



Herbals for Resilience and Febrifuge Medicine in Tropical Ethnobotany: A Review

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ABSTRACT

Resources from the mutual relationship among traditional human population and plants in the tropical world can give answers for many of the unsolved problems especially when the causal organisms are microbes or virulent components of the sub-microscopic nature. Therefore resilience, life, and longevity are promises of the herbal world with which humans existed for several centuries. A total of thirty-six plants of Ethnobotanical importance that are widely used by the people of the Western Ghats and allied forest area of Nilgiris are covered in the document. These include plants for their daily life such as food, energy boosters and medicines for fever, bronchial obstructions and anti-microbial properties. Folklore medicines are many times neglected in modern life but they can still serve life better at times when all are in lockdown and many are in the knockdown state. Hence the knowledge of what is around will be meaningful and beneficial.

Key Words: Herbal medicine, ethnobotany, tropical, sore throat, cough

Received 20.02.2022

Revised 01.03.2022

Accepted 18.03.2022

INTRODUCTION

Life at times is difficult for people groups in the semi-urban and rural areas especially at times of lockdown due to pandemics. Panic situations due to lack of curative medicine for blowing infectious diseases creates confusion to people of the present day as knowledge from the past is almost lost. Plants are fundamental to almost all life on Earth, providing protection and sustenance for organisms ranging from bacteria to large mammals [1]. Traditional knowledge serves vital roles comprising fluid balance, protection, immune reactions, particulate pollution clearance, surfactant and mucus production, and restoration [2].

Timber and non-timber stem, root, bark, flowers, seeds, exudates and pigments serve the multifarious requirement. Primary phytochemicals such as glycerides, pectin and starches that occur as storage products in seeds and cell walls were used effectively for material use traditionally. Secondary phytochemicals are used for medicines, preservatives and various other purposes of life. The resources covered in the present work are indigenous to the South-Western region of India located between 08°19'18" – 21°16'24" N and 72°56'24" -78°19'40" E with an average elevation of 1200 m ranging from 300 to 2695 m. The present document is based on the detailed survey of medicinal plants and collection performed in Nilgiris area [3] with special reference to the original specimens in the Herbaria of Union Christian College, Aluva, India and Botanical Survey of India, Coimbatore, consulted for taxonomic scrutiny and identification. Local names and local uses were noted and incorporated into the respective parts. Present work focus to document what is around for the immediate requirement. It will make life smoother during difficult times when scams and panic situations are around.

ETHNOBOTANIC HEALTH BOOSTERS AND FEBRIFUGES OF WESTERN GHATS

Tropical evergreen forests are storehouses of herbals used in alternative medicine. The present work records 35 angiosperm plants from various plant families and all of them are Ethnobotanical specimens as they give resilience and or herbal medicines to tribal community. Table 1 gives a detailed approach on the Ethnobotanical specimens along with the health boosting properties and bioactive chemicals detected from scientific studies.

Table 1. Ethnobotanical Health Boosters and Febrifuges of Western Ghats

Botanical Name	Family Name	Health boosting Properties	Bioactive chemicals detected	Reference
<i>Ageratum conyzoides</i> L.	Asteraceae	The leaf paste with a little lime (calcium hydroxide) is applied to the forehead. It is good as colic, febrifuge, purgative, and treatment of ulcers. For stomach ailments like dysentery, flatulence, diarrhea, fever, and rheumatism. Paniyas use the plant for the treatment of headaches.	Dihydroencecallin, caryophyllene, enecalinal, bornyl acetate, germacrene D, sesquiphellandrene, with a dominance of precocene I, precocene II and phenolic chromenes.	[4]
<i>Ailanthus excels</i> Roxb.	Simaroubaceae	Leaves with antipyretic activity are used for treating the same in children by making a bed out of it. An ayurvedic formulation dasamularista used for fatigue and helps in cell regeneration is made out of this plant. Treatment of Epstein-Barr virus and malaria is another property of the plant.	1,4-dihydroexcelsin and excelsin	[5]
<i>Allium cepa</i> Linn.	Liliaceae	Chopped onion in honey is used for cold and cough	Isothiocyanates, quercetin and Vitamin C	[6, 7]
<i>Anacardium occidentale</i> L.	Anacardiaceae	The stem bark of the plant is powdered and consumed orally to reduce hypertension. Bark shaving of the plant is mixed with those of Spondias to make a tea used for asthma, colds, and congestion by Cuna tribes. Fruit juice is orally taken for treating asthma and headache by Kanitribals of Tirunelveli	2-trifluoroacetoxydodecane, oleic acid, 1- cyclohexylnonene, 2,3-dihydroxypropyl ester, octadecanoic acid	[8,9]

