



ANEAMIA- REVIEW ON ANTI ANEAMIC ACTIVITIES IN PLANTS

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Abstract: Anaemia is a common form of nutritional disorder, the principal cause of which is iron deficiency. It is prevalent in both industrialised and developing countries. Infants, children, women of child bearing age, pregnant women and the elderly are considered to be particularly vulnerable to iron deficiency because their intake or absorption is poor. Iron deficiency is the most common single-nutrient deficiency disease in the world, affecting about 15% of the world population, 35% of women and 43% of young children. It occurs when the body's iron stores become depleted and a restricted supply of iron to various tissues becomes apparent. This may result in depletion of haemoglobin and iron-dependent intra-cellular enzymes participating in many metabolic pathways. Therefore, there is the need for proper management of micronutrient deficiencies most especially iron deficiency. The medicinal plants have enormous commercial potential throughout the globe. In worldwide herbal boom, it is estimated that high quality phytomedicinals will provide safe and effective medication. In India, Ayurveda, Siddha, Unani etc. consist of large number of herbal remedies, being used from ancient times and having their potential therapeutic claims. The medicinal plants have the potential to correct anaemia problems. There are so many plants like stem bark of *Sorghum bicolor*, the leaves of *Brillantasia nitens*, *Tectona grandis* and *Allium ascalonicum* are used traditionally for the treatment of anaemia. The present review aims at aetiology and pharmaco-epidemiology of anaemia along with the herbal approach counteracting the disorder.

Key words- Anaemia, Herbs, Iron deficiency, Haematotoxicant.

Introduction:-

Anaemia is a common blood disorder that affects people of all ages, although the people at greater risk are the elderly, young women of child-bearing age and the infants^[1]. Anaemia medically stands for lowered haemoglobin level (normal for male: 13.5 - 17.0 gms% & for female: 12.0-15.5 gms%) either with normal or lowered red blood cells depending upon the age and sex. Haemoglobin is basic requirement of the body necessary for transporting oxygen throughout the body^[2]. Haemoglobin functions as the moving power stations in the body. So lowered haemoglobin may cause fatigability, unusual tiredness and energy shutdown in all the parts of the body. At the most, 10% of the blood i.e. 350 ml to 400 ml can be donated without any feeling of exhaustion^{[1][2]}. This condition is not a disease but could develop as a result of various diseases. There are over 400 types of anaemia, many of which are rare but in all cases there is lower than normal number of circulating red blood cells^[3].

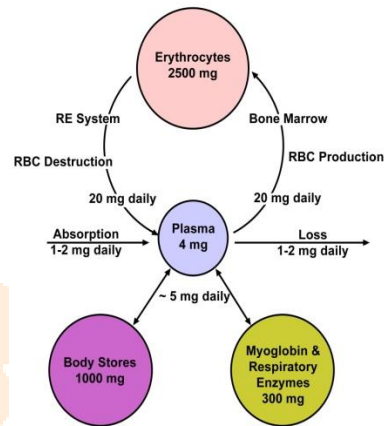
Anemia is a blood disorder. Blood is a vital liquid that flows through your veins and arteries. Your body contains about 5 to 6 quarts of blood, which are constantly being pumped throughout your body by your heart. Blood carries oxygen, nutrients, and other essential compounds. It also helps regulate your body temperature, fights infection, and gets rid of waste products^[4].

Many infants, childrens and women of childbearing age, particularly in the poorer countries of the developing world, are iron deficient^{[3][1]}. About half of these iron deficient individuals develop iron deficiency anaemia (IDA), the most advanced form of the disease, which has several major negative impacts on health and contributes substantially to the risk of early death and Disability^[5]. The incidence of anaemia is higher in the world especially in the developing countries were due to the presence of many aggravating factors such as poor nutrition, high prevalence of blood parasites example, plasmodium, trypanosomes and helminthes infestation. It is also known that women are susceptible to anaemia during pregnancy due to high demand from the developing feotus^[6].

Types Of Anemia:

Iron-deficiency anemia

Iron deficiency anemia develops when body stores of iron drop too low to support normal red blood cell (RBC) production. Inadequate dietary iron, impaired iron absorption, bleeding, or loss of body iron in the urine may be the cause^[7]. Iron equilibrium in the body normally is regulated carefully to ensure that sufficient iron is absorbed in order to compensate for body losses of iron (see the image below)^{[7][1]}.



Fig,1 Iron deficiency anaemia

Vitamin-deficiency anemia: Vitamin deficiency anemia is a lack of healthy red blood cells caused when you have lower than normal amounts of certain vitamins. Vitamins linked to vitamin deficiency anemia include folate, vitamin B-12 and vitamin C.

Vitamin deficiency anemia can occur if you don't eat enough foods containing folate, vitamin B-12 or vitamin C, or it can occur if your body has trouble absorbing or processing these vitamins^[9].

Vitamin Deficiency Anemia

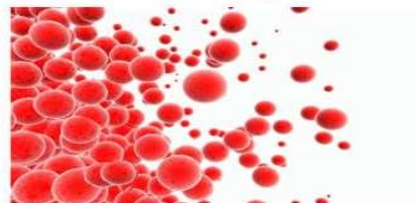


Fig: 2,vitamin deficiency

Anemia and Pregnancy - Physiological adaptation in pregnancy leads to physiological anemia of pregnancy. This is because the plasma volume expansion is greater than red blood cell (RBC) mass increase which causes hemodilution. Normal pregnancy increases iron requirement by 2–3 fold and folate requirement by 10–20 fold.

Nutritional iron deficiency anemia (IDA) is the commonest (90%) cause of anemia in pregnancy. IDA is associated with increased maternal and perinatal morbidity and mortality, and long-term adverse effects in the newborn. A 55-kg pregnant woman is estimated to need approximately an additional 1000 mg of iron over the whole pregnancy. It has been estimated that the daily iron requirements of a 55-kg pregnant woman increases from approximately 0.8 mg in the first trimester to 4–5 mg during the second trimester and >6 mg in the third trimester. Pregnant women need iron to cover their basic losses, increased RBC mass and demand from fetoplacental unit. This requirement is not met by food alone in developing countries and oral iron supplementation is justified^[10].

