Review Article

Exploring the Therapeutic Potential of Jeevaloka Chenduram for Anaemia: A Review

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ABSTRACT

Anaemia remains a pressing health concern worldwide, especially among women and children in underprivileged communities. While conventional iron therapies are widely used, their frequent gastrointestinal side effects often result in poor patient adherence. Siddha medicine, a traditional Indian medical system, offers promising alternatives such as *Jeevaloka chenduram* (JLC), a herbo-metallic formulation traditionally used to combat anaemia. Although direct scientific evaluations of JLC are currently scarce, several of its constituent ingredients have been studied individually and are reported to enhance haematological parameters and support iron homeostasis. Notably, herbs like *Zingiber officinale* (ginger) and *Piper nigrum* (black pepper) are known to facilitate iron absorption and reduce gastrointestinal discomfort. Research on comparable Siddha preparations has shown improvements in haemoglobin levels and iron profiles, with few reported side effects. This review compiles and critically examines available scientific data related to the pharmacological actions and safety profiles of the ingredients used in JLC. A structured literature search across platforms such as PubMed and Google Scholar was conducted to gather relevant studies focusing on haematinic activity and toxicity. The summarised evidence suggests that JLC may offer a viable and more tolerable alternative to standard iron supplements. This review aims to lay the groundwork for future investigations, including clinical and toxicological studies, to scientifically validate the traditional claims and explore the therapeutic potential of this formulation in contemporary anaemia management.

Keywords: *Jeevaloka chenduram*, Anaemia, Siddha medicine, Haematinic activity, Herbo metallic formulation, Traditional medicine.

INTRODUCTION

Anaemia is a prevalent public health concern, especially impacting young children, pregnant and postpartum women, and menstruating adolescent girls and women. It is most commonly found in countries with lower incomes, particularly in rural areas and among individuals with limited education. The primary factors leading to anaemia are iron deficiency, inadequate nutrition, genetic blood disorders like thalassemia and sickle cell trait, and infections like malaria. Iron deficiency is the most prevalent nutritional cause, frequently resulting from insufficient dietary intake, while other vitamin deficiencies and blood loss also play a role. Infections and chronic diseases exacerbate anaemia by hindering nutrient absorption or inducing inflammation [1].

Iron supplements, like ferrous sulphate, are frequently prescribed to address iron deficiency anaemia, but they frequently result in unpleasant side effects such as a metallic taste in the mouth, discomfort in the upper abdomen, nausea, diarrhoea, and constipation. These adverse reactions can impact patient adherence. Consuming iron alongside meals may alleviate these effects, but it can also hinder the absorption of iron. Consequently, there is an increasing demand for alternative therapies that provide improved effectiveness with fewer adverse effects [2].

Siddha is among the oldest traditional healthcare systems. It is founded on the proposition that the body's three humors - *Vatham, Piththam, and Kapham*, should be balanced, and it maintains a strong emphasis on using natural remedies such as herbs and minerals. Yoga, nutrition control, and lifestyle changes are all part of Siddha treatment, which integrates mental, physical, and spiritual health. The total number of diseases mentioned in Siddha literature is 4448[3]. *"Veluppu Noi",* which corresponds literally to "pallor", is one of the illnesses that can be classified according to symptoms and is strongly related to the present categorisation of anaemia. In this clinical condition the conjunctiva, tongue, and nail bed turn into pallor, and it is also called paandu *noi* or *venmai noi*[4]. It is classified into 6 types that is *Vali Paandu* (haemolytic anaemia), *Azhal Paandu* (megaloblastic anaemia), *Iyya Paandu* (pernicious anaemia), *Mukkutra Paandu* (sickle cell anaemia) and, based on toxaemia, one type that is called *Nanju Paandu* (Thalassemia). Apart from these 5 types, it is found to be described by the other classification *Mannun paandu,* which is caused by the consumption of ashes, mud and so on. This can be correlated with iron deficiency anaemia[5].

Siddha medicine has long been used to treat anaemia with various herbal and mineral-based formulations. It comprises 64 types of medicines, divided into 32 internal and 32 external forms[6]. Multiple Siddha formulations of polyherbal, herbo-mineral, or herbo-metallic origin, such as *Chooranam, Vadagam, Manappagu, Nei, Mathirai, Elagam*, *Karpam*, *Chendhuram*, etc., are available for the treatment of anaemia[7]. *Chenduram* is one of the 32 internal medicines which has a shelf life of 75 years."

