

Review article

Selected Food cum Medicines (*Ghiza e Dawa*) effective in Anaemia

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ABSTRACT

Anaemia, a widespread health problem, is considered a moderate public health issue affecting children and women in Sri Lanka. In the Unani system of medicine, a condition known as *Faqr ud-dam* closely resembles anemia. The Unani medical system offers a treasure of single drugs for treating and managing various ailments. This study aims to scientifically review selected Unani single drugs used as food cum medicines effective in the management of *Faqr ud-dam* (Anaemia). All the selected drugs contained micronutrients needed for hemopoiesis such as Fe, Zn and vitamin C and possessed pharmacological actions like anti-anaemic, hemopoiesis, hemo-protective, muharrik (exhilarant) and hepatoprotective. This review provides a comprehensive overview and analysis of the nine food –cum- medicine items used to treat anaemia in Unani medicine. This covers their nutrient contents and scientific studies in related to anaemia.

Key words: Anaemia, *Faqr ud dam*, food- cum- medicines, iron deficiency, Unani single drugs

INTRODUCTION

Anaemia represents a significant global health challenge. Within Sri Lanka, this condition has emerged as a moderate public health issue, affecting various demographic groups. Specifically, the prevalence rates among preschool children, non-pregnant women, and pregnant women stand at 33%, 39%, and 34%, respectively. World Health Organization data indicates that 39% of

Sri Lankan women between 15 and 50 years of age, who are not pregnant and constitute a crucial component of the nation's labor force, suffer from anaemia (Chathuranga *et al.*, 2014). Nutritional deficiencies among these females are mainly accountable for anaemia. Sri Lanka has limited national survey on anaemia; most of them are related age or the specific population (Sheriff *et al.*, 2021).

Anaemia is defined by WHO as a condition in which the hemoglobin content of blood is lower than normal as a result of a deficiency of one or more essential nutrients (WHO, 2008). Anaemia can cause from various factors, including nutritional deficits, infections, inflammatory conditions, and genetic disorders affecting hemoglobin. Among all potential causes, iron deficiency is globally recognized as the primary contributor to anaemia. The main causes of iron deficiency are malnutrition and blood loss. Mal absorption of iron from the diet or dietary lack of iron in veganism and other causes are increasingly common in iron deficiency. The incidence of both folate and vitamin B12 deficiency is also rising. Lack of vitamin C intake will be effects the absorption of iron from non-haem iron sources (Benson *et al.*, 2021). Iron deficiency is most prevalent worldwide, with children and adolescents facing a remarkably higher risk.

The concept of *faqr ud dam* is a condition mentioned in the Unani system of medicine and corresponds to anaemia that is described in modern science. One of the most important causes of *faqr ud dam* is dietary disorder with severe malfunction of the liver due to alteration in its temperaments (Akhtar, 2010): The Unani system of medicine has a treasure of herbs for the treatment and prevention of diseases. These play a vital role in the management of anaemia with its safety, efficacy, and availability. The treatment plan in Unani medicine compacts the cause of iron deficiency and also specially the iron rich plants used in anaemia. These single drugs possess pharmacological actions like anti-anaemic, haemopoiesis, *muharrrik* (exhilarant) and hepatoprotective actions.

Diet therapy comes in first in the line of treatment of the Unani system of medicine

for any ailments. There are many single drugs and compound formulations indicated for anaemia in Unani classical texts. Most of the single drugs are food cum medicines (*Ghiza e dawa*) which are known as functional foods. *Aam* (Mango), *Ananas* (Pineapple), *Anar* (Pomegranate), *Amrood* (Guava), *Tamr* (Dates), *Palak* (Spinach), *Chukandar* (Beet root), *Gul e Gudhal* (Flower of China rose) and *Gul e Surk* (Rose flower) are some of them. *Aam*, *Ananas*, *Anar*, *Amrood*, and *Tamr* are popular fruits in most parts of the world. This study aims to review the scientific evaluations of selected single drugs in relation to the management of anaemia. Further these are the food cum medicines that commonly available and frequently consumed among Sri Lankans.

