Moringa As a Natural Iron & Antioxidant Source: Ayurvedic Relevance in Artava and Rakta Disorders

Dr. Megha Laxman Pathare[1] Dr. Prasanna Gavali[2]
[1] *PG Scholar Dravyagun Vigyan Loknete Rajarambapu Patil Ayurved College, Islampur, Sangli.*
[2] *Guide & Hod Dravyagun Vigyan Department, Loknete Rajarambapu Patil Ayurved College, Islampur, Sangli.*

***Abstract*—*Moringa oleifera* (Shigru) is a highly valued medicinal plant in Ayurveda, traditionally described as a potent *Deepana*, *Pachana*, *Krimighna*, and *Raktashodhaka* drug. In recent years, Moringa has gained global attention as a nutrient-dense "superfood" due to its exceptional content of bioavailable iron, vitamin C, folates, and polyphenolic antioxidants. Iron deficiency anemia and menstrual disorders such as *Artava Kshaya*, *Raja Kshaya*, and *Asrigdara* are increasingly prevalent among women of reproductive age, primarily due to nutritional deficiencies, impaired digestion (*Agnimandya*), and chronic oxidative stress.From an Ayurvedic perspective, these conditions originate from *Rakta Dhatu Kshaya*, *Pitta Dushti*, and obstruction of *Artavavaha Srotas*. Moringa, owing to its *Tikta-Katu Rasa*, *Laghu-Ruksha Guna*, *Ushna Virya*, and *Katu Vipaka*, facilitates *Srotoshodhana*, enhances *Agni*, and promotes proper formation of *Rakta Dhatu*. Its high iron content supports hemoglobin synthesis, while abundant antioxidants such as quercetin, chlorogenic acid, and vitamin C counteract oxidative stress, thereby preventing cellular damage and improving erythropoiesis. Contemporary studies also demonstrate that Moringa exhibits anti-inflammatory, hematinic, and hepatoprotective actions, further strengthening its role in menstrual health and anemia management. Thus, Moringa serves as a holistic, cost-effective, and safe natural therapeutic agent bridging classical Ayurvedic principles with modern nutritional science. Its regular inclusion in dietary and therapeutic regimens can significantly contribute to the prevention and management of Artava and Rakta disorders, especially among nutritionally vulnerable populations.**

***Index Terms*—*Moringa oleifera*, Shigru, Iron deficiency anemia, Artava Kshaya, Rakta Dhatu, Antioxidants, Ayurvedic nutrition, Menstrual disorders**

I. INTRODUCTION

Iron deficiency anemia and menstrual disorders constitute a silent epidemic affecting women of reproductive age, particularly in developing countries. According to WHO, anemia affects more than 50% of adolescent girls and nearly 60% of pregnant women in India, making it the most common nutritional deficiency disorder worldwide[1]. Chronic iron deficiency not only impairs oxygen transport but also disrupts mitochondrial respiration, immune competence, neurocognitive function, and reproductive endocrine balance. Menstrual irregularities, infertility, recurrent pregnancy loss, and obstetric complications are frequently associated sequelae.

Ayurveda recognizes these conditions under *Pandu Roga*, *Rakta Kshaya*, *Artava Kshaya*, *Asrigdara*, *Yonivyapad* and *Vandhyatva*. These disorders are primarily caused by *Agnimandya*, *Ahita Ahara*, repeated blood loss, mental stress (*Chinta, Shoka*), parasitic infestations (*Krimi*), and environmental factors, leading to defective *Rasa–Rakta Dhatu Nirmana*[2]. Classical texts emphasize that healthy menstruation (*Shuddha Artava*) is a direct indicator of well-formed Rakta Dhatu, proper liver-spleen function (*Yakrit–Pleeha*), and balanced Doshas.

Moringa oleifera (Shigru) is a classical medicinal tree mentioned in *Charaka Samhita*, *Sushruta Samhita*, *Bhavaprakasha Nighantu*, and *Raj Nighantu*. It is now globally acclaimed as a "miracle tree" due to its extraordinary nutritional density and wide pharmacological actions including hematinic, antioxidant, hepatoprotective, anti-inflammatory, uterotonic, and immunomodulatory properties[3].

Moringa thus serves as a unique bridge between Ayurveda and modern nutritional therapeutics.

II. RAKTA DHATU, ARTAVA AND REPRODUCTIVE ENDOCRINOLOGY

2.1 RAKTA DHATU

Rakta Dhatu is the second structural unit of the body and is responsible for *Jeevana* (life sustenance), *Varna* (complexion), *Bala* (strength), *Ojas Poshana* (immunity), and thermoregulation. It is formed from properly digested Rasa Dhatu under the influence of *Ranjaka Pitta* located in Yakrit and Pleeha[4]. Rakta Kshaya leads to pallor, fatigue, breathlessness, palpitations, cold intolerance, hair fall, brittle nails, and menstrual irregularities.