<i>Artemisia nilagirica</i> (Clarke) Pamp.	Asteraceae	The plant is extensively used by the Nilgiri Paniyas as a febrifuge. Juice of the whole plant is consumed for endocrinal disorders, gastrointestinal disorders as well as dermatological Infections/ Diseases by the herbal healers of Nilgiris, the Western Ghats	Borneol, camphene, Monoterpenoids, and Sesquiterpenoids.	[10,11]
<i>Calotropis gigantea</i> L.	Asclepiadaceae	The root bark decotion as a febrifuge, fruits with red chili, for the treatment of anemia, the latex of the plant is applied to reduce migraine, the powdered whole plant used as a general health tonic.	The root of <i>C.gigantea</i> contains 7-oxi pregnanin-oligoglycosides, cardiac glycosides, Root bark of the plant consists of giganteol, isogiganteol, beta amyrrin, 2 isomeric crystalline alcohols, and cardiolites. Latex contains 0.15 % calatin, 0.15% calotoxin, 0.45 % uscharin. Latex also contains calcium oxalate, Beta calotropol, Beta amerin, Alpha calatropol, Alkaloids, glycosides, and mudarine extracted from leaves. Stem consist of beta calatropeol, Beta amerin, giganteol. Flower consist of n-alpha calatropeol, beta calatropeol, mudarin and asclipin. Bitter resins akundarin, amerin, cariactive, glycosides, calotropin.	[4,12]
<i>Cameliasinensis</i> (Linn.) Kuntze	Theaceae	Crushed flowers are applied all over the body for treating fever, Leaves have a cooling effect and serve as a febrifuge for typhoid In Butan.	Polyphenols, volatile oils and alkaloids	[13]
<i>Canavaliagladiata</i> (Jacq.) DC	Fabaceae	The pods have highly nutritious and stimulants. It is used as a vegetable and restorative. Soup of the tender pod is given to the patients suffering from jaundice by tribes of Tripura.	Canavalin, concanavalinsa&b, canalin, gibberelins, vitamin B, vitamin K and tocoferol.	[14]
<i>Capsicum fruitensis</i> L.	Solanaceae	Irulas used its immature fruits to relieve cough	9,12-octadeca dionoic acid, and hexadecanoic acid.	[15]

<i>Chassalia curviflora</i> (Wall.) Thw.	Rubiaceae	Application of leaf paste as a poultice to the forehead to relieve headache by Irulas	carbohydrate, triterpenoids, saponins, Phyto-steroids, flavonoids, phenolic compounds, fixed oils, and fats alkaloid,	[16]
<i>Cissus quadrangularis</i> L.	Vitaceae	<i>C. quadrangularis</i> is well known in gastric disorder treatment by tribal healers. The plant is used by Irulas as an ingredient of rasam (a culinary preparation) the whole plant along with 10 gms of jeera (<i>Cuminum cyminum</i>), pepper (<i>Piper nigrum</i>), and four cloves (<i>Alium sativum</i>), a glassful is taken orally to alleviate cough. This is consumed daily once for three days at bedtime.	vitamin C, carotenoids, calcium, carotenoids, β sitosterol, triterpenoids, and ascorbic acid	[17]
<i>Clematis gouriana</i> Roxb. ex DC	Ranunculaceae	Inhaling the smoke of burnt root is used to relieve headaches by Irulas. The treatment for right-sided headache is done by inhalation through the left nostril and vice versa. The anti-inflammatory, antispasmodic, anti-analgesic, and antidiuretic were also found.	tannins, terpenoids, and saponins	[18]
<i>Colocasia esculenta</i> (Linn.) Schott	Araceae	The tender leaves are cooked and eaten as food by Irulas to remove chest congestion, particularly with smokers. The use of <i>C. esculenta</i> as baby food is good in treating health conditions like pneumonia, enteritis, diarrhea, and beriberi.	Rich in Ca, K, Ph, Mg, and vitamins A, B and C, β -sitosterol and stigmasterol, 7 α -diol nonacosane and cyanidin 3-glucoside, 14 α -methyl-5 α -cholesta-9, 18-diol; 25-methyl triacont-10-one; aliphatic compounds	[19]
<i>Curcuma longa</i> L.	Zingiberaceae	Inhalation of rhizome smoke after burning is used to relieve headaches due to	Tumerones, curcuminoids, Curcumin and tetrahydrocurcumin	[19]