MATERIALS AND METHODS

A literature search was accomplished for anaemia, *faqr ud dam* and selected Food cum medicines (*Ghiza e Dawa*) effective in anaemia in classical books and research articles. There are large numbers of foods and drugs that were named in the management of anaemia. Amongst them, some plant-origin drugs available and easily accessible all over Sri Lanka were selected for review. Journal publications in English language and published from 2005 to up to date were searched in online electronic databases PubMed, Google scholar and Research-gate for articles using the search terms 'Botanical name of the selected plants or Common name or 'Tibbi name and 'Haemopoiesis' or 'Haemo- protective' or 'Hepato protective' or 'Nutritional composition' or 'Iron deficiency anaemia'.

RESULTS AND DISCUSSION

Iron deficiency anaemia

Iron deficiency is the most widespread nutrient deficiency globally. Iron deficiency anaemia is defined by The World Health Organization (WHO) as a

condition in which the number of red cells (and consequently their oxygen-carrying capacity) is insufficient to meet the body's physiological needs. There is a recognized decrease of hemoglobin concentration below the following thresholds: <130 g/L for adult men, <120 g/L for adult non-pregnant women, and pediatric values that start at <110 g/L for ages 6–59 months and increase with age (Navya and Prasad, 2022).

Signs and symptoms of anaemia

The signs and symptoms of *faqr ud dam*, as described in the Unani system, include pallor of body complexion, edematous face, eyelids, and upper or lower limbs, and occasionally generalized swelling throughout the body with pitting edema due to *raddi bukharat* (obnoxious gases). Additional manifestations may include gingivitis, disturbed sleep or excessive somnolence, loss of appetite, indigestion, flatulence, and delayed healing of wounds or ulcers (Verma et al., 2021). Symptoms of anaemia described in the modern scientific literature are fatigue, Fast or irregular heartbeat, reduced cognitive function, dyspnea, lack of energy, pounding or "whooshing" in your ears, headache, cold hands or feet, pale or yellow skin, chest pain, weakness, and dizziness. These symptoms can be interpreted as indicative of symptomatic anaemia and may thus play a role in diagnostic and therapeutic decisions (Weckmann et al., 2023).

Prevention and management of anaemia

Dietary insufficiency of iron is treated by oral iron supplements. Oral iron is readily available, inexpensive, effective, safe, and convenient. Because of patients intolerant of oral iron or with conditions where oral iron is likely to be ineffective or harmful, the IV route is preferred (Auerbach and Adamson, 2016).

Alternatively, it could be treated with iron supplements and an iron rich diet. Iron tablets may have certain side effects such as abdominal cramping, nausea, constipation, and dark, hard stool (Varma et al., 2021). Therefore, Herbal drugs including Unani drugs got attention due to their variable role in the management of anaemia with no or negligible side effects and cost-effectiveness. In the management and prevention of anaemia Unani literature recommends light, readily digestible food to improve digestion and appetite. Most of the spices were described for treatment of anaemia as single drug for their iron content and pharmacological actions. The diet specifically prefers in anaemia are the *Ghiza e lateef* (soft diet) *Kaseerut taghzia* (high nutritious diet) and *Jaiyyad ul Kaimus* (easily absorbable) diets from plant, mineral and animal sources (Husain and Sherwani, 2023).

Single herbs effective in anaemia and used as food cum medicine

The following list of food cum medicines has been mentioned in Unani text books and research articles, for its curative effect in anaemia (Husain and Sherwani, 2023; Ahmad et al., 2019).

- Aam (*Mangifera indica*)
- Amrood (*Psidium guajava*),
- Ananas (*Ananas comosus*)
- Anb (*Vitis vinifera*)
- Anjeer (*Ficus carica*)
- Apricot (*Prunus armeniaca*)
- Asl (*Apis indica*)
- Badam (*Prunus amygdalus*)
- Bathua (*Chenopodium album*)
- Bean (*Phaseolus vulgaris*)
- Behi (*Cydonia oblonga*)
- Cabbage (*Brassica oleracea*),
- Cauliflower (*Brassica oleracea*)
- Cherry (*Prunus avium*)
- Chulai (*Amaranthus polygamus*)