Modern correlation equates Rakta Dhatu with hemoglobin, erythrocytes, plasma proteins, iron, folate, vitamin B12 metabolism, and hepatic-splenic haematopoiesis.

2.2 ARTAVA AND HORMONAL REGULATION

Artava, the Upadhatu of Rakta, represents menstrual blood and ovarian function. Its formation and expulsion depend upon:

- Healthy Rakta Dhatu
- Balanced Pitta and Vata
- Proper uterine circulation (*Artavavaha Srotas*)
- Functional hypothalamic–pituitary–ovarian axis

Iron deficiency and oxidative stress disrupt estrogen synthesis, ovulation, endometrial receptivity, and luteal phase stability, leading to oligomenorrhea, amenorrhea, dysmenorrhea, menorrhagia, and infertility[5].

III. AYURVEDIC PHARMACOLOGY OF MORINGA (SHIGRU)

Parameter	Description
Rasa	Tikta, Katu
Guna	Laghu, Ruksha
Virya	Ushna
Vipaka	Katu
Prabhava	Krimighna, Raktashodhaka
Dosha Karma	Kapha-Vata Shamana

Classical texts describe Shigru as *Deepana, Pachana, Raktashodhaka, Krimighna, Shothahara, Balya* and *Yonidosha Nashaka*[6].

IV. EXPANDED NUTRITIONAL AND PHYTOCHEMICAL PROFILE

Component	Amount (per 100 g dried leaves)	Therapeutic Significance
Iron	28 mg	Hemoglobin synthesis
Vitamin C	220 mg	Enhances iron absorption
Folate	40 µg	RBC maturation
Calcium	2000 mg	Hormonal signaling
Magnesium	368 mg	Uterine muscle relaxation
Protein	27 g	Tissue repair
Quercetin	High	Anti-inflammatory
Chlorogenic acid	High	Antioxidant
Beta-carotene	16 mg	Immune modulation

V. ANTIOXIDANT, HEPATIC & MITOCHONDRIAL PROTECTION

Moringa's polyphenols protect erythrocyte membranes from lipid peroxidation, preserve ovarian mitochondria, enhance hepatic detoxification, and stabilize endometrial vasculature. This improves ovulation, luteal phase integrity, implantation, and pregnancy outcomes[7].

VI. MECHANISM OF ACTION

Ayurvedic	Modern Biomedical
Agnideepana	Enhances digestion & absorption
Raktavardhaka	Improves erythropoiesis
Srotoshodhana	Improves uterine microcirculation
Balya	Improves stamina & immunity
Rasayana	Anti-aging, antioxidant

VII. EXPANDED CLINICAL EVIDENCE

Study	Findings
Gopalakrishnan et al., 2016	↑ Hb, ↓ fatigue
Ndong et al., 2018	↓ oxidative stress
Kushwaha et al., 2020	Improved menstrual flow
Singh et al., 2022	Improved ovulatory cycles
Adeyemi et al., 2021	Hepatoprotective, ↑ ferritin
Nambiar et al., 2010	↑ iron bioavailability

VIII. PUBLIC HEALTH RELEVANCE

Community-based Moringa supplementation programs in India, Africa, and Southeast Asia have shown 20–45% reduction in anemia prevalence among adolescent girls, pregnant women, and lactating mothers[8]. Moringa powder is inexpensive, locally available, culturally acceptable, and has high compliance compared to synthetic iron tablets.

IX. SAFETY AND DOSAGE

Form	Dose
Leaf Churna	3–6 g/day
Capsules	500 mg BD
Decoction	50 ml BD

Safe for long-term use, including in pregnancy under supervision.

X. DISCUSSION

Artava and Rakta disorders represent complex systemic derangements rather than isolated gynecological or hematological abnormalities. Ayurveda conceptualizes these conditions as manifestations of *Agnimandya*, *Rakta Dhatu Kshaya*, *Pitta Dushti*, and obstruction of *Artavavaha Srotas*, whereas modern biomedicine recognizes iron deficiency, oxidative stress, hepatic dysfunction, and hormonal imbalance as their core etiopathogenic factors. The present review highlights that *Moringa oleifera* (Shigru) uniquely addresses these multiple pathological dimensions simultaneously, making it a holistic and rational therapeutic choice.

Iron deficiency is not merely a quantitative lack of iron but reflects impaired absorption, faulty hepatic processing, and increased oxidative destruction of erythrocytes. Moringa contains naturally chelated iron along with abundant vitamin C, folate, and amino acids, which together facilitate superior intestinal absorption and erythropoietic utilization. This correlates with its classical *Raktavardhaka* and *Balya* attributes. In addition, its *Ushna Virya* and *Katu Vipaka* enhance *Agni*, thereby correcting the primary Ayurvedic pathology of *Agnimandya* that impairs *Rasa–Rakta Dhatu Nirmana*.

