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Research Trends in Medicinal Plant Sciences

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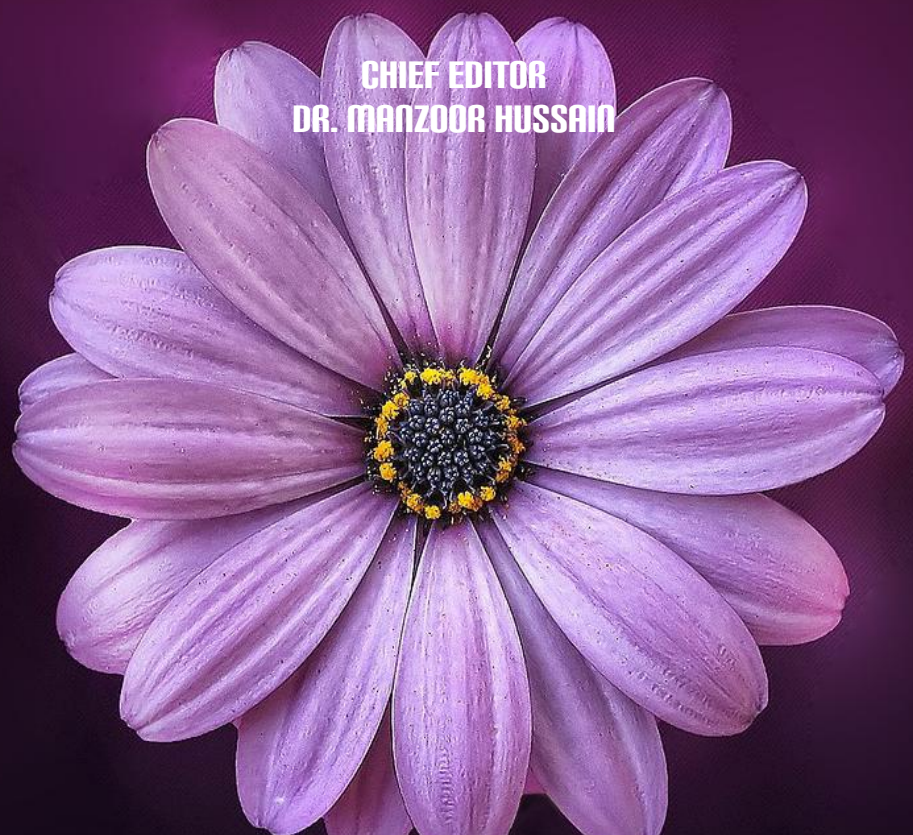

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Chapter - 2

Medicinal Climbers of Karikkiyur Hills in the Southern Western Ghats of Tamil Nadu, India

Divya Bharathi G, Saradha M, Jansirani P and P. Samydurai

Abstract

The present investigation was conducted in Karikkiyur hill which is located in Kilkothagiri, Nilgiri District, Tamil Nadu, India to explore the diversity of climbers and their curatives. Primary field survey was conducted in the hills where inhabitants provided support and given necessary information on medicinal plants. A total of 25 species belonging to 19 genera comprising of 15 families of medicinally important climbers were identified. The indigenous people using medicinal climber to cure various ailments such as boils, bleeding disorders, cold and cough, fractures, stomach ache worm infestation, sneezing, antidote, cancer, eye infection, digestive disorders etc. It is evident from the study that the ethnic people still value traditional medicine.

Keywords: ailments, climbers, Karikkiyur hills, indigenous knowledge

Introduction

Climbing plants are important group of plants whose structural support does not come entirely from its own tissue with original rooting position in the soil or a surface close to the soil and whose climbing efforts could take its foliage and reproductive organs into tree canopies (Burnham, 2009). About 5000-10,000 climber species are recorded within angiosperms (Caballe, 1993). Climbing plants have existed since the first upright support plant appeared on earth. Their medicinal value has not received much attention despite potentials in this group of plants (Divya Bharathi *et al.,* 2019). Data on modern temperate and tropical forests where abundance and taxonomic identification of climbers was made indicated 10-25% of woody species are lianas with 4-12% biomass contribution, a proportion similar to that of ancient forest communities (Phillips *et al.* 2008). Climbers not only form important structural components but also play important ecological role in forest dynamics, diversity and nutrient recycling (Gentry and Dodson, 1987; Schnitzer and Bongers, 2002). Climbing plants constitute significant portion of diverse and abundant plant community in most tropical forests

around the globe, constituting about 25% of woody species in lowland tropical moist and wet forests (Bongers *et al*., 2005).

India is one of the 12-mega biodiversity center with three hot spots of biodiversity *viz*., Western Ghats, Western Himalayas and eastern Himalayas. India has about 265 climber species, of which 125 are woody and the rest are herbaceous. About 100 species are medicinally important (Chaudhuri, 2007). Nowadays, approximately 2,50,000 species of higher plants are known to exist on planet earth. Among those numbers 35,000 species have been used for their medicinal value (Yirga *et al*., 2011). A large percentage of human population in developing nations, especially in rural settings, relies heavily on traditional medicines as source of primary healthcare (Samydurai *et al.,* 2012).

About 80% of the medicinal plants are used in worldwide are available in the Western Ghats. (Heywood, 1993; Saradha *et al.,* 2017). Climbing plants are important group of plants with much potential in botanical medicine. The plants are widely used in traditional systems of medicine (Eilu and Bukenya-Ziraba, 2004; Samydurai *et al.,* 2017). In recent years some workers (Balasubramanian *et al.* 1997; Saradha *et al.,* 2017a; Senthilkumar *et al.* 2005; Sarvalingam *et al.,* 2011) have reported various climbing medicinal plants used in Southern western Ghats.

Study area

The study area Karikkiyur hills consist of evergreen forest at an altitude of 1,847 m above sea level, 11˚43’ Northern latitude and 76˚88’ of Eastern longitude. The average annual temperature is 16.2 ˚C. The rainfall here averages 1300mm. Rainfall is low in the month of December-February and the weather is chill and very cold. During March to May the weather is warm and hot. During June to October there is continuous heavy rain.

Materials and methods

The present study was carried out through intensive and extensive field visits during June 2018-Oct 2019 to collect information on climbers and its traditional uses. The data were documented through interviews, discussion and field observation with folk practitioners and knowledgeable people of the study area using standard methods adopted by Jain and Goel (1995). During field survey, the plants have been collected in their flowering and fruiting stages from the natural habitats. They were identified with the help of local floras (Gamble and Fischer, 1915-1936; Matthew, 1983; Nair and Henry, 1983; Henry *et al.* 1987; 1989; Chandrabose and Nair, 1988). Further, the identification were confirmed by referring authentic specimens in the Madras Herbarium (MH) of Botanical Survey of India, Southern

Circle, Coimbatore and the voucher specimens deposited in the Herbarium of Department of Botany, Nirmala College for Women, Coimbatore, Tamil Nadu.

Results and discussion

In the present study curative properties of 25 climbers belonging to 19 genera and distributed over 15 families were documented. The plants are tabled with correct botanical names followed by family, local name, habit, part(s) used and medicinal uses (Table 1). Rural people traditionally use about 9500 wild plants for various purposes like medicine, food, fodder, fuel, fiber and other miscellaneous purposes (Van Andel, 2000). In the study area Rosaceae is the most dominant family with 4 species followed by Menispermaceae and Convolvulaceae with 3 genera each, Cucurbitaceae, Vitaceae and Piperaceae with 2 genera each, Acanthaceae, Aristolochiaceae, Celastraceae, Colchicaceae, Elaeagnaceae, Ranunculaceae, Rubiaceae, Rutaceae and Smilacaceae were represented with single genera and single species (Figure 1).

Analysis of habit forms indicates that 5 plants were stem twining climber, spine climber, tendril climber and woody climber, 2 were herbaceous climbers and others were glabrous and extensive climbers in the documented plant species (Figure 2). Similar data have been reported on documentation of climbing flora in Maruthamalai hills of Southern Western Ghats of which it harbour a rich diversity (Sarvalingam *et al.,* 2011).

The most commonly used medicinal climbers *viz*., *Clematis gouriana, Cyclea peltata, Stephania japonica, Tinospora cordifolia, Cayratia pedata, Cissus quadrangularis, Zehneria scabra, Z. maysorensis, Ipomoea cairica, I. purpurea, Thunbergia fragrans, Aristolochia indica, Celastrus paniculatus, Gloriosa superb, Smilax aspera, Elaeagnus kologa, Piper mullesua, Piper schmidtii, Rosa leschenaultiana, Rubia cordifolia Rubus ellipticus, R. racemosus, R. niveus* (Table 1 and Figure 3). Which are played an important role in the primary healthcare system of local community in the study area. The plants are used to cure various disorders such as boils, bleeding disorders, cold and cough, fractures, stomach ache worm infestation, sneezing, antidote, cancer, eye infection, digestive disorders etc. Several studies have reported the plants used for wound healing, fever, stomach problem, itching, skin irritations and other skin diseases in various parts of the world (Harsha *et al*., 2003; Ayyanar and Ignacimuthu, 2005 and Sarvalingam *et al.,* 2011).

Further, it is evident from the study that, different plant parts of climbers were used as medicines in which the fruits (9) are most frequently used for the treatment of ailments followed by leaves (6), flowers (4), roots (3),

whole plant (3), shoot (1). Similarly, Egharevba and Ikhatua (2008) documented about 41 plants belonging to 29 families were different plant parts are used for the study such as leaves, stem, bark, seed, root, fruits and flowers. The composition of phytochemical constituents and its uses are varying in different parts of the same plant and it might be used to confirm extraction of the different bioactive agents in preparation of herbal medicine (Busia, 2016).

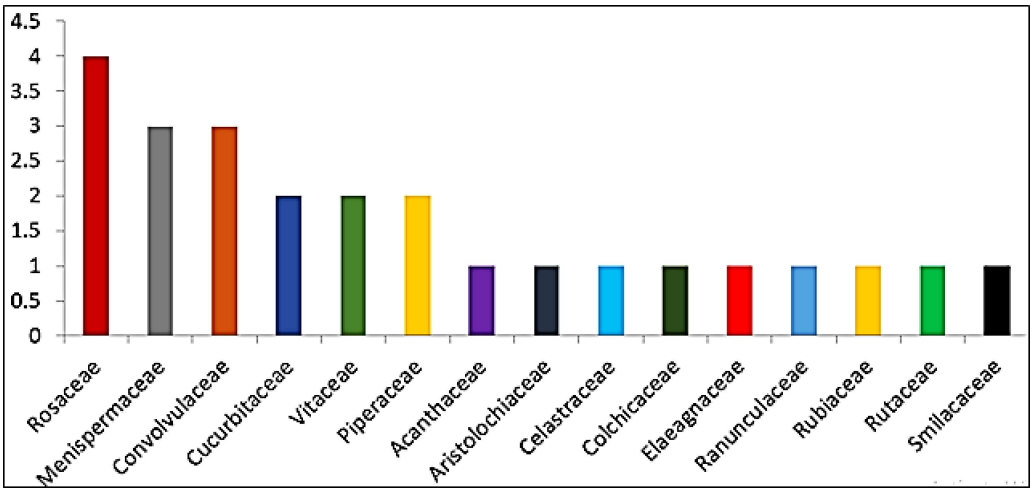

Fig 1: Dominant family of the study

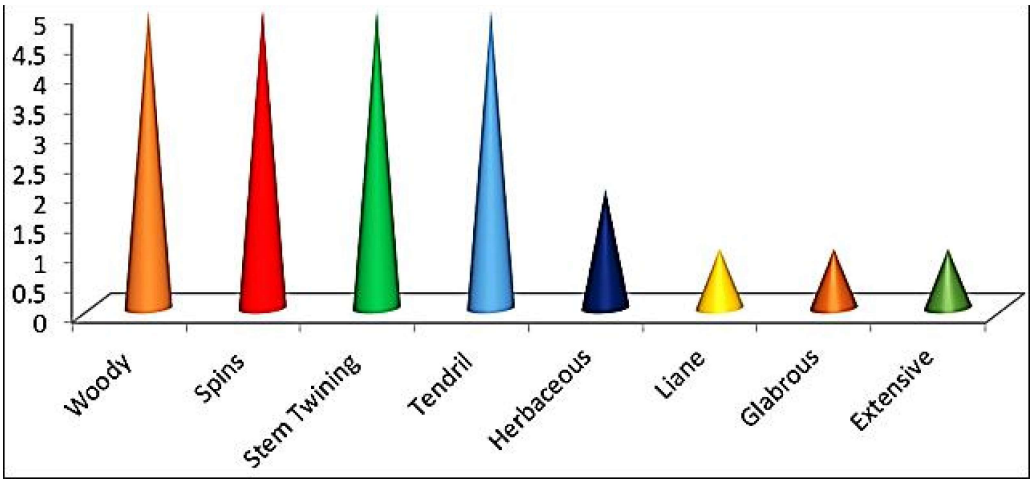

Fig 2: Habit analysis from the study area

Fig 3: a. *Cayratia pedata* b. *Celastrus paniculatus* c. *Clematis gouriana* d. *Elaeagnus kologa* e. *Piper mullesua* f. *Rubus niveus*

Table 1: Documentation of climbing flora from Karikkiyur hills of Southern Western Ghats of Tamil Nadu, India

S. No.	Binomial Name	Family	Local name	Habit	Parts used	Medicinal uses
1.	*Clematis gouriana* Roxb. *ex* DC.	Ranunculaceae	Manivila Mangodi	Herbaceous Climber	Leaves	Antidote for insect bite
2.	*Cyclea peltate* (Lam.) Hook. f., & Thoms.	Menispermaceae	Pata, Sirupathavali	Stem Twining Climber	Leaves	Leave paste applied for boils
3.	*Stephania japonica* (Thunb.) Miers	Menispermaceae	Patakilammu	Stem Twining Climber	Root	Internal bleeding disorders
4.	*Tinospora cordifolia* (Willd.) Miers.	Menispermaceae	Amirtavalli	Stem Twining Climber	Whole plants	The leaves are boiled in water and used for medicinal bath
5.	*Toddalia asiatica* (L.) Lam.	Rutaceae	Kindu mullu	Woody Climber	Fruit	Everyday intake of fruit decoction cures cough and cold
6.	*Cayratia pedata* (Lour.) A. L. Juss.	Vitaceae	Kattuppirantai	Liane	Leaves	Cures skin diseases
7.	*Cissus quadrangularis* L.	Vitaceae	Pirandai	Tendril Climber	Whole plant	Paste applied on bone fractures
8.	*Zehneria scabra* (L. f.) Sond	Cucurbitaceae	Naai pagal	Glabrous Climber	Leaves	Leaf juice is mixed with honey and intaken to cure stomach ache
9.	*Zehneria maysorensis* (Wight & Arn.) Arn.	Cucurbitaceae	Musumusukai	Herbaceous Climber	Fruit	The fruit powder is intaken every 5 days to get rid of worm infestation
10.	*Ipomoea aquatic* Forsskal	Convolvulaceae	Nali, Vallai	Stem Twining Climber	Flower	Fresh flowers are heated over flame and kept on fore head to get cure from migraine
11.	*Ipomoea cairica* (L.) Sweet	Convolvulaceae	Railway Creeper	Extensive Climber	Root	Roots are boiled in water and intaken get cure from sneezing.

12.	*Ipomea purpurea* (L.) Roth	Convolvulaceae	Pal kodi	Tendril Climber	Whole plant	The whole plant is taken to feed cattle, which yield more milk
13.	*Thunbergia fragrans Roxb.*	Acanthaceae	White Thunbergia	Tendril Climber	Flowers	These represent purity and used during rituals during marriage.
14.	*Aristolochia indica* L.	Aristolochiaceae	Kozhikkundu's	Tendril Climber	Leaves	Antidote for snake bite
15.	*Celastrus paniculatus* Willd.	Celastraceae	Kuvarikuntal	Woody Climber	Leaves	Regular intake of plant decoction is said to cure cancer
16.	*Gloriosa superba* L.	Colchicaceae	Kan vili poo	Tendril Climber	Flower	The flowers are grinded into paste and applied overnight to cure eye infection
17.	*Smilax aspera* L.	Smilacaceae	Italian Sarsaparilla	Spines Climber	Fruit	The fruit powder is mixed with pine ash to get rid of head ache.
18.	*Elaeagnus kologa* Schult.	Elaeagnaceae	Perungudi	Woody climber	Fruit	The fruits are edible and these provide energy.
19.	*Piper mullesua* Buch.-Ham. ex D. Don.	Piperaceae	Kuttikurumulaku	Woody climber	Fruit	The fruits are intaken raw as it cure cold.
20.	*Piper schmidtii* Hook. f.	Piperaceae	Wild pepper	Woody climber	Fruit	The fruits are substituted for *P. nigrum*
21.	*Rubus ellipticus* Smith.	Rosaceae	Yellow Himalayan raspberry	Spines Climber	Fruit	Fruits are edible, It is intaken by pregnant women to increase hemoglobin in the body
22.	*Rubus racemosus* Roxb.	Rosaceae	Sema mullu	Spines Climber	Fruit	Fruit edible. It cures digestive disorders
23.	*Rubus niveus* Thunb.	Rosaceae	Velli Mullu Chedi	Spines Climber	Fruits Shoot	Tender shoots are edible cures stomach worm.
24.	*Rosa leschenaultiana* Red. & Thory ex Wight & Arn.	Rosaceae	Nilgiri cluster-rose	Spines Climber	Flower	Dried flower petals are used for fragrance it also helps to increase appetite
25.	*Rubia cordifolia* L.	Rubiaceae	Manjitti	Stem Twining Climber	Root	Used as antidote for snake bite

Conclusion

In this study, we have documented current state of climbing medicinal plants knowledge and use of herbal medicines for the treatment of various ailments and management of human diseases among the people inhabiting the Karikkiyur hills, the Nilgiris. The finding of the study suggests that climbing plants have great medicinal value for treatment of common diseases and ailments. Further studies need to conservation of medicinal climbers for the sustainable utilization of its potential medicinal properties and drug discoveries.

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