- *Gul e Gudhal* (*Hibiscus rosa-sinensis*)
- *Gul e Gulab* (*Rosa damascena*)
- Hazelnut (*Corylus avellana*)
- *Hulba* (*Trigonella foenum*)
- Jaggery (*Caryota urens*)
- *Jujubes* (*Ziziphus jujuba*)
- *Kaddu* (*Cucurbita maxima*)
- *Kamsara* (*Pyrus pyrifolia*)
- Lemon (*Citrus limonum*)
- Lime (*Citrus aurantifolia*)
- *Mouz* (*Musa paradisica*)
- Mulberry (*Morus alba*)
- *Palak* (*Spinacia oleracea*),
- *Papita* (*Carica papaya*)
- Peach (*Prunus persica*)
- Plum (*Prunus ceracifera*)
- *Anar* (*Punica granatum*)
- *Shaddock* (*Citrus grandis*)
- *Tahlab* (*Spirulina platensis*)
- *Tamr* (*Phoenix sylvestris*)
- *Tarbooz* (*Citrus lanatus*),
- *Tuffah* (*Malus domestica*)
- *Zafran* (*Crocus sativus*)
- *Zaitoon* (*Oleum europium*)

Special diets recommended for anaemia

- *Zirbaj* (A sour meat dish dressed with vinegar and honey or with acid syrup, raisins, few figs were sometimes added)
- *Sikbaz* (Acid minced flesh similar to *zirbaj*)
- *Zardah* (Rice dressed with *Crocus sativa*)
- *Yakhni* (Broth prepared from meat and rice)
- *Shorbae teetar* (Bird's soup)
- *Ghost Daraj* (Meat)
- *Masoosat* (Soup prepared with aromatic spices) (Ahmad *et al.*, 2019)

The nutrient contents of Food cum medicines (*Ghiza e Dawa*) in relation to anaemia

The medicinal plants are flourishing as a main source of drugs and used in therapies in worldwide (Gunawardana and Jayasuriya., 2019). Many medicinal plants with hematopoietic effect were mention in Unani Medicine. Some of them are food cum medicine. All these are good sources of iron, zinc and vitamin C. The comparative content values of iron, zinc and vitamin C among the selected plants were shown in Fig: 01, Fig: 02 and Fig: 03 respectively. Also, these foods can help

iron deficiency anaemia through various mechanisms alone or with medications.

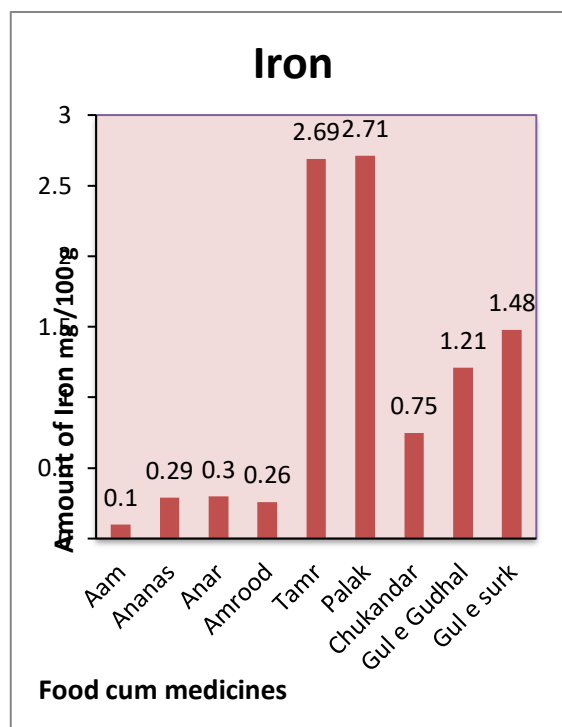


Figure 1: Iron content (mg /100 g) of selected food cum medicines effective in anaemia

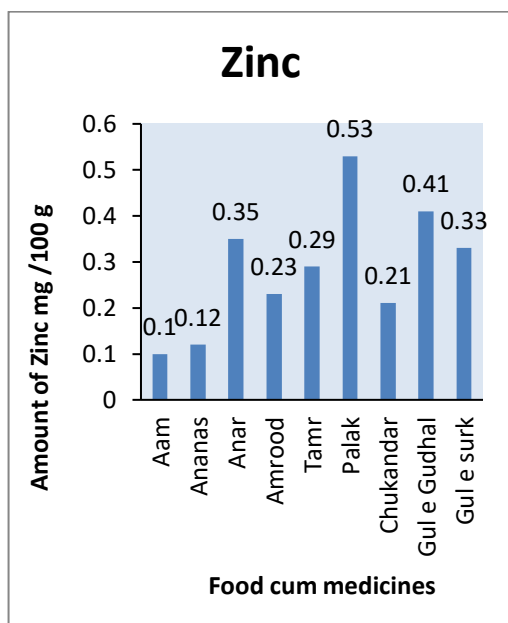


Figure 2: Zinc content (mg/100 g) of selected food cum medicines effective in anaemia