JEEVALOKA CHENDURAM" (JLC) is one of the herbo-metallic preparations. It is used to manage *Pandu, Kamalai, Mahotharam, Peruvayru,* generalised and nutritional oedema, obesity, and acute and chronic nephritis. This study aims to compile and summarise all available preclinical data on *Jeevaloka chenduram* for the treatment of anaemia. It focuses on evaluating the strength of evidence supporting its efficacy. The findings may highlight the potential of this Siddha formulation and open avenues for future research in traditional medicine to manage anaemia.

MATERIALS AND METHODS

Study design: Review

Research type: Literature review

Data collection method: The methodology for this study was designed to systematically gather and analyse the herbo-metallic preparation of JLC. The data was collected from various Siddha literatures, and online platforms like PubMed, Cochrane, ScienceDirect, Medline, Scopus, and Google Scholar were used in search of articles.

Selection of Drug

The herbo-metallic formulation of JLC was selected from the Siddha literature, the pharmacopoeia of Siddha research medicines, chapter 1, page 28 [8].

Collection of Raw Drug:

The raw drugs were purchased from a local shop in *Thakkalai, Kanyakumari* district. The herbal drugs were authenticated by a botanist (Certification No: NISMB7072024), and the metallic drugs were authenticated by an Associate Professor from the Department of *Guna Padam* (Certification No: Gun/Aut/27/24) at the National Institute of Siddha, Chennai.

Table 1: Profile of *Jeevaloka chenduram* [8]

S.NO	Ingredients	Botanical / Chemical Name	Quantity
1.	*Aya chenduram*	Ferrum	120 g
2.	*Kaandha chenduram*	Magnetic oxide	120 g
3.	*Mandura chenduram*	Ferroso ferric oxide	120 g
4.	*Potrilaikaiyan chooranam*	*sphagneticola calendulacea*	120 g
5.	*Chukku*	*Zingiber officinale*	120 g
6.	*Milagu*	*Piper nigrum*	120 g
7.	*Thippili*	*Piper longum*	120 g
8.	*Elarisi*	*Elettaria cardamomum*	120 g
9.	*Seeragam*	*Cuminum cyminum*	120 g
10.	*Lavangam*	*Syzygium aromaticum*	120 g
11.	*Keezhanelli samoolam*	*Phyllanthus amarus*	120 g
12.	*Potrilaikayan juice*	*sphagneticola calendulacea*	120 g

Preparation method

1. Preparation of *Aya chenduram, Kaandha chenduram, Mandura chenduram*

Purified *Ayampodi, Kaandham,* and *Manduram* are powdered separately in a *kalvam*. *Gandhaga dravagam* (Acidum sulphuricum) is added and mixed well, and the mixture is exposed to sunlight and then ground with *Potrilaikaiyan juice* for two days. After drying, the process is repeated with the juice for 2–3 days, and the material is shaped into thin *villais*. These are sealed in separate agals with seven layers of clay cloth and subjected to *putam* using 300–400 *varatties* individually. Two additional *putams* are performed with *Potrilaikaiyan juice*. After the *putam* procedure, the *villais* are ground and powdered.

2. Preparation of *Potrilaikaiyan Chooranam*

Karisalai samoolam was dried and placed in a *kalvam*, ground with the juice of *Potrilaikaiyan* leaves for two days, then dried in sunlight and powdered. This process was repeated twice.

3. Preparation of *Jeevaloka chenduram*

Chukka, Milagu, Thippili, Elarisi, Seeragam, Lavangam and *Keezhanelli samoolam*-these seven ingredients are mixed together and ground with *potrilaikayan juice* for three days; *villaias* are made, dried, powdered again and used in this process twice. Then *chenduram* of *ayam, Kaandham, Manduram* and the compound of *chooranam* are well mixed together in a *kalvam*.

Clinical dosage: 5 to 10 *Arisiyedai* (125 to 250 mg)

Adjuvant: Ghee, Butter or Honey.

RESULTS

Scientific Evaluation of Jeevaloka Chenduram

Value of Iron in Raw Drugs

The iron content in each drug is described below Table 2.

Table 2: Described by the value of iron in raw drugs

Raw drugs	Iron (mg/100g)
Ferrum (Elemental Iron)	~100% (pure iron)[9]
Magnetic oxide (Fe_3O_4)	~72% Fe by weight [9]
Ferroso ferric oxide (Fe_3O_4)	~72% Fe by weight [9]
Sphagneticola calendulacea	Not available
Zingiber officinale	1.5 – 2.0 [10]
Piper nigrum	0.2 – 0.3 [11]
Piper longum	Not available
Elettaria cardamomum	4 – 8 [12]
Cuminum cyminum	3 – 7 [13]
Syzygium aromaticum	6 – 10 [14]
Phyllanthus amarus	5 – 6 [15]

Preclinical toxicological studies

Wistar albino rats or mice of both sexes, following OECD and WHO guidelines, were used for toxicity testing. Acute toxicity involved a single oral dose up to 10 times the standard dose, with a 14-day observation period. Sub-acute and repeated toxicity studies administered doses ranging from 2 to 10 times daily for 28 to 90 days. Detailed toxicological data for each drug are summarised in Table 3.