		<p>cold by Irula tribe. A paste made of turmeric and curry leaves is used for asthmatic treatment daily for one month. Consuming a glass of milk with a teaspoon of turmeric is effective for asthma. Powder of turmeric along with cow urine is used for eosinophilia. The paste made out of turmeric powder with castor oil rolled into cotton cloth is burned and the smoke is used as a cure for migraine. A half teaspoonful of fresh turmeric powder in 30 ml of warmed milk is good for cold and cough. Cough can be treated by drinking hot milk with turmeric powder and ghee. Turmeric powder along with powdered black pepper consumed with milk cures malaria</p>		
<p><i>Cyathoclinepurpurea</i> (Ham. ex D. Don) Kunize</p>	Asteraceae	<p>The leaf paste is applied by Paniyas as a poultice on the forehead to reduce headache. The roots help to treat stomach pains. This plant releases an essential oil that has anthelmintic, antimicrobial, and hypotensive activities.</p>	<p>Three santamarine, sesquiterpene lactones, 9β-acetoxyparthenolide and 9-acetoxycostunolide.</p>	[20]
<p><i>Daturametel</i> Linn.</p>	Solanaceae	<p>The shade-dried flowers are cut into pieces and made into a cigarette. It is smoked as a cure for asthma by Irulas and Naogaon, Antioxidant activity of extract from fresh leaves was 47-71%</p>	<p>alkaloids hyoscyamine, hyoscyne and atropine, and daturilin</p>	[2]
<p><i>Dioscoreaoppositifolia</i> Linn.</p>	Dioscoreaceae	<p>Underground tubers cooked eaten by the</p>	<p>steroids, triterpene, sugar, tannin, and amino acid</p>	[22]

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		tribals population for general stamina in Nilgiris		
<i>Dodonaeviscosa</i> (Linn.) Jacq	Sapindaceae	Foliage and tips of plant enhance circulation, act as an expectorant, used for treating scurvy, inflammation, renal problems, ulcers, arthritis, and sore throat. Leaves are dipped in gingelly oil and tied over the affected area for bone fractures by Sholaga tribes	The plant is rich in flavonoids, alkaloids fat, and fixed oil, phenolics, steroids, tannins, saponins mucilage, gums, carbohydrates, reducing glycosides, trace elements, and sugar	[23]
<i>Eleusinecoracana</i> (Linn.) Gaertn.	Poaceae	Used by Irulas to cure typhoid fever. The grains are prepared as <i>Kali</i> (a culinary preparation) and leaves of Kaggidae (<i>Solanumnigrum</i>) fried without oil eaten together. The fever will get reduced within two hours. Seeds of the plant are consumed orally by Zay people in Ethiopia for treating diarrhea. Fermented seeds along with traditional drink are used as medicine for curing body ache due to exhaustion.	Steroids, Tannins, alkaloids, terpenoids, phenols, balsams, and cardiac glycosides	[24]
<i>Erythrinasubumbrans</i> (Hask.) Merr	Fabaceae	The leaf juice is given orally (one teaspoonful) to cure fever by Paniyas. It is taken daily thrice for three days. The patient is covered with a blanket whenever he takes medicine	Dichloromethane, n-hexane, and methanol/1-methoxyerythrabysin II, dichloromethane/erystagallin A, erycristagallin, 5-hydroxysophoranon, erysubin F.	[25,26]
<i>Gomphostemmaheyneanum</i> Wall. ex Benth.	Lamiaceae	The leaf paste is used for treating headaches by Paniyas. It is applied only once at the time of headache or if the pain persists the application daily once in the evening for three days. Used for treatment of	phenols, flavonoids, alkaloids, terpenoids, and steroids	[27]