Aplastic anemia: Aplastic anemia may be either acute or chronic and can develop at any age. It tends to be more common in young people, however. Aplastic anemia increases the risk of leukemia and other blood disorders. If untreated, aplastic anemia can lead to serious consequences such as arrhythmia and heart failure^[11].

Aplastic anemia develops when the bone marrow is damaged, and it can no longer synthesize enough stem cells. Stem cells are cells that give rise to other blood cells^{[11][1]}.

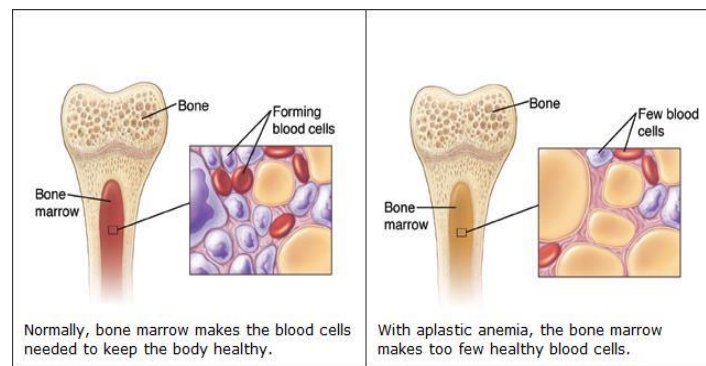


Fig:3, Aplastic anemia in bone marrow

Hemolytic anemia :- Hemolytic anemia is a condition that causes red blood cells to be destroyed and removed from the blood too early. Red blood cells are responsible for carrying oxygen throughout the body. When red blood cells are destroyed too early, oxygen is not delivered to the rest of the body efficiently^[12]. Many underlying conditions can cause hemolytic anemia, including some genetic diseases^{[12][1]}.

Hemolytic Anemia

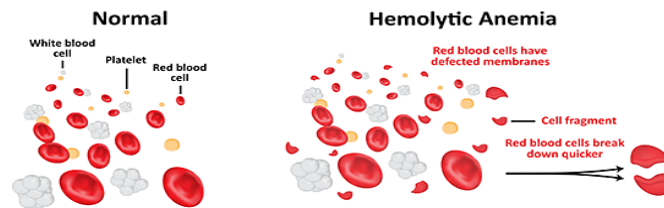


Fig: 4 Hemolytic anemia

Sickle cell anemia :- SCD is a serious group of conditions which are inherited (genetic). It affects the red blood cells in the blood. Sickle cell anaemia is the name of a specific form of SCD in which there are two sickle cell genes (see below). With SCD, the red blood cells have a tendency to go out of shape and become sickle-shaped (like a crescent moon) - instead of their normal disc shape^[13].

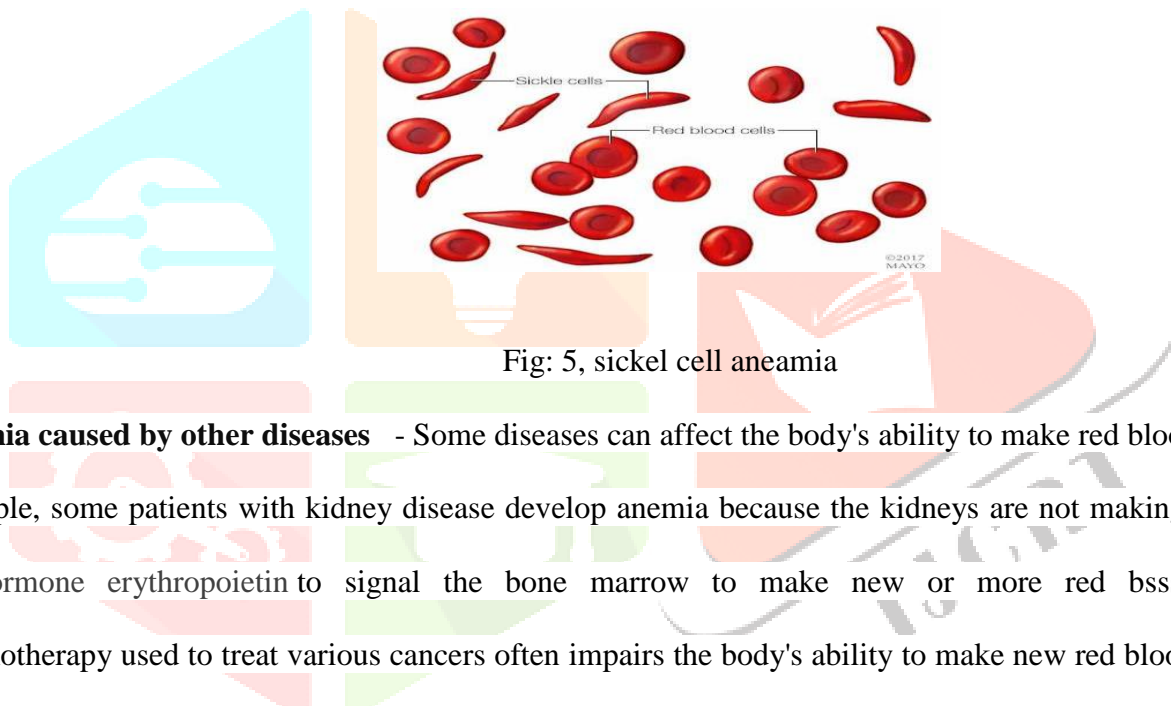


Fig: 5, sickle cell anaemia

Anemia caused by other diseases - Some diseases can affect the body's ability to make red blood cells. For example, some patients with kidney disease develop anemia because the kidneys are not making enough of the hormone erythropoietin to signal the bone marrow to make new or more red blood cells. Chemotherapy used to treat various cancers often impairs the body's ability to make new red blood cells, and anemia often results from this treatment^{[18][1]}.

