

Floristic diversity and medicinal importance of South Vagaikulam Region Tirunelveli, Tamil Nadu, South India

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ABSTRACT

The present study was aimed to explore the plant diversity wealth of South Vagaikulam village, which is yet to be botanized to make the flora of Tirunelveli complete. The result of plant diversity of South Vagaikulam shrub jungles includes 133 species of flowering plants, 115 genera belonging to 49 families. Among the 133 species, 126 species belongs to dicotyledons and 7 species belongs to monocotyledons. The most dominant family in the present study area is Asteraceae with 12 species (21%). Next to that Fabaceae and Euphorbiaceae comprise 10 species (19%), Amaranthaceae includes 9 species (17%), Lamiaceae contains 8 species (15%), and Verbenaceae embraces 5 species (9%). In addition to the floristic study, the present study enumerated the medicinally important plants in the shrub jungles which are used to cure various diseases.

KEY WORDS: Angiosperm, asteraceae, South Vagaikulam, medicinal

INTRODUCTION

Biodiversity constitutes various resources upon which families, communities, and future generations depend for meeting their livelihoods. Human beings are very much associated with the plant kingdom for its survival from the very beginning of its appearance on this earth (Elizabeth and Dowdeswell, 1995). India is one of the mega biodiversity-rich nations in the world where the medicinal plants are part of our tradition that is even respected today. The main traditional systems of medicine in India include Ayurveda, Siddha, Unani, and Homeopathy. 75% of the medicinally important plant species in India grows in almost wild condition (Laloo *et al.*, 2006; Kannan and Jeeva, 2008). The WHO defines traditional medicine as approaches, health practices, knowledge, and incorporating plant-based medicines which are applied to treat, diagnose, and prevent diseases (WHO, 2003).

Since time immemorial, ancient people mainly depend on herbal remedies for the treatment of diseases and disorders (Singh *et al.*, 2003). Ethnomedicine is widely

practiced among the tribal populations of our nation. Jain (2001) pointed out over 400 different tribal and ethnic groups in India which constitute about 7.5% of India's population. There has been keen interest among researchers in the area of medicinal plants and their properties in different parts of India. There are also many reports on the use of medicinal plants for treating various ailments either by tribal people or indigenous communities of India (Saikia *et al.*, 2006). Apart from the tribal groups, rural people also possess knowledge about the uses of medicinal plants (Kumar *et al.*, 2012). Medicinal preparations derived from plants in the simple form of plant parts or in the complex form of crude extract mixtures are active against a number of diseases. It is clear that the plant kingdom harbors an unlimited source of active ingredients in the management of diseases (Shariff, 2001).

Tribal communities in Tamil Nadu meet their healthcare by using non-timber forest products and preparations based on indigenous knowledge. It has been also established that herbal drugs obtained from medicinal plants are safe with fewer side effects (Ayyanar and Ignacimuthu,

2005). Kani tribal people in Tirunelveli hills still depend on medicinal plants to treat various diseases viz., cough, cold, fever, headache, poisonous bites, etc. However, the ethnobotanical survey with medicinal uses among the tribes in selected areas of Mundanthurai sanctuary is reported (Ignachimuthu *et al.*, 1998). There are also few reports available on ethnomedicinal uses of medicinal plants in the forests of Tirunelveli hills and its neighboring areas (Ayyanar and Ignacimuthu, 2009; 2010). Since then only limited number of ethnobotanical study have been carried out in this area. With this knowledge, the present study was aimed to explore the plant diversity wealth of South Vagaikulam village, which is yet to be botanized to make the flora of Tirunelveli complete.

MATERIALS AND METHODS

The source of materials for this floristic research was the extensive and intensive field collections of specimens from various parts of South Vagaikulam village. Collections were repeated until full data on flowering and fruiting were gathered. All the specimens are stored in Xavier's College Herbarium, St. Xavier's College, Palayamkottai. Apart from the herbarium specimens, the plants are documented through photography.

During the field studies, complete specimens with triplicates were collected. Characters such as height of the plant, nature of bark in case of trees, smell of the leaves/flowers, color of the flowers/fruits, pubescence, secretions on the vegetative and reproductive parts, and habit/habitat association were also documented. In case of small herbs, the whole plants with roots or underground parts were collected. The data such as date of collection, names of the family and species, uses, locality, habit frequency, habitat distribution, nature of stem, leaf, texture and color of the flowers, fruits, and other related notes were recorded in the field notebook.

