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Research Article

# AN ETHNOBOTANICAL EXPLORATION OF MEDICINAL PLANTS IN MANAR BEAT, KARAMADAI RANGE, WESTERN GHATS, TAMIL NADU

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**ABSTRACT**

**Objectives:** This investigation provides an ethnobotanical information that truly focused on the traditional medicinal plants used by Irula community inhaled in Manar beat to treat various human diseases. Ethnobotanical study about medicinal plants was carried out from January 2018 to December 2018 in Manar beat, Karamadai range, Western Ghats, Tamil Nadu.

**Methods:** The traditional in-depth knowledge of medicinal plants was collected during group discussion, interviews, and guided field walks along with tribe. All the traditional medicinal plants collected during the field visit were identified with local floras and the identity was authenticated by Botanical Survey of India.

**Results:** A total of 89 medicinally important endemic, threatened and endangered aromatic herbal plants distributed in 71 genera and 42 families were collected and identified. Among the surveyed plants, Fabaceae and Moraceae with eight species were the largest plant families, respectively. Leaves (35%) are most widely used plant part of reported plants and decoction forms are mostly used by Irulas. The surveyed plants were checked for conservation status in Red Data List formulated by the International Union for Conservation of Nature; around nine species were listed out.

**Conclusion:** The documentation of the medicinal herbal plants will be a good reference to all the young researches to carry out various conservation works.

**Keywords:** Ethnobotany, Manar beat, Irulas, Medicinal plants, International Union for Conservation of Nature.

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## INTRODUCTION

The traditional knowledge in the use of plant species is a routine practice in rich diversified countries, India is one of the leading countries in this practice with heritage of cultural traditions [1]. Starting from the ancient time, the medicinal herbs play key source of drugs. According to the WHO, the world's large population relies on the traditional systems of medicines, particularly on plant-based system to meet their primary health-care needs [2]. Globally estimated that 300,000 plant species are exist, for this only around 15% have been evaluated to determine their pharmacological potential, so invention of new products from natural sources is nowadays highly encouraged [3]. Some of the important medicinal plants are commercially harvested for the extraction of various types of active ingredients. The various medical traditional systems such as Unani, Siddha, and Ayurvedic are hugely depended on the active medicinal properties of plants, whereas the precious wealth of indigenous knowledge is in danger of being lost. The use of traditional tribe's knowledge also reflects the values embedded in the tradition sub-held by elders, especially about traditional medicine. The landscape is an essential to the efficacy of medicines, which is well understood by the practitioners, it should not be seen as "miracle" cures based on chemical compounds, but due to curative energy that draws its medicinal qualities founded on a relationship between the plants and the people [4].

Tribal communities are found dispersed in almost all states of India. There are 533 ethnic communities numbering 51,628,638 tribal people distributed all over India. Conventionally, ethnic people are highly knowledgeable about the medicinal plants and their medicinal values. These indigenous people are using a historical continuity of resource use and possess a broad knowledge base of the complex ecological system in their own localities. This knowledge has been accumulated through a series of observation transmitted from one generation to next generation [5].

The conservation and sustainable utilization of biological resources are achieved through documentation of the indigenous knowledge through ethnobotanical studies [6]. The key threats for medicinally important plants are due to overdependency by local people, grazing, forest fires, and commercial activities. The local people depend on these plants are due to the effective nature, non-availability of medical facilities, and ethnocultural beliefs. Cultivation is clearly a sustainable alternative to the present collection of medicinal plants from the wild habitat [7].

Based on the above concepts, an extensive ethnobotanical survey was carried out in Manar beat, Karamadai range, to document the information about the traditional medicinal practices based on the medicinal plant species. The aim of the present study is to evaluate the traditional uses of local native plants to provide safe and efficient information gathered from Irulas, a local tribe inhabited in our study area and documentation of native and active plant species used for the treatment and prevention of various diseases and ailments.

## METHODS

### Study area

Ethnobotanical survey was carried out in Manar beat, Karamadai range, Western Ghats, Tamil Nadu, from January 2018 to December 2018. The study area lies between 11°16' N latitude and 76°58' E longitude. It has tropical climate with maximum temperature beyond 35°C during summer (May–June) and below 21°C during winter (December–January) and average annual rainfall is about 709 mm. Different types of vegetation are available in Karamadai reserve forest, namely, scrub jungle, dry deciduous forest, mixed deciduous forest, moist deciduous forest, and riparian vegetation. Manar beat is an evergreen tropical moist deciduous forest with rich vegetation of floras and faunas. The