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		digestive problems by Kuruma tribes of Wayanad. Leaf paste is taken orally to cure diarrhea and dysentery		
<i>Leucaslavandulifolia</i> Sm.	Lamiaceae	Paniyas used this for children suffering from cold and cough. A poultice of fresh leaves can be used for treating wounds, inflammations, dermatosis for remedy. It is good stomachic and febrifuge	Chrysoeriol, acacetin, linifoliside, and taraxerone	[28]
<i>Lobelia nicotianifolia</i> Roth ex Schult	Campanulaceae	Used by Paniyas as a chest congestion reliever. The dried leaf is made into powder and used as a beedi for clearing chest congestion. Used daily once for five to seven days or until chest congestion relieves	alkaloids, the principal being lobelanidines, lobeline	[4, 29]
<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Magnoliaceae	Used by Irulas to cure fever. Methanol extract of <i>Micheliachampaca</i> possesses high antibacterial activity. Taking bath in water boiled with the flower helps in eliminating the body odor. The kind of oil from flower is useful in ophthalmia and gout. The stem bark is a stimulant, astringent, expectorant, and possesses febrifugal properties.	The plant contains unsaturated aliphatic ketones, n-alkane hydrocarbons, quercetin, and beta-sitosterol	[30, 31]
<i>Naraveliazeylanica</i> (L.) DC.	Ranunculaceae	Vine is crushed and inhaled to cure a headache by Kurichya.	Alkaloid, Tannin, Saponin, Phenol, and Flavanoid	[32, 33]
<i>Passiflora edulis</i> Sims	Passifloraceae	Leaves are dried and smashed for the treatment of pneumonia. The tea made out of their leaves possesses properties of tonic.	Isovitexin and isoorientin.	[1, 61]

<i>Plectranthusamboinicus</i> (Lour.) Spreng.	Lamiaceae	leaves are effective against respiratory difficulties, skin problems, digestive disorders and urinary diseases.	Rich in volatile and non-volatile oils. Contains flavanoids, terpenoids and phenolics	[35, 36]
<i>Plumeria alba</i> L.	Apocynaceae	It is used by Irulas as the cure for migraine. The stem bark is made into a paste with dry chili (<i>Capsicum annum</i>) and applied on forehead daily evening at bedtime for two to three days or until pain relieve	The plant contains a mixture of β sitosterols, amyrsiniridoids, protein plumeride, isoplumericinplumeridecoumerate glucoside, and plumeridecoumerate. The fresh leaves and bark contain resinic acid, pluierride, and fulvoplumierin, a mixture of sterols, terpenoids and plumieride.	[37]
<i>Ricinuscommunis</i> L.	Euphorbiaceae	Paniyas used the plant to cure the respiratory problem. The oil in combination with incantations is applied on the chest daily once at bedtime for five days	terpenoids, alkaloids, flavonoids, benzoic acid derivatives, coumarinsterpenoids fatty acids, and tocopherols	[4]
<i>Santalum album</i> L.	Santalaceae	Often used as a refrigerant by Irulas. The heartwood is made into a paste and applied all over the body (body cooling)	Several terpene alcohols and sterio-isomers of bergamotols	[4, 38]
<i>Sauropus androgynous</i> (L.)Merrr.	Euphorbiaceae	The high nutrient and vitamin content of this plant make it a suitable species as a vegetable. It is also used as an antiseptic agent. Cardiovascular diseases and hypertension can be treated using roots.	Vitamins like ascorbic acid, riboflavin and thiamin	[38]
<i>Scopariadulcis</i> L.	Scrophulariaceae	Paniyas used it as a cure for fever, cold, and cough.	steroidal glycosides are common	[39]
<i>Solanumviolaceum</i> Ortega ssp. <i>Violaceum</i> Matthew	Solanaceae	Root paste is used in treating vomiting and indigestion, leaves and fruits decotion is used for treating headache by the tribes of Mandais, Bangladesh. It is useful in curing dry	Rich in steroidal compounds	[40, 41]

