



**DRUG REVIEW ON DARVYADI LOHA: AN AYURVEDIC FORMULATION FOR PANDU  
W.S.R TO IRON DEFICIENCY ANEMIA IN CHILDREN**

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**ABSTRACT**

The pediatric population suffers from a variety of disorders, nutritional deficiency disorders being one among the major one. Nutritional Iron deficiency anemia (IDA) is the most common cause of anemia in India. It is estimated that iron deficiency affects about 30% of the world population and about 70-90% in the developing countries, including India. *Pandu Roga* is one among the *Rasa Pradoshaja Vikaras* and is associated with *Rakta Alpata* and *Pandura Varna*. IDA in childhood can adversely affect a child's growth and development, behaviour, cognition and intelligence. Without treatment, the condition can worsen and the health consequences associated with anemia are not sudden and loud but are gradual and destructive. The side effects of oral hematinic drugs are frequently encountered, and hence the scope of a safe and effective Ayurvedic formulation has got relevance. *Darvyadi Loha* is a herbo-mineral preparation mentioned in Ayurvedic classics under *Pandu Roga Chikitsa Prakarana*, which contains the ingredients like *Daarvi* (*Berberis aristata* Dc.), *Amalaki* (*Emblica officinalis* Gaertn), *Vibhitaki* (*Terminalia bellerica* Roxb.), *Haritaki* (*Terminalia chebula* Retz.), *Pippali* (*Piper longum* Linn.), *Maricha* (*Piper nigrum* Linn.), *Shunti* (*Zingiber officinalis*), *Vidanga* (*Embelia ribes* Burm. f.), *Loha Bhasma* (incinerated iron). *Anupana* mentioned was *Ghruta* and *Madhu*. In this article, the review of the drug *Darvyadi Loha* has been described.

**KEYWORDS:** *Darvyadi Loha*, *Pandu*, Iron Deficiency Anemia, *Loha Bhasma*

**INTRODUCTION**

Child health and nutrition is always a prime focus of attention for every parent. Improper nutrition not only affects the child's physical growth and health but also their psycho-social and emotional development.

The paediatric population suffers from a variety of disorders, nutritional disorders being one among them. Iron deficiency anemia is one such nutritional deficiency which adversely affects the growth and development of children.

Iron deficiency anemia (IDA) is currently the most wide spread micro nutrient deficiency in the world and affects nearly 1.5 billion people globally.<sup>[1]</sup> It is estimated that iron deficiency affects about 30% of the world population and about 70-90% in the developing countries, including India.<sup>[2]</sup> Nutritional Iron deficiency anemia (IDA) is the most common cause of anemia in India.<sup>[3]</sup> According to Ayurveda, a disease associated with *Rakta Alpata* and *Panduta* of body is designated by the name *Pandu Roga*. The main diagnostic feature of *Pandu Roga* is the change of colour in the body which is *Pandura Varna*. *Panduta* or pallor in the skin which occurs due to vitiation of *Rakta Dhatu* in the body,<sup>[4]</sup>

which is a very scientific approach by ancient Acharyas towards this disease. *Pandu Roga* has similarity with that of Anemia in many aspects such as etiological factors, signs and symptoms and therapeutics.

Without treatment the anemic condition can worsen. The health consequences are not sudden and loud but are gradual and destructive. Iron containing drugs are widely used in modern medicine as hematinics and the side effects of oral hematinic drugs are frequently encountered.<sup>[5]</sup> These drugs are known to induce some adverse reactions mainly; gastrointestinal symptoms like nausea, vomiting, epigastric pain, eructation, pyrosis, borborygami, colic pain, flatulence, constipation, black faeces and diarrhea.<sup>[6]</sup> Therefore the scope of a safe and effective Ayurvedic formulation has got relevance. *Darvyadi Loha*<sup>[7]</sup> is a herbo-mineral compound preparation mentioned in Ayurvedic treatises in the treatment of *Pandu Roga*. The aim behind the administration of any formulation is to reach out the target tissue or organ for reversing the disease pathology. The pharmaco-dynamic study of individual constituents of this drug has revealed action over the etiopathology of *Pandu Roga*.