**Table 1: Summary of surveyed medicinal plants in Mannar beat, Karamadai range, Western Ghats**

| S. No. | Botanical name | Family name | Local name | Habit | Parts used | Active principle | Therapeutic uses | Mode of preparation |
|---|---|---|---|---|---|---|---|---|
| 1. | *Acacia caesia* Willd. | Mimosaceae | Nanjupattai | Climbing shrub | Bark | Phenols | Wound healing and skin diseases | Paste |
| 2. | *Acacia concinna* Dc. | Mimosaceae | Shiakakai | Climbing shrub | Bark, leaves | Alkaloids | Jaundice, constipation, skin problems, and astringent | Powder |
| 3. | *Acalypha fruticosa* Forsk. | Euphorbiaceae | Ceera sedi | Shrub | Roots, leaves, and stem | Terpenoids and tannins | Febrifuge, whooping cough, toothache, constipation, and eye infection | Extraction |
| 4. | *Acanthus ilicifolius* L. | Acanthaceae | Kalutai mulli | Shrub | Roots, leaves, and stem | Steroids and terpenoids | Rheumatism, asthma, paralysis, psoriasis, astringent, wounds, and leukorrhea | Decoction |
| 5. | *Achyranthes aspera* L. | Amaranthaceae | Nayuruvi | Herb | Whole plant | Alkaloids and steroids | Stomach ache, piles, menstrual disorder, and dysentery | Extraction |
| 6. | *Adenanthera pavonina* L. | Mimosaceae | Ani kundumani | Tree | Leaves | Fatty acids | Diarrhea | Juice |
| 7. | *Adenostemma lavenia* O. Kze. | Asteraceae | Vadakala | Herb | Leaves and root | Alkaloids | Wound healing, injuries, and worms | Extraction and paste |
| 8. | *Aerides maculosum* Lindl. | Orchidaceae | - | Epiphyte | Leaves and flower | Glycosides, saponins, and steroids | Skin diseases and wound healing | Decoction |
| 9. | *Aerva lanata* Juss. | Amaranthaceae | Ciru-pulai | Herb | Roots | Flavonoids | Snakebite, cough, asthma, and headache | Decoction |
| 10. | *Ailanthus excelsa* Roxb. | Simaroubaceae | Peru | Tree | Bark | Alkaloids and flavonoids | Skin diseases, jaundice, anthelmintic, expectorant, antiasthmatic, allergy, antispasmodic, antipyretic, and bronchoconstriction | Paste |
| 11. | *Alangium salvifolium* Wang. | Alangiaceae | Alandi | Tree | Root, seeds, fruits, and leaves | Flavonoids, glycosides | Hemorrhoids, rheumatism arthritis, loose stool, herpes, and blood disorders | Decoction and paste |
| 12. | *Albizzia amara* Boiv. | Mimosaceae | Oonjapattai | Tree | Bark and root | Terpenoids, saponins | Inflammations and snakebite | Decoction |
| 13. | *Alysicarpus monilifer* DC. | Fabaceae | Kasukkoti | Herb | Leaves, stem, and root | Saponins and alkaloids | Inflammation, chest pain, skin diseases, jaundice, and fever | Paste and decoction |
| 14. | *Anisomeles malabarica* R.Br. | Lamiaceae | Payemiratti | Herb | Whole plant and leaves | Alkaloids and glycosides | Antispasmodic, diaphoretic, rheumatic pains, dyspepsia, and colic | Paste |
| 15. | *Anodendron paniculatum* A. DC. | Apocynaceae | Sarakkodi | Climber | Leaves and fruits | Alkaloids and glycosides | Jaundice | Powder |
| 16. | *Argyreia cuneata* Ker Gawl. | Convolvulaceae | Kanvalipoo | Climbing shrub | Leaves | Alkaloids and lipids | Diabetes, skin diseases, and cough | Decoction |
| 17. | *Aristolochia indica* Linn. | Aristolochiaceae | - | Climber | Whole plant | Alkaloids and flavonoids | Cough, astringent, and purgative | Juice |
| 18. | *Artocarpus hirsuta* Lamk. | Moraceae | Aiyinipila | Tree | Seed and fruit | Flavonoids | Asthma and skin diseases | Powder |
| 19. | *Artocarpus integrifolia* Linn. | Moraceae | Palamarum | Tree | Root bark | Flavonoids, terpenoids | Asthma, fever, and diarrhea | Extraction |
| 20. | *Atalantia monophylla* Correa. | Rutaceae | Kattuelumeachi | Shrub | Whole plant | Alkaloids | Rheumatism, joint pains, and connective tissues disorders | Decoction |

