



A HAEMATINIC POTENTIALS OF MEDICINAL HERBS – A CURRENT SCENARIO

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ABSTRACT

Herbal plants are playing an important role in healing ailments. Most of the World's populations preferred to take natural products as medicine due to minimal or lack of adverse effects. The potentials of herbal preparation were well utilized by Siddha system of medicine. Herbal products were obtained from the god as a boon in treating various diseases. Anemia is a major problem in the current world especially during childhood period, pregnancy times, and also more during the old age and the complications ends with mortality. In order to reduce the incidence of anemia and mortality rate, an attempt was made through this review paper. In this review paper explored the haematinic activity of various herbs with its Phytochemicals, Vernacular names, Other names are explained.

KEYWORDS: Anemia, Haematinic activity, Herbs, *Siddha*, Phytochemicals.

INTRODUCTION

Humans were mostly depends on herbs for its nutritional value and medicinal uses. Most of the medicinal needs were satisfied by the herbal plants. The important herbal products such as herbal teas, medicinal raw materials, essential oils, spices, flavouring and dietary supplements.^[1]

The secondary metabolites or phytochemicals were responsible for the medicinal uses of various herbs. These chemicals were bio active, with producing definite physiological and biochemical actions of animals as well as in human beings. These secondary metabolites includes such as alkaloids, flavonoids, tannins, phenolics, saponin, steroids, glycoside, and terpenes etc.^[2]

Thus the medicinal plants were used by the human being from the ages in traditional medicine including Siddha due to its efficacy and these type of research on medicinal plants paved the way for the discovery of novel drug used against diverse diseases. According to WHO results in 2008, states that 80% of the world's population depends on the traditional medicine for their primary health care needs.^[3]

The Drugs obtained from the natural origin were considered as less toxic and also it was free from adverse

effects in compared with the synthetic drugs. They were widely used by the practitioners of traditional medicines due to their minimal or lack of adverse effects and low cost.^[4]

Anemia is a common blood disorder in all ages, it had the greater risk at the elderly, young women of child-bearing age and also in infants. Presently, more than half of the world's population suffered with the some forms of anemia in their life time.^[5]

The main impacts of anemia were due to poor nutrition, high prevalence of blood parasites example, plasmodium, trypanosomes, Habits, and helminthes infestation.^[6]

The best doctor will give the least medicine – Benjamin Franklin.

Although there were so many drugs have been validated for the treatment of anaemia, but they were not affordable to many people due to their poverty particularly in the developing countries. Siddha system of medicines utilized the importance of medicinal plants and used the plants for treating various health care ailments. In addition with that the rural populations in various parts of the world did not have the adequate accessment of high quality drugs in the treatment of anaemia, Thus an attempt was made through this review

with haematinic activity of various herbs which were easy affordable, less adverse effects.

Anemia

Anemia is a common term for describing a group of conditions with reduction of oxygen-carrying capacity of blood. Anemia may be caused due to the deficiency of blood or red blood cells or of hemoglobin. It is condition in which the body does not have adequate red blood cells (RBCs) or hemoglobin (Hb). There were several types

of anemia among these iron deficiency anemia was the most commonest one.

Commonest Symptoms

The commonest symptoms were Pale skin, Weak rapid pulse, Fatigue, loss of energy, Dizziness, Tachycardia occurs with mild work, Feels exhausted, Giddiness, Shortness of breath, headache, Leg cramps, low blood pressure, Insomnia, Tinnitus, Poor growth, Loss of appetite, Spoon shaped nails, Spleen enlargement, sore in angle of mouth, Chest pain.^[7]



Fig. 1: Types of Anemia.