Causes Of Anemia^[8]:

- Anemia from active bleeding
- Iron deficiency anemia
- Anemia of chronic disease
- Anemia related to kidney disease
- Anemia related to pregnancy
- Anemia related to poor nutrition
- Pernicious anemia

- Sickle cell anemia

More Anemia Causes :

Thalassemia, Alcoholism, Bone marrow-related anemia, Aplastic anemia, Hemolytic anemia, Anemia related to medications^{[8][1]}.

Other less common causes of anemia include

Thyroid problems, cancers, liver disease, autoimmune diseases (lupus), paroxysmal nocturnal hemoglobinuria (PNH), leadpoisoning, AIDS, malaria, viral hepatitis, mononucleosis, parasitic infections (hookworm), bleeding disorders, and insecticide exposure^[18].

Symptoms Of Anemia^{[8][2]}:

- The signs of anemia can be so mild that you might not even notice them. At a certain point, as your blood cells decrease, symptoms often develop. symptoms may include:
- Dizziness, lightheadness, or feeling like you are about to pass out
- Fast or unusual heartbeat
- Headache
- Pain, including in your bones, chest, belly, and joints
- Problems with growth, for children and teens
- Shortness of breath
- Skin that's pale or yellow
- Cold hands and feet
- Tiredness or weakness

Mechanism of action anemia:

Schematic illustration of the main mechanisms contributing to anemia and iron deficiency in cancer patients. Blood losses due to tumor growth (especially in gastrointestinal cancers) or after surgery, possibly favored by concomitant coagulopathy, and inadequate iron intake due to cachexia and malnutrition lead to absolute iron deficiency (ID). Inflammation increases hepcidin synthesis in the liver, leading to functional ID^[16]. Treatment with erythropoiesis stimulating agents may contribute to functional ID, determining a discrepancy between iron need for erythropoiesis and iron supply from the stores. Other factors, such as bone marrow infiltration by tumor cells, myelosuppression caused by chemo-or radio-therapy, and concomitant chronic kidney disease (CKD), often contribute to the development of anemia in cancer patients^[17].

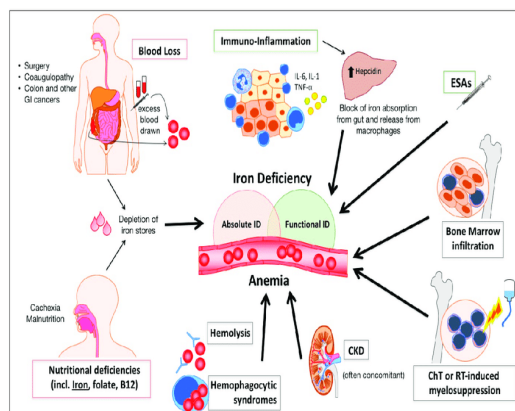


Fig:6, General mechanism of anaemia.

Complications: Since blood cells / haemoglobin are very vital, if anaemia is not cared for or treated properly with supplements or proper food intake, serious damage will often follow with loss of functions endangering life and sometimes even death can be rewarded. Commonly, anaemia gives angina (chest pain) with shortness of breath and palpitation creating fear for life^[14].

General treatment: Whatever may be the cause, the first line of treatment in Allopathy is usually with supplements like iron, folic acid, Vit C and Vit B₁₂ (either in tablet form or injection as per condition or disease of the sufferer, i.e. if intestine absorption is poor, supplements will be given through injections). If it is a critical or emergency condition, then transfusion of blood (i.e. substitution) will be opted as early as possible after analyzing compatibility. Blood can be transferred as a whole or in components as necessary^{[17][1]}.

Secondly, treatment will be planned after analyzing the cause of the anaemia with all sorts of investigations. Dietary insufficiency will be treated with prolonged prescription of supplements with advice to take good nutritious diet. The response to oral drugs can be seen only after two weeks. In case of bleeding spots (leakage), treatment (sealing / healing either by medicines or surgery) will be opted accordingly (removal of uterus in heavy flow menstruation, spleen in case of tremendous destructions, haemorrhoids in case of recurrent bleeding, etc.). Antibiotics will be prescribed if there is any infection.

Unless otherwise, cause has been corrected, anaemia will never go off and often may worsen with time even with supplements or transfusion^[19].

AYURVEDIC APPROACH- Caring for blood count is essential for life since whole life / health relies on it. With clear-cut causes like accidental bleeding, heavy menstruation, pregnancy, poor nutrition, the person can be treated accordingly with the prescribed essential supplements in the form of foods / tablets / tonics / injections and in case of critical condition blood transfusion may be a must. No one can deny this principle. But using supplements (in the form of tablets / tonics / injections) continuously without regular nutritious food to maintain blood counts / haemoglobin is not acceptable. In general, 50% of anaemic patients can be cured with diet alone, 30% may need supplements and medicines and 20% may need blood transfusion and medicines.

Even though well substituted, if the cell activity is not capable of absorbing the same, the substitute will go waste and the cell will continue to be less active or diseased. Homeopathic medicines can tackle the complaint or disease without persistent usage by treating the root cause. Anaemia is an ongoing process of chronic fatigue. Complaints will creep up with time when not attended properly. So it is better to analyze the cause and treat the condition right to the requirement. To distinguish from other ways, Homeopathy can end the endless episode of anaemia by targeting reality. More specific the treatment is, the more effective the treatment will be. Ayurvedic medicines can boost the nutrition absorption, cells production, control the destruction and can maintain stable levels^[20].

Ayurvedic medicines commonly used to treat anaemia are-

Mangifera indica

Family: Its belongs to the family anacardiaceae

Common name: Mango that is native to india.