*(Contd...)*

**Table 1: (*Continued*)**

| S. No. | Botanical name | Family name | Local name | Habit | Parts used | Active principle | Therapeutic uses | Mode of preparation |
|---|---|---|---|---|---|---|---|---|
| 21. | *Azadirachta indica* A. Juss. | Meliaceae | Vembu | Tree | Whole plant | Flavonoids | Virus infection, anti-inflammatory, insecticide, and skin diseases | Extraction |
| 22. | *Bachanania axillaris* (Desr.) | Anacardiaceae | Kolamaavu | Tree | Bark, fruit, and leaves | Phenols and flavonoids | Anticancer, antidiarrheal, anti-inflammatory, antioxidant, depurative, purgative, and tonic | Decoction |
| 23. | *Bauhinia racemosa* Lamk. | Fabaceae | Vellaimantarai | Tree | Whole plant | Phenols and flavonoids | Cough, abdominal diseases, anorexia, and ascaris | Juice and decoction |
| 24. | *Begonia malabarica* Lamk. | Begoniaceae | - | Herb | Leaves and whole plant | Flavonoids and steroids | Respiratory infections, diarrhea, blood cancer, and skin diseases | Decoction and paste |
| 25. | *Benkara malabarica* Lamk. Tirveng. | Rubiaceae | Sirukarai | Thorny small tree | Leaves | Alkaloids and flavonoids | Abdominal pain and throat infection | Juice and paste |
| 26. | *Blachia umbellata* Baill. | Euphorbiaceae | Aatthumanthai | Shrub | Leaves | | Rheumatism | Paste and tonic |
| 27. | *Blepharis boerhaaviaefolia* Pers. | Acanthaceae | - | Under shrub | Leaves, root, fruit, and seeds | Alkaloids and flavonoids | Wound healing, ulcers, nasal, asthma, throat inflammation, spleen disorders, diarrhea, urinary disorder, kidney stone, and nervous disorders | Decoction |
| 28. | *Cadaba fruticosa* (L.) Druce. | Capparidaceae | Chikondai | Shrub | Leaves | Alkaloids and glycosides | Dysentery, diarrhea, body pain, and poisonous bites | Juice |
| 29. | *Cadaba trifoliata* Wight. & Arn. | Capparidaceae | Kattagatti | Shrub | Leaves, stem, and roots | Tannins | Antirheumatic, anthelmintic, antibacterial, and viral infection | Decoction and extraction |
| 30. | *Calamus rotang* Linn. | Arecaceae | Pirambu | Climber | Fruit and leaves | Flavonoids | Astringent, antidiarrheal, anti-inflammatory, chronic fevers, piles, abdominal tumors, strangury, antibilious, and spasmolytic | Decoction |
| 31. | *Capparis grandis* Linn. f. | Capparidaceae | Pachara | Tree | Whole plant | Alkaloids and flavonoids | Ulcer, asthma, and anorexia | Tonic and juice |
| 32. | *Capparis zeylanica* Linn. | Capparidaceae | Adhandai | Shrub | Root | Fatty acids and flavonoids | Dysentery and diarrhea | Extraction |
| 33. | *Caralluma adscendens* R.Br. | Asclepiadaceae | Kallimudayan | Herb | Stem, root, and flower | Lipids | Cough, cold, diarrhea, high pressure, and swelling | Decoction and paste |
| 34. | *Caralluma pauciflora* N. E.Br. | Asclepiadaceae | Puliyanprinadai | Herb | Leaves and whole plant | Flavonoids and saponins | Ulcer, rheumatism, diabetes, and inflammation | Decoction and paste |
| 35. | *Caralluma umbellata* Haw. | Asclepiadaceae | Erumaikalli mulayan | Herb | Stem | Glycosides | Stomach disorder, abdominal pain, obesity, diabetes, and ulcer problems | Juice |
| 36. | *Cassia javanica* L. | Caesalpiniaceae | Konari | Tree | Seeds and bark | Glycosides and flavonoids | Laxative, antipyretic, fever, and emesis | Decoction |