**MATERIALS AND METHODS****Ingredients of the formulation are**

1. Darvi (*Berberis aristata* DC.)
2. Haritaki (*Terminalia chebula* Retz.)
3. Vibhitaki (*Terminalia bellerica* Roxb.)
4. Amalaki (*Emblica officinalis* Gaertn.)
5. Pippali (*Piper longum* Linn.)
6. Maricha (*Piper nigrum* Linn.)
7. Shunti (*Zingiber officinalis*)
8. Vidanga (*Embelia ribes* Burm.)
9. Loha Bhasma (Incinerated iron)

**1. Darvi (*Berberis aristata* DC.)<sup>[8]</sup>****Fig. 1: Darvi heart wood.**

It is an erect glabrous spinescent shrub and belongs to the family Berberidaceae. It contains Berberine, oxyberberine, berbamine, arimaline, karachine, palmatinr, oxycanthine and taxilamine. Pharmacological activities of the plant includes antipyretic, hypoglycaemic, gastro irritant, local anaesthetic, anti cancerous, anti coagulant, anti bacterial, anti protozoal, anti inflammatory anti trachoma, CNS depressant and fresh berries are laxative in action.

**Useful part:** root, stem, fruit, extract (*Rasanjana*)

**Ayurvedic properties**

*Rasa:* Tikta, Kashaya (*Rasanjana – Katu*)

*Guna:* Ruksha, Laghu

*Veerya:* Ushna

*Vipaka:* Katu

*Doshagnata:* Kapha Pitta Shamaka

*Rogagnata:* Shotha, Netrabhishyanda, Karna Shoola, Mukha Roga, Vrana, Phiranga, Upadamsha, Bhagandara, Visarpa, Agnimandya, Kamala, Yakrut Vikara, Aruchi, Trishna, Kasa, Jwara and Twak Dosh.

**2. Haritaki (*Terminalia chebula* Retz.)<sup>[9]</sup>****Fig. 2: Haritaki fruit.**

It is one of the ingredients in *Triphala* and belongs to family Combretaceae, well known by name Chebulik myrobalan. Preliminary studies for photochemical screening suggest the presence of Antharquinone glycoside, chebulinic acid, chebulagic acid, tannic acid, terchebin, tetrachebulin, Vitamin C, arachidic, behenic, linoleic, oleic, palmitic and stearic acids (fruit kernels). *Haritaki* is one of the important herbs of Ayurveda having properties of antibacterial, anti-fungal, anti-inflammatory, antistress, antispasmodic, hypotensive, indurance promoting activity, anti hepatitis B virus activity.

**Useful part:** fruit rind.

**Ayurvedic properties**

*Rasa:* Kashaya, Tikta, Madhura, Katu, Amla

*Guna:* Laghu, Ruksha

*Virya:* Ushna

*Vipaka:* Madhura

*Doshagnata:* Tridosha Shamaka

*Rogagnata:* Vata Vyadhi, Shotha, Vrana, Mukha Roga, Kantha Roga, Nadi Daurbalya, Mastishka Daurbalya, Netra Abhishyanda. Drishti Mandhya, Indriya Daurbalya, Agni Mandya and Shoola.

**3. Vibhitaki (*Terminalia bellerica* Roxb.)<sup>[10]</sup>****Fig. 3: Vibhitaki fruit.**

It is a large tree which belongs to the family Combretaceae, and commonly called as Belliric myrobalan. Chemical constituents present in this drug includes Chebulagic acid, ellagic acid and its ethyl ester, gallic acid, fructose, galactose, mannitol and rhamnase, B- sitosterol and bellericanin (fruits), protein and oxalic acid (seed), oxalic acid and tannins (bark), palmitic, oleic and linoleic acids (kernel and its oil). It is known for Purgative, blood pressure depressant, antifungal, antihistaminic, activity against viral hepatitis and vitiligo, antiasthmatic, broncho-dilatory, antispasmodic, antibacterial, CNS stimulant, amoebicidal, antistress and endurance promoting activity.