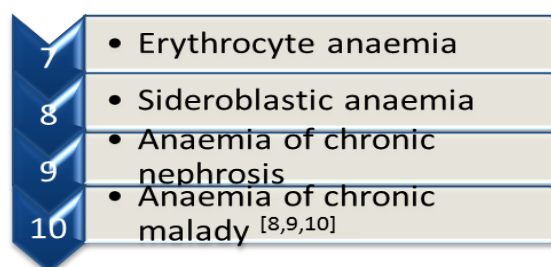
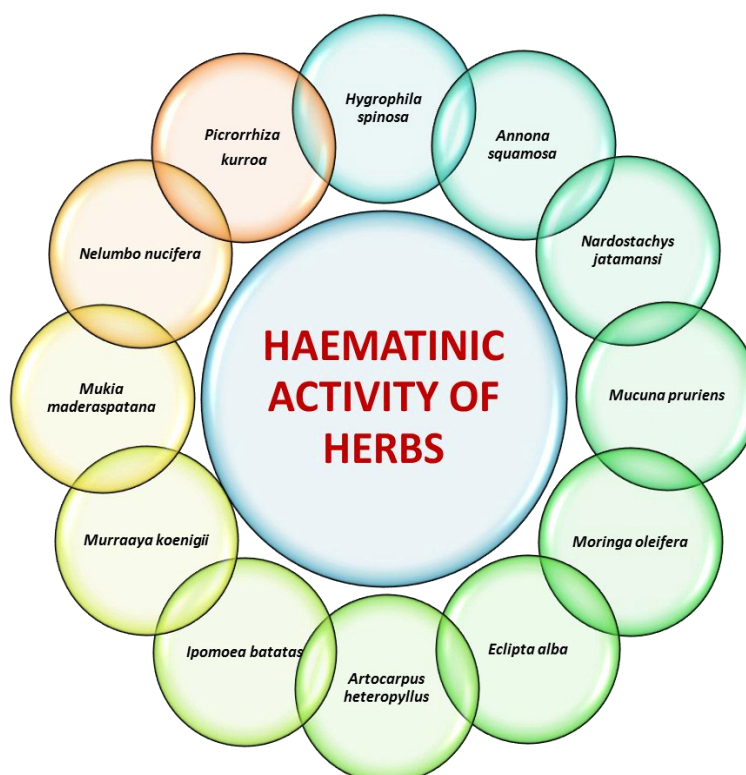


Fig. 2: An Overview of Haematinic Herbs.



1. Scientific name: *Hygrophila spinosa***Other names**

Nithagam, Ikkuram, Kaakandam, Thuragathamoolam, Mundagam.

Vernacular Names

Tamil	: Neermulli
English	: Long leaved barieria
Telugu	: Nirugobbi
Malayalam	: Vayaichulli
Kanada	: Kollavali, Kalavankabija
Sanskrit	: Kokilaksha
Hindi	: Talmakhana

Properties and Action

Suvai (Taste): Inippu (sweet), Kaippu (bitter)
 Thanmai (Potency): Thatppam (Cold Potency)
 Pirivu (Bio-Transformation): Inippu (sweet)
 Seigai (Actions): Demulcent, Diuretic, Refrigerant, Aphrodisiac, Tonic.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for alkaloids, carbohydrates, phenolic compounds, tannins, phytosterol, nitrogen, saponins albuminoids, alkaloids, essential oils, myrastic, carbohydrates and glycosides palmatic, stearic and linolic acids.^[12]

Haematinic Activity

The Ethanolic extract of *H. Spinosa* with the dose level of 100 & 200 mg/kg was examined on male albino rat's showed a marked increase of haemoglobin. Thus The Ethanolic extract of *H. Spinosa* showed a potent haematinic activity.^[13]

2. Scientific name: *Annona squamosa***Vernacular Names**

Tamil	: Seetha
English	: Custard apple, Sugar apple.
Telugu	: Seetaphalam
Malayalam	: Sirpa
Kanada	: Sitapal
Sanskrit	: Subha
Hindi	: Sharifah