*(Contd...)*

**Table 1: (*Continued*)**

| S. No. | Botanical name | Family name | Local name | Habit | Parts used | Active principle | Therapeutic uses | Mode of preparation |
|---|---|---|---|---|---|---|---|---|
| 37. | *Cassia occidentalis* Linn. | Caesalpiniaceae | Peyaverai | Shrub | Seeds, leaves, root, fruit, and whole plant | Glycosides | Cutaneous diseases, cough, asthma, sweetish, bitter, stomachic, fevers, good for sore throat, diuretic, ringworm, scorpion, elephantiasis, sting, snakebite, ascites, purgative, febrifuge, sore eyes, and skin diseases | Extraction |
| 38. | *Celtis phillipensis* Blanco. | Cannabaceae | Kodalimuruki | Tree | Root | Terpenoids | Diarrhea | Decoction |
| 39. | *Cenchrus ciliaris* Linn. | Poaceae | Kollukattai pullu | Herb | Leaves | Lipids | Kidney pain, wound healing, and tumors | Decoction |
| 40. | *Centella asiatica* Urb. | Apiaceae | Vallarai | Creeping herb | Leaves | Terpenoids and glycosides | Wound healing, brain tonic, and cardiotonic | Infusion |
| 41. | *Cereus pterogonus* Lamk. | Cactaceae | Ooci kalli | Shrub | Whole plant | Proteins | Purgative, astringent, constipation, refrigerant, antiperiodic, and antipyretic | Extraction |
| 42. | *Ceropegia juncea* Roxb. | Asclepiadaceae | Jaathili | Climbing herb | Leaves and root | Alkaloids and steroids | Bacterial infection, ulcer, and inflammation | Decoction and juice |
| 43. | *Chamaecrista pumila* (Lam.) K. Larsen. | Fabaceae | - | Shrub | Whole plant and leaves | Tannins and flavonoids | Diarrhea and bacterial infection | Decoction |
| 44. | *Cipadessa baccifera* Miq. | Meliaceae | Pullipancheddi | Shrub | Whole plant | Alkaloids | Indigestion, cough, and antifertility | Juice |
| 45. | *Cissampelos pareira* Linn. | Menispermaceae | Malai Thangivaer | Climber | Root and leaves | Flavonoids and alkaloids | Wound healing, antidote, anorexia, indigestion, blood purification, and anti-inflammation | Paste |
| 46. | *Cissus quadrangularis* Linn. | Vitaceae | Pirandai | Climbing shrub | Stem, root, and leaves | Flavonoids and terpenoids | Bone breakage, appetizer dyspepsia, indigestion, and piles | Juice |
| 47. | *Clausena dentata* (Willd.) M. Roem. | Rutaceae | Kattu karuveppilai | Small tree | Leaves and root | Alkaloids and coumarins | Gastrointestinal disorders, fever, rheumatism, headache, hypotension, and sore throat | Tonic and paste |
| 48. | *Clerodendron serratum* Spr. | Verbenaceae | Angaravalli | Shrub | Leaves, stem, seed, and root | Flavonoids and phenols | Asthma and respiratory diseases | Paste and decoction |
| 49. | *Coccinia grandis* (Linn.) Voigt. | Cucurbitaceae | Kovakai | Climber | Fruit | Alkaloids and glycosides | Leprosy, fever, asthma, bronchitis, and jaundice | Juice |
| 50. | *Combretum albidum* G. Don. | Combretaceae | Odai Kodi | Climber | Leaves, fruit, and stem bark | Terpenoids and flavonoids | Peptic ulcer, diarrhea, dysentery, jaundice, and skin diseases | Paste, juice, and decoction |
| 51. | *Cordia sinensis* Lam. | Boraginaceae | Sellai | Small tree | Leaves and fruit | Flavonoids | Anti-inflammatory, blood pressure, hypotensive, and diuretic | Decoction |
| 52. | *Crataeva adansonii* DC. | Capparidaceae | Marvilinga | Small tree | Stem bark | Phenols | Joint pain | Decoction |

*(Contd...)*

**Table 1: (*Continued*)**

| S. No. | Botanical name | Family name | Local name | Habit | Parts used | Active principle | Therapeutic uses | Mode of preparation |
|---|---|---|---|---|---|---|---|---|
| 53. | *Crataeva religiosa* Forst. | Capparidaceae | Mavilankai | Small tree | Bark | Phenols and terpenoids | Urinary complaints, snakebite, and ascites | Decoction |
| 54. | *Crotalaria hebecarpa* (DC.) Rudd. | Fabaceae | Godhadi | Herb | Whole plant | Flavonoids | Skin diseases, snakebites, and jaundice | Paste and powder |
| 55. | *Crotalaria pallida* Aiton. | Fabaceae | Kilukiluppai | Shrub | Leaves | Alkaloids and flavonoids | Vermifuge and fever | Extraction |
| 56. | *Cyrtococcum patens* A. Cam. | Poaceae | - | Herb | Leaves | Alkaloids | Fever, cough, and anti-inflammation | Decoction |
| 57. | *Cyrtococcum trigonum* A. Cam. | Poaceae | Abbu karkai | Herb | Leaves and root | Alkaloids | Nervous disorder | Paste and decoction |
| 58. | *Daemia extensa* R.Br. | Asclepiadaceae | Kodalma | Climber | Whole plant | Saponins and tannins | Gastric ulcers, uterine, and menstrual complaints | Juice and decoction |
| 59. | *Dalbergia coromandeliana* Prain. | Fabaceae | Nukkam | Shrub | Leaves, bark, and fruit | Alkaloids and saponins | Wound healing and skin diseases | Decoction and paste |
| 60. | *Dalbergia lanceolaria* Linn. f. | Fabaceae | Erigai | Tree | Seeds, root, and leaves | Phenols and flavonoids | Mild laxatives and inflammatory | Tonic and juice |
| 61. | *Dioscorea hirsuta* Blume | Dioscoreaceae | Pulidumpa | Climber | Leaves and stem | Saponins | Diuretic, rheumatism, and snakebites | Decoction, juice, and paste |
| 62. | *Dioscorea oppositifolia* Linn. | Dioscoreaceae | Kavala-kodi | Climber | Tuber | Saponins | Stomach pain, spleen disorders, and cancer of uterus | Decoction |
| 63. | *Diospyros buxifolia* (Blume) Hiern. | Ebenaceae | Irampalai | Tree | Leaves, stem, and flower | Alkaloids and flavonoids | Antiviral, anti-HIV, and indigestion | Decoction |
| 64. | *Diploclisia glaucescens* Diels. | Menispermaceae | Kottaiyachachi | Climber | Leaves and fruit | Tannins and alkaloids | Diarrhea, biliousness, gonorrhea, and syphilis | Powder and juice |
| 65. | *Dodonaea viscosa* Linn. | Sapindaceae | Virali | Shrub | Whole plant | Terpenoids | Headache and wound healing | Paste |
| 66. | *Drypetes roxburghii* (Wall.) Hurus. | Euphorbiaceae | Irukoli | Tree | Bark and leaves | - | Joint pain and rheumatism | Decoction and infusion |
| 67. | *Ficus bengalensis* Linn. | Moraceae | Aal | Tree | Bark and latex | Steroids and flavonoids | Rheumatism, dysentery, diabetes, gonorrhea, and piles | Juice |
| 68. | *Ficus benjamina* Linn. | Moraceae | Pimpri | Tree | Whole plant | Alkaloids | Ulcers and leprosy | Decoction |
| 69. | *Ficus racemosa* Linn. | Moraceae | Atthi | Tree | Roots and fruits | Flavonoids and terpenoids | Blood purifier and laxative | Decoction |
| 70. | *Ficus religiosa* Linn. | Moraceae | Arasu | Tree | Bark and leaves | Phenols and tannins | Purgative, vomiting, and mouth ulcer | Decoction |
| 71. | *Ficus tjakela* Burm. | Moraceae | - | Tree | Leaves and stem | - | Fever, cough, and cold | Decoction |
| 72. | *Ficus tomentosa* Roxb. | Moraceae | - | Tree | Leaves and bark | Phenols | Poultice, boils, cuts, and wound | Paste and crushed leaves |
| 73. | *Gardenia resinifera* Roth. | Rubiaceae | Kambipicin | Tree | Buds and leaves | Flavonoids | Antispasmodic, expectorant, carminative, and stimulant | Paste |
| 74. | *Helicteres isora* Linn. | Sterculiaceae | Vadampiri | Large shrub | Root, bark, and stem bark | Flavonoids and terpenoids | Expectorant, demulcent, astringent, intestinal worms, diarrhea, and dysentery | Decoction and juice |
| 75. | *Heterostemma tanjorense* Wight. and Arn. | Apocynaceae | Palakeerai | Climber | Leaves | Alkaloids | Antiviral, antibacterial, skin diseases, and fever | Paste, tonic, and infusion |