Medicinal Uses: Various parts of plant are used as a dentrifice, antiseptic, astringent, diaphoretic, stomachic, vermifuge, tonic, laxative and diuretic and to treat diarrhea, dysentery, anaemia, asthma, bronchitis, cough, hypertension, insomnia, rheumatism, toothache, leucorrhoea, haemorrhage and piles. All parts are used to treat abscesses, broken horn, rabid dog or jackal bite, tumour, snakebite, stings, datura poisoning, heat stroke, miscarriage, anthrax, blisters, wounds in the mouth, tympanitis, colic, diarrhea, glossitis, indigestion, bacillosis, bloody dysentery, liver disorders, excessive urination, tetanus and asthma.

Oluwasegun Modupe, et al., published in march 2016 was investigated on Optimizing dose of aqueous extract of *Mangifera indica* L stem bark for treating anaemia and its effect on some disaccharidases activity in iron deficient weanling rats.

Telfairia occidentalis

Family: Its belongs to the family Cucurbitaceae

Common names: Fluted gourd, fluted pumpkin, and ikong-ubong, that is native to southern Nigeria.



Medicinal Uses: *Telfairia occidentalis* is an important staple vegetable grown in Nigeria. The plant produces luxuriant edible green leaves, which are rich in iron and vitamins. Stems of the plants have branching, long twisting tendrils and the leaves are divided into three to five leaflets with the terminal leaflets up to 15 cm long, while the male plant is grown principally for leaves and seeds, which are important soup condition. Recent studies have shown that *Telfairia occidentalis* leaf is rich in minerals (such as iron, potassium, sodium, phosphorus, calcium and magnesium), antioxidants, vitamins (such as thiamine, riboflavin, nicotinamide and ascorbic acid, phyto-chemicals such as phenols. Harvesting of fluted pumpkin takes place 120-150 days after sowing.

Other Uses Of The Plants:

The leaves contain essential oils, vitamins; root contains cucubitacine, sesquiterpene, lactones (Iwu, 1983). The young leaves sliced and mixed with coconut water and salt are stored in a bottle and used for the treatment of convulsion in ethno medicine (Gbile, 1986). The leaf extract is useful in the

management of cholesterolemia, liver problems and impaired defense immune systems (Eseyin et al., 2005a, b). The roots are used as rodenticide and an ordeal poison (Gill, 1992).

Mojisola C. Cyril-Olutayo, et al., published in 2018 Jul, 16 was investigated on Studies on the effect of a nutritious vegetable, *Telfairia occidentalis*, on HbSS blood Mojisola C. Cyril-Olutayo.

Brillantaisia nitens

Family: Its belongs to the family Acanthaceae.

Common names: Tropical Giant Sage, Pedjindo, boloboloye, that is native to the African tropics and subtropics.



Medicinal Uses: The leaves are used to take care of yaws and rheumatism, anaemia, and the decoction is taken to ease childbirth, menstrual pain and stomach ache. It has been reported to have antiplasmodial and analgesic potentials.

Peter Akah, et al., published in February 2010 was investigated on Aqueous extract and methanol fractions of the leaves of *Brillantaisia nitens* Lindau. reverses phenylhydrazine - Induced anaemia in rats.

Sorghum bicolor

Family: its belongs to the family Poaceae

Common names: Sorghum, Milo, Broomcorn, Durra, Karrir-corn, Guinea-corn, Shattercane



Tropical Uses:

Though sorghum is used largely for forage in the US, it is very important in the world's human diet, with over 300 million people dependent on it (Bukantis, 1980). Grown for grain, forage, syrup and sugar, and industrial uses of stems and fibers. Grain sorghum is a staple cereal in hot dry tropics, the threshed grain ground into a wholesome flour. Stalks used as animal feed. Important summer fodder where temperatures are high and rainfall insufficient for corn. Most important for silage or green soiling, or for hay when grown irrigated in very dry areas. Pearled grain cooked like rice or ground into flour. Sorghum, with large juicy stems containing as much as 10% sucrose, used in manufacture of syrup; sugar can be manufactured from sorghum. Broomcorn used for making brooms. The seed is used as food, in brewing "kiffir beer", the kiffir corn malt and cornmeal is fermented to make *Leting* (a sour mash), the pith is eaten, and the sweet culm chewed (Watt and Breyer-Brandwijk, 1962). Arubans make porridge and muffins from sorghum meal. Parched seed are used as coffee substitutes or adulterants (Morton, 1981).

Medicinal uses:

In these plant used as folk medicine such as antiabortive, cyanogenetic, demulcent, diuretic, emollient, intoxicant, and poison, sorghum is a folk remedy for cancer, epilepsy, flux, and stomachache (Duke and Wain, 1981). The root is used for malaria in southern Rhodesia; the seed has been used for breast disease and diarrhea; the stem for tubercular swellings. In India, the plant is considered anthelmintic and insecticidal, and in South Africa, in combination with *Erigeron canadense* L., it is used for eczema (Watt and Breyer-Brandwijk, 1962). In China, where the seeds are used to make alcohol, the seed husk is braised in brown sugar with a little water and applied to the chest of measles patients. The stomatic seeds are considered beneficial in fluxes (Perry, 1980). According to Morton (1981) Curacao natives drink the leaf decoction for measles, grinding the seeds with those of the calabash tree (*Crescentia*) for lung ailments. Venezuelans toast and pulverize the seeds for diarrhea. Brazilians decoct the seed for bronchitis, cough and other chest ailments, possibly using the ash for goiter. Arubans poultice hot oil packs of the seeds on the back of those suffering pulmonary congestion. According to Grieve's Herbal (1931), a decoction of ca 50 g seed to a liter of water is boiled down to ca 1/2 liter as a folk medication for kidney and urinary complaints.

M. Sènou, A.P. Tchogou, et al., published in 2016 was investigated on Efficiency of Sorghum bicolor extract in the treatment of induced anemia on Wistar Rats.

FOENICULUM VULGARE

Family: its belongs to the family Apiaceae

Common names :Fennel, Sweet fennel (var. *dulce*), Bitter fennel (var. *vulgare*).