**Useful part:** fruit rind, seed, seed kernal

**Ayurvedic properties**

*Rasa:* Kashaya

*Guna:* Ruksha, Laghu

*Veerya:* Ushna

*Vipaka:* Madhura

*Doshagnata:* Tridosha Shamaka

*Rogagnata:* Shotha-Vedanayukta Vikara, Charma Roga, Granthi Visarpa,

*Agnimandya, Shwitra, Palitya, Pratishyaya, Kasa, Shwasa, Swarabhagna, Hridroga, Vrana, Vatavyadi.*

#### 4. *Amalaki (Emblia officinalis Gaertn.)*<sup>[11]</sup>



**Fig. 4: Amalaki fruit pulp.**

It belongs to family Euphorbiaceae and popularly known as Indian gooseberry.

It is a large deciduous tree and is one of most famous and commonly used herb in Ayurveda. Chemical constituents are; carotene, nicotinic acid, riboflavine, D-glucose, D-fructose, myoinositol and a pectin with D-galacturonic acid, phyllembic acid and phyllembin (fruits) and fatty acids (seed oil); 1,2,3, 6 trigalloylglucose, terchebin, corialgin, ellagic acid, alkaloids, phyllantidine and phyllantine (leaves & fruits). It is also a very good source of Vitamin - C.

**Useful part:** fruit

**Ayurvedic properties**

*Rasa:* Amla, Madhura, Kashaya, Tikta, Katu

*Guna:* Guru, Ruksha, Sheeta

*Veerya:* Sheeta

*Vipaka:* Madhura

*Doshaghnata:* Tridosha Shamaka

*Rogaghnata:* Paittika Vikara, Daha, Paittika Shirashula, Mootravarodha, Rakta Pitta, Yakrut Pleeha Vikara, Kasa, Swasa, Hridroga, Amlapitta, Parinama Shula, Arsha, Vibandha, Udavarta, Netra Roga, Daha Prashamana, Chakshushya, Nadibalya, Rochana, Deepana.

#### 5. *Pippali (Piper longum Linn.)*<sup>[12]</sup>



**Fig. 5: Pippali fruit.**

This aromatic slender climber belongs to the family Piperaceae, and popularly known as Indian long pepper. Chemical constituents present in it are two alkaloids; piper longumine and piper longuminine, major alkaloid piperine and sesamin piperidine (stem and fruits). Pippali is one of the commonly using herbs of Ayurveda having the poroperties of Antibacterial, antiinflammatory, insecticidal, antimalarial, CNS stimulant antitubercular, anthelmintic, hypoglycaemic, antispasmodic, anti-giardial, antinarcotic and anti ulcerogenic.

**Useful part:** fruit, root

**Ayurvedic properties**

*Rasa:* Katu

*Guna:* Laghu, Snigdha, Tikshna

*Veerya:* Anushna Sheeta

*Vipaka:* Madhura

*Doshaghnata:* Kapha Vata Shamaka

*Rogaghnata:* Agni Mandya, Aruchi, Ajeerna, Gulma, Pandu, Amavata, Shwitra, Yakshma, Vibandha, Arsha, Yakrut Vikara, Krimi Roga Shotha, Sheeta Yukta Vedana, Mastishka daurbalya, Vata

*Vyadhi, Udara shoola.*

*Karma:* Raktotkleshaka, Medhya, Vatahara, Deepana, Vatanulomana, Shoolaprashamana, Jantughna, Balya, Rasayana, Mutrala, Shirovirechana.

#### 6. *Maricha (Piper nigrum Linn.)*<sup>[13]</sup>



**Fig. 6: Maricha fruit.**

*Maricha* belongs to the family Piperaceae, well known by the name Black pepper. It is a branching and climbing perennial shrub with rooting at the nodes. The chemical constituents include Piperidine, piperidine, ferupenine, dihydroferupenine, piperonal, piperine, piperolenine. It possess the properties of Antioxidant, anticonvulsant, CNS depressant, muscle relaxant, antipyretic, anti-inflammatory, hepatoprotective, antimicrobial, antiulcer, antibacterial, lipolytic, Ciclo oxygenase inhibitory activity.