*(Contd...)*

**Table 1: (*Continued*)**

| S. No. | Botanical name | Family name | Local name | Habit | Parts used | Active principle | Therapeutic uses | Mode of preparation |
|---|---|---|---|---|---|---|---|---|
| 76. | *Hibiscus micranthus* Linn. f. | Malvaceae | Sitraamutti | Shrub | Leaves and roots | Tannins and anthraquinones | Asthma, diuretic, and febrifuge | Decoction |
| 77. | *Ipomoea obscura* Ker-Gawl. | Convolvulaceae | Siruthaali | Climber | Seed, root, and leaves | Alkaloids and steroids | Anthelmintic, diuretic, and laxative | Decoction |
| 78. | *Kyllinga triceps* Rottb. | Cyperaceae | Veluttanirbasi | Herb | Leaves | Terpenoids | Antidiabetes and dysentery | Juice |
| 79. | *Lantana camara* Linn. | Verbenaceae | Unnichedi | Shrub | Leaves | Terpenoids and steroids | Anti-inflammatory, antiseptic, and dysentery | Juice |
| 80. | *Neptunia oleracea* Lour. | Mimosaceae | Sundaikkirai | Herb | Root | Phenols | Bones of the nose and hard palate, syphilis, and cure earache | Juice |
| 81. | *Oldenlandia herbacea* Roxb. | Rubiaceae | Nonnanampullu | Herb | Whole plant and leaves | Glycosides | Elephantiasis, fever, verminosis, inflammation, asthma, bronchitis, and ulcer | Decoction and paste |
| 82. | *Perotis indica* O. Ktz. | Poaceae | Narival | Herb | Whole plant | - | Snakebites and bronchitis | Infusion |
| 83. | *Phyllanthus debilis* Hook.f. | Euphorbiaceae | Arulundi | Tree | Root, leaves, and whole plant | Tannins and terpenoids | Fever, jaundice, gastritis, urinary difficulties, bone fractures, menorrhagia, leukorrhea, asthma, endometritis, wound healing, and liver diseases | Paste and decoction |
| 84. | *Pongamia pinnata* (L.) Pierre | Fabaceae | Pungan | Tree | Leaves, stem, seed, and flower | Steroids | Antidiabetic, rheumatism, Anti-inflammatory, piles, skin diseases, and wounds | Juice and paste |
| 85. | *Salvadora persica* Linn. | Salvadoraceae | Uka | Shrub | Leaves | Flavonoids | Antiplaque and analgesic | Tonic |
| 86. | *Santalum album* Linn. | Santalaceae | Sandhanam | Tree | Leaves and stem | Fatty oils | Gastric irritability, dysentery, skin diseases, and gonorrhea | Paste |
| 87. | *Terminalia arjuna* (Roxb.) Wight and Arn. | Combretaceae | Marudha maram | Tree | Bark, leaves | Flavonoids | Heart disease, ulcers, dysentery, and wounds | Decoction and powder |
| 88. | *Vallaris solanacea* O. Kze. | Apocynaceae | - | Climber | Root and bark | Terpenoids | Analgesic, antidiarrheal, and dysentery | Tonic and paste |
| 89. | *Ziziphus oenoplia* Mill. | Rhamnaceae | Churipala chedi | Climbing shrub | Fruit and bark | Flavonoids and phenols | Diarrhea, diabetes, and anti-cancerous | Decoction |

vegetation is floristically rich compared to other regions and represents several unique habitats. The vegetation was conducted in six small villages of Manar beat situated in Karamadai range which are occupied by Irula tribals.