Properties and Action

Suvai (Taste): Fruit – sweet, others Thuvarpu (Astringent), Karppu (Pungent)
 Thanmai (Potency): Veppam (Hot Potency)
 Pirivu (Bio-Transformation): Karppu (Pungent)
 Seigai (Actions): Anthelmintic, Astringent, purgative, Detergent, Cooling, Tonic.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for alkaloids, steroids, tannins, phenols, reducing sugar, saponin and flavonoids.^[14]

Haematinic Activity

On oral administration of the liquid extract of dicot genus of *Annona squamosa* leaves was observed on the haemolytic anemic rats. The Pulp extract of *A. squamosa* showed a significant increase in hemoglobin. Thus The Pulp extract of *A. squamosa* showed a potent haematinic activity.^[15]

3. Scientific name: *Nardostachys jatamansi***Other names**

Sadamaasi, Jadamaanji, Paisaasi, Sadilai, Maamisaboohakesini.

Vernacular Names

Tamil	: Sadamaanji
English	: Valerina root
Telugu	: Jadamamsi
Malayalam	: Manij
Kanada	: Jeta-mavashi
Sanskrit	: Jatmamsi
Hindi	: Vilayati-jatamasi

Properties and Action

Suvai (Taste): *Inippu* (Sweet), *Karppu* (Pungent)

Thanmai (Potency): *Veppam* (Hot Potency)

Pirivu (Bio-Transformation): *Karppu* (Pungent)

Seigai (Actions): Stimulant, Antispasmodic, Diuretic, Expectorant.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for terpenoid ester, nardo-stachysin, Sesquiterpenes, coumarins, lignans, neolignans, alkaloids, Alpha-patchouli-ol, angelicin, β -eudesmol, β -atchoulense, β -sitosterol, calarene, elemol, jatamansin, jatamansinol, jatamansone, n-hexacosanyl, n-hexacosane, Oroselinol, patchouli alcohol, valeranone, valeranone, nardostachnol, seychellene, seychellane, nardostachone, ketone, jatamansic acid, jatamansone semicarbazone, lupulol, Malliene, Calarenol, terpenic, coumarin-jatamansin, propionate, cyclohexanal ester, heptacosanyl pentanoate, diethaniod bicyclic-ketone-nardostachone, actidine, Nardal.^[16]

Haematinic Activity

On oral administration of liquid suspension of *N. Jatamansi* was given at a dose level with the ranges of 100, 200, 400 mg/kg to the Wistar albino rats for 15 days. The medical parameters showed the vital increase of haemoglobin. Thus *N. Jatamansi* showed a potent haematinic activity in Wistar albino rats.^[17]

4. Scientific name: *Mucuna pruriens***Other names**

Kannduthi, Markadi

Vernacular Names

Tamil : Poonakaali
English : Common Cowitch
Telugu : Pillidagu
Malayalam : Choraivalli
Kanada : Nasugenne
Sanskrit : Atmagupta
Hindi : Kavach

Properties and Action

Suvai (Taste): *Thuvarpu* (Astringent)

Thanmai (Potency): *Thattpam* (Cold Potency)

Pirivu (Bio-Transformation): *Inippu* (Sweet)

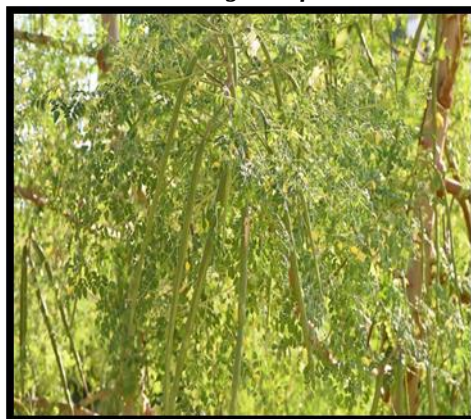
Seigai (Actions): Astringent, Nervine tonic, Aphrodisiac, Diuretic, Vermifuge.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for Glycosides, Flavonoids, Saponins, Steroids, Phenols, Alkaloids, Molish's test positive, Fehling test positive. Ferric chloride test Positive, Potassium dichromate test positive, niacin, ascorbic acid, aminoacids, glutathione, lecithin, gallic acid, beta sitosterol, L-DOPA, synthesizing dopamine, protein, palmitic, oleic, stearic, behenic, linoleic, linolenic acid.^[18]

