



# Traditional haematinic Herbo-mineral compounds in ayurvedic pharmaceuticals: A classical review

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## Abstract

A haematinic is a nutrient required for the formation of blood cells in the process of haematopoiesis. Deficiency in haematinics can lead to anaemia. Anaemia is the most common blood disorder affecting about a third of the global population. The most common nutritional cause of anaemia is iron deficiency. The treatment of Iron Deficiency Anaemia (IDA) involves supplementation with external iron containing drugs, of which several types of modern medicines are available in the market. It has been reported that long- term treatment of IDA with these drugs is associated with constipation, heartburn, nausea, gastric discomfort and diarrhoea. In ayurveda, the disease *pandu roga* can be compared to IDA, especially owing to the clinical manifestation of '*panduta*' or pallor in the whole body. Ayurvedic anaemia correcting agents have been practiced for centuries. Ayurvedic formulations have also been abundantly consumed and available in the market due to their effectiveness. In this study, major texts of Ayurveda and *rasa shastra* were searched for drugs which are indicated in *pandu*. It is found that not only iron containing drugs, other metallic and mineral drugs also found to be indicated in *pandu*. It is found that many hematinic multi-ingredient ayurvedic formulations contain *triphala* which is a mild laxative and counters constipating property of iron, *trikatu* which enhances the appetite and address malabsorption, *vidanga* which is effective in nullifying worm infestation induced anaemia. Similarly, cow's urine is a good bio enhancer of iron. All these are clear indicators of continued relevance and effectiveness of haematinics in ayurveda.

**Keywords:** Ayurveda pharmaceuticals, Haemopoietic, Iron Deficiency Anaemia (IDA), *Pandu*

## 1. Introduction

Indian pharmaceuticals (*rasashastra*) is a branch that deals with the pharmaceutical formulations of mercury, minerals, animal products, precious stones, metals, calcium compounds and alkaline compounds and their processing. In ancient Ayurveda, the focus has been on the herbs and their therapeutic usages. Subsequently, conversion of these drugs into suitable consumable medicinal form is established by some specific processing methods. The impact of these drugs in curing the diseases as well as in immunizing and rejuvenating is found to be highly effective. In comparison to other herbal drugs, these are well-known for quicker assimilation, longer shelf life, easy preservation, good therapeutic values and their faster action in smaller doses (Angadi, 2022).

A haematinic is a nutrient required for the formation of blood cells in the process of haematopoiesis and deficiency in haematinics can lead to anaemia. In cases of haematinics deficiency, haematinics can be administered as medicines to increase the haemoglobin content of the blood (Tripathi, 2023).

Anaemia is a blood disorder in which the blood has a reduced ability to carry oxygen due to below normal number of red blood cells or a reduction in the amount of haemoglobin. Before a person becomes noticeably pale, anaemia must be significant. Anaemia is the most common blood disorder, affecting about one-third of the global population, and can be caused by blood loss, decreased red blood cell production, or increased red blood cell breakdown; iron deficiency is the most

common nutritional cause, accounting for about half of all anaemia cases as Iron Deficiency Anaemia (IDA). It is a serious health problem as it causes general debility, lethargy, lassitude, sub optimal work performance, poor intelligence, mental retardation and abdominal immune response (Gardner *et al.*, 1977). In Ayurveda, the disease *pandu roga* can be compared with IDA. Especially owing to the clinical manifestation of '*panduta*' or pallor in the whole body. Ayurveda describes three humours; *vatha*, *pitta* and *kapha*, which are responsible for a healthy state or causation of any disease. *Pandu roga* is predominantly a result of vitiation of *pitta dosha* and along with other humours. the vitiation of *pitta dosha* leads to discolouration of the skin and pallor (*pandu*) owing to blood reduction (*alpa rakta*) or vitiation of blood (*vidushya rakta*) (Achary, 2005).

The state of IDA is being managed with the supplementation of external iron-containing drugs, for which several types of modern medicines are available in the market. These modern iron formulations contain one or the other types of iron salts, such as ferrous sulphate, ferrous fumarate, ferrous glycine sulphate, ferric hydroxide, ferric ammonium citrate, iron choline citrate, ferrous calcium citrate, iron dextran, iron sorbitol citrate, ferrous gluconate, ferric hydroxide and ferrous succinate (Samal, 2016). It has been further reported that the long-term treatment of IDA with these drugs is associated with constipation, heartburn, nausea, gastric discomfort and diarrhoea. Ayurvedic formulations are also abundantly available in the market despite the availability of allopathic anaemia correcting agents as referred above (Nandkarni, 1976). The ayurvedic anaemia correcting agents are found to be practiced for centuries. With this background, an effort was made to review various type of metals and minerals and its formulations that have proven efficient in the management of *pandu roga*, with special reference to IDA.