Medicinal uses:

Carminative/stomachic, aromatic, antiemetic, anti-anemic, anti-inflammatory, antispasmodic, expectorant, hepatic, mild stimulant, slightly estrogenic, galactagogue, diuretic, orexigenic.

CHANDRAKANTAKUSHWAH, DEEPANSHU, et al., published in 2018 was investigated on ANTI-ANEMIC ACTIVITY OF HYDRO-ALCOHOLIC EXTRACT SEEDS OF FOENICULUM VULGARE IN PHENYLHYDRAZINE INDUCED ANEMIC RATS.

Prunus domestica

Family: its belongs to the family Rosaceae.

Common name: Plum



Medicinal uses:

The dried fruit, known as prunes, is a safe and effective laxative and is also stomachic. The bark is sometimes used as a febrifuge and is styptic. An infusion of the flowers has been used as a mild purgative for children. Although no specific mention has been seen for this species, all members of the genus contain

amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being.

Other uses:

A green dye can be obtained from the leaves , A dark grey to green dye can be obtained from the fruit, A yellow dye is obtained from the bark , A gum obtained from points of damage along the stem can be used as an adhesive , The ground up seeds are used cosmetically in the production of face-masks for dry skin , A semi-drying oil is obtained from the seed The reddish-brown wood is very close-grained, hard, compact. Liable to warp and split. It is used for musical instruments.

Pawan Goud, Shivendra Raghuwanshi, et al., Published in 2018 was investigated on ANTI ANEMIC ACTIVITY OF FRUIT OF PRUNUS DOMESTICA IN PHENYLHYDRAZINE INDUCED ANEMIC RAT.

Punica granatum

Family: Its belongs to the family Puniaceae

Common Name : Anar, Pomegranate, Dadimah, Dalimba.



Medicinal uses: Food Value, Heart Problems, Stomach Disorder, Dental Care, Cancer, Osteoarthritis, Diabetes, Anemia.

Shravan Kumar, et al., published on 2016 was investigated in Anti-Anaemic Activity of Ethanolic Extract of Punica Granatum Seeds on Phenylhydrazine-Induced Anaemic Rats.

Brassica oleracea

Family: Its belongs to the family Brassicaceae or Cruciferae

Common names: Wild Cabbage, Broccoli, Tronchuda cabbage, Brussels sprouts, Kohlrabi, Sprouting broccoli.



Medicinal Uses:

The leaves are cardiogenic and stomachic. They have been used in the treatment of gout and rheumatism. The leaves can be used as a poultice to cleanse infected wounds - the mid-rib is removed and the leaf ironed then placed on the affected area whilst still hot. The poultice should not be left on too long or it can cause blisters. The seeds are anthelmintic, diuretic, laxative and stomachic.

D. Gupta, et al., Published on June 2018 was investigated in ANTI-ANEMIC ACTIVITY OF HYDRO-ALCOHOLIC LEAF EXTRACT OF BRASSICA OLERACEA VAR IN PHENYLHYDRAZINE INDUCED ANEMIC RATS.

Lycium barbarum

Family : Its belongs to the family Solanaceae

Common Names: wolfberry, boxthorn, goji, berry, Barbary



Medicinal Uses:

In Traditional Chinese Medicine, Lycium barbarum can treat various diseases, including blurry vision, abdominal pain, infertility, dry cough, fatigue, dizziness, and headache. Meanwhile, Lycium barbarum have long been used in Oriental medicine as a potent anti-aging agent. For instance, it is effective for counteracting.

Deepanshu Gupta, et al., Published on 2018, was investigated in Anti-anemic activity of hydro-alcoholic extract of leaves of Lycium Barbarum in phenylhydrazine induced anemic rats.

Kedrostis foetidissima

Family: Its belongs to the family Cucurbitaceae

Common Name: Appakovai, Kukumadumda, Kukumadumdarnara, Nurakvels



Medicinal Uses:

Leaf juice is used for treating common cold in children. the leaf juice is extracted by pounding the leaves and 5 to 6 drops of the juice is given to children to treat cold, Eczema, Diarrhea, measles, Boils.

Baskaran K, et al., Published on 2016 was investigated in Anti-Anemic Activity of Ethanolic Leaf Extract of Kedrostis foetidissima in Phenylhydrazine Induced Anemic Rats.

Allium tricoccum

Family: Its belongs to the family Alliaceae

Common Name: Wood Leek, Ramp



Medicinal Uses:

Traditionally the leaves were used in the treatment of colds and croup, and also as a spring tonic. The warm juice of the leaves and bulb was used externally in the treatment of earaches. The fruit also used for the treatment of anaemia, A strong decoction of the root is emetic.

DEEPANSHU, et al., Published in 2018 was investigated on ANTI-ANEMIC ACTIVITY OF HYDRO-ALCOHOLIC EXTRACT OF FRUIT OF ALLIUM TRICOCCUM IN PHENYLHYDRAZINE INDUCED ANEMIC RATS.

Sauropus androgynus L. Merr.

Family: Its belonging to the family Euphorbiaceae.

Common Names: Star gooseberry, Sweet leaf bush, Phak waan baan, Cekur manis, Katuk, Binahian, and Dom nghob.



Medicinal Uses:

This plant is used in traditional medicine to relieve fever, treat urinary problems, and increase breast milk production and consumed as salad, prepared as curry, or stir-fried. It is known as “multigreen” vegetable due to its perceived superior nutrition and vitamin content in comparison to other vegetables. *S. androgynus* was reported to have approximately 7.4 g protein per 100 g of fresh leaves whilst, for comparison, spinach has 2.0 g, mint 4.8 g, and cabbage about 1.8 g.

Patonah Hasimun, et al., Published in February 2018 Was investigated on Anti-Anemic and Analgesic Activity of *Sauropus Androgynous L Merr* on Female Mice Model. Volume 8, Issue 1, Page 98-102.

