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ResearchArticle

Traditional Knowledge on few Medicinal Plants of Biligirirangana Hill, Karnataka, India

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Abstract

Biligirirangana hills (BR Hills) is located in Yelandur taluk, Chamarajanagar District, Western Ghats towards Tamilnadu. The ethno botanical plant survey was executed for the documentation of therapeutic plants. The tribal people have the inborn knowledge about the medicinal plants and their use. In this presentstudy, we have selected 90 plant species belonging to 48 families out of which 38 plant species are herbs, 16 shrubs, 27 treesand 9 climbers were identified with their appropriate information and reported in this paper with BR hills, tribes, medicinal plants, their medicinal uses according to tribal communities to cure different ailments. The most common illness treated by the traditional healers are jaundice, diabetes, asthma, fever, cold, cough, digestive problems, piles, paralysis, skin problems, diarrhoea, haemorrhage, kidney problem, gastrointestinal disorders etc.

Introduction

Traditional medicines are the part of human culture. Plant varieties have been used as traditional medicines since ancient days from our ancestor's. Herbal therapies are deliberated as the oldest form of health care known to mankind on this earth. The information of medicinal plants and their uses have been increasing in different parts of the world. The knowledge of medicinal plants have been accumulated in the course of many centuries based on different medicinal systems such Ayurveda, Homeopathy, Unani and siddha. India is one of the 17 mega biodiversity country in the world. It has 45,000 plant species, out of which 15,000-20,000 plants have primitive medicinal values[1]. The World Health Organisation has estimated that 80% of the populations of developing countries being unable to afford pharmaceutical drugs rarely on the plant based traditional medicines to sustain their primary health care needs[2]. The traditional knowledge of the indigenous people not only comprises the information about the ecosystem, but also they have vast knowledge about the use of specific plants used asfood, medicine, and building materials[3]. In India, it is reported that traditional practitioners use 2,500 plant species and 100 plant species serve as a regular source of medicine[4]. The traditional knowledge and the use of medicinal plants is very common from variety of perspectives, like in the development and shows the relationship between a culture and its environment[5]. Prior to the development of modern medicine,

the traditional systems of medicine that have evolved over the centuries within various communities, are still maintained as a great traditional knowledge base in herbal medicines[6].Several bioactive compounds have been discovered from plantson the basis of ethno-botanical survey and it is used in the form of drugs. In 2001, researchers identified 122 compounds used in modern medicine which were derived from traditional plant sources 80% of these have a traditional use identical or related to the current use of active elements of the plant. Documenting the indigenous knowledge on traditional medicinal plants and their uses is important for the conservation and their sustainable utilization of biological sources[7]

Madegowda in 2009 reported about the indigenous traditional knowledge and conservation of BR Hills. There are many sacred groves in BR Hills which are commonly protected, and which usually have a significant religious connotation for protecting the community. Medicinal plants have a wide range of bioactive molecules and also have lot of antimicrobial properties such as anti-diabetics, anticancer agents and immune suppressive compounds. Medicinal plants are rich in producing secondary metabolites like Terpenes, Flavoniods, Steroids, Phenolic acids and Tannins.Documenting the traditional knowledge is important for the conservation of medicinal plants as well as their therapeutic uses. Since, it is not explored much, medicinal plants are highly under threat

due to over exploitation. In this point of view, we have made an attempt to collect the information on traditional medicinal plants in BR Hills, Karnataka.