**Useful part:** fruit

**Ayurvedic properties**

*Rasa:* Katu

*Guna:* Laghu, Teekshna, Ruksha

*Veerya:* Ushna

*Vipaka:* Katu

*Doshaghnata:* Kapha Vata Shamaka

*Rogagnata: Agnimandya, Ajeerna, Yakrit Vikara, Grahani, Krimi, Shwitra, Kilasa, Pama, Tarunya Pidaka, Shotha Vedanayukta, Timira,, Pratisyava Kasa Shwasa, Hikka, Mootra- Krichchhra, Dhvajabhanga, Rajorodha, Kushtha. Charma Roga,*  
*Karma: Raktokleshaka, Srotoshodhana, Deepana, Pachana, Vatanulomana, Krimighna, Sweda Janaka, Lekhana, Nadibalya, Lalasrava Janaka, Kushthaghna, Jwaraghna, Vishamajwara Pratibandhaka, Avrishya.*

#### 7. *Shunti (Zingiber officinalis)*<sup>[14]</sup>



**Fig. 7: Shunti rhizome.**

It belongs to the family Zingiberaceae. It is a small plant with horizontal jointed tuberous rhizomes. Chemical constituents present in this drug are Heptane, octane, camphene, casinine, gingerol, curcumene, zingerone, cineol, sabinene and myrcene. It has the properties like Anti inflammatory, hypolipidaemic, antiatherosclerotic, antiemetic, antioxidant, antibacterial, antitumoural, hypoglycaemic, inotropic, inhibition in prostaglandin release (dose dependent), Antipyretic, appetiser, uterotonic and anti bacterial.

**Parts used:** rhizome

**Ayurvedic properties**

*Rasa: Katu*

*Guna: Laghu, Ruksha, Teekshna*

*Veerya: Ushna*

*Vipaka: Katu*

*Doshagnata: Vata Kapha Shamaka, Pitta Vardhaka.*

*Rogagnata: Shotha, Switra, Shleepada Amavata, Nadi Daurbalya, Vata Vyadhi, Agnimandya, Aruchi, Chardi, Ajeerna, Koshta Vata, Grahani, Gulma, Anaha, Vibandha, Hridroga*

*Karma: Lekhana, Sheeta Prashamana, Rochana, Bhedana Madaka, Deepana, Pachana, Triptighna, Pittasaraka, Grahi, Garbhasravakara, Vajikarana, Swedajanana, Jwaraghna, Rasayana.*

#### 8. *Vidanga (Embelia ribes Burm.)*<sup>[15]</sup>



**Fig: 8 – Vidanga fruit.**

It is a large scandent shrub which belongs to the family Myrsinaceae. Chemical constituents are Embelin, quercitol, tannin, christembine, embelic acid, fatty ingredients, resinoid, volatile oil and vilangin (fruit), potassium embelate, 4-benzoquinone (plant). Presence of embelin has highlighted by the action of anthelmintic, antibiotic, antitubercular, antiimplantation, antiovolatory, antifertility, antiinflammatory, hypotensive.

**Useful part:** fruit

**Ayurvedic properties**

*Rasa: Tikta, Katu*

*Guna: Laghu, Ruksha Teekshna*

*Veerya: Ushna*

*Vipaka: Katu*

*Doshagnata: Kapha Vata Shamaka*

*Rogagnata: Shiroroga, Akshepaka, Krimiroga, Apasmara, Pakshaghata, Krimidanta, Dantashoola, Agnimandya, Ajeerna, Vamana, Udarashoola, Arsha, Mutrakrichra*

*Karma: Jantughna, Kushthaghna, Shirovirechana, Nadibalya, Deepana, Pachana, Anulomana, Shirovirechana.*

#### 9. *Loha Bhasma (incinerated iron)*<sup>[16]</sup>



**Fig. 9: Shudha Loha Bhasma.**

Iron is mentioned third among the *Shuddha Loha*. Iron is a chemical element with the symbol Fe (Latin: *ferrum*) and is the fourth most common element in the Earth's crust.

**Chemical and physical properties**

Atomic number: 26.

Atomic weight: 55.85.

Density: 7.874.

Melting point: 1535<sup>0</sup> C.

Boiling point: 3000<sup>0</sup> C.