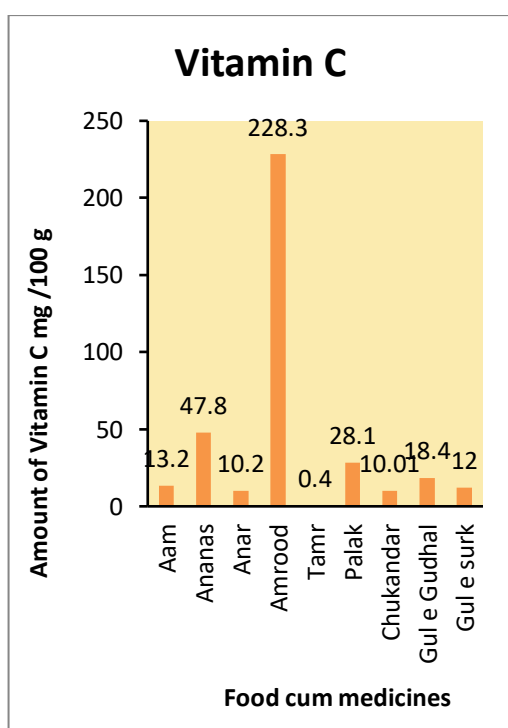


Figure 3: Vitamin C content (mg/100 g) of selected food cum medicines effective in anaemia.

Aam (Mango/ *Mangifera indica* L.)

The fruit of *Mangifera indica* has been specifically examined for its iron content

to develop natural iron products as a potential solution to iron deficiency (Saha et al., 2018). It also contains small quantities of citric, tartaric, and malic acids, which enhance iron absorption. Mango juice is considered a restorative tonic for heat stroke. Furthermore, Mango kernel extract has been investigated for its hepato-protective activity. It has been suggested that mangiferin is responsible for scavenging reactive oxygen species (ROS) and free radicals involved in cellular injury of mouse liver by modulating cell growth regulators (Sarath et al., 2009).

Ananas (Pineapple / *Ananas comosus* (L.) Merr)

It contains numerous volatile compounds in small quantities and complex mixtures. Pineapple is also a rich source of minerals and vitamins that provide various health benefits (Ali et al., 2020). The findings of Managa and colleagues suggest that a mixed fruit juice (Beet root, pineapple, and papaya) may serve as a potential therapeutic alternative in the prevention and management of anaemia in children and women (Managa et al., 2022).

Anar (Pomegranate / *Punica granatum*)

The Fruit contains several enzymes, sugar, citric acid and malic acids as well as rich in vitamin C and iron which contributes its nutritional and medicinal effects (Mirihaigalla and Fernando., 2021) A pomegranate-based drug was studied in trial animals with controlled animals; the study revealed the efficacy of the trial drug in haematenic pharmacological activity and in enhancing haemopoisis thereby proved its efficacy in treating iron deficiency anaemia. The haematanic activity of the drug showed 16.41% improvement in Haemoglobin levels in experimental animals (Meenakshi et al., 2018).

Amrood (Guava / *Psidium guajava*)

It contains a broad spectrum of phytochemicals including polysaccharides, vitamins, essential oils, minerals, enzymes, and proteins (Joseph and Priya, 2011). Extracts of *Psidium guajava* have been evaluated for their iron content to formulate natural iron products as a potential solution to iron deficiency, without causing the adverse effects associated with commercial iron supplements (Saha *et al.*, 2018). The hepato-protective effect of aqueous extracts of *Psidium guajava* and the phospholipid complex has been demonstrated against paracetamol-induced hepatotoxicity (D' Mello and Rana, 2010). In the groups treated with extract of Amrood (200, 400 mg/kg) and phospholipid complex (100 mg/kg), the serum levels of SGOT, SGPT, ALP, and bilirubin were decreased compared to the intoxicated control group. This finding was further validated by histopathological examination of the liver.

Tamr (Dates / *Phoenix dactylifera* L.)