Table 3: Scientific review of preclinical toxicological studies

Drugs	Acute/subacute and repeated oral toxicity study	Outcome
Aya chenduram	Rats were assigned to 5 groups (n=2 each), with 1 group as control. The remaining groups received the test drug at doses of 40, 80, 160, and 320 mg/kg, respectively (14 days).	No toxicity observed up to 320 mg/kg[16].
Kaandha chenduram	30 Wistar albino rats were divided into 6 groups and given *Chenduram* orally for 14 days at doses up to 1600 mg/animal. In a separate 28-day study, 5 rats were split into three groups, receiving either water (control), 100 mg, or 200 mg of the formulation.	No signs of acute and subacute toxicity were detected[17].
Mandura chenduram	Animals were divided into groups and given the test drug at 300 and 2000 mg/kg for 14 days in the acute study. In the subacute study, both sexes were grouped and treated with 2.34, 11.7, and 23.4 mg/kg doses for 28 days, while one group served as a control.	No toxic effects were observed in acute or subacute studies[18].
Zingiber officinale	Sprague Dawley rats were tested according to OECD guidelines, including acute (5000 mg/kg, single oral dose for 14 days), subacute (2000 mg/kg, repeated oral doses for 28 days), and chronic (1000 mg/kg, repeated oral doses for 90 days) toxicity studies.	No adverse effects were observed across all dose levels and durations, indicating a high safety margin for the extract[19].
Piper nigrum	Sprague Dawley rats were given a single oral dose of 5,000 mg/kg for acute toxicity and observed for 14 days. For subchronic testing, male and female rats received daily doses of 300, 600, and 1,200 mg/kg for 90 days.	*Piper nigrum* does not induce acute or subchronic toxicity in rats[20].
Piper longum	Wistar rats received single and repeated oral doses up to 2000 mg/kg for acute toxicity and daily doses of 250–1000 mg/kg for 28 days in sub-acute testing. Recovery was monitored for two weeks post-treatment to assess reversibility.	The extract is considered safe for oral use up to 500 mg/kg, with mild liver toxicity at higher doses of 1000 mg/kg[21].
Elettaria cardamomum	Swiss albino mice received a single oral dose of 2000 mg/kg and were monitored for 14 days. In a 28-day study, mice were given daily oral doses of 100, 200, or 400 mg/kg.	No harmful effects were detected at doses up to 400 mg/kg[22].
Cuminum cyminum	Albino rats received up to 2000 mg/kg of cumin seed aqueous extract in an acute oral toxicity study[23]. In a separate 45-day trial, female Wistar rats were given cumin essential oil at 250, 500, and 1000 mg/kg/day[24].	No mortality or significant adverse effects were observed.
Syzygium aromaticum	Wistar rats received oral doses of clove (*Syzygium aromaticum*) extract for 28 to 90 days. The highest dose commonly administered was up to 1000 mg/kg body weight per day.	No major toxic effects were observed[25].
Phyllanthus amarus	Acute toxicity tests used single high doses (2000–5000 mg/kg) to observe effects within 24 to 72 hours. Sub-chronic studies involved daily doses (100–1000 mg/kg) for 28 to 90 days.	No significant toxicity at tested doses, indicating a favourable safety profile[26].

Preclinical pharmacological studies

Albino rats or mice of both sexes and standard weight were used in all experiments. Phenylhydrazine was used to induce anaemia in some studies (n=15), while others (n=18) did not specify the induction method. Medicines were administered orally, with treatment durations ranging from 28 to 42 days. Detailed information on studies involving *Ayam, Kaandham, Madura chenduram, Phyllanthus amarus* and *Cuminum cyminum* is provided in Table 4.

Clinical study

Patients with anaemia were grouped based on severity and treatment type. Each group received standardised therapy for a fixed duration, typically 4 to 8 weeks. Clinical outcomes such as haemoglobin levels and symptom improvement were monitored at regular intervals. Data analysis focused on comparing efficacy and safety across groups throughout the treatment period. Detailed information on studies involving *Ayam and Kaandham chenduram* is provided in Table 5.