		cough, asthma, and chronic febrile infection. Root paste is applied for poison by Kurichiyar tribes of Wayanad, Fruits of <i>S. violaceum</i> are consumed raw /dried for treating chest pain, liver diseases, cough, fever, stomach pain, and digestion by tribes of Pakke wildlife sanctuary, Arunachal Pradesh		
<i>Trigonella foenum-graceum</i> L.	Fabaceae	Irulas use it to cure lower abdominal pain due to excessive body heat.	Protein, mucilage, calcium, vitamin B, Iron, dietary fiber are common	[42]
<i>Vitex trifolia</i> L.	Verbenaceae	Juice of plant taken orally or topically or inhaled for treatment of gastrointestinal problems by the Kani tribes of Kerala. Tribes of Aravalli hills uses make use for headaches, coughs, and fever. Inhaling fresh leaf juice or application of flower paste relieve from headache. Placing a leaf stuffed pillow under the head helps to reduce headaches. Smoking of bidi filled with crushed dry leaves helps to relieve cough and headache. Tying the fresh root on the right arm helps to cure fever.	Lanostane, triterpene one new lignan, matairesinol, ecdysone, 20-hydroxyecdysone, 20-hydroxyecdysone, 4'-O-β-D-glucopyranoside 2,3-monoacetone, polypodine B, and turkesterone	[43]

DISCUSSION

The 35 taxa under study represent 21 families, of which the genera *Colocasia* [19] and *Dioscoria* [22] belong to edible category and *Cameliasinensis* [13] is a non-alcoholic beverage. The family Lamiaceae represented here by three genera is known for its medicinal and aromatic properties. *Trigonella* [42] and *Capsicum* [15] are used as spices and the genus *Allium* [6, 7] is a condiment. The traditional use of *Curcuma longa* [19] externally and internally in ayurveda, cosmetics, rituals and in culinary purposes as colouring and flavouring agent can be attributed to its versatile antimicrobial and therapeutic properties and curcumin extracted from the rhizome is a reference standard for antioxidant property. *Santalum album* is the second most expensive wood of the world, known for its incredible medicinal properties, used in cosmetic industry [30]. It is inferred that many of the biochemical components in these plants are curative, smoothening and provide resilient effect to those who are suffering.

CONCLUSION

Turning to nature can bring back the human existence sustainable despite the several decades of exponential growth through globalization, colonialism and industrialization. Thirty-Six plants and their importance is surely a resource from the tropical area, which have proven records of utilisation by the traditional people and were answers to many of their health problems against several of the physical, seasonal and microbe causes. They include plants for their daily life such as food, energy boosters, medicines for fever, bronchial obstructions, and anti-microbial properties. Folklore medicines are many times neglected in modern life but they can still serve life better at times when all are in lockdown and many are in the knockdown state. Hence the knowledge of what is around will be meaningful and beneficial.

ACKNOWLEDGMENTS

Authors acknowledge the valuable permission from the authorities of Union Christian College to prepare the review paper. A word of thanks to the library staff of Union Christian College, for reference work.

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CITATION OF THIS ARTICLE

Thara K Simon and Justin R Nayagam. Herbs for Resilience and Febrifuge Medicine in Tropical Ethnobotany: A Review. *Bull. Env.Pharmacol. Life Sci., Spl Issue* [1] 2022 : 50-60