Conductivity: relatively poor conductor of heat and electricity

Dissolution: dissolves in water but process takes many months

Atmospheric exposure: reacts with oxygen and form iron oxide (Fe<sub>2</sub>O<sub>3</sub>).

Chemical response: turns into iron salts when exposed to acids. It remains unaffected by alkalies.

**Ayurvedic properties<sup>[17]</sup>**

*Rasa: Tikta, Madhura, Kashaya*

*Guna: Sheeta, Sara, Guru, Ruksa*

*Veerya: Sheeta (Ushna according to Rasa Kamdhenu)*

*Karma: Lekhana, Balya, Vrushya, Ayushya, Chakshushya, Rudhirakrut, Vajikara, Rasayana, Prabhuta Gunakrut.*

*Doshakarma: Kaphahara, Tridosahara*

*Rogaghna Karma: Pandu, Kamala, Shotha, Shula, Arsha, Krumi, Shosha, Pliha Roga, Koshta, Rudhira Roga, Prameha, Vandhyatva.*

**Method of preparation:** As the quantity of the each ingredient is not mentioned specifically, in the formulation, all the ingredients have to be taken in equal quantity. They have to be powdered separately and mixed uniformly till the attainment of a homogeneous mixture.

**Anupana mentioned:** *Ghruta* and *Madhu*.

**DISCUSSION**

*Pandu* is a *Pitta Pradhana Tridoshaja Vyadhi* and *Pitta* is responsible for the normal colour of the body and when it gets vitiated, loss of complexion or *Panduta* occurs. Ayurveda considers *Pandu* more as a form of metabolic error rather than a nutritional disorder. *Agni-Mandya* and *Pitta Dushiti* are invariably present in the *Samprapti* of the *Pandu Roga*. Therefore medicines which are having *Deepana Pachana* should be selected for the management of this disease.

Most of the drugs of *Darvyadi Loha* having *Katu Rasa* and *Ushna Virya* which improves *Agni*, removes *Ama* and *Sroto Rodha* and also reduces *Vata* and *Kapha*, thereby favours the *Samprapti Vighatana*. Apart from these, it also contains drugs which are having *Rasayana Gunas*, *Yakrut Uttejaka*, *Krimighna*, *Pandupaha* and *Rakta Shodhaka* properties which helps in proper *Rakta Dhatu Utpatti*. *Yakrut* is the *Moolasthan* of *Raktavaha Srotas* and in *Pandu*, *Alpa Raktata* is the cardinal feature. So *Yakrut Uttejaka* property of drugs like *Darvi* and *Amalaki* helps the *Yakrit* to produce good quantity and quality of *Rakta Dhatu*. *Pitta Rechaka* property of the drugs in the formulation helps to reduce the increased

*Drava Roopi Pitta* in *Pandu Rogi* and restore the *Prakruta Guna* of *Pitta*. The *Krimighna* action of the drugs, mainly of *Vidanga*, helps to remove the worm infestation which is one of the causes for anemia and various other gastro intestinal complaints that can lead to *Agni Mandya*.

“*Pandau Shreshtam Ayou....*” – iron is the best in management of *Pandu* as mentioned by *Acharya Vagbhata*. *Loha Bhasma* in the drug helps to restore the iron storage of the body (by virtue of *Samanya Visheshha Sidhanta*). *Amalaki* present in the formulation is a rich source of Vitamin C and thereby helps in the absorption of iron. Vitamin C reduces ferric iron to ferrous iron, which remains soluble even at neutral pH and is better absorbed.

*Anupana* used were *Madhu* and *Ghruta*, which are *Deepana* and have *Yogavahi* property too. It also increases the palatability of the medicine.

**CONCLUSION**

Nutritional deficiency anemia's like iron deficiency anemia, affects millions of people worldwide, especially in developing countries like India. Children are at greater risk and iron deficiency for longer periods can affect various bodily functions, affects growth and development, causes various diseases and also lead to cognitive and behavioral impairments. *Agni* is the prime force for the sustenance of all biological systems/living beings. When *Agni* is affected, diseases like *Pandu* occur. By considering the pharmaco- dynamic study of the compound, it can be concluded that *Darvyadi Loha* is having a positive effect in the management of *Pandu Roga*.

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