Table 4: Scientific review of preclinical pharmacological studies

Drugs	Preclinical haematinic activity study details	Outcome
Aya chenduram	*Aya Chenduram* was tested over 5 weeks in 2 groups of 5 animals each. One group received 20 mg/100 g body weight, while the other served as the control.	The treated group showed an Hb level of 11.2 ± 0.4, significantly higher than the control group's 5.5 ± 0.28[16].
Kaandha chenduram	Wistar albino rats (18–30 rats) were experimentally induced with anaemia using phenylhydrazine and assigned to various groups, each containing 6 animals. The drug was administered orally at different dosage levels, typically between 50 and 200 mg/kg, for a duration ranging from 14 to 28 days.	*Kaandha Chenduram* improved blood parameters by increasing Hb, RBC count, haematocrit, and serum iron while reducing total iron-binding capacity in anaemic rats[27].
Mandura chenduram	*Mandoora Chenduram* was administered for 28 days to three groups of animals, each with three animals (n = 3). Group I was the control, while Groups II and III received doses of 30 mg/kg and 2000 mg/kg body weight, respectively.	Hb levels improved from 8.1 ± 2.2 g/dL in controls to 13.0 ± 1.5 g/dL and 13.4 ± 1.0 g/dL at 30 mg/kg and 2000 mg/kg doses, respectively[18].
Phyllanthus amarus	Wistar rats were divided into control and treatment groups, with anaemia induced using phenylhydrazine. Methanol extract of *Phyllanthus amarus* was given orally at 100 and 200 mg/kg for 14 days.	significantly increased haemoglobin levels to 12.2 g/dL and 13.5 g/dL at 100 and 200 mg/kg doses, respectively [28].
Cuminum cyminum	Animal studies typically involved 6 to 10 rats per group, with anaemia induced before daily oral treatment of *Cuminum cyminum* at 100–500 mg/kg for 14 to 28 days.	significantly increased haemoglobin levels, reaching values between 12.5 and 14.3 g/dL in treated animals[29].

Table 5: Scientific review of clinical trials

Drugs	Clinical study details	Outcome
Aya chenduram	The clinical study included 60 patients with iron deficiency anaemia who received *Aya Chenduram* at 65 mg twice daily for 60 days. This was an open-label randomised comparative trial.	*Aya Chenduram* significantly increased Hb levels from about 7.8 g/dL to 11.9 g/dL over 60 days. It also improved other blood parameters, demonstrating its effectiveness in treating iron deficiency anaemia[30].
Kaandha chenduram	20–30 patients are enrolled and divided into two groups. A control and test group receiving *Kaandha Chenduram* given at 130–260 mg twice daily for 30 to 45 days.	Increase in haemoglobin from about 9.7 to 11.2 g/dL and a rise in serum ferritin from 9.3 to 13.5 ng/mL. A reduction in total iron-binding capacity further indicated improved iron availability[27].