**Data collection**

Fieldwork was conducted over the 12 months period focusing on collecting ethnobotanical information from local people about the medicinal plants in Manar beat. A total of 15 tribal people (seven men and eight women) aged between 35 and 85 who were cooperating fully were interviewed. Interview was conducted using semi-structured questionnaires and open-ended conversations at homes. The vegetation of the study area, plants therapeutical properties, and the kind of ailments used were among the questions asked. All kinds of information were documented and recorded.

**Fig. 1: Hill view of Manar beat, Karamadai range**

Fig. 2: Collection of traditional knowledge of plants from tribe

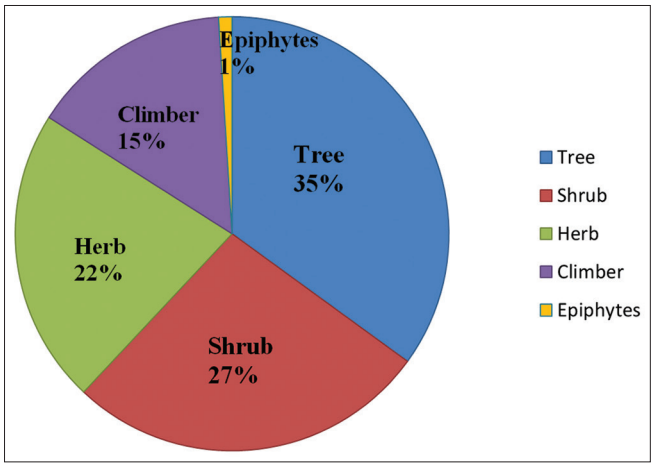


Fig. 3: Life form of plants used as medicinal plants in Manar beat

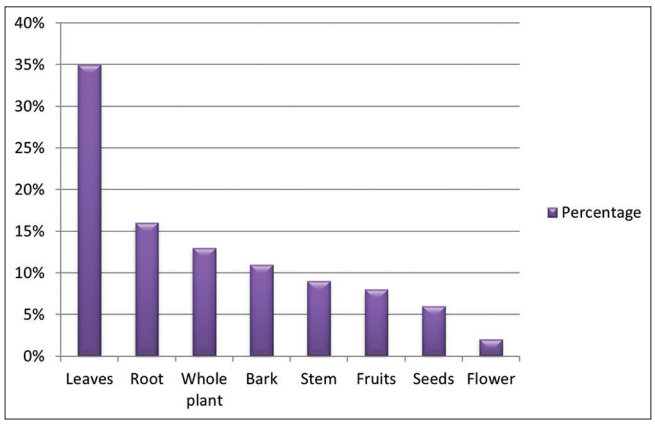


Fig. 4: Different plant parts used for the various health-care problems in Manar beat tribes

### Identification

Identity of the collected plant species was done with the volumes of The Flora of the Nilgiri and Pulney Hill-tops [8], The Flora of Presidency of Madras [9], and The Flora of Tamil Nadu Carnatic [10]. The identity is authenticated by matched with type specimens available in the herbarium of Botanical Survey of India, Southern Circle, TNAU Campus, Coimbatore, Tamil Nadu. Herbarium specimens were collected and deposited in the Herbarium of Botany Department, Vellalar College for Women (Autonomous), Erode, Tamil Nadu, India, for future reference.

Table 2: Distribution of species occurred in different families

| S. No. | Name of the families | Number of the species |
|---|---|---|
| 1. | Acanthaceae | 2 |
| 2. | Alangiaceae | 1 |
| 3. | Amaranthaceae | 2 |
| 4. | Anacardiaceae | 1 |
| 5. | Apiaceae | 1 |
| 6. | Apocynaceae | 3 |
| 7. | Arecaceae | 1 |
| 8. | Aristolochiaceae | 1 |
| 9. | Asclepiadaceae | 5 |
| 10. | Asteraceae | 1 |
| 11. | Begoniaceae | 1 |
| 12. | Boraginaceae | 1 |
| 13. | Cactaceae | 1 |
| 14. | Caesalpiniaceae | 2 |
| 15. | Cannabaceae | 1 |
| 16. | Capparidaceae | 6 |
| 17. | Combretaceae | 2 |
| 18. | Convolvulaceae | 2 |
| 19. | Cucurbitaceae | 1 |
| 20. | Cyperaceae | 1 |
| 21. | Dioscoreaceae | 2 |
| 22. | Ebenaceae | 1 |
| 23. | Euphorbiaceae | 4 |
| 24. | Fabaceae | 8 |
| 25. | Lamiaceae | 1 |
| 26. | Malvaceae | 1 |
| 27. | Meliaceae | 2 |
| 28. | Menispermaceae | 2 |
| 29. | Mimosaceae | 5 |
| 30. | Moraceae | 8 |
| 31. | Orchidaceae | 1 |
| 32. | Poaceae | 4 |
| 33. | Rhamnaceae | 1 |
| 34. | Rubiaceae | 3 |
| 35. | Rutaceae | 2 |
| 36. | Salvadoraceae | 1 |
| 37. | Santalaceae | 1 |
| 38. | Sapindaceae | 1 |
| 39. | Simaroubaceae | 1 |
| 40. | Sterculiaceae | 1 |
| 41. | Verbenaceae | 2 |
| 42. | Vitaceae | 1 |