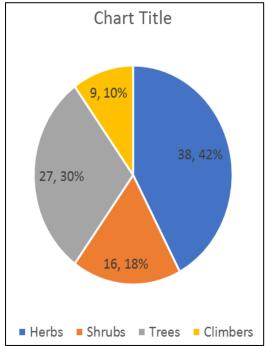


Fig 1: Percentage of selected Medicinal plant species in the study

Materials and methods Study Area

The Biligirirangana hills commonly called as BR Hills, is a hill range situated in Eastern part of Western Ghat towards Tamilnadu [7]. It is protected under the Wildlife Protection Act on 1972 and declared as Tiger Reserve in December 2010. This region has been the home for the soliga tribes for hundreds of years. Vivekananda Girijana Kalyana Kendra (VGKK) has been working in BR hills for the past 30 years for the integrated development of Soligas, BR hills lies in the elevation range of 1200mm in Western Ghats of Karnataka. It is located in north latitudinal range 77-77⁰16 E and between 11⁰47⁻12⁰9 N. The total land area of the forest is 540 sq.km. The mean temperature of the hill has a huge variation minimum 9°C to 16°C and maximum reaches around 20°C to 38°C. The annual average rainfall recorded at the base is around 600mm in the periphery and 3000mm in the higher elevations(Aravind 2001). The major habitat type of BR Hills are moist and dry deciduous forest. The soliga tribes are commonly known to use more than 300 herbs for the treatment of various traditional ailments and this forest area has almost 800 plant species. "Doddasampige" is one of severalsacred groves of BR Hills of the Soliga people. The tree is on the banks of a river, Bhargavi [8] This topography leads to thick vegetation of BRHills Wildlife Sanctuary (Fig.2).





Range of BRT Wild Life Sanctuary

Fig 2: Figure showing the Rangeof the study area

Selection of Plant Sample

Medicinal plants were documented from BR Hills. From the survey we have selected 90 different medicinal plant species based on their medicinal values. The information towards the usage of medicinal plants were collected from the local tribal practitioners in their local language. Detailed information relevant to medicinal plants particularly use of medicinal plants to cure various diseases, frequency of visiting to forest area, collection of plant species, method of collection, method of processing, methods of formulation, and extent of cultivation of medicinal plants were collected from the literature review, tribes, local Soligas, Vivekananda Girijana Kalyana Kendra employees, nursery and Forest department employees and also from Grampanchayat members and documented[9]. Standard methods were followed for the collection of plant species, identification and preservation and their uses in curing different aliments.

Result and Discussion

The present study was carried out in BR Hills Western Ghats, Karnataka, from July 2017 to December 2017 about the

traditional knowledge on medicinal plants and their uses. The BR Hills is known for its diverse species of Flora and Fauna. BR Hills forest range has further classified into 5 types viz... dry deciduous, moist deciduous, scrub, evergreen and shola. Tribes use medicinal plants for to cure various fatal diseases such as fever, diabetes, malaria, cholera, dysentry, hepatitis, jaundice, leukemia, herpes, cut, wounds, uterus problem, eye diseases, bronchitis, tuberculosis, asthma, diarrhea, epilepsy etc. The result on the survey of traditional medicinal plants are listed in the below table. A total of 90 selected medicinal plant species belonging to 48 families were identified for the treatment of human ailments in the study area. All these plant species are arranged in alphabetical order. For each plant species, scientific name, family, local name, part used, habitat and medicinal uses are provided. The most dominating families were Fabaceae consists 7 species, Euphorbiaceae consists 6 species, Rutaceae consists 6 species, Lamiaceae consists 5 species, Amaranthaceaeconsists 4 species Caesalpinaceae consists 4 species and Solanaceae consists 4

species followed by Moraceae, Asclepiadaceae and Malvaceae consists 3 species each followed by Lecythidaceae, Combretaceae. Liliaceae. Plumbaginaceae. Menispermaceae, Zingiberaceae and Piperaceae consists 2 species each. Out of which 38 species are herbs, 16 shrubs, 27 trees and 9 climbers. The plants with the highest fidelity level are Andrographis paniculata(Burm.f). Wall, Bryophyllum pinnatum (Lam) Oken, Gymnema sylvestre R.Br, Ocimum sanctumL, Rauvolfia serpentinaL Benth, Tinospora cardifolia (Thunb)and Tylophora indica (Burm.f).Merr .According to the observation made, traditional healers use different part of the plants for the treatment to cure various diseases such as leaves, roots, stem, fruits, latex and twigs and in some cases whole plant can also be used. However, leaves are found most frequently used part. The common diseases treated by the traditional healers were diabetes, jaundice, asthma, fever, cold, cough, digestive problems, piles, paralysis, skin diseases, diarrhoea, haemorrhage, kidney problem, gastrointestinal disorders etc.

Table No.1 Traditional Medicinal Herbs and their uses

Host	Family	Local name	Part used	Medicinal uses
Acalypha indica L	Euphorbiaceae	Kuppi	Leaves	Constipation, scabies, eczema, asthma, urinary problem
Achyranthes aspera L	Amaranthaceae	Uttarani	Whole plant	Asthma, itching, hysteria, skin diseases, ulcer, cancer, stone in bladder
Acorus calamus L	Acoraceae	Baje	Rhizome, root	Gastro intestinal problem, ulcer, inflammation, gastritis, sweating, rheumatoid, arthritis, stroke, obesity, sinus, musculoskeletal disorders
Aerva lanata JUSS	Amaranthaceae	Hittulka	Whole plant	Sexually transmitted diseases
Aloe vera (L) Burm.f	Aloeceae	Loksara	Leaves, pulp, leaf juice	Protecting the skin, burns, sunburn, acne, abdominal tumors
Alternanthera sessilis (L) R,Br	Amaranthaceae	Honagone	Whole plant	Acne, asthma, bronchitis
Amaranthus dubius Mart	Amaranthaceae	Dantu	Leaves, flower, stem	Haemorrhage, kidney problem, anaemia, constipation
Andrographis paniculata (Burm.f0 Wall	Acanthaceae	Nela bevu	Leaves, stem	Malaria, diarrhoea, dysentery, burns, cancer, diabetes, ulcer, leprosy
Asparagus racemosa Willd	Liliaceae	Shatavari	Whole plant	Infertility
Bacopa monnieri (L) Pennell	Plumbaginaceae	Neeru brahmi	Whole plant	Epilepsy, asthma, gastric, ulceration, promote hair growth, itching, dandruff, mental disorders
Boerhavia diffusa L	Nyetaginaceae	Komme	Leaves, roots, seeds	Renal disorders, kidney stones, nephritis, skin diseases, head ache, piles
Bryophyllum pinnatum (Lam.) Oken	Crassulaceae	Gandukalinga	Leaves, rhizome	Cardiac diseases, kidney stones, hypertension
Cassia tora L	Caesalpinaceae	Chagathe gida	Leaves, seeds	Burns, cuts, wounds, skin problem
Chlorophytum laxum R.Br	Liliaceae	Bicheti grass	Leaves, roots	Piles, diarrhoea, dysentery
Centella asiatica (L) Urban	Apiaceae	Ondelaga	Whole plant	Vitamin B, purifies blood, epilepsy, hysteria, agitation, insomnia, urinary tract, infection, asthma
Cissampelos pareira L	Menispermaceae	Kodupalli/ parera beru	Leaves, seed, bark, root	Heart problem, kidney stones, asthma, arthritis, stomach pain
Cleome viscosa L	Cleomaceae	Kadu sasive	Leaves, seeds	Stomach ache, urethral discharges, headache,

				tumors, inflammation, skin diseases, malaria, fever, cough, blistering, rheumatism
Crotalaria juncea L	Fabaceae	Sanna senabu	Leaves, seed	Obesity, blood disorders, skin diseases, gastritis, fever
Curcuma longa L	Zingiberaceae	Arisina	Roots, rhizome	Chronic wounds, skin problem, burns, cuts, arthritis, inflammation, injuries, cholesterol
Curculingo orchioides Gaertn	Hypoxidaceae	Nela tengu	Leaves, roots, rhizome	Piles, fatigue, bronchitis
Cynodon dactylon (L) Pers	Poaceae	Garike	Leaves, rhizome, whole plant	Bleeding, piles, skin diseases, wounds, scabies, ring worm, vomiting diarrhoea, leucoderma, allergy, anaemia
Cynoglossum zeylanicum (Vahl) Thunb	Boraginaceae	Armada soppu	Leaves, roots, flower, seeds	Dysentery, ring worm, rheumatism, swelling, inflammation
Daucus carota L	Apiaceae	Gajjari	Leaves, seeds	Improves digestion, eye sight, blood cholesterol, eczema
Euphorbia antiquorum L	Euphorbiaceae	Mudumula	Leaves, stem	Fistula, skin diseases
Euphorbia Hirta L	Euphorbiaceae	Kempu neneyakki soppu	Leaves, root	Gastro intestinal tract infection, dysentery, bleeding, piles
Phyllanthus amarus schum	Euphorbiaceae	Nela nelli	Leaves, fruits, roots	Eye diseases, jaundice, urinal disorders, diarrhoea, dysentery, stomach pain
Plectranthus amboinicus Spreng	Lamiaceae	Dodda patre	Whole plant	Cold, cough, fever, headache
Plumbago zeylanica L	Plumbaginaceae	Chitramula	Roots	Functioning of liver, digestive system, metabolism of body
Portulaca oleracea L	Portulaceae	Doddagoni soppu	Leaves, stem, flower	Piles, wound, abdominal disorders, bronchitis, asthma, eye diseases
Ruta chalepensis L	Rutaceae	Naagadali	Leaves, flowers	Hysterical infections, cough
Sida cardifolia L	Malvaceae	Kisangi	Whole plant	Skin diseases, fever, head ache, herpes, wounds, vaginal discharges
Solanum indicum L	Solanaceae	Kirigulla	Root, fruit	Fever, dropsy, skin diseases, piles, eye diseases
Solanum nigrum L	Solanaceae	Ganike	Leaves, roots, berries, stem	Bronchitis, itching, asthma
Solanum xanthocarpum Schard & H. Wendl	Solanaceae	Nela gulla	Whole plant especially fruit	Bronchitis, asthma, chronic gastro intestinal problem, cough
Sauropus androgynus (L) Merr	Phyllanthaceae	Chakramuni	Leaves, stem	Anti-diabetes, cough, anti-inflammatory
Tribulus terrestris L	Zygophyllaceae	Neggilu	Leaves	Musculoskeletal disorders, fever
Uraria picta (Jacq.) DC	Fabaceae	Mur ele honne	Leaves, flowers	Anti-cancer, anti-inflammatory, cardio vascular diseases, bone fracture
Zingiber officinale Roscoe	Zingiberaceae	Shunti	Rhizome, roots	Fever, bronchitis, asthma, cough, digestion problem, diarrhoea, piles, stomach ache, cardiac diseases, anaemia

Table No.2: Traditional Medicinal Shrubs and their use

Host	Family	Local name	Part used	Medicinal uses
Abutilon indicum L. (SW)	Malvaceae	Srimudre	Whole plant	Tuberculosis, ulcer haemorrhage
Calotropis gigantea L	Asclepiadaceae	Ekkada gida	Leaves, roots, latex	Piles, spleen, disorders, antidote for snake poison, cough, skin diseases, diarrhoea, haemorrhage, respiratory problem
Cassia auriculata L	Caesalpinaceae	Avarike	Leaves, flower, root, seed	Diabetes
Cassia occidentalis L	Caesalpinaceae	Dodda	Leaves, root,	Rheumatism, dropsy, fever, venereal diseases

		Chagathe	seed	
Epiphyllum oxypetalum (DC) Haworth	Cactaceae	Brahma kamala	Flower, stem	Tuberculosis, uterine, haemorrhage, cough
Hemidesmus indicus (L) R.Br	Asclepiadaceae	Sogade beru	Root, latex	Musculoskeletal disorders, wound, sinus, urinary diseases, skin diseases, anaemia, jaundice, diabetes
Manihot esculenta Crantz	Euphorbiaceae	Maragenasu	Tubers	Hypertension, head ache
Mentha arvensis L	Lamiaceae	Pudina	Leaves, seeds	Cold, cough, fever, vomiting
Mimosa pudica L	Mimosaceae	Muttidare muni	Whole plant	Wounds, urinary tract infection, piles, sinus
Ocimum tenuiflorum L	Lamiaceae	Krishna tulsi	Leaves	Essential oil, herbal tea, antioxidant, cold, cough
Ocimum sanctum L	Lamiaceae	Sri tulsi	Leaves	Fever, wound, ulcer, epilepsy, digestive problems, skin diseases, cold, cough, antioxidant
Ocimum basilicum L	Lamiaceae	Kamakasturi	Leaves, seeds	Cough, cold, bleeding, piles, constipation
Rauwolfia serpentine L Benth.	Rutaceae	Sarpa ganda	Leaves, fruits	Bite of poisonous snake
Toddalia asiatica (L) Lam	Rutaceae	Kadumenasina gida	Leaves, fruit	Fever, cough, stomach ache, malaria, diarrhoea
Vitex Negundo L	Verbenaceae	Lakki	Whole plant	Anti-cancer, rheumatism
Withania somnifera (L) Dunal	Solanaceae	Ashwaganda	Leaves, roots	Inflammation, bronchitis, asthma, ulcer, hypertension

Table No.3: Traditional Medicinal Trees and their uses

Host	Family	Local name	Part used	Medicinal uses
Acacia catechu WILD	Fabaceae	Kaggali	Leaves, bark, gum	Skin diseases, fever, herpes, musculoskeletal disorders, dental diseases,
Aegle marmelos. L. Corr	Rutaceae	Bael patre/belwa	Leaves, fruit	Gastrointestinal disorders, skin diseases, cardiovascular system, constipation, menstrual irregularities
Alangium salvifolium (L.F) WANG	Alangiaceae	Ankola	Leaves, fruit, root	Urinary tract infections, sinus, wounds
Azadirachta indica A Juss	Meliaceae	Bevu	Leaves, bark	Skin problem, dental treatment
Careya arborea ROXB	Lecythidaceae	Dolli	Leaves	Fever, wound, sinus, cuts
Cassia fistula L	Caesalpinaceae	Kakke	Leaves, bark	Burns, skin problem
Citrus medica L	Rutaceae	Madala	Leaves, fruit, seeds, pulp	Abdominal colic, digestive problem, piles
Couroupita guianensis Aubl	Lecythidaceae	Lingada	Leaves, fruit	Common cold, malaria, stomach pain, tooth pain, hypertension, tumors, inflammation, wound
Elaeocarpus ganitrus Roxb	Elaeocarpaceae	Rudrasksha	Leaves, fruit, bark	Nervous system, high blood pressure, tuberculosis, small pox, chicken pox
Emblica officinalis L	Euphorbiaceae	Bettada nellikai	Leaves, fruit, seeds, roots, bark, flower	Alopecia, hair treatment, digestive system
Ficus racemosa L	Moraceae	Atti	Leaves, fruit, root, bark, latex	Leucorrhoea, anaemia, burns, fatigue, leprosy, urinary discharges
Ficus religiosa L	Moraceae	Arali	Bark	Fever, herpes, wounds, bone fracture, skin problem
Ficus Benghalensis L	Moraceae	Aalada	Bark, aerial root, tender leaf	Fever, fracture, skin diseases, wounds, sinus, diarrhea
Gymnosporia montana (Roth) Benth	Celastraceae	Kankada	Leaves, roots	Dysentery, menorrhoea
Helicteres isoraL	Sterculiaceae	Peda muri	Fruits, Bark, roots,	Leucorrhoea, blood disorders, burning

(endangered)			latex	sensation fatigue, urinary discharges, leprosy
Madhuca longifolia J.F.Macbr	Sapotaceae	Hippe	Leaves	Skin diseases, nerve disorders, cough, burning sensation
Magnolia champaka (L) Baill	Magnoliaceae	Sampige	Leaves, flower, stem	Urge to urination, stomach ache, renal disorders, diabetes, wounds, malaria, fever, inflammation
Moringa oleifera Lam	Moringaceae	Nugge	Leaves, fruit, flower, roots	Worms in stomach, iron deficiency, diarrhea
Murraya koenigii L	Rutaceae	Kari bevu	Leaves, bark, root	High growth digestion problem, sickness, nausea
Polyalthia longifolia Sonn	Annonaceae	Ubbina / Kamboda	Leaves, bark	Fever, skin diseases, diabetes, hypertension, intestinal problems
Pongamia pinnata (L). PIERR	Fabaceae	Honge	Leaves, fruit, bark, twigs	Wounds, skin diseases, piles, musculoskeletal disorders
Pterocarpus marsupium ROXB	Fabaceae	Honne	Leaves, twigs, gum, latex	Fever, piles, skin diseases, musculoskeletal disorders, diabetes
Saraca asoca (Roxb) Willd	Fabaceae	Ashoka	Leaves, bark	Cancer, uterus problems
Sesbania grandiflora L	Fabaceae	Agasi	Leaves, bark, flower	Fever, night blindness, rhinitis, running nose, abdominal pain, liver, spleen disorders, diarrhoea, respiratory tract infection, epilepsy, oral infection, throat infection, rheumatism
Syzygium cumini L	Myrtaceae	Jamppu nerale	Fruit	Diabetes
Terminalia arjuna (Roxb) Wight & Arn	Combretaceae	Matti	Bark	Skin diseases, wounds, tumors, orchitis
Terminalia chebula Retz	Combretaceae	Alale kayi	Leaves, seeds	Fever, loss of appetite, cough, asthma, obesity, jaundice, digestion problem

Table No.4 Traditional Medicinal climbers and their uses

Host	Family	Local name	Part used	Medicinal uses
Basella alba L	Basellaceae	Basale soppu	Leaves, stem	Blood cancer, bruises, burns, anticancer, antiviral
Cissus quadrangularis L	Vitaceae	Mangaravalli/ Narale	Leaves, pulp	Bone fracture, joint pain, periodontal diseases, haemorrhage
Clematis gouriana Roxb. ex DC	Ranunculaceae	Thalejadari	Leaves, stem	Fever, puerperal fever, bruises, musculoskeletal disorders
Gymnema sylvestre R.Br	Apocynaceae	Madunasini	Whole plant, especially leaves, seeds, roots	Diabetes, weight loss, stimulating digestive system, diuretic
Piper betle L	Piperaceae	Veeleyadele	Leaves, roots	Calcium deficiency, antiseptic, malaria
Piper nigrum L	Piperaceae	Kari menasu	Fruit	Spices, cold, cough, digestive system, low blood pressure, weight loss, antioxidants, cancer
Rubia cardifolia L	Rubiaceae	Chitravalli	Leaves, stem, roots, fruits	Skin diseases, arthritis, uric acid, diarrhoea, dysentery, chronic fever, renal infection, antiseptic diabetes
Tinospora cardifolia (Thunb)	Menispermaceae	Amruthaballi	Leaves, stem	Diabetes, high cholesterol, allergy, rhinitis, stomach pain, lymphoma, cancer, rheumatoid, arthritis, hepatitis, peptic ulcer, gonorrhea, syphilis
Tylophora Indica (Burm.f) Merr	Asclepiadaceae	Adu muttada balli	Leaves root	Asthma, bronchitis

Tribes were exclusively depend on medicinal plants for their health care practices so that they use these plants against various diseases by tentative trial and error method (Patil 2012). Some of the species of medicinal plants mentioned in this paper were already reported in some earlier works but the purpose and uses were different. *Euphorbia*

HirtaLplantspecies was used to cure septic ulcer in the corne of nails and toes and increasing the mother's breast milk [10] A total of 38 medicinal plant species were already documented with their uses[11]. Chlorophytum laxum R.Br plant species was used to cure for piles and astringent but now it is totally vanished due to over exploitation[12]Aerial parts of Ocimum species from western Himalayas is a very good source of minerals and other phytochemicals which are having therapeutic potential [13]. Asparagus racemosa Willd is used for frigidity and sexual weakness[14]. All the plant species used by the traditional healers for the treatment of various diseases are still available in the study area. At present, the medicinal plants are highly threatened due to over exploitation. With this concern, an attempt was made to collect the information on traditional medicinal plants in BR Hills, Karnataka. Herbal medicines are less cost effective and have no side effects[15-17] Hence, documentation on traditional knowledge of medicinal plants is important for the conservation of forest as well as to sustain their medicinal value[18]

Conclusion

The present study reveals that people and tribes in BR Hills, Karnataka have immense knowledge on medicinal plants and their uses to cure various fatal diseases as a treatment, among the Indian Flora the south western part constitutes about 25,000 species. A total of 90 species of medicinal plants belongs to 49 families were obtained through the field survey and documented. Relevant information about the medicinal plants and uses are held by the tribes and local peoples of BR Hills. Hence, there is a need to motivate younger generation to acquire the knowledge on medicinal plants and their therapeutic uses. These medicinal plants associated with endophytes and they are the source of producing novel bioactive compounds which could have significant industrial, pharmaceutical and agricultural applications. The plants species having medicinal properties are disappearing due to unsustainable removal primary healthcare and the numbers of traditional healers are also decreasing. Hence, there is a need for documentation of traditional knowledge on medicinal plants.

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