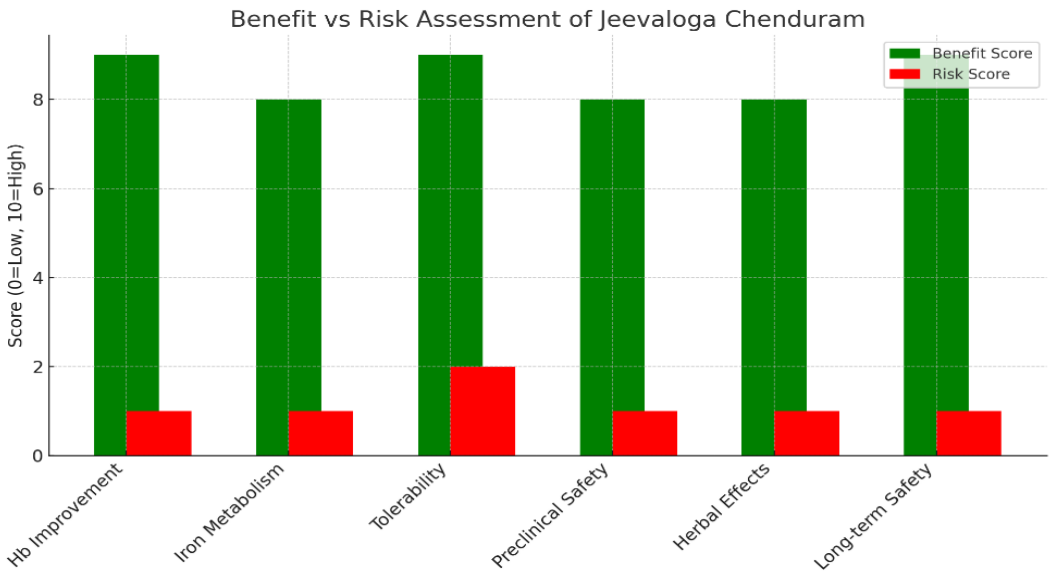

Figure 1: Benefit-Risk Profile of *Jeevaloka Chenduram* in Anaemia Management

DISCUSSION

Anaemia, especially iron-deficiency anaemia, remains a major health issue worldwide, often linked to poor nutrition and infections. Conventional iron supplements can cause side effects, leading to poor compliance. Siddha medicine offers alternative therapies like JLC, a herbo-metallic formulation with iron-rich ingredients. It combines bioavailable iron and medicinal herbs to improve absorption and reduce side effects.

Studies adhering to OECD and WHO safety protocols have shown that several Siddha herbo-metallic formulations—such as *Aya Chenduram, Kaandha Chenduram, and Mandura Chenduram*—are generally non-toxic in animal experiments. For instance, *Aya Chenduram* was found to be safe in rats at doses as high as 320 mg/kg, while *Kaandha Chenduram* exhibited no adverse effects even when administered at 1600 mg per animal over a two-week period. *Mandura Chenduram* also demonstrated good tolerance across various dose levels. Furthermore, individual herbal ingredients commonly included in JLC, like *Piper nigrum* (black pepper), *Cuminum cyminum* (cumin), and *Phyllanthus amarus*, showed high safety margins in rodent studies, indicating the overall safety of the combined formulation when used within recommended limits.

Pharmacological studies in experimental anaemia models support the effectiveness of these formulations. *Aya Chenduram* notably increased haemoglobin concentrations in rats induced with anaemia, while *Kaandha Chenduram* improved several blood parameters, including haemoglobin, red blood cell counts, serum iron, and haematocrit, along with lowering total iron-binding capacity, suggesting better iron utilisation. *Mandura Chenduram* also demonstrated significant blood-building (haematinic) activity by markedly raising haemoglobin levels at higher doses. Additionally, herbal components like *Phyllanthus amarus* and *Cuminum cyminum* played a supportive role by enhancing haemoglobin levels in anaemic animal models.

Clinical investigations further validate these traditional medicines' efficacy. In an open-label trial involving 60 iron-deficient anaemia patients, *Aya Chenduram* treatment led to an increase in haemoglobin from 7.8 to 11.9 g/dL over 60 days. Similarly, *Kaandha Chenduram* showed improvements in haemoglobin, serum ferritin, and reduced total iron-binding capacity in patients, indicating not only effectiveness but also potentially better tolerance compared to conventional iron supplements, which often cause gastrointestinal irritation.

Although direct research on *Jeevaloka chenduram* is limited, its composition closely mirrors that of *Aya and Mandura, kaandha Chenduram*, allowing reasonable assumptions regarding its therapeutic potential. It contains both elemental and bioavailable forms of iron, along with herbs known for their adaptogenic, anti-inflammatory, and digestive benefits. This combination may enhance iron absorption, promote red blood cell production, and reduce oxidative stress and inflammation—key factors in anaemia management. The inclusion of digestive and carminative herbs such as *Zingiber officinale* (ginger), *Piper nigrum* (black pepper), *Piper longum* (long pepper), *Elettaria cardamomum* (cardamom), *Cuminum cyminum* (cumin), and *Syzygium aromaticum* (clove) is likely to help reduce gastrointestinal side effects commonly linked with iron therapies, thereby improving patient compliance.

Research has highlighted the specific benefits of these herbs in anaemia treatment: *Zingiber officinale* demonstrates antioxidant and haematopoietic effects [31]. *Piper nigrum* enhances iron absorption and haemoglobin[32]. *Piper longum* has anti-inflammatory and immune-supporting properties[33]. *Elettaria cardamomum* protects blood cells from oxidative damage and supports haematological health[34]. *Cuminum cyminum* increases iron bioavailability and promotes erythropoiesis[35], and *Syzygium aromaticum* provides anti-inflammatory and gastroprotective effects[36], aiding treatment tolerance.

CONCLUSION

The cumulative evidence from safety tests, biological studies, and patient trials on comparable Siddha remedies highlights *Jeevaloka chenduram* as a promising and reliable option for managing anaemia. Its dual role in replenishing iron and enhancing overall physiological balance positions it well within integrative treatment approaches. To fully realise its therapeutic potential, further well-designed clinical research and detailed studies on its absorption and metabolism are necessary to standardise its use and ensure consistent effectiveness.

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