Luffa aegyptiaca

Family: Its belongs to the family Cucurbitaceae

Common Names: Angled Loofah, Courge Éponge, Courge Torchon, Dishcloth Sponge, Éponge Loofa, Éponge Végétale.

**Medicinal Uses:**

Hay fever, Swelling (inflammation) of the nasal cavity and sinuses (rhinosinusitis), Common cold, Pain, Menstrual problems, Shingles (herpes zoster), Other conditions like treatment of iron deficiency anemia, rich nutrition present in the plant.

Ankur Joshi, et al., Published in 2017 Was investigated on ANTI-ANAEMIC ACTIVITY OF HYDRO-ALCOHOLIC LEAF EXTRACT OF LUFFA AEGYPTIACA IN PHENYLHYDRAZINE INDUCED ANEMIC RATS VOL 7 NO 7 (2017): VOLUME 7, ISSUE 7, 2017 (SPECIAL ISSUE: IPSAPHARM).

Azadirachta indica,

Family: Its belongs to the family Meliaceae

Commonly known: Neem, nimtree or Indian lilac.

**Medicinal Uses:**

Products made from neem trees have been used in India for over two millennia for their medicinal properties. Neem products are believed by Siddha and Ayurvedic practitioners to be anthelmintic, antifungal, antidiabetic, antibacterial, contraceptive, and sedative. It is considered a major component in Siddha medicine and Ayurvedic and Unani medicine and is particularly prescribed for skin diseases. Neem oil is also used for healthy hair, to improve liver function, detoxify the blood, and balance blood sugar levels. Neem leaves have also been used to treat skin diseases like eczema, psoriasis, etc.

Insufficient research has been done to assess the purported benefits of neem, however. In adults, short-term use of neem is safe, while long-term use may harm the kidneys or liver; in small children, neem oil is toxic and can lead to death. Neem may also cause miscarriages, infertility, and low blood sugar.

EMBLICA OFFICINALIS

Family: Its belongs to the family Euphorbiaceae

Common Names: Amalagam, Amalaki, Amla, Amlabaum, Amlaj, Amulch, An mole, Anwala churna, Chyavanprash, Emblic myrobalan, Gebrau chilicher, Hyponidd, Indian gooseberry, Kalpaamruthaa, Nelli, Ngop, Shabju, Sripthalam, Toppinelli, Triphala, Yeowkan tse, Ziphuyu-si.



Medicinal Uses:

Amla, being rich source of vitamin C, is considered to be effective in slowing down the ageing process. Ageing is a cumulative result of damage to various cells and tissues, mainly by oxygen free radicals. Vitamin C is a scavenger of free radicals which breaks them down; it has an antioxidant synergism with vitamin E which prevents pre-oxidation of lipids.

Antioxidant activity, Anti-ulcer Activities, Immune modulatory Activities, Antipyretic and Analgesic Activities, Hepatoprotective Activity, Anti-Inflammatory Activity, Cardio-protective Activity, Anti cancer activity, Pharmacological Perspectives Antitumor Activity, Cytoprotective, Antitussive, Gastro-protective activity, Memory Enhancing Effects, Chelating Agent, Hair Growth Property, As Snake Venom Neutralizer.

Various diseses to cure these plant:

In Respiratory disease: In Diabetes, In Gonorrhoea, Nausea, In constipation, In Skin cancer, In Ophthalmic Disorder, Hair Growth, In Reducing Cholesterol and Dyslipidemia, In Headache, Nanoparticles, In Skin Sores and Wounds, Skin Whitening.

Vamsee Veena A,et al.,Published in 2015,Was investigated on Comparative anti anemic activity of Azadirachta indica leaves and its combination with Emblica officinalis in phenyl hydrazine induced anemia using rats.

Schrebera swietenioides

Family: Its belongs to the family Oleaceae

Common Names: Weaver's Beam Tree



Medicinal Uses:

The plant has a long history of being used to treat various diseases. The roots, bark and leaves are bitter, acrid, appetising, digestive, thermogenic, stomachic, depurative, constipating urinary astringent and anthelmintic. They are useful in treating a range of conditions including indigestion, skin diseases, leprosy, anaemia, boils and burns and rectal disorders.

Other Uses:

The heartwood is of a brownish grey colour; it is not clearly demarcated from the sapwood. It is very close-grained, heavy, hard and durable. It is reckoned less subject to crack or warp than any other wood. It is used by weavers in many parts of their looms, particularly for the beam: it is also used in turnery and serves also for a great variety of other uses.

PRASUNA SUNDARI PINGALI, et al., Published in 2015 was investigated on STUDY OF ANTI-ANAEMIC EFFECT OF SCHREBERA SWIETENIOIDES ROXB. IN RAT MODELS.

Jatropha tanjorensis

Family: Its belongs to the family Euphorbiaceae.

Common Names: Catholic vegetables, Jatropha, 'Hospital too far', lapalapa and Iyana ipaja.



Medicinal Uses:

The leaves are employed traditionally in the treatment of anaemia, diabetes and cardiovascular diseases. It is a traditionally used medicinal plant in South-Eastern Nigeria with many claims from local consumers that it possesses blood replenishing properties. It has been reported that *Jatropha* leaves are rich in beta blockers, anti-cancer agents, anti-anaemic, anti-microbial activities, anti-plasmodial and anti-oxidant effects against oxidative stress induced by malaria parasite.

MacDonald Idu, et al., Published in 2014, Was investigated on Anti-anaemic activity of *Jatropha tanjorensis* Ellis & Saroja in Rabbits.

Glycyrrhiza glabra

Family: Its belongs to the family Leguminosae

Common Names: Atimadhuranu, mulaithi, Licorice, madhuka.