## RESULTS

Altogether 89 medicinally important plants belonging to 42 families and 71 genera were documented from the study area (Figs. 1 and 2). The documented medicinal plants and their vernacular name, family, status, active principle, and ethnomedicinal uses along with mode of preparation have been summarized in Table 1 and Plate 1. These plant species are used for the treatment of many diseases by tribal people. Among the 89 species of angiosperms, 80 species belong to dicotyledons and 9 species belong to monocotyledons. Dicotyledons (90%) are dominant than the monocotyledons (10%). Of 42 families, 37 families belong to dicotyledons and 5 families belong to monocotyledons are recorded in Table 2. Fabaceae and Moraceae were dominated with eight species.

As per the Red Data List formulated by the International Union for Conservation of Nature, around nine plants were enumerated in the Red Data List. Among these, eight plants are least con

cern and they possess valuable medicinal properties and one plant is vulnerable (Table 3).

The result of habit wise analysis shows that the tree diversity dominates in the study area. Tree recorded 31 species (35%), shrub 24 species (27%), herb 18 species (22%), climber 13 species (15%), and epiphyte 1 species (1%) shown in Fig. 3.

The result of part wise plant species used to cure different ailments was recorded. The plant parts such as leaves (35%), root (16%), whole plant (13%), bark (11%), stem (9%), fruits (8%), seeds (6%), and flower (2%) were used for illness. Among these plant parts used, leaves are top in list (Fig. 4).

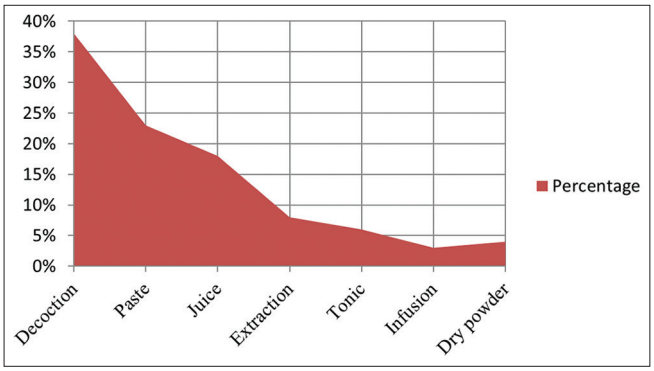


**Fig. 5: Pie diagram showing the mode of the action of ethnomedicinal plants**

After the part wise analysis, the mode of the action of ethnomedicinal plants used for curing diseases in the form of decoction (38%), paste (23%), juice (18%), extraction (8%), tonic (6%), infusion (4%), and dry powder (3%) shown in Fig. 5.

## DISCUSSION

From this survey, we have recorded 89 plants belonging to 42 families, most of the plants belong to Fabaceae family in earlier research also supported that even they could find most of the plants belong to Fabaceae family in different regions [11,12]. Fabaceae is of great ethnobotanical importance in indigenous and urban communities throughout the world. Their medicinal value lies partly in their effectiveness in the treatment of a wide variety of human ailments. The variety of chemically active constituents, such as tannins, flavonoids, alkaloids, and terpenoids often found in members of this family, are substances with a high level of biological activity, and the fact that they are used extensively would suggest a pattern of global ethnomedicinal knowledge [13].