Haematinic Activity

The leaf extract of *M. pruriens* showed a marked increased level of hemoglobin. Thus *M. pruriens* showed a potent haematinic activity.^[19]

5. Scientific name: *Moringa oleifera***Other names**

Sikkuru, Kiranjium, Kizhavi, Sobanjanam.

Vernacular Names

Tamil : Murungai
English : Horse radish, Drum stick tree
Telugu : Munaga
Malayalam : Murinna
Kanada : Nugge- gida
Sanskrit : Sigrum Sigrum- valkalum
Hindi : Sahijna

Properties and Action

Suvai (Taste): *Thuvarpu* (Astringent), *Kaippu* (bitter)

Thanmai (Potency): *Thattpam* (Cold Potency)

Pirivu (Bio-Transformation): *Inippu* (Sweet)

Seigai (Actions): Antispasmodic, Stimulant, Expectorant, Diuretic, Emmenagogue, Abortifacient, Acrid, Vomiceant, Antilithic, Tonic.^[11]

Chemical compounds

The results of chemical analysis indicated the positive results for 9-octadecenoic acid (20.89%), L-(+)-ascorbic acid- 2,6-dihexadecanoate (19.66%), 14-methyl-8-

hexadecenal (8.11%), 4 hydroxyl-4-methyl-2-pentanone (7.01%), 3-ethyl-2, 4-dimethylpentane (6.14%), phytol (4.24%), octadecamethyl-cyclononasiloxane (1.23%), 1, 2-benzene dicarboxylic acid (2.46%), 3, 4-epoxyethanone comprising (1.78%), N-(1-methylethylidene)- benzene ethanamine (1.54%), 4, 8, 12, 16-tetramethylheptadecan-4-olide (2.77%), 3-5-bis (1, 1-dimethylethyl)-phenol (2.55%), 1-hexadecanol (1.23%), 3, 7, 11, 15-tetramethyl-2 hexadecene-1-ol (1.17%), hexadecanoic acid (2.03%) and 1, 2, 3-propanetriyl ester-9 octadecenoic acid(1.23%), oleic acid (84%), L-(+) ascorbic acid- 2, 6-dihexadecanoate (9.80%), 9-octadecenoic acid (1.88%), methyl ester-hexadecanoic acid (1.31%) and 9- octadecenamide (0.78%).^[20]

Haematinic Activity

The crude liquid extract of seeds of *Moringa oleifera* were administered to Wister albino rats for 3 weeks and then medical parameters were analysed. The report showed marked increased level of haemoglobin. Thus *M.oleifera* showed a potent haematinic activity.^[21]

6. Scientific name: *Eclipta alba*



Other names

Karisaalai, Karisalanganni, Kariyasaalai, Kaikesi, Kaiveesi, Kaiyanthagarai, Birungarajam, Karrippan, Kaiyyan, Thegarajam

Vernacular Names

Tamil	: Karisalangani
English	: Trailling eclipta
Telugu	: Guntagalijaeru
Malayalam	: Kanjunm
Kanada	: Kadige- garage
Sanskrit	: Bhiringaraj, Kesaranja.
Hindi	: Bungrah

Properties and Action

Suvai (Taste): **Karppu** (Pungent)
Thanmai (Potency): **Veppam** (Hot Potency)
Pirivu (Bio-Transformation): **Karppu** (Pungent)
Seigai (Actions): Cholagogue, Alterative, Emet, Purgative, Deobstruent, Hepictonic Tonic.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for 10-Octadecenoic acid, methyl ester (25.89%), c-Sitosterol(18.94%), 9,19- Cyclocholestan-3-ol-7-one,4a-dimethly-[20R] (12.14%), Dodecanoic acid, 10 methyl, methyl ester (11.61%), Tridecanol, 2-ethyl-2-methyl (10.20%), 1,2 Benzenedicarboxylic acid, butyl octy ester (10.13%), 1-Heptatriacotanol (7.46%), Oleic acid, eicosyl ester (3.58%).^[22]