## 2. Materials and methods

A comprehensive literature review was undertaken to compile classical references pertaining to mineral drugs and formulations indicated in *pandu*. Authoritative Ayurvedic texts, including *rasa ratna samuchaya*, *rasa tarangini*, *rasendra sara sangraha*, *ayurveda prakasha* and *bhaishajya ratnavali* were systematically consulted. Relevant information was retrieved using classical terminologies associated with hematinic and blood-promoting actions, such as *panduhara*, *raktakara*, *rakta vardhana* and *rakta sanjanana*.

The survey encompassed both printed editions and authenticated digital resources, notably the National Institute of Indian Medical Heritage (NIIMH) digital library, the AYUSH Research Portal, and other recognized online repositories of classical Ayurvedic literature. References to individual mineral drugs as well as Herbo-mineral compound formulations described in these sources were identified and critically reviewed.

For individual drugs, details of *rasa panchaka*, *karma*, effects on *dosha*, and therapeutic indications were extracted to elucidate their pharmacodynamic profile. In the case of compound formulations, constituent ingredients of mineral and herbal origin, along with processing media such as herbal juices employed for *bhavana*, were documented. The indications of each formulation were also recorded. All findings were systematically tabulated with appropriate textual references to facilitate an understanding of the rationale underlying the use of specific minerals and herbs in the management of *pandu*.

## 3. Results and discussion

*Rasoushadhis* are the Herbo-mineral formulations that have been prescribed by ayurvedic physicians for a long time with rare mention of toxicity (Gupta *et al.*, 2012). It is noted that Herbo-mineral compounds are more interactive and stable compared to herbs, resulting in faster therapeutic action and a longer shelf life. Minerals and metals were less used for the internal administration due to their toxic nature. Indian pharmacetics explains specific processes that help convert the metals into relevant consumable medicinal forms in the preparation of all these Herbo-mineral formulations.

Causative factors of *pandu roga* are the habitual consumption of tastes like *amla* (sour), *katu* (pungent), and *ushna ahara* (hot potency), along with *ratrijagarana* (night -vigil), excessive physical exertion, and persistent mental stress, provokes *pitta dosha* and initiates *pandu roga*. The aggravated *Pitta* located in the *hridaya* is propelled through the *dasha dhamani* by *vata*, resulting in *rasavaha srotodushti* with the involvement of *vata*, *rakta*, *kapha*, *twak*, and *mamsa*, thereby manifesting as *pandu varnata*. predominant *pitta*-associated *tridosha* vitiation weakens *jatharagni*, leading to inadequate formation of *poshaka rasa*, subsequent *rakta kshaya*, and the clinical expression of *pandu roga* (Kaushik and Khobragade, 2018).

*Pitta* has properties like *tikshna* (sharpness), *ushna* (heat), *sara* (mobility), *laghu* (lightness), *snigdha* (unctuousness), etc., which bring about biochemical changes at the cellular and tissue levels. Activities such as digestion, thirst, appetite, energy production, body temperature, colour and complexion are maintained by *pitta* which has a *drava* (liquid) consistency with actions similar to *agni*, during the digestion process, mostly due to its *teja* (heat) component, despite its liquidity-*drava* nature. This fact is evident from how *pachaka pitta* (digestive component of biological fire) carries out *pachana* (digestive) *karma* (action). The qualitative increase of *ushna guna* of *pitta* is also a measure of the capacity of digestion. Substances with properties like *ruksha*, *kashaya*, *laghu* can reduce the *drava guna* of *pitta* and support proper *agni* function. Similarly, substances with *madhura* and *sheeta* properties are capable to reduce the *ushna* property of *pitta* to maintain the proper function of *agni* (Chandramohan *et al.*, 2025)

The state of IDA is being managed with the supplementation of external iron-containing drugs for which several types of modern medicines are available in the market. There are significant references about the administration of iron and other mineral compounds in the classics of Ayurveda. In all these unique Herbo-mineral formulations, iron is the major ingredient. In modern medicines like haematinics, drugs containing iron are widely used. Some of the adverse drug reactions induced by these drugs are understood as gastro intestinal symptoms like nausea, vomiting, colic pain, flatulence, constipation, black faeces and diarrhoea. Hence, Ayurveda still has abundant opportunity to provide alternative options for medicines and treatment in this arena.

Being an essential element in the human body, metals and minerals have a high chemical reaction with enzymes and are absorbed more rapidly than *kashtoushadhi*. The analytical study of ayurvedic *bhasma* preparations contains metal in various form along with other organic compounds depending on the media used in *shodhana* and *marana* procedures. A single *bhasma* indicated in many diseases depends on the *anupana* used and the media as well. This has a unique contribution, which can be assessed clinically and experimentally rather than by mere analytical parameters. The *lauha bhasma* is predominantly incorporated with *triphala* rich in Vitamin C, facilitates iron absorption and has a diverse range of therapeutic benefits not only in terms of haematological parameters but also in the betterment of comorbidities and other organ systems.