The large specimens were trimmed to the size of about 20 cm length, and the excess of leaves and flowers were removed without altering the arrangement and position of leaves, flowers, and fruits. The collected specimens were poisoned immediately after collection. This was done by dipping the whole plant in the denatured spirit. The specimens were pressed after spreading out of the leaves and flowers neatly. Some leaves were placed facing up and others facing down to show the characters on both surfaces.

The characters of the plant were studied and checked with regional flora such as Gamble, Flora of the Presidency

of Madras, Matthew's Flora of the Tamil Nadu Carnatic, and Hooker's flora of the British India, and the correct determinations were established.

RESULTS

The result of plant diversity of South Vagaikulam shrub jungles includes 133 species of flowering plants, 115 genera belonging to 49 families. Among the 133 species, 126 species belongs to dicotyledons and 7 species belongs to monocotyledons. The most dominant family in the present study area is Asteraceae with 12 species (21%). Next to that Fabaceae and Euphorbiaceae comprise 10 species (19%), Amaranthaceae includes 9 species (17%), Lamiaceae contains 8 species (15%), and Verbenaceae embraces 5 species (9%). The detailed investigation of the flora of present study and their medicinal values in a different area is represented in Table 1 and Figure 1. All the obtained information were used for treating different ailments.

DISCUSSION

India is endowed with a rich biological diversity with about 12% of the global plant wealth. However, nearly one-third of the total plant species of India are endemic. In the present study, among the various families of flowering plants in India, the dominant ones are Orchidaceae, Leguminaceae, Gramineae, Rubiaceae, Euphorbiaceae, Acanthaceae, Compositae, Cyperaceae, Labiatae, and Urticaceae. Ramarajan and Murugesan (2012) studied 63 medicinal plants collected from the Tirunelveli hills, South India. Of which, about 52 medicinal plants were used for the treatment of several diseases either in single or in combination with other ingredients. In the present study also, the floristic wealth of the South Vagaikulam, Tirunelveli district was explored, and the results showed the presence of 133 species of flowering plants, 115 genera belonging to 49 families. The most dominant family in the present study area is Asteraceae with 12 species (21%). In addition to the floristic study,

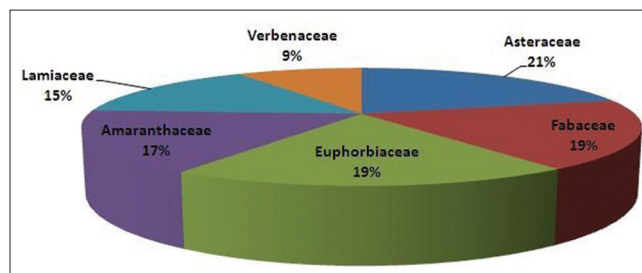


Figure 1: Dominant families present in the study area

Table 1: Floristic diversity and medicinal importance of South Vagaikulam Region

Botanical name	Family name	Parts used	Medicinal uses
<i>Abrus fruticulosus</i> Wall.	Fabaceae	Leaves and root	Digestive disorders and traditional medicines
<i>Abutilon indicum</i> G.Don	Malvaceae	Root and bark	Fever and astringent
<i>Acacia nilotica</i> Willd.	Mimosoideae	Leaves and bark	Astringent and cooling
<i>Acalypha ciliata</i> Forssk.	Euphorbiaceae	Leaves and root	Laxative and Vermifugal properties
<i>Acalypha indica</i> Linn.	Euphorbiaceae	Leaves	Ulcers, bronchitis, and Constipation
<i>Acanthospermum hispidum</i> DC.	Asteraceae	Stem and leaves	Dermatological affections
<i>Achyranthes aspera</i> , L.	Amaranthaceae.	Root	Cough
<i>Aerva lanata</i> (Linn.)	Amaranthaceae	Whole plant	Astringent, cooling, and leprosy
<i>Ageratum conyzoides</i> , Linn.	Asteraceae	Whole plant	Laxative and cough
<i>Allmania nodiflora</i> (L.) R.Br.ex wight	Amaranthaceae	Fruits and leaves	Constipation, dysentery, and febrifuge
<i>Aloe vera</i> L.	Liliaceae	Whole plant	Ulcer, cooling agent, and heart problems
<i>Alternanthera sessilis</i> R.Br	Amaranthaceae	Leaves	Purgative and carminative
<i>Alysicarpus rugosus</i> DC.	Fabaceae	Stem	Relief pain
<i>Alysicarpus vaginalis</i> DC.	Leguminosae	Leaves and stem	Pulmonary troubles
<i>Amaranthus viridis</i> Linn.	Amaranthaceae	Whole plant	Toothache and dropsy
<i>Andrographis echinoides</i> (L.) Nees	Acanthaceae	Whole plant	Antibacterial and antifungal activity
<i>Aeschynomene indica</i> L.	Fabaceae	Whole plant	Skin disease
<i>Asparagus racemosus</i> Willd.	Asparagaceae	Tuberous root	Ophthalmic, anodyne, stomachic, and dysentery
<i>Asystasia gangetica</i> T.Lawiana, Dalz.	Acanthaceae	Leaves	Fever and skin disease
<i>Azadiracta indica</i> , A.Juss	Meliaceae	Leaves and wood	Small box and pesticides
<i>Barlaria cuspidata</i> , Heyne.	Acanthaceae	Nuts	Masticator and intoxicating
<i>Biophytum sensitivum</i> (L.) Dc.	Oxalidaceae	Whole plant	Diuretic, expectorant, snake bite, and stimulant
<i>Boerhavia erecta</i> Linn.	Nyctaginaceae	Leaves and roots	Asthma
<i>Boerhavia diffusa</i> Linn.	Nyctaginaceae	Root and leaves	Jaundice
<i>Borassus flabellifer</i> L.	Arecaceae	Leaves and bark	Tonic and digestive problems
<i>Borreria hispida</i> , L.Sch.	Rubiaceae	Leaves and seeds	Diarrhea and dysentery
<i>Calotropis gigantea</i> . (R.Br) ex.aid.	Asclepiadaceae	Root, bark, and flower	Paralysis, swelling, and intermittent fever
<i>Cardiospermum halicacabum</i> L.	Sapindaceae	Root and leaves	Emetic and diabetes
<i>Carmona retusa</i> (Vahl) Masam.	Boraginaceae	Whole plant	Cough and colic
<i>Cassia absus</i> L.	Caesalpinaceae	Seeds and leaves	Blood pressure, ringworm, and skin disease
<i>Cassia auriculata</i> L.	Caesalpinaceae	Whole plant	Cooling and astringent
<i>Catunaregam spinosa</i> sub sp. Taylorii	Rubiaceae	Fruit and stem	Fever and asthma
<i>Celosia argentea</i> L.	Amaranthaceae	Whole plant	Antiprotozoal
<i>Chrotalaria verucosa</i> L.	Fabaceae	Whole plant	Fever and dysentery
<i>Cissus quadrangularis</i> Linn.	Euphorbiaceae	Whole plant	Laxative, anthelmintic, carminative, and asthma
<i>Citrullus colocynthis</i> Schrad	Cucurbitaceae	Fruit and seeds	Jaundice and urinary problem,
<i>Cleome angustifolia</i> Forssk	Capparaceae	Whole plant	Expectorant and stimulant
<i>Cleome gynandra</i> Linn.	Capparidaceae	Leaves and seeds	Headache and neuralgia
<i>Coccinia grandis</i> (Linn.) Voigt.	Cucurbitaceae	Roots, leaves, and fruits	Vomiting, burning sensation, and antipyretic
<i>Commelina benghalensis</i> Linn.	Commelinaceae	Whole plant	Hemorrhage and fever
<i>Commiphora berryi</i> . Engl.	Burseraceae	Whole plant	Neuralgia
<i>Corchorus aestuans</i> Linn	Tiliaceae	Leaves	Leprosy, itching, and rat killing
<i>Corchorus trilocularis</i> L.	Tiliaceae	Stem and leaves	Jaundice and astringent
<i>Crinum difixum</i> . Ker.	Amaryllidaceae	Bulb	Cancer and ulcer
<i>Cucumis trigonus</i> . Roxb.	Cucurbitaceae	Roots, fruits, and seeds	Cough, anemia, and abdominal disorders.
<i>Cyanotis axillaris</i> L.	Commelinaceae	Whole plant	Whooping cough
<i>Cymbopogon flexuosus</i> Wats.	Cyperaceae	Leaves and root	Cooling and astringent
<i>Datura metal</i> Linn.	Solanaceae	Leaves and stem	Body pain and headache
<i>Dichrostachys cinerea</i> (L.) Wight and Arn	Mimosaceae	Roots and tender shoots	Astringent, digestion, and ophthalmia
<i>Digera muricata</i> DC.	Amaranthaceae	Leaves	Stomachic, ulcer, and fever
<i>Eclipta alba</i> (L.) Hassk.	Asteraceae	Whole plant	Jaundice and fever
<i>Elephantopus scaber</i> Linn.	Asteraceae	Roots and flowers	Skin disease and cough
<i>Elytraria acaulis</i> (L.f) Lindau	Acanthaceae	Leaves and root	Heart problem
<i>Emilia sonchifolia</i> (L.) DC.	Asteraceae	Whole plant	Astringent and ophthalmic
<i>Euphorbia hirta</i> L.	Euphorbiaceae.	Leaves	Headache
<i>Euphorbia thymifolia</i> Linn.	Euphorbiaceae	Whole plant	Ringworm and woods
<i>Evolvulus alsinoides</i> (Linn.)	Convolvulaceae	Whole plant.	Amentia, forgetfulness, and diarrhea
<i>Gloriosa superba</i> Linn.	Liliaceae	Rhizome	Abortifacient, purgative, and lice
<i>Gmelina asiatica</i> L.	Verbenaceae	Root and wood	Catarrh of the bladder and blood purifier
<i>Gomphrena globosa</i> Linn.	Amaranthaceae	Root	Cough
<i>Hedyotis aspera</i> Heyne. ex .Roth	Rubiaceae	Whole plant	Psoriasis, diabetes, and wound healings
<i>Hemidesmus indicus</i> (Linn.) R.Br.	Asclepiadaceae	Roots, leaves, and stem	Hemorrhoids and leucoderma
<i>Hibiscus vitifolius</i> L.	Malvaceae	Leaves	Diarrhea
<i>Hyptis suaveolens</i> Poit	Lamiaceae	Leaves and root	Stomachic
<i>Indigofera tinctoria</i> Linn	Leguminosae	Whole plant	Hepatoprotective and tonic
<i>Indigofera glandulosa</i> Willd.	Leguminosae	Whole plant	Demulcent

(Contd...)

Table 1: Contd...

Botanical name	Family name	Parts used	Medicinal uses
<i>Jasminum trichotomum</i> Heyne.	Oleaceae	Leaves and stem	Cooling and astringent
<i>Jatropha curcas</i> L.	Euphorbiaceae	Latex and seed	Ulcers, tumors, and skin disease
<i>Jatropha glandulifera</i> Roxb.	Euphorbiaceae	Seed and root	Purgative, ulcer, and glandular swelling
<i>Justicia simplex</i> D. Don	Acanthaceae	Whole plant	Stomachic and expectorant
<i>Kleinia grandiflora</i> Wall. Ex DC.	Asteraceae	Leaves	Scorpion bite
<i>Lantana camara</i> L.	Verbenaceae	Leaves and root	Antiphylogistic
<i>Lantana wightiana</i> Wall.	Verbenaceae	Leaves	Pest control, mosquito fogging, and fumigation
<i>Leucas aspera</i> (Willd.) Link.	Lamiaceae	Leaves and flowers	Dyspepsia, verminosis, and chronic skin eruption
<i>Leucas biflora</i> R. Br.	Lamiaceae	Leaves and stem	Cough
<i>Merremia emarginata</i> Hallier f.	Convolvulaceae	Leaves	Cold and cough
<i>Merremia tridentata</i> Hall. F.	Convolvulaceae	Stem and root	Skin eruption
<i>Micrococca mercurialis</i> (L.) Benth.	Euphorbiaceae	Leaves	Child fever, headache, and filariasis of the eyes
<i>Mimosa pudica</i> L.	Mimosaceae	Seed and leaves	Vaginopathy, metropathy, and ulcers
<i>Molineria trichocarpa</i>	Hypoxidaceae	Whole plant	Whooping cough
<i>Mollugo nudicaulis</i> Lam. Sps.	Aizoaceae	Leaves	Wounds
<i>Moschosma polystachum</i> (Linn.) Benth	Lamiaceae	Whole plant	Leprosy and ulcer
<i>Nothosaerva brachiata</i> Wight	Amaranthaceae	Stem and leaves	Merwara
<i>Ocimum basilicum</i> L.	Lamiaceae	Whole plant	Antipyretic, carminative, and diuretic
<i>Ocimum canum</i> Sims	Lamiaceae	Leaves root	Stimulant, carminative, and diaphoretic
<i>Oldenlandia umbellata</i> Linn.	Rubiaceae	Leaves and root	Bronchitis and asthma
<i>Opuntia elotior</i> Mill.	Cactaceae	Leaves and fruits	Cooling and dysentery
<i>Orthosiphon thymifloras</i> (Roth)	Lamiaceae	Whole plant	Leprosy, ulcer, and fever
<i>Pancratium triflorum</i> Roxb.	Amaryllidaceae	Leaves and rhizome	Cardiotonic, diuretic, and expectorant
<i>Parthenium hysterophorus</i> L.	Asteraceae	Leaves	Dysentery
<i>Pavonia odorata</i> Willd.	Malvaceae	Stem and root	Febrifuge
<i>Pedaliium murex</i> L.	Pedaliaceae	Leaves and root	Dysuria and gonorrhea
<i>Phyllanthus amarus</i> Schum and Thonn.	Euphorbiaceae	Leaves and roots	Diuretic, febrifuge, dysentery, and jaundice
<i>Phyllanthus maderaspatensis</i> L.	Euphorbiaceae	Leaves and root	Dysentery and headache
<i>Physalis minima</i> L.	Solanaceae	Fruits and leaves	Tonic, diuretic, and purgative
<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Root and leaves	Vesicant and diuretic
<i>Polygala elongata</i> Klein.	Polygalaceae	Leaves	Purgative
<i>Polygonum barbatum</i> Linn	Polygonaceae	Leaves and fruit	Ulcers and cooling
<i>Premna latifolia</i> Roxb.	Verbenaceae	Leaves and stem	Body pain
<i>Prosopis cineraria</i> (L.) Druce.	Fabaceae	Wood and leaves	Astringent, demulcent, and pectoral
<i>Pupalia lappacea</i> Moq.	Amaranthaceae	Whole plant	Body pain and ulcer
<i>Rhynchosia minima</i> (L.) Dc	Papilionaceae	Leaves	Abortifacient
<i>Rivea hypocrateriformis</i> , Choisy.	Convolvulaceae	Roots	Parturition
<i>Scoparia dulcis</i> Linn.	Scrophulariaceae	Whole plant	Fever, cough, and bronchitis
<i>Sida cardifolia</i> Linn.	Malvaceae	Root and seeds	Disorder of blood and piles
<i>Solanum nigrum</i> L.	Solanaceae	Leaves and stem	Diuretic and digestive
<i>Solanum surattense</i> Sch. and Wendl.	Solanaceae	Whole plant	Expectorant and diuretic
<i>Spermacoce hispida</i> L.	Rubiaceae	Leaves	Dysentery
<i>Tephrosia purpurea</i> (L.) Pers	Fabaceae	Whole plant	Skin disease and elephantiasis
<i>Teramnus labialis</i> (L.f.)	Fabaceae	Fruits and leaves	Rheumatism, tuberculosis, and nervous affections
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Fruits and leaves	Diuretic and calculus affections
<i>Trichodesma indicum</i> (L.) Lehm.	Boraginaceae	Whole plant	Carminative and anti-inflammatory
<i>Tridax procumbens</i> L.	Asteraceae	Leaves	Dysentery, diarrhea, and snake bites
<i>Triumfetta rotundifolia</i> Lam.	Tiliaceae	Leaves	Cough, fever, and gonorrhea
<i>Vernonia cinerea</i> (L.) Less.	Asteraceae	Leaves and stem	Cough, colic, and leucoderma
<i>Vicoa indica</i> (L.) Dc	Asteraceae	Whole plant	Scorpion sting and throat disorders
<i>Vigna trilobata</i> L.	Fabaceae	Leaves and pulses	Nervous disorders
<i>Vitex negundo</i> L.	Verbenaceae	Leaves	Cataplasm for weak eyes
<i>Xanthium strumarium</i> L.	Asteraceae	Seeds	Venereal disease
<i>Zizyphus nummularia</i> (Burm f.) Wight	Rhamnaceae	Fruit and leaves	Cutaneous disease and bilious affections
<i>Zornia diphylla</i> Span.	Fabaceae	Herb and root	Dysentery and soporific

the present study enumerated the medicinally important plants in the shrub jungles which are used to cure various diseases.

The instinctive knowledge about the medicinal uses of native plants was preserved by the local communities throughout India. This indigenous knowledge was older

than the Ayurveda. However, India did not have any formal ethnobotanical education until last decade. Currently, there are no measures taken specifically to conserve the various species of medicinal plants. The tribals suggest that medicinal plants are to be cultivated commonly in herbal gardens (Anand, 2006). Moreover, we can also identify potential sites where such rare and valuable medicinal

plants were found and still available as community conserved areas or more specifically medicinal-plant conservation areas (Kala, 2005; and Singh *et al.*, 2012). There is an urgent need for conservation of these plant species as many of them are able to unknown cures for modern day diseases. Hence, the results of the present study paved a pathway for the botanist and other biologist for the sustainable utilization of the natural resources. This study provides the further scope of research on the biological properties of the medicinal plants and extension activities required to develop the usage of ethnomedicinal plants for the society.

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