Haematinic Activity

The ethanolic extracts of root of *Eclipta alba* was administered to the Asian cat fish, *Claris bateachus* for 28 days. Then the medical parameters were analysed, it showed the marked increased level of haemoglobin level. Thus *E. alba* showed a potent haematinic activity.^[23]

7. Scientific name: *Artocarpus heterophyllus*



Other names

Sakkai, palauv, palasam, varukkai, ehaaravalli.

Vernacular Names

Tamil	: Pala
English	: Jack fruit tree
Telugu	: Panasa
Malayalam	: Pilava
Kanada	: Halasu
Sanskrit	: Panasa
Hindi	: Kathal

Properties and Action

Suvai (Taste): **Inippu** (Sweet)
Thanmai (Potency): **Thatppam** (Cold Potency)
Pirivu (Bio-Transformation): **Inippu** (Sweet)
Seigai (Actions): Astringent, Laxative, Demulcent, Nutrient, Tonic.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for Phytosterols, terpenoids, Anthraquinone, Flavonoids, Phenols, glycosides, Diterpenes.^[24]

Haematinic Activity

The Ethanol leaf extract of *Artocarpus heterophyllus* was screened for phytochemicals and its acute toxicity was tested on mice. The extract was given to wistar rats for 7 days at the dose levels of 100, 300 and 500 mg/kg b.w, respectively, following induction. The ethanolic leaf extracts of *A. Heterophyllus* showed a increased level of haematological indices of diabetic rats. Thus *A. Heterophyllus* showed a potent haematinic activity.^[25]

8. Scientific name: *Ipomoea batatas*



Other names: *Seenikizhangu*

Vernacular Names

Tamil	: Sarkaraivalli kizhangu
English	: Sweet potato
Telugu	: Genasu
Malayalam	: Chakkara valli
Kanada	: Genasu
Hindi	: Ratalu

Properties and Action

Suvai (Taste): *Inippu* (Sweet)
Thanmai (Potency): *Thatppam* (ColdPotency)
Pirivu (Bio-Transformation): *Inippu* (Sweet)
Seigai (Actions): Nutrient, Refrigerant.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for polyphenols such as anthocyanins, phenolic acids (eg, caffeic acid), Caffeoylquinic acid deriva-tives like chlorogenic, dicaffeoylquinic, and tricafeoyl-quinic acids, vitamins A, B and C, iron, calcium phosphorus, d-glucopyranosyl-(1→2)-β-d-galactopyranosyl-(1→2)-β-d-glucuronopyranosyl]-28 - O- β- d glucopyranoside (san-drosaponin IX) (1) and oleanolic acid-3-O-[β-d-galactopyranosyl-(1→3)-β-d-glucuronopyranosyl]-28- O-β-d-glucopyranoside. The total contents of saponin 1 and 2 are 200.01 mg/100 g dry weight. The saponin 1 content is: 161.20 mg/100 g dry weight and saponin 2 content is: 14.67 mg/100 g dry weight.^[26]

Haematinic Activity

The extract of sweet potato was administered to the white rabbits for 2 weeks. Medical parameters were

analysed. It showed a potent increase of haemoglobin level. Thus the extract of *Ipomoea batatas* showed a potent haematinic activity.^[27]

9. Scientific name: *Murraaya koenigii*



Other names: *Kariveppilai*, *Karuveppilai*, *Kariyapillai*.