Copper is a micronutrient required for proper organ function and metabolic processes such as haemoglobin synthesis, as a neurotransmitter, for oxidation and cellular respiration. Zinc is a catalyst for many enzymes required for red blood cell production. As a result, zinc deficiency may be associated with anaemia (Gupta *et al.*, 2012). Thus, it is evident that our ancient scholars may have had the idea about the utility of these metals in haemopoiesis.

The minerals and metals indicated in *pandu roga* with the chemical composition (*rasa panchaka*) is mentioned in table 1 and formulations mentioned in various texts like *rasaratna samuchaya*, *rasendra sara sangraha*, *ayurveda prakasha*, *yogaratnakara*, *bhaishajyaratnavali*, *rasa tarangini*, *charaka samhita*, *sarngadhara samhita* and *ashtanga Hridaya*, etc., has been mentioned in Table 2.

Most of these indicated minerals have *kashaya tikta/kashaya madhura* properties, which will help reduce the *pitta dosha* properties. Further, many of them have *sheeta veerya*, *rasayana* and *balya* properties as well. It is important to note that some of these have specific properties of *raktavidhikara* and *rakta sanchanana* as well. We can also observe the dosha effects related properties as well; for example, most of the haematinic drugs possess *kapha pittahara/tridoshahara* properties.

among indications for *pandu roga*, there are some other diseases mentioned as well like *prameha*, *rajayakshma*, *kamala*, *halimaka*, splenic disorders (*pliharoga*), *hridroga*, *swasa* and *kasa*. When it is observed in the quality, some have *laghu ruksha* property that will help to reduce the liquidity nature of *pitta*. Further, some have the property like *guru snigdha* which can be *pittahara* as well as rejuvenates in terms of facilitating *rakta sanchanana*, etc.

Careful observation of formulations as tabulated in Table 2, reveals that most of the formulations for the treatment of *pandu* possess *bhasmas* containing iron such as *lauha bhasma*, *mandura bhasma*, *kanta lauha bhasma*, *abhraka bhasma*, *gairika*, *vimala* and *kasisa bhasma*. *Swarna makshika bhasma* contains both iron and copper and *tamra bhasma* contain copper.

Apart from *lauha*, other minerals like *abhraka*, *vaikranta*, *makshika*, *tamra*, *mandura*, *vanga*, *vatsanabha*, *shilajatu* are very common and repeatedly used in many formulations and least mentioned drugs like *vimala*, *gairika*, *kasisa*, *srotonjana/souviranjana*, *yashada*, *pittala*, *tarkshya*, *vajra*, *gomeda*, *rajavarta*, *yavakshara*, *suryakshara* also found to be effective as haematinic drug.

*Parada* and *gandhaka* are not directly indicated to *pandu roga* as a term since they are *rasayanas*, but they are useful for *sarvaroga*. Their synergetic action and *yogavahi* properties can be compared. It can be observed that *lauha bhasma* is the most repeated drug with 26 entries, next come *parada* & *gandhaka* with 19 entries each, which can be attributed to their distinctive properties. Next comes *mandura bhasma* with 15 entries, *abhraka* with 13 entries, *tamra* with 10 entries, *swarna* with 5 entries, *makshika*, *vatsanabha*, *tankana* & *jayapala* with four entries, *harithala* with 3 entries, *manashila* & *vaikranta* with 2 entries and *kaparda*, *sphatika*, *tutha*, *shankha*, *vanga* & *shilajathu* with one entry respectively.

Similarly, while considering the herbal drugs, the main repeated drugs are *triphala*, *musta*, *guduchi*, *trikatu*, *devadaru*, *danti*, *chitraka*, *jeeraka*, *trivrit*, *vidanga*, *panchakola*, *haridra*, *vatsanabha* & *jayapala*. When it comes to *bhavana dravya*, the repeatedly used ones are *triphala kwatha*, *gomutra*, *nimbu swarasa*, *chitraka*, *bhringaraja*, *kumari swarasa* and *godugdha*. It is important to note that, in *bhavanadravyas*, there will be a repeated occurrence of the same herbal ingredients, which can be attributed to their ability to nullify the common side effects of Iron formulations. This can be the explanation for *triphala bhavitha* iron formulations acting as a laxative to nullify the common side effect of constipation, similarly *gomutra* helping to enhance the absorption power of the formulations & *vidanga* acting as *krimighna*, nullifying the *nidana* of *panduroga* (malabsorption/worm infestation induced anaemia).