**Medical Uses:**

Traditionally the plant has been recommended as a prophylaxis for gastric and duodenal ulcers and in dyspepsia as an anti-inflammatory agent during allergenic reactions. In folk medicine, it was used as a laxative, emmenagogue, contraceptive, galactagogue, anti-asthmatic drug and antiviral agent. Glycyrrhiza roots were used for its demulcent and expectorant property. It is useful in anemia, gout, sore throat, tonsillitis, flatulence, sexual debility, hyperdypsia, fever, coughs, skin diseases, swellings, acidity, leucorrhoea, bleeding, jaundice, hiccough, hoarseness, bronchitis, vitiated conditions of vata dosha, gastralgia etc. It was an important ingredient in medicinal oils for the epilepsy, paralysis, rheumatism, hemorrhagic diseases and also used in the treatment of diarrhea, fever with delirium and anuria.

Mohammad Mahdi Zangeneh, et al., Published in 2017 October Was investigated on Evaluation of the anti-anemic potential of *Glycyrrhiza glabra* aqueous extract in Phenylhydrazine-treated rats.

Aegle marmelos

Family: Its belongs to the family Rutaceae.

Common Name: Bael

Medicinal Uses:

Aegle marmelos is traditionally used to treat jaundice, constipation, chronic diarrhea, dysentery, stomachache, stomachic, fever, asthma, inflammations, febrile delirium, acute bronchitis, snakebite, abdominal discomfort, acidity, burning sensation, epilepsy, indigestion, leprosy, myalgia, smallpox, spermatorrhoea, leucoderma, eye disorders, ulcers, mental illnesses, nausea, sores, swelling, thirst, thyroid disorders, tumors, ulcers and upper respiratory tract infections. It is also used to treat Anaemia, Fractures, Healing of Wounds, Swollen Joints, High Blood Pressure, Diarrhoea, Healthy Mind and Brain Typhoid Troubles during Pregnancy.

Joshi Ankur, et al., Published in April 2017 Was investigated on Anti-anemic activity of hydro-alcoholic leaf extract of *aegle marmelos* in phenylhydrazine induced anemic rats. Vol. 9, Issue, 04, pp.48928-48931,

Hoslundia opposita

Family: which is belongs to the Family: Lamiaceae

Common names: orange bird berry, bird gooseberry (Eng.); Uyaweyawe (Zulu)



Traditional Uses: In these plants having so many properties and uses one of the important thing is it also available in different countries like Western Africa countries such as Cameroon, infusions from leaves of *H. opposita* are reported to be used as a purgative, diuretic, febrifuge, antibiotic, and antiseptic as well as for anaemia and skin diseases by traditional healers. In Eastern Nigeria *H. opposita* is widely used in folk medicine for the treatment of cough, chest pain, fever, hookworm, stomach disorders, wounds, liver diseases and mental disturbances. Leaves or root of *H. opposita* are used oral or topical to treat chronic and deep wounds, stomach ulcer, as well as dermatitis in some regions of Ghana. Furthermore, Essential oils from the leaves of *H. opposita* are extensively used as insect repellents. Leaves infusion is used as antidiabetic in Guinea.

Sadri Abdullah Said et al January 08, 2018 was investigation of the Antimalarial Effect and Other Properties of *Hoslundia opposita*.

Khaya senegalensis

Family: its belongs to the family Meliaceae that is native to Africa.

Common names: Include African mahogany, dry zone mahogany, Gambia mahogany, khaya, wood, Senegal, mahogany, cailcedrat, acajou, djalla, and bois rouge.



Traditional Uses: The wood is valued for carpentry, joinery, furniture, cabinet work, ship building and decorative veneer. It is suitable for construction, flooring, interior trim, vehicle bodies, toys, novelties, railway sleepers, turnery and pulpwood,

Other Uses: The wood is used for dug-out canoes, household implements such as mortars and spoons, and drums. It is also used as fuelwood and for charcoal production.

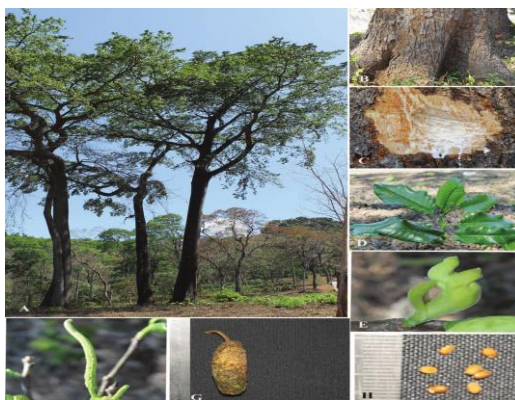
The bitter-tasting bark is highly valued in traditional medicine. Bark decoctions or macerations are widely taken against fever caused by malaria, and against stomach complaints, diarrhoea, dysentery and anaemia, as anodyne in cases of rheumatism and headache, and as tonic, emmenagogue and anthelmintic.

A. Onu, Y. Saidu et al Both are published in 2013 was investigated Effect of Aqueous Stem Bark Extract of *Khaya senegalensis* on Some Biochemical, Haematological, and Histopathological Parameters of Rats.

Milicia excels

Family: its belongs to the family Moraceae that is native to Africa

Common name:



Uses Of *Milicia excels*: Bark preparations are externally applied to treat scabies, wounds, loss of hair, fever, venereal diseases and sprains. They are also applied as an enema to cure piles, It is used to treat a wide range of conditions including cough, asthma, heart trouble, lumbago, spleen pain, stomach pain, abdominal pain, oedema, ascites, dysmenorrhoea, gonorrhoea, general fatigue, rheumatism, sprains.

W Mamidou Koné, A G Koffi, et al published in 2011 Oct 2 was investigated on Ethnomedical Study and Iron Content of Some Medicinal Herbs Used in Traditional Medicine in Cote D'Ivoire for the Treatment of Anaemia.

Ricinus communis

Family: Its belongs to the family Euphorbiaceae that is native to traditional Africa, in south Africa

Common names: Castor oil probably comes from its use as a replacement for castoreum, a perfume base made from the dried perineal glands of the beaver (*castor* in Latin). It has another common name, palm of Christ, or palma Christi.