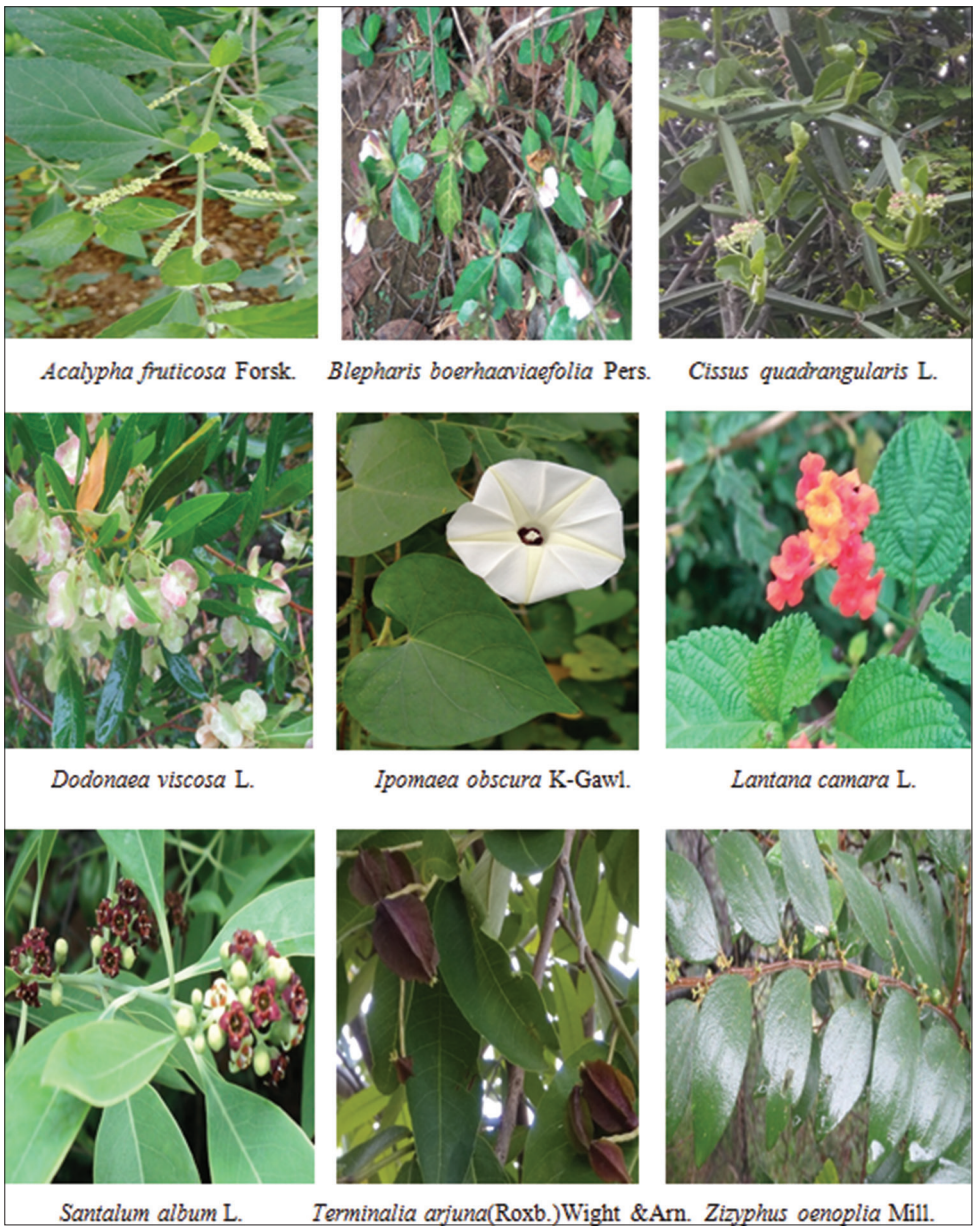


**Plate 1: Photograph of some of the surveyed ethnomedicinal plants**

**Table 3: International Union for Conservation of Nature plant list category recorded in the study area**

| S. No. | Name of the plants | International Union for Conservation of Nature category |
|---|---|---|
| 1. | *Acanthus ilicifolius* | LC |
| 2. | *Azadirachta indica* | LC |
| 3. | *Cenchrus ciliaris* | LC |
| 4. | *Centella asiatica* | LC |
| 5. | *Dalbergia lanceolaria* | LC |
| 6. | *Kyllinga triceps* | LC |
| 7. | *Neptunia oleracea* | LC |
| 8. | *Pongamia pinnata* | LC |
| 9. | *Santalum album* | V |

LC: Least concern, V: Vulnerable

Leaves and roots are generally forming the most frequently used plant parts in traditional medicine [14,15]. Among the plant parts, the leaves are most frequently used for the treatment of diseases. This is in consonance with the findings [16]. The roots, fruits, bark, gum and latex, stem, seeds, and flowers are also used as per their availability and curing ability. Many indigenous communities throughout the world also utilized mostly leaves for the preparation of herbal medicine [17,18]. Leaves of *Azadirachta indica* are used for the treatment of skin diseases. The present finding is agreed with the previous report [19,20]. Among the plant part, the root of *Aerva lanata* is used for the treatment of asthma [21].

The present population is switching back to natural medicine, and in this aspect, documentation of medicinal plants is an important one. This type of documentation will help in the conservation of medicinal plants.

## CONCLUSION

The present study revealed that the traditional healers of Manar beat, Karamadai range, are rich in ethnobotanical knowledge. Documentation of 89 medicinal plant species which Fabaceae and Moraceae was occurred in highest proportion of medicinal plants. From this listed plants, nine plants were enumerated in the Red Data List. Medicinal plants used in local health-care traditions are regularly becoming extinct due to overutilization, population explosion, and for other anthropogenic reasons. Therefore, it is essential to conserve such knowledge secreted in the different parts of the country and people should be promoted and protect the medicinal plants for future.

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## AUTHORS' CONTRIBUTIONS

Author 1 and 3 to investigate and supervised the findings of this work. Author 1 and 2 performed to separate the tables, figures in category wise and Author 1 performed to writing of the manuscript.

## CONFLICTS OF INTEREST

There are no conflicts of interest.

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