**Table 1.** Properties of haematinic minerals and metals (Ashok D Satpute, 2019; Sadananda Sharma, 2004; Sri Madhava, 2016)

Sl. No.	Drug	Rasa	Guna	Virya	Vipaka	Karma	Effect on doshas	Indication
1	Abhraka (Mica) Lepidolite	Kashaya, Madura	Snigdha (Unctuous)	Sheeta (Cold)	Madura	Rasayana (Rejuvenative), Rakthakarma	Tridosahara (Alleviates all tridoshas)	Sarvaroga (All diseases), Pandu
2	Vaikranta (Tourmaline)	Shadrasa-Madura, Amla, Lavana, Katu, Tikta, Kashaya	Guru (Heavy), Snigdha (Unctuous)	Sheeta (Cold)	Madura	Balya (Strengthening), Rasayana (Rejuvenative)	Tridosahara (Alleviates all tridoshas)	Pandu (Anemia) (Rajayakshma (Phthisis), Visha (Poisoning))
3	Makshika (Chalcopyrite/ Copper pyrite)	Madura, Tikta, Kashaya, Katu	Snigdha (Unctuous)	Sheeta (Cold)	Katu	Rasayana (Rejuvenative), Jeevaniya (Health and life promoting)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Prameha (Diabetes), Swayadhu (Swellings), Kushta (Skin disorders)
4	Vimala (Iron pyrite)	Katu, Tikta	Snigdha (Unctuous), Guru (Heavy)	Sheeta (Cold)	Katu	Rasayana (Rejuvenating), Vajikarana (Aphrodisiac)	Vata pitta hara (Alleviates vata and pitta dosha)	Pandu (anaemia)
5	Shilajatu (Asphaltum Punjabinum)	Katu, Tikta	Laghu (Light), Ruksha (Dry)	Ushna (Hot)	Katu	Rasayana (Rejuvenative), Yogavahi (Synergistic)	Kapha hara (Alleviates kapha dosha)	Pandu (anaemia), Rajayakshma (Phthisis)
6	Gairika (Haematite)	Kashaya, Madura	Snigdha (Unctuous)	Sheeta (Cold)	Madura	Balya (Strengthening)	Vata pitta hara (Alleviates vata and pitta dosha)	Raktasrava nashaka (Controls bleeding), Rakta prasadaka (Haematinic)
7	Kasisa (Ferrous sulphate)	Amla, Tiktha, Kashaya	Laghu (Light), Ruksha (Dry)	Sheeta (Cold)	Katu	Balya (Strengthening), Rakta Sanchanana (Haemopoetic property)	Vata kapha hara (Alleviates vata and kapha dosha)	Pandu (anaemia), Pleeha rogas (Spleen disorders), Switra (Vitiligo)
8	Srotonjana & Souviranjana (Stibnite/ Antimonite)	Kashaya, Madura	Laghu (Light), Snigdha (Unctuous)	Sheeta (Cold)	Katu	Lekhana (Scraping), vranaropana (Wound healing property), Raktaprasadaka (Haematinic)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Raktapitta (Bleeding disorder), Vrana (wounds)
9	Tamra (Copper)	Kashaya, Madura	Laghu (Light), Snigdha (Unctuous)	Ushna (Hot)	Madura	Lekhana (Scraping), Vishahara (Nullify the poisonous effect)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Visha (Poisoning), Sthoulya (Obesity)
10	Lauha (Iron)	Tiktha, Kashaya	Guru (Heavy), Ruksha (Dry)	Sheeta (Cold)	Madura (Sweet)	Lekhana (Scraping), Vrishya (Aphrodisiac), Netryam (Good for eyes)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Rajayakshma (Phthisis), Pliha (Spleen disorders)

11	Mandura (Iron Oxide)	Tiktha, Kashaya	Laghu (Light), Ruksha (Dry)	Sheeta (Cold)	Madura	Dipana (Carminative), Vrishya (Aphrodisiac), Rakta Vridhikara (Haematinic)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Kamala (Jaundice), Rajayakshma (Phthisis), Pliha (Spleen disorders)
12	Vanga (Tin/ Stannum)	Tiktha, Kashaya, Lavana	Laghu (Light), Ruksha (Dry)	Sheeta (Cold)	Madura	Balya (Strengthening), Rasayana (Rejuvenative), Vrishya (Aphrodisiac)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (Anemia), Prameha (Diabetes), Rajayakshma (Phthisis), Vrana (wounds)
13	Yashada (Zinc)	Kashaya, Katu	Laghu (Light), Ruksha (Dry)	Sheeta (Cold)	Katu	Balya (Strengthening), Netryam (Good for eyes), Viveka samrudhikara (Improves intellect)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Prameha (Diabetes), Vrana (Wounds)
14	Pittala (Brass)	Tiktha	Laghu (Light), Ruksha (Dry)	Sheeta (Cold)	Katu	Balya (Strengthening), Krimighna (Anti- microbial)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Kushta (Skin disorders)
15	Tarkshya (Emerald)		Guru (Heavy), Snigdha (Unctous)	Sheeta (Cold)		Balya (Strengthening), Vishaghna(Anti poisonous), Vrishya (Aphrodisiac)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Swasa (Bronchial asthma)
16	Vajra (Diamond)	Shadrasa- Madura, Amla,Lavana a, Katu , Tikta, Kashaya.	Guru (Heavy), Snigdha (Unctuous), Tikshna (Sharp)	Sheeta (Cold)	Madura	Balya (Strengthening), Rasayana (Rejuvenative), Yogavahi (Synergistic), Vrishya (Aphrodisiac)	Tridosahara (Alleviates all tridoshas)	Pandu (anaemia), Rajayakshma (Phthisis), Klaihya (Infertility)
17	Gomeda (Zircon/ Hassonite)	Amla	Guru (Heavy), Snigdha (Unctuous), Tikshna (Sharp)	Ushna (Hot)		Balya (Strengthening), Dipana (Carminative), Twachyam (Good for skin), Budhi prabodhana (Intellect enhancer)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Rajayakshma (Phthisis), Vata vikaras
18	Rajavarta (Lapis Lazuli)	Katu, Tikta	Laghu (Light), Ruksha (Dry)	Sheeta (Cold)	Katu	Dipana (Carminative), Rasayana (Rejuvenative), Vrishya (Aphrodisiac)	Kapha pitta hara (Alleviates kapha and pitta dosha)	Pandu (anaemia), Prameha (Diabetes), Rajayakshma (Phthisis)
19	Yavakshara (Potassium Carbonate)	Katu	Laghu (Light), Snigdha (Unctuous)	Ushna (Hot)	Katu	Dipana (Carminative), Pachana (Digestive), Sweda pravartaka (Improves perspiration) Mutrala ( Diuretic)	Kapha vatahara (Alleviates kapha and data dosha)	Pandu (anaemia), Prameha (Diabetes), Hridroga (Heart disorders)

20	Suryakshara (Potassium Nitrate)	Katu, Lavana	Thikshna (Sharp)	Ushna (Hot)	Katu	Dipana (Carminative),	Kapha vatahara (Alleviates kapha and data dosha)	Pandu (anaemia), Prameha (Diabetes), Rajayakshma (Phthisis), Mootrashmari (Urinary calculus)
21	Vatsanabha (Aconitum Ferox)	Madhura, Tikta, Kashaya, Katu	Laghu (Light), Tikshna (Sharp), Vyavayi (Piercing)	Ushna (Hot)	Katu	Yogavahi(Carries the quality of combined drugs), Rasayana (Rejuvenative), Dipana (Carminative), Balavardhanam (Strengthening)	Tridoshahara (Alleviates Tri Doshas)	Pandu (anaemia), Pliha Roga (Splenic Disorders), Swasa (Bronchial asthma), Kasa (Cough), Kushta (Skin diseases, Jwara (Fever)

\* *Amla* (Sour), *Kashaya* (Astringent), *Katu* (Pungent), *Lavana* (Salty), *Madura* (Sweet), *Tikta* (Bitter)

**Table 2.** Herbo-mineral formulations indicated in *pandu roga* (Sastri, 1988; Gopala, 1998; Murthy, 2015a&b; Mishra and Sharma 2016; Babu, 2019; Sharma and Dash, 2019; Shastri and Lochan, 2019)

Sl. No.	Formulations (Reference)	Mineral ingredients	Herbal ingredients	Bhavana dravya	Indication
1	Hamsa Mandura (RRS/19/42-44)	Mandura	Trikatu, Triphala, Trimada, Chavya, Daruharidra, Granthi, Devadaru	Gomutra	Pandu, Halimaka, Urushambha, Kamala, Arsha
2	Kala Vidhwamsana Rasa (RRS/19/45-53)	Parada, SwB, RB, TB, Gandhaka, LB	Vatsanabha	Nimbu swarasa, Dathura swarasa, Kantakari swarasa, Brihati swarasa, Arka ksheera, Naktamala swarasa, Gomutra	Pandu
3	Panchanana Rasa (RRS/19/54-64)	KLB, SwB, TB, RB, AB, Parada, Gandhaka, Haritala, Manashila, Vaikranta Bhasma	-	Nimbu Swarasa	Pandu, Rajayakshma, Halimaka, Kushta, Vit vibandha, Grahani, Jwara, Athisara, Swasa, Kasa, Arshas, Prameha, Gulma
4	Arogya Sagara Rasa (RRS/19/65-72)	Gandhaka, Parada SMB, Haritala, Manashila, AB Tankana, Sphatika, TB, Vaikranta Bhasma	-	-	Pandu, Arochaka, Arshas, Gulma, Shopha, Swasa, Udavarta, Jwara, Sutika roga
5	Pandu Panka Shoshana Rasa (RRS/19/73-74)	TB, Parada/Rasa sindura, Gandhaka	Vatsanabha	Chitraka swarasa	Pandu, Sopha
6	Pitta Pandwari Rasa (RRS/19/75-76)	Parada, LB	Trimada, Trikatu, Triphala, Kutaja	Madhu	Pittaja Pandu
7	Trailokya Sundara Rasa (RRS/19/77-78)	Parada, Gandhaka LB, AB	Triphala, Guduchi satwa, Shigru mula, Varahi kanda	Bhringaraja swarasa	Pandu, Sopha

8	Jayapala Rasa (RRS/19/79-81)	Parada, Gandhaka TB	Jayapala, Guggulu	-	Pandu
9	Panduhari Harithaki (RRS/19/82-86)	Parada, Gandhaka, Haritala	Korandi, Bhringaraja, Satavari, Punarnava, Guduchi satwa	Godugdha	Pandu
10	Vijaya Vatika (RRS/19/87-90)	Parada, Gandhaka	Haritaki, Chitraka, Ela, Twak, Patra, Mustha, Renuka, Nagakesara, Vyosha, Pippalimula	Purathana guda	Pandu, Sopha
11	Nisha Louha (RSS/2/1, BR/12/29)	LB	Haridra, Daruharidra, Triphala, Katurohini	-	Pandu, Kamala
12	Dhatri Louha (RSS/2/2, BR/12/30)	LB	Amalaki, Vyosha, Haridra	-	Pandu, Kamala, Halimaka
13	Panchanana Vati (RSS/2/3-4, BR/12/90-91)	Parada, Gandhaka TB, AB	Guggulu, Jayapala	-	Pandu, Sopha
14	Mahat Pranavallabha Rasa (RSS/2/5-11, BR/12/83-89)	Hingulotha Parada, Gandhaka (Kashmira), LB, TB, Kaparda Bhasma, Tutham	Hingu, Triphala, Snuhi ksheera, Yavakshara, Jayapala, Danti, Trivrit	Aja Ksheera	Pandu, Kamala, Halimaka, Anaha, Shleepada, Galaganda, Gandamala, Vruna, Sotha, Urusthambha, Murcha, Kasa, Swasa, Jeerna jwara, Vataraktha, Apachi
15	Kameshwara Rasa (RSS/2/12-15)	Parada, Gandhaka	Haritaki, Chitraka, Mustha, Ela, Patra, Pippali, Trikatu, Pippalimula, Vatsanabha, Nagakesara, Eranda, Puratana Guda,	Dattura Swarasa	Pandu
16	Trikatrayadi Louha (RSS/2/16-19 BR/12/38-43)	MB, KLB	-	Triphala, Trikatu, Trimada kwatha	Pandu, Kamala, Halimaka, Pliha roga, Kasa, Swasa, Udara, Gulma, Ajeerna, Parinamashula
17	Vidangadi Louha (RSS/2/20-22, BR/12/32-33)	LB	Vidanga, Triphala, Vyosha	Gomutra Or Puratana Guda	Pandu, Shotha, Halimaka
18	Trailokya Sundara Rasa (RSS/2/23-26, BR/12/104-108)	Parada, Gandhaka AB, LB	Triphala, Vyosha, Mocharasa, Musali, Guduchi Satwa,	Triphala kwatha, Shigru, Chitraka mula kwatha	Pandu, Kshaya, Shotha, Jwara, Atisara
19	Darvyadi Louha (RSS/2/27, BR/12/23-27)	LB	Daruharidra, Triphala, Vyosha, Vidanga		Pandu, Kamala
20	Chandra Suryathmaka Rasa (RSS/2/28-37, BR/12/74-82)	Parada, Gandhaka, LB, AB, Shanka Bhasma, Varatika Bhasma	Gokshura beeja	Kwatha of Patola, Parpata, Bharngi, Vidari, Shatapushpika, Danti, Vasa, Kundali, Kakamachi, Indraravuni, Varshabhu, Kesharaja, Shalinja shaka, Drona pushpika	Pandu, Halimaka, Kamala, Jeerna jwara, Visha, AmlaPitta, Arochaka, Shula, Pliha, Udara, Anaha, Ashtila, Gulma, Vidradhi, Sotha, Hikka, Mandagni, Kasa, Swasa, Bhagandara, Upadamsha, Kandu, Vruna, Apachi, Urusthambha, Katigraha