The dried date flesh contains a high level of nutrients. Significantly it contains iron (10.7 mg/kg), calcium (536 mg/kg), and 9.80 mg of ascorbic acid. Dates overcome anaemia with its immense amount of iron and vitamin C content. Further, it helps in raising hemoglobin levels and improving iron stores in the human body. The study of Naveed and others proved the haematopoietic effect of date fruits in iron deficiency anaemia (Naveed *et al.*, 2023). A study that was designed to evaluate effects of date consumption and iron deficiency anaemia, revealed that the consumption of date fruit increased Hgt, Hct, and serum ferritin levels in all age groups. Iron deficiency anaemia could be controlled and prevented with cost-effective through dietary modification (Farhnaz *et al.*, 2019).

Palak (Spinach / *Spinacia oleracea* L.)

Spinach is an edible flowering plant in the family of Chenopodiaceae. The species *oleracea* Linn, is well known for its vitamin and mineral contents (Tedom *et al.*, 2020). This vegetable contains high amount of carotene (Vitamin A), calcium, iodine and ferrous ions, and it is considered suitable for children and pregnant women. A recent study proved that consuming 100 grams of *Palak* boiled in 30 °C water for 7 days will increase hemoglobin levels in mild anaemia (Natalia *et al.*, 2019). Banerjee and others proved that high bioavailability along with anti-oxidant activities of Fe content in *Palak* (Banerjee *et al.*, 2019).

Chukandar (Beet root / *Beta vulgaris*)

Betaxanthins (yellow) and betacyanins (red) are water-soluble nitrogenous pigments found in *Beta vulgaris* that serve as valuable natural food colorants. These pigments are widely used in various food products, including baked goods, yogurt, candies, ice cream, and processed meats. Numerous *in vitro* studies have demonstrated that betalains (including betaxanthins and betacyanins) derived from beetroot possess significant antioxidant properties (Kazimierczak *et al.*, 2014). Furthermore, flavonoids and phenolic compounds present in beet leaf extracts are believed to contribute to their hematinic properties.

Beta vulgaris has been identified as a natural source for pharmaceutical applications, particularly for its haematopoietic effects and potential in the treatment of anaemia (Gheith and El-Mahmoudy, 2018). Extracts from the leaves and stalks of *B. vulgaris* have shown haematopoietic and anti-anaemic effects in phenylhydrazine-induced anaemia models, as demonstrated through both *in vitro* and *in vivo* assays.

Gul e Gudhal (China rose flower/ *Hibiscus rosa-sinensis*)

Research articles and ancient literature have shown that the flowers of Ghudal possess haemo-protective activity, haemopoietic activity, anti-tumor, anti-diabetic, antioxidant activity and anti-depressant pharmacological actions. Recent research study showed that the methanolic extract of *H. rosa-sinensis* flowers are effective haemo-protective against phenylhydrazine-induced haemotoxicity in Charles foster rats. This activity of extract may be due to high phenol and flavonoid contents of *Hibiscus rosa-sinensis* L. flowers (Meena et al., 2021). Mishra and Tandon (2012) found in their research that, a significant increase in the level of hemoglobin and count of RBC with 30 days administration of aqueous extract of *Hibiscus rosa-sinensis* L. flowers in male Swiss albino mice.

Gul e surk (Rose flower/ *Rosa damascena* Mill.)

Gul-e-Surk has been extensively utilized in the food, perfume, and medicinal industries. Historically, it has been employed in the treatment of numerous conditions, including cardiovascular diseases, gastrointestinal disorders, inflammatory processes, wound healing, skin diseases, mental health issues, pregnancy-related complications, and menstrual irregularities. Consequently, it is regarded as a significant medicinal plant in various traditional systems of medicine (Davoodi et al., 2017). They highlighted that the rose flower is an excellent source of bioactive compounds such as terpenes, flavonoids, glycosides, and anthocyanins. Key constituents include citronellol, geraniol, nerol, quercetin, kaempferol, myrcene, gallic acid, and linalool. Furthermore, the distilled water extract of *Rosa damascena* flowers has demonstrated hematopoietic effects in animal models (Osama et al., 2020).

CONCLUSION

Anaemia and iron-deficiency anaemia are common medical conditions and have become global health problems. It leads to several complications. There are available treatments for anaemia, and due to adverse drug effects, the patient compliance is less in oral iron supplementation. The use of natural therapy in the treatment and prevention of disease is not only safe but also it is easily available. Since these are natural food supplements alongside provide other nutritional benefits to the individual. Therefore it is timely important to explore natural resources in healthcare.

CONFLICT OF INTEREST STATEMENT

The author declare that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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