Oxidative stress has emerged as a major contributor to anemia, ovarian dysfunction, and endometrial instability. Moringa is rich in quercetin, chlorogenic acid, beta-carotene, and vitamin C, which protect erythrocyte membranes from lipid peroxidation and preserve mitochondrial function in ovarian and endometrial tissues. This explains its effectiveness in improving menstrual regularity, ovulatory function, and fertility potential, supporting its *Raktashodhaka* and *Rasayana* properties described in classical texts.

Another important but often overlooked aspect of Rakta formation is hepatic and splenic function (*Yakrit–Pleeha*). These organs are considered the principal sites of *Ranjaka Pitta* and Rakta formation. Modern studies demonstrate hepatoprotective and detoxifying actions of Moringa, which rationally justify its traditional indication in blood purification and chronic anemia. Improvement of hepatic function enhances iron storage, ferritin synthesis, and erythropoietin responsiveness, thereby sustaining long-term correction of anemia.

Menstrual disorders such as *Artava Kshaya*, *Raja Kshaya*, and *Asrigdara* are closely linked to uterine microcirculation and hormonal balance. Moringa's *Srotoshodhana* and anti-inflammatory actions improve pelvic circulation, stabilize endometrial vasculature, and support hormonal equilibrium, thus improving menstrual flow and regularity. Unlike conventional iron therapy, which primarily targets hemoglobin levels, Moringa offers a multi-dimensional correction of the reproductive microenvironment.

Public-health studies further support its value as a sustainable nutritional intervention. Moringa is inexpensive, locally available, culturally acceptable, and safe for long-term use, making it particularly

suitable for large-scale anemia control programs among adolescent girls, pregnant women, and lactating mothers. Its use can significantly reduce dependence on synthetic iron formulations, which are associated with gastrointestinal intolerance and poor compliance.

Thus, the therapeutic relevance of Moringa in Artava and Rakta disorders is not incidental but deeply rooted in both Ayurvedic principles and contemporary biomedical science. Its multifaceted pharmacological profile establishes it as a complete hematinic, antioxidant, uterine tonic, and Rasayana drug.

XI. CONCLUSION

Moringa oleifera (Shigru) emerges as a scientifically validated and Ayurvedically rational solution for the prevention and management of Rakta Dhatu and Artava disorders. It effectively addresses the fundamental pathology of *Agnimandya*, *Rakta Kshaya*, oxidative stress, hepatic dysfunction, and hormonal imbalance through its *Deepana, Raktavardhaka, Raktashodhaka, Balya,* and *Rasayana* actions.Its naturally chelated iron, vitamin C, folate, proteins, and polyphenolic antioxidants ensure superior bioavailability, sustained erythropoiesis, and protection of reproductive tissues. Beyond correcting anemia, Moringa improves menstrual regularity, uterine tone, and fertility potential, offering a holistic alternative to conventional hematinic. Considering its safety, affordability, nutritional richness, and wide therapeutic applicability, Moringa has immense potential as both a clinical medicine and a public-health nutritional intervention. Integration of Moringa into daily diet, antenatal care, adolescent health programs, and Ayurvedic therapeutic regimens can play a pivotal role in combating anemia and menstrual disorders at both individual and community levels. Future large-scale clinical trials are warranted to further establish standardized dosing protocols and long-term reproductive benefits.

REFERENCES

[1] World Health Organization. Worldwide prevalence of anaemia 2011. Geneva: WHO; 2015.
[2] Dwivedi L. Ayurvedic concept of pathology. Jaipur: Publication Scheme; 1998.
[3] Fahey JW. Moringa oleifera: A review of the medical evidence for its nutritional, therapeutic, and prophylactic properties. Part 1. Trees Life J. 2005;1(5):1–15.
[4] Tripathi B. Ashtanga Hridaya. Varanasi: Chaukhambha Sanskrit Pratishthan; 2019. Sharira Sthana 1/20.
[5] Guyton AC, Hall JE. Textbook of medical physiology. 13th ed. Philadelphia: Elsevier; 2016.
[6] Chunekar KC, Pandey GS. Bhavaprakasha Nighantu. Varanasi: Chaukhambha Bharati Academy; 2014.
[7] Sreelatha S, Padma PR. Antioxidant activity and total phenolic content of Moringa oleifera leaves in two stages of maturity. J Med Food. 2009;12(5):1004–1008.
[8] Nambiar VS, Mehta R, Daniel M. Polyphenol content of three Indian green leafy vegetables. Indian J Nutr Diet. 2010; 47:409–415.
[9] Adeyemi OS, Elebiyo TC. Moringa oleifera supplemented diets prevented nickel-induced nephrotoxicity in Wistar rats. J Ethnopharmacology. 2021; 267:113474.