21	Pandu Soodana Rasa (RSS/2/38-39, BR/12/92-93)	Parada, Gandhaka, TB	Jayapala, Guggulu	-	Pandu, Shotha
22	Mandura Vajra Vataka (RSS/2/40-43)	MB	Panchakola, Maricha, Devadaru, Triphala, Vidanga, Mustha	Gomutra	Pandu, Mandagni, Arochaka, Arshas, Grahani, Urusthambha, Pliha, Anaha, Galaroga
23	Laghvananda Rasa (RSS/2/44-46)	Parada, Gandhaka, LB, AB, Tankanam	Vatsanabha, Maricha	Bringaraja swarasa Amlavetasa swarasa	Pandu, Aruchi, Mandagni Grahani, Jwara, Vatha Kapha vikaras
24	Sammoha Louha (RSS/2/47-49)	LB, AB	Trikatu, Triphala, Chitraka, Vidanga.	-	Pandu, Kamala, Hridroga Shotha, Bhagandara, Krimi, Mandagni, Arochaka
25	Trayooshanadi Mandura (RSS/2/50-52, BR/12/68s-73)	MB	Trayooshana, Trimada, Triphala, Darvi, Suradaru,	Gomutra	Pandu, Kamala, Halimaka, Arsha, Shotha, Kamala, Urusthambha, Kumbhakamala
26	Pranikalpadruma Gola Rasa (AP/1/569-574)	Parada, Gandhaka, KLB, Swarna Patra Tankana	Palashabeeja, Pippali	Godugdha	Pandu, Kamala, Kshaya, Kasa, Swasa
27	Chaturmugha Rasa (AP/1/591-597)	Parada, Gandhaka LB, AB, SwB	Eranda Patra	Kumari Swarasa	Shosha, Pandu, Kasa, Swasa, Kushta, Prameha, Shula, Mandagni, Hikka, AmlaPitta, Adhyavatha, Vruna, Visarpa, Vidradhi, Apasmara, Unmada, Arshas
28	Lauha Bhasma (BR/22/8)	LB	-	Gomutra	Pandu
29	Ayasthiladi Modaka (BR/22/9)	LB, SMB	Tila, Trayooshana, Kola	-	Pandu
30	Ayamala Prayoga (BR/22/21)	MB	-	Gomutra	Pandu, Shotha
31	Navayasa Louha (BR/22/28, YR/56 Ch.Chi/16/70-71 <sup>15</sup> )	LB	Trikatu, Triphala, Trimada.	-	Pandu, Kamala, Hridroga, Kushta, Arshas
32	Ashtadashanga Louha (BR/22/34-36, (BP))	LB	Kiratathiktha, Suradaru, Darvi, Guduchi, Katuka, Patola, Duralabha, Parpataka, Nimba, Trikatu, Triphala, Trimada.	-	Pandu, Halimaka, Shotha, Prameha, Grahani, Swasa, Kasa, RaktaPitta, Arshas, Vakgraha, Amavatha, Vrana, Gulma, Kapha vidradhi, Switra, Kushta

33	Kamalanthaka Louha (BR/22/44-50)	LB, AB, MB, VB	Jeeraka, Shunti, Pippali, Gajapippali, Pippalimula, Gandhapatra, Darvi, Chavya, Yavanika, Chitraka, Katphala, Rasna, Devadaru, Triphala, Rasanjana, Ativisha, Kesaraja, Bringaraja, Somaraji, Manduka Parni	-	Kamala, Pandu, Halimaka, Kasa, Swasa, Shirashoola, Pliha roga, Jeerna Jwara, Shotha, Gulma, Hridroga, Jwara
34	Panchamritha Louha Mandura (BR/22/51-58 (Rasachandamshu)	LB, TB, Gandhaka AB, Parada, MB	Trikatu, Triphala, Trimada, Kiratathikta, Devadaru, Haridra, Daruharidra, Pushkaramula, Yavani, Karavi, Jeeraka, Shati, Dhanya, Chavya	Gomutra Punarnava Kwatha	Grahani, Pandu, Kamala, Shotha, Jeerna jwara, Pliha roga, yakrit roga, Gulma, Udara, Kasa, Swasa, Prathishyaya
35	Vajravataka Mandura (BR/22/59-64, YR)	MB	Panchakola Maricha, Devadaru, Triphala, Vidanga, Mustha	Gomutra	Pandu, Mandagni, Arochaka, Arshas, Grahani, Urusthambha, Krimi, Pliha roga, Udara, Galaroga
36	Punarnavadi Mandura (BR/22/65-67, Ch.Chi/16/93-95)	MB	Punarnava, Trivrit, Trikatu, Vidanga, Devadaru, Pushkarahva, Triphala, Haridra, Daruharidra, Danti, Chavya, Kutaja, Pippalimula, Musthaka	Gomutra	Pandu, Shotha, Udara, Anaha, Shula, Arshas, Krimi, Gulma
37	Anandodaya Rasa (BR/22/94-98, (Rasamanjari))	Parada, Gandhaka, LB, AB, Vatsanabha Tankana	Maricha	Bringaraja Swarasa, Amla Dadimam	Pandu Aruchi Nashtagni
38	Pandu Panchanana Rasa (BR/22/99-103, (R.Yo.Sa))	LB, AB, TB, MB	Trikatu, Triphala, Danti, Chavika, Krishna jeeraka, Chitraka, Haridra, Daruharidra, Trivrit, Manakanda, Indrayava, Katuki, Devadaru, Vacha, Mustha	Gomutra	Halimaka, Pandu, Shotha, Urusthambha, Pliha, Yakrit Roga, Gulma
39	Yogaraja (BR/22/109-115, Ch.Chi/16/)	Shilajathu, Roupya makshika Bhasma, SMB, LB	Triphala, Trikatu, Chitraka, Vidanga	-	Pandu, Visha, Raja yakshma, Vishama jwara, Kushta, Prameha, Swasa, Hikka, Arochaka, Apasmara, Kamala, Gudaja Roga
40	Lauhasava (BR/22/129-133, Sha.Sam.Ma/10/34-38 <sup>16</sup> )	LB	Trikatu, Triphala, Trimada, Yavani, Dhataki, Kusuma	-	Pandu, Shotha, Mandagni, Gulma, Arshas, Kushta, Pliha, Kandu, Kasa, Swasa, Bhagandara, Arochaka, Grahani, Hridroga

41	Mandura Vataka (AH Chi/16/16-18 <sup>17</sup> YR (Ratna pradipa))	SMB, MB	Devadaru, Mustha, Daruharidra, Shadushana, Vidanga, Triphala	Gomutra	Kamala, Pandu, Arshas, Prameha, Kushta, Ajirna, Pliha roga
42	Mandura Lavana (YR/56)	Mandura Saindhava	-	Gomutra	Pandu
43	Madhu Mandura (YR/56)	Mandura	Guduchi, Gokshura, Musali, Mundi, Satavari	Gomutra, Triphala kwatha, Kumari swarasa	Chira Pandu roga
44	Manduradyarishta (YR/56 (Gadanigraha))	Mandura, Lauhapatra	Purana Guda, Kola bark, Danti, Chitraka, Pippali, Vidanga, Triphala	-	Pandu, Krimi, Arshas, Kushta, Kasa, Swasa

\*AB (Abhakra Bhasma), AH (Ashtanga Hridaya), AP (Ayurveda Prakasha), BP (Bhava Prakasha), BR (Bhaishajya Ratnavali), Ch.Chi (Charaka Samhita Chikitsa Sthana), KLB (Kanta Loha Bhasma), LB (Lauha Bhasma), MB (Mandura Bhasma), RB (Rajatha Bhasma), RRS (Rasa Ratna Samucchaya), RSS (Rasendra Sara Sangraha), SMB (Swarna Makshika Bhasma), SwB (Swarna Bhasma), TB (Tamra Bhasma), VB (Vanga Bhasma), YR (Yoga Ratnakara)

#### 4. Conclusion

This study has been conducted referring only five classic books of Ayurveda which itself gave 21 individual minerals and metals and 44 formulations which can be attributed towards Haematinics. From a pharmaceutical perspective, these drugs encompass various types of formulations beyond mere *khalviya aushadhis*, including *churna*, *rasakriya*, *avaleha*, *puta paka*, etc. Some formulations, even though not readily available in the market, there is immense potential to meet current healthcare needs, thereby warranting production by pharmaceutical companies. This study provides preliminary data and can pave the way for further research on Ayurveda haematinics.

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#### Notes

*Trikatraya*: Formulation containing *triphala*, *trikatu* and *trimada*.

*Triphala*: Formulation containing *amalaki* (*Phyllanthus emblica* L.) *vibhitaki* (*Terminalia bellirica* (Gaertn.) Roxb.) and *haritaki* (*Terminalia chebula* Retz.).

*Trikatu*: Formulation containing *pippali* (*Piper longum* L.), *shunthi* (dry ginger- *Zingiber officinale* L.) and *maricha* (*Piper nigrum* L.).

*Trimada*: Formulation containing *vidanga* (*Embelia ribes* Burm.f.), *musta* (*Cyperus rotundus* L.) and *chitraka* (*Plumbago zeylanica* L.).