarlokat teṟintu poṭa uruṇṭumele kantakantāṉ viḷaiyum pūmi tāṉêṉṟa taṉukkuḷḷe vīḻkat tāṉum tāḷakantāṉ uṟpatti yāṉa vāṟe.

69. சிவந்தவரி தாரமது செஞ்சிலைபோற்
காட்டும் உவந்ததனை யுண்முறையோ
டுண்டால்—இவர்ந்தாழ் சுரங்குளிர்மா

வாத முடற் சூலை நமை குஷ்டம்
இரங்குமென நாளும் இசை

Civantavari tāramatu ceñcilaipoṟ kāṭṭum uvantataṉai yuṇmuṟaiyoṭu ṭuṇṭāl—ivarntāḷ curaṅkuḻirmā vātumuṭaṟ cūlaṉimai kuṭṭam iraṅkumêṉa nāḷum icai.

70. தானென்ற கந்தகத்தான் படைகட் காதி
சத்துருவாய்த் தானிருக்குஞ் சரக்குக்
கெல்லாம் பானென்ற தாளகமிப் படியே
காய்ச்சு பாங்கான வருணத்துக் காருங்
கண்டாய் கானென்ற சரக்குக்குக் காலன்
காலன் காட்டினாற் கெடுத்தழிக்குங்
கடினம் மெத்த வேனென்ற சரக்குக்கு
டோரி யாகும் மிடுக்கான வூறலென்ற
சரக்குத் தானே

Tāṉêṉṟa kantakantāṉ paṭaikaṭṭu kāti catturuvāyt tāṉirukkuñ carakkuk kêllām pāṉêṉṟa tāḷakamip paṭiyākāyccu Pāṅkāṉa varuṇattuc kākuṅ kaṇṭāy. kāṉêṉṟa carakkukkuk kālaṉ kālaṉ kāṭṭiṉaṟ kêṭuttaḷikkuṅ kaṭiṉam mêtta veṉêṉṟa carakkukku ṭoriyākum miṭukkāṉa vūṟalêṉṟe carakkuttāṉe.

71. முந்நீர் சிவணிய செந்நூரி யாக்கை
முப்பிணி யானல வெப்பமா நளிரே
மாறிய நாள்பகல் வீறிய யாம்மு மாசுறு
காய மூசுபு வெவ்வினை மருந்தனு பானமு
மிருந்தையிற் றுளக வடுநறு முத்திற
மிடுமுறையிற் சேயள மீசுர மாகிய மீசுரப்
படவிகை பொருமுல வைக்கெதிர்
பூரணிக் குவையே யஃதான்று

Munnīr civaṇiya cênnīr yākkai muppiṇi yāṉavai vêppamā naḷire māṟiya nāḷpakal vīṟiya yāmmu māsuṟu kāya mūcupu vêvviṉai maruntaṉu pāṉamu miruntaiyiṟ ṟuḷaka vaṭunaṟu muttiṟam iṭumuṟai ilcêya mīccuram ākiya mīcurap paṭalikai pêrumūla vaikkêtir pūḷaik kuvaiye yaḥtāṉṟu.

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Declarations

Conflict of interest None.

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