Vernacular Names

Tamil	: Karivembu
English	: Curry Leaf
Telugu	: Kari-Vepo- Chettu
Malayalam	: Kari- Veppa
Kanada	: Kari Bevu- Karibrvina Glad
Sanskrit	: Surabhinimba
Hindi	: Karayapak

Properties and Action

Suvai (Taste): *Karppu* (Pungent)
Thanmai (Potency): *Veppam* (Hot Potency)
Pirivu (Bio-Transformation): *Karppu* (Pungent)
Seigai (Actions): Stomachic, Tonic.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for flavonoids $7.43 \pm 0.03\%$, phenols $4.25 \pm 0.04\%$, saponins $2.50 \pm 0.01\%$, alkaloids $1.90 \pm 0.01\%$, tannins $0.86 \pm 0.02\%$ and glycosides $0.11 \pm 0.01\%$, carbohydrate $39.44 \pm 0.04\%$, moisture content $23.42 \pm 0.10\%$, crude fibre $6.30 \pm 0.05\%$, ash content $15.60 \pm 0.21\%$, fats $6.48 \pm 0.22\%$, protein $8.38 \pm 0.02\%$, vitamin A (β-carotene) 6.04 ± 0.02 mg/100g, vitamin C (ascorbic acid) 0.04 ± 0.002 mg/100g, thiamin 0.89 ± 0.01 mg/100g, riboflavin 0.09 ± 0.001 mg/100g, niacin 2.73 ± 0.02 mg/100g and vitamin E 0.03 mg/100g, Calcium 19.75 mg/100g, magnesium 49.06 ± 0.02 mg/100g, sodium 16.50 ± 0.21 mg/100g, potassium, zinc 0.04 ± 0.001 mg/100g.^[28]

Haematinic Activity

On oral administration of the liquid extract of curry leaves and amla fruit with the dose levels of 200 and 400 mg/kg b.w. to the Wistar albino rats for 30 days. Then medical parameters were analysed. It showed a potent haematinic effect in combination with amla fruit than compared with administration of curry leaf extract alone.^[29]

10. Scientific name: *Mukia maderaspatana*



Other names

Aayilyeyam, Irukuranggin kai, Mosumossukkai

Vernacular Names

Tamil	: Musumusukkai
English	: Rough bryony
Telugu	: Musumusukaya
Malayalam	: Chitrati
Hindi	: Bilavi

Properties and Action

Suvai (Taste): *Thuvarpu* (Astringent), *Karppu* (Pungent)

Thanmai (Potency): *Veppam* (Hot Potency)

Pirivu (Bio-Transformation): *Karppu* (Pungent)

Seigai (Actions): Expectorant, Astringent.^[11]

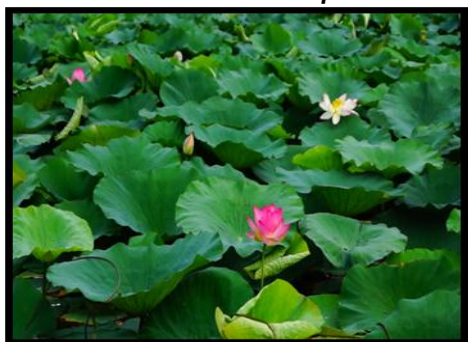
Phytochemistry

The results of phytochemical analysis indicated the positive results for Alkaloids, Flavonoids, Carbohydrates, Saponins, Tannins, steroid, terpenoids, cardiac glycerides, 2-Methylthiolane, S,S-dioxide, Diazeene, bis(1,1-dimethylethyl), 3-Buten-2-ol, 2-Butyn-1-ol, 4-methoxy, Dichloroacetic acid, 4-methylpentyl ester, 2-(Chloromethyl)-2,3-dihydro-4(1H)-quinolinone, Pantolactone Compounds, Eugenol.^[30]

Haematinic Activity

The extract of *Mukia maderaspatana* with the dose levels of 150 mg/kg and 300 mg/kg were given for 4 days. Then medical parameters were analysed. It showed a potent increase level of hemoglobin and possessed much more haematinic activity.^[31]

11. Scientific name: *Nelumbo nucifera*



Other names

Aravinthan, Ellimnai, Soriyanaptu, Ponmanai, Vinthagam, Pundariham, Padumam, Kamalam, Nalinam, Mulari, Mundagam, Maalundhi, Saroham, Kokanaham, Indai, Kanjam, Appusam, Amboruham, Salasam, Vanasam, Vaarisam, Saraseeruham, Panheruham, Saroruham, Pangasam.

