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

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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].

The conservation and sustainable utilization of biological resources are achieved through documentation of the indigenous knowledge through ethnomedical 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

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

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| 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, leaves    | Phenols          | Wound healing and skin diseases                      | Paste               |
| 2.    | Acacia concinna Dc.               | Mimosaceae        | Shiakakai      | Climbing shrub | Bark, leaves    | Alkalds          | Jaundice, constipation, skin problems, and astringent | Powder              |
| 3.    | Acalypha fruticosa Forsk.         | Euphorbiaceae     | Ceern sedi     | Shrub          | Roots, leaves, and stem | Terpenoids and tannins | Pebrifuge, whooping cough, toothache, constipation, and eye infection | Extraction          |
| 4.    | Acanthus ilicifolius L.           | Acanthaceae       | Kalata mulli   | Shrub          | Roots, leaves, and stem | Steroids and terpenoids | Rheumatism, asthma, paralysis, psoriasis, astringