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Medicinal plants of Hirekalgudda state forest, Karnataka, India

T. Vasantha Naik✉[1], K.M.Prashantha[2] H.A.Sayeswara [3], and H.S.Ravikumar Patil[4]

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Abstract

The present contribution relates to the diversity of the medicinal flora of the Hirekalgudda state forest of Hassan district in the state of Karnataka. 54 medicinal floras belonging to 28 families have been reported which are used by villagers for primary health care to cure various ailments. These documented medicinal plants are remedy for number of diseases like bronchitis, diarrhea, skin diseases, gonorrhoea, jaundice etc. Relative abundance of medicinal flora showed maximum of Fabaceae (18.44%), followed by Euphorbiaceae (12.88%), Laminaceae (7.36%), Apocyanaceae (7.36%), Asclepidaceae (3.70%), Myrtaceae (3.70%), Verbinaceae (3.70%), Curbitaceae (3.70%) and Rubaceae (3.70%). Out of 28 families, 19 families were represented by a single species each (1.84%). The investigators identify the plants that need conservation and protection. Public and private involvement in management and utilization of medicinal plants in sustainable way is essential to combat human pressures on these valuable natural resources. The present investigation also gives some basic ideas to the researchers who are working in the areas of phytochemistry, pharmacology and biotechnology for further detailed study.

Keywords: Biodiversity, Hirekalgudda state forest, Hassan, medicinal flora

Introduction

Plants are indepensable source of both preventive and curative medicine (Purabhi Saikia and Mohamed Latif, 2011). Hundreds of plants species are recognized for their therapeutic values and used to treat various diseases.People living in remote areas primarily depend on herbal and indigenous healthcare systems due to limited access to modern healthcare facilities and their expensive nature. About 12.5% of the total 4, 22,000 plant species documented worldwide is reported to have medicinal values (Schippamann *et al.*, 2002). In India, drugs of herbal origin have been used in traditional systems of medicines such as *Unani* and *Ayurveda* since ancient times (Ramu and Prabha, 2009). The drugs are derived either from whole plant or from different organs, like leaves, stem, bark, root, flower, seed, etc. Some drugs are prepared from excretory plant product such as gum, resins and latex. Even Allopathic system of medicine has adopted a number of plant-derived drugs which form an important segment of the modern pharmacopoeia. Among ancient civilization, India has been known to be rich repository of medicinal plants. The forest in India is the principal repository of large number of medicinal and aromatic plants, which are largely collected as raw materials for the manufacture of drugs and perfumery products. The biodiversity of medicinal plants of different regions were recorded by a number of investigators (Priti *et al.*, 2011; Raafat *et al.*, 2008; Gidey, 2010; Kharkwal, 2009). Medicinal plants occupied an important position in the socio-cultural, spiritual and medicinal arena of rural people of India. Their sustainable management and harvesting can conserve biodiversity, sustain human and environmental health, generate employment and enhance export earnings. Therefore, an attempt has been made to document the diversity and uses of medicinal plants grow in Hirekalgudda state forest of Hassan district of Karnataka state.

Author's Address
[1] Department of Botany, D.R.M. Science College, Davangere University, Davangere, Karnataka, India
E-mail: drtvasanthnaik@gmail.com
[2]Department of Botany, Sahyadri Science College (Autonomous), Kuvempu University Shivamogga, Karnataka, India
[3]Department of Zoology, Sahyadri Science College (Autonomous), Kuvempu University Shivamogga, Karnataka, India
[4]Department of Biotechnology, G.M.Institute of Technology, Davanagere, Karnataka, India

Study area

The study area Hirekalgudda state forest is located away from Arasikere taluk of Hassan district. It lies between 15^0 6' to 76^0 75' Eastern latitude and 13' 4^0 to 13' 5^0 Northern latitude. This forest consists of a mass of rocky hills raising more or less 3100 mt. above the surrounding area.

Material and Methods

Intensive exploration trips were conducted twice a week from August 2005 to August 2007. Field trips were made twice a week in the beginning and once in the week later to obtain a thorough collection of ephemerals. The work was conducted among local people, rural persons, farmers and *vaidyas* to know the medicinal importance of the mentioned plants. The plants with medicinal values are known from local people and rural persons were collected, and studies were conducted to know their medicinal uses.

The plant specimens were collected after drying. The herbarium sheets were prepared and identified (Diwakar and Sharma, 2000; Naik, 1998; Sharma *et al.*, 1996; Singh *et al.*, 2001). The authenticity of the identified plant specimens were checked by referring the recent monographs and through comparison with authentic herbarium specimens at Madras Herbarium, Botanical survey of India, Sri Krishnadevaraya University Herbarium, Anantapur (SKU), Regional Research Centre, Bangalore (RRCBI) and Manasagangotri, Mysore(MGM).

Results and Discussion

During the floristic exploration on medicinal plants of Hirekalgudda state forest, 54 species of belonging to 28 families were collected. The details regarding family, morphology of useful parts and medicinal values of the medicinal plants were given in the Table-1.

Table -1: Distribution of medicinal plants in Hirekalgudda state forest

S. No.	Botanical Name of Medicinal plant	Family	Morphology of the parts used	Medical usage
01	*Acacia nilotica* L.	Mimosaceae	Leaves and gum	Haemorrhoea, ulcers and leprosy
02	*Acalypha indica* L.	Euphorbiaceae	Leaves and root	Skin diseases, expectorant and dysentery
03	*Achyranthes aspera* L.	Amaranthaceae	Whole plant	Rheumatism, scabies and piles
04	*Adhatoda zeylanica* Medikus	Acanthaceae	Leaves and flowers	Jaundice, leucoderma and loss of memory
05	*Aegle marmelos* (L.) Corr. Serr.	Rutaceae	Fruit, bark and leaves	Hypochondria
06	*Azadirachta indica* A. Juss.	Meliaceae	Flowers, leaves and seeds	Jaundice, chicken pox and measles
07	*Bacopa monnieri* (L.) Pannel	Scrophulariaceae	Whole plant	Brain tonic and anticonvulsant
08	*Bauhinia variegate* L.	Caesalpiniaceae	Root and bark	Diarrhoea, leprosy and intestinal worms
09	*Calotropis gigantea* (L.) R.Br.	Asclepiadaceae	Whole plant	Purgative, leprosy and piles
10	*Carissa carandus* L.	Apocyanaceae	Root and fruit	Piles, eye diseases and hemorrhage
11	*Cassia auriculata* L.	Caesalpiniaceae	Bark, root and seeds	Urinary discharge, skin diseases and tumors
12	*Cassia tora* L.	Caesalpiniaceae	Pod, seeds and leaves	Skin diseases, diabetes and eye diseases
13	*Catharanthus roseus* (L.) G. Do.	Apocyanaceae	Whole plant	Anticancer, insect bite and diabetes
14	*Ceiba pentandra* (L.) Gaertner	Bombacaceae	Root, bark and flower	Dysentery, skin eruptions and haemoptysis

15	*Cissus quadrangularis* L.	Vitaceae	Root, leaves and stem	Dyspepsia, indigestion and piles
16	*Crotolaria retusa* L.	Fabaceae	Whole plant	Diarrhoea, scabies and leprosy
17	*Cucumis sativus* L.	Cucurbitaceae	Fruits and seeds	Demulcent, diuretic and headache
18	*Datura stramonium* L.	Solanaceae	Flowers and seeds	Curing bites of mad dog, tumors and elephantiasis
19	*Eucalyptus globulus* Labill	Myrtaceae	Dried leaves, root and essential oil	Purgative, stimulant and expectorant
20	*Euphorbia heterophylla* L.	Euphorbiaceae	Leaves and root	Dropsy, rheumatism and anthelmintic
21	*Ficus benghalensis* L.	Moraceae	Whole plant	Diabetes, gonorrhoea and piles
22	*Gymnema sylvestre (*Retz) R.Br.ex	Asclepiadaceae	Leaves and root	Diabetes, vomiting and cardio tonic
23	*Heliotropium indicum* L.	Boraginaceae	Whole plant	Ulcer, skin diseases and rheumatism
24	*Helicterus isora* L.	Sterculiaceae	Root, bark and fruits	Diarrhoea, constipating and vermifuge
25	*Hyptis suaveolens* (L.) Poit	Laminaceae	Leaves	Skin diseases, dental problems and rheumatism
26	*Ixora coccinea* L.	Rubiaceae	Root, leaves and flowers	Cough, gonnorrhoea and diarrhoea
27	*Jasminum pubescens* Willd	Oleaceae	Leaves and flowers	Cough, inflammation and rheumatism
28	*Jatropha curcas* L.	Euphorbiaceae	Fruits, leaves and root	Diarrhoea, dysentery and urinary discharge
29	*Jatropha glandulifera* Roxb.	Euphorbiaceae	Fruits and leaves	Chronic rheumatism, sinuses and paralysis
30	*Leucas aspera* (Willd) Link	Lamiaceae	Whole plant	Chronic rheumatism, skin eruption and snake bite
31	*Mangifera indica* L.	Anacardiaceae	Root, bark and seed	Astringent, dysentery and bronchitis
32	*Mimusops elengi* L.	Sapotaceae	Bark, stem and flower	Astringent, anthelminitic and diarrhoea
33	*Momordica charantia* L.	Cucurbitaceae	Whole plant	Constipation and fever
34	*Nerium odorum* Sol.	Apocynaceae	Root	Astringent, toothache and epilepsy
35	*Ocimum americanum* L.	Lamiaceae	Whole plant	Toothache, stomachic and asthma
36	*Ocimum basilicum* L.	Lamiaceae	Whole plant	Stomachic, anthelmintic and toothache
37	*Parkinsonia aculeate* L.	Caesalpiniaceae	Flowers	Antiseptic, diarrhea and gonorrhoea
38	*Passiflora foetida* L.	Passifloraceae	Whole plant	Skin diseases, flatulence and inflammations
39	*Phyllanthus emlica* L.	Euphorbiaceae	Fruits	Jaundice and swelling
40	*Physalis minima* L.	Euphorbiaceae	Whole plant	Diuretic, laxative and expectorant
41	*Pongamia pinnata* (L.) Pierre	Fabaceae	Root and seeds	Anthelmintic, tumors and piles
42	*Psidium guajava* L.	Myrtaceae	Leaves, root and fruit	Rheumatism, diarrhea and dysentery
43	*Pterocarpus marsupium* Roxb.	Fabaceae	Leaves, heatwood and gum	Astringent, constipation and diarrhoea

44	*Sesamum orientale* L.	Pedaliaceae	Whole plant	Dysentery, urinary complaints and ulcers
45	*Tamarindus indica* L.	Caesalpiniaceae	Bark, seed and flowers	Opthalmia, eye diseases and vaginal discharge
46	*Tectona grandis* L. f	Verbinaceae	Root and leaves	Inflammations, dyspepsia and flatulence
47	*Terminalia catappa* L.	Combretaceae	Fruits and bark	Piles, dyspepsia and eye diseases
48	*Thevetia peruviana (*Pers.) Merr.	Apocynaceae	Root, leaves and seeds	Tumors, purgative and abortifacient
49	*Toddalia asiatica* (L.) Lam	Rutaceae	Leaves and root	Diarrhoea, fever and rheumatism
50	*Tragia involucrate* L.	Euphorbiaceae	Whole plant	Hypodermic, diuretic and sterility
51	*Tribulus terrestris* L.	Zygophylaceae	Leaves and root	Gonorrhoea and increase menstrual flow
52	*Tridax procumbens* L.	Asteraceae	Whole plant	Skin diseases and elephantiasis
53	*Vitex negundo* L.	Verbinaceae	Whole plant	Asthma, epilepsy and piles
54	*Zornia diphylla* (L.) Perse	Fabaceae	Whole plant	Dysentery and inflammation

These collected medicinal plants are used for the treatment of several diseases like ulcers, leprosy, measles, gonorrhea, jaundice, chicken pox diarrhea, piles, headache, elephantiasis, dropsy, rheumatism, diabetes and skin diseases. The most represented families are Fabaceae (10) followed by Euphorbiaceae (7 species), Laminaceae and Apocyanaceae (4 species each) and Asclepidaceae, Cucurbitaceae, Myrtaceae, Rubaceae and Verbinaceae (2 species).

Percentage of families are given in Table- 2 and depicted in Fig. 1.

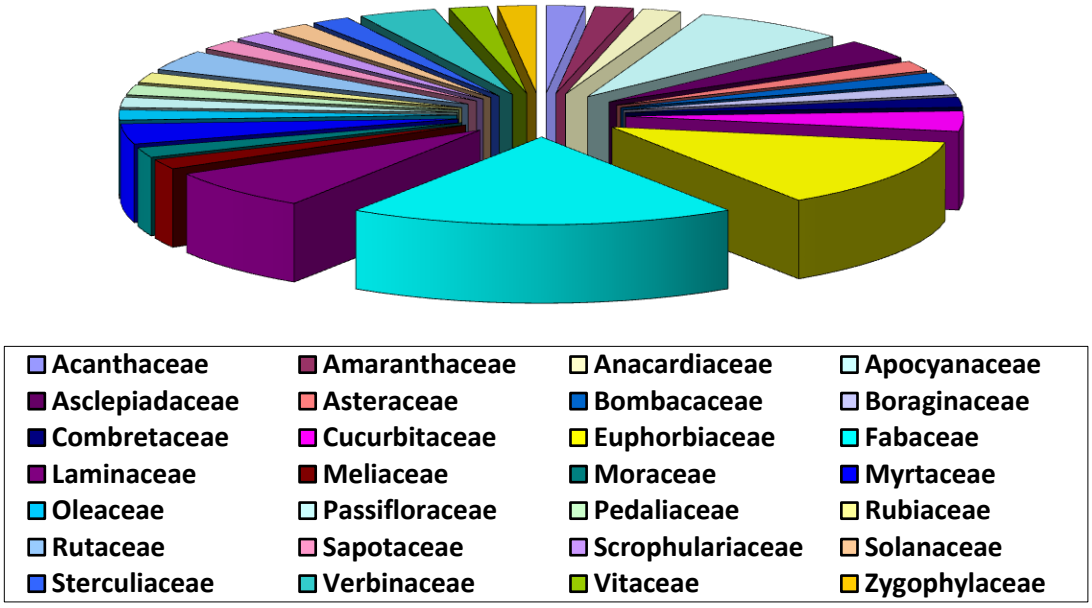

Fig. 1: Distribution of medicinal plants

Table- 2: Percentage of families

Family	Percentage
Acanthaceae	1.84
Amaranthaceae	1.84
Anacardiaceae	1.84
Apocyanaceae	7.36
Asclepidaceae	3.7
Asteraceae	1.84
Bombacaceae	1.84
Boraginaceae	1.84
Combretaceae	1.84
Cucurbitaceae	3.7
Euphorbiaceae	12.88
Fabaceae	18.44
Laminaceae	7.4
Meliaceae	1.84
Moraceae	1.84
Myrtaceae	3.7
Oleaceae	1.84
Passifloraceae	1.84
Pedaliaceae	1.84
Rubiaceae	1.84
Rutaceae	3.7
Sapotaceae	1.84
Scrophulariaceae	1.84
Solanaceae	1.84
Sterculiaceae	1.84
Verbinaceae	3.7
Vitaceae	1.84
Zygophylaceae	1.84

Some plants like *Achyranthes aspera, Euphorbia heterophylla, Heliotropium indicum, Hyptis suaveolens, Jatropha glandulifera, Psidium guajava, Toddalia asiatica* and *Vitex negundo* are used in the treatment of Rheumatism. Plants like *Bauhinia variegata, Crotolaria retina, Helicterus isora, Ixora coccinea, Mimusops elengi, Parkinsonia aculeate Jatropha curcas* and *Toddalia asiatica* are used for Diarrohoea. *Acalypha indica, Cassia tora, Hyptis suaveolens* and *Passiflora foetida* are used in the treatment of skin diseases. Similarly *Adhatoda zeylanica, Azadirachta indica* and *Phyllanthus emblica* are used for Jaundice. In addition to this, some plants like *Catharanthus roseus, Ficus bengalensis* and *Gymnema sylvestre* are used to cure diabetes.The Phytochemical constituents and medicinal properties of most of the medicinal plants were recorded in the last few decades by a number of workers (Nandakerni, 1976; Joshi, 2000; Nudrat and Usha, 2005).A large number of medicinal plants of great commercial value grow spontaneously in the forests. Forestry plays an important role in the economy of the district. However, the collection of medicinal plants should preferably be done in a planned and systematic manner through experts in government organizations. So that herbal wealth is not overexploited. Due to unscientific collection and over exploitation, many of the medicinal plants are on the verge of extinction in the study area.

All the forest based medicinal herbs can be cultivated in congenial agro-climatic conditions under the guidance of technical experts. Public and private involvement in management and utilization of medicinal plants in sustainable way is essential to combat human pressures on these valuable natural resources. Encouraging people to grow medicinal plants in home gardens and mixing with crops in farmlands are important.

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