Vernacular Names

Tamil	: Thamarai
English	: The sacred Lotus
Telugu	: Tamara
Malayalam	: Aravindam
Kanada	: Tavare
Sanskrit	: Pankaja

Properties and Action

Suvai (Taste): *Inippu* (Sweet)

Thanmai (Potency): *Thatppam* (Cold Potency)

Pirivu (Bio-Transformation): *Inippu* (Sweet)

Seigai (Actions): Coolant, Sedative, Expectorant, Demulcent, Nutrient, Tonic.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for Nuciferine, Lotusine, Pronuciferine, Rutin, Hyperin, Demethylcoclaurine, Linalool, Luteolin glucoside, Dehydroanonaine, Anonaine, Armeapavine, β -sitosterol, Kaempferol-3-O- β -D-glucuronide, Asimilobine, Demethylcoclaurine, Lirinidine, Dehydronuciferine, Quercetin, Liriodenine, Dehydroemerine, Isoquercitrin (Hirsutrin), Nornuciferine, N-methylasimilobine, N-methylcoclaurine, Roemerin, N-norarmepavine, Kaempferol, Kaempferol-3-O- α -rhamnopyranosyl-1(1 $\rightarrow$ 6)- β -D-glucopyranoside, Kaempferol, Kaempferol-3-O- α -rhamnopyranosyl-1(1 $\rightarrow$ 2)- β -D-glucopyranoside, Kaempferol-3-O- β -D-glucopyranoside, Kaempferol-3-O- β -D-glucoronopyranoside, Isoquercitrin, Roemerine, Pronuciferine, Nornuciferine, Liriodenine, Anonaine, Acetic acid, Gluconic acid, Tartaric acid, Malic acid, Ginnol, Nonadecane, Succinic.^[32]

Haematinic Activity

The ethanolic extract of *Nelumbo nucifera* was administered to the Wistar albino rats. Then medical parameters were analysed, it showed a significant increase of hemoglobin and possessed the greater efficacy of haematinic activity.^[33]

12. Scientific name: *Picrorrhiza kurroa*

Other names: Kadurohini, Kadaharohini

Vernacular Names:

Tamil	: Kadugarohini
English	: Picrorrhiza
Telugu	: Katki
Malayalam	: Katukurohini, Katuruhini
Kanada	: Katikarohini
Sanskrit	: Katvi, Katuruhini, Katuka
Hindi	: Katuka, Kuru, Kutki

Properties and Action

Suvai (Taste): Kaippu (Bitter), Karppu (Pungent)
 Thanmai (Potency): Veppam (Hot Potency)
 Pirivu (Bio-Transformation): Karppu (Pungent)
 Seigai (Actions): Anti periodic, Cathartic, Stomachic, Anthelminthic.^[11]

Phytochemistry

The results of phytochemical analysis indicated the positive results for iridoid glycosides, cucurbitacins, unsaturated sterols/triterpenes, polyphenols, Kukin.^[34]

Haematinic Activity

The extract of *Picrorrhiza kurroa* with the dose level of 100 mg/kg/day and 200 mg/kg/day were administered to the rats. Then the medical parameters were analysed, It showed a better haematinic effect.^[35]

CONCLUSION

The importance of herbal plants have been well utilized by the Siddhars for treating various health ailments. In this review the plants which have the haematinic activity have been well explained. In order to reduce the incidence and mortality rate caused by anemia an attempt was made through this article by exploring herbal plants to the World.

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