Traditional Uses: *Ricinus communis* have been widely used in traditional medicine such as abdominal disorders, arthritis, backache, muscle aches, bilharziasis, chronic backache and sciatica, chronic headache, constipation, expulsion of placenta, gallbladder pain, period pain, menstrual cramps, rheumatism, sleeplessness, and insomnia.

The *Ricinus communis* leaves are used in anemic disorders, and applied to breasts of females for an increase in milk secretion.

Dr. D. Y. Patil et al there published in 2019 was investigated EVALUATION OF HEMATINIC ACTIVITY OF NAGA BHASMA IN PHENYLHYDRAZINE-INDUCED ANEMIA IN EXPERIMENTAL RATS

Imperata cylindrical

Common Name: Cogongrass or kunai grass

Family: Its belongs to the family belongs to the family Poaceae



Traditional Uses: The flowers and the roots are antibacterial, diuretic, febrifuge, sialogogue, styptic, and tonic. The flowers are used in the treatment of haemorrhages, wounds etc, They are decocted and used to treat urinary tract infections, fever, thirst etc. The root is astringent, antifebrile, antivenous, diuretic, emollient, haemostatic, restorative, and tonic. It is used in the treatment of nose bleeds, haematuria, haematensis, oedema and jaundice. The root has antibacterial action against staphylocococcus aureus, bacillus dysenteriae etc., A decoction of the root is used as an anthelmintic and also to treat digestive disorders such as indigestion, diarrhea and dysentery. The root bark is febrifuge, restorative and tonic. Extracts of the plant have shown viricidal and anticancer activity.

Other Uses Of These Plant: The plant leaves are woven to make mats, bags and raincoats. The inflorescences are valued for stuffing pillows and cushions. The stems are used in thatching roofs. A fibre obtained from the leaves is used in making paper Can be planted on sandy soils to prevent erosion. The plants form impenetrably dense clumps and when planted close together in drifts make an excellent ground cover.

E L Bomisso, and F H Tra Bi et al both are published in 2019 was investigated in Ethnomedical Study and Iron Content of Some Medicinal Herbs Used in Traditional Medicine in Cote D'Ivoire for the Treatment of Anaemia.

Amaranthus spinosus

Common Name: Spiny Amaranth

Family: Its belongs to the plant Amaranthaceae.



Traditional Uses Of Amaranthus Spinus L: As mentioned in the juice of *A. spinosus* is used by tribal of Kerala, India to prevent swelling around stomach while the leaves are boiled without salt and consumed for 2–3 days to cure jaundice. It is used as anti-inflammatory, antimalarial, antibacterial, antimicrobial, antidiuretic, antiviral and hepatic disorders. The plant possess hepatoprotective, antioxidant activity, water extract of plant showed significant immune-stimulating activity and stem extract showed antimalarial activities. It used internally in the treatment of internal bleeding, diarrhoea and in excessive menstruation. In Indian traditional system of medicine (Ayurveda) the plant is used as febrifuge, antipyretic, laxative and diuretic. Besides its culinary value, it is a popular medicinal plant used to reputed for treat digestible, bronchitis, appetizer, biliousness, galactagogue, haematinic, stomachic effects, nausea, flatulence, anorexia, blood diseases, burning sensation, leucorrhoea, leprosy, piles and as a treatment for hallucination, healing of wounds and rheumatism, and to arrest the coughing up of blood. All parts of the plant are known to contain medicinally active constituents

Medicinal uses of *Amaranthus spinosus* Linn. as mentioned in Ayurvedic text is: Leaf infusion is diuretic and used in anemia.

In these *amaranthus spinus* linn was investigated in the professor W Mamidou Koné, and colleagues. They are published in 2011 Traditional Medicine in Cote D'Ivoire for the Treatment of Anaemia, These persons are well good explanation for the traditional uses of the different plants in these journal.

Cajanus cajan (Linn.)

Family: Its belongs to the families Papilionaceae; Fabaceae

Common names: pigeonpea, red gram, tur, pwa kongo, gungo peas.



Medicinal uses:

The roots are anthelmintic, sedative, expectorant and vulnerary. An infusion of the leaves is used as a treatment for pulmonary conditions such as coughs and bronchitis. The leaf juice is taken internally in the treatment of haemorrhages, coughs and diarrhoea. An infusion of the leaves, combined with *Dactyloctenium aegyptium*, is used to accelerate childbirth. Young leaves are chewed to treat boils on the tongue. A decoction is used for washing ulcers. The boiled leaves are applied to sores and wounds to hasten cicatrization. Young shoots and the green seedpods are used to make a good pectoral infusion. An infusion of the flowers and leaves is diuretic and is used as a diabetes remedy. An infusion of the flowers is pectora. A decoction of the plant is diuretic and laxative. It is used in the treatment of sore throats. An infusion of the seeds is diuretic. A flour made from the seeds is resolutive. Leaf contains cholesterol. The root bark contains numerous flavones including cajanflavanone and cajanone, and triterpenes. The root contains cajanone, an antimicrobial agent. An enzyme called 'urease' can be extracted from the plant. It has medicinal applications.

Adebola Olumide Akinsulie, et al., published in 2005 was investigated in Clinical Evaluation of Extract of *Cajanus cajan* (Ciklavit(R)) in Sickle Cell Anaemia.

CONCLUSION:

The highest prevalence of anemia exists in the developing world where its causes are multifactorial. With limited resources and complex socioeconomics in the developing world, combating anemia is a global public health challenge. Different studies indicate high prevalence of anemia in adolescent boys and girls. Adolescent health is the most important indicator of development of a nation. Hence, urgent attention is needed in this area. Evidence suggests that preventive supplementation coupled with nutrition education may be a more effective strategy associated with better compliance and improvement in nutrition status. However, anaemia-free population is practically possible when the consequences of anaemia and its preventive and curative measures are popularised among the common public especially the rural population. This extensively cited and well documented review will definitely help the researcher in invention of suitable antianaemic drug, experimental study protocol preparation and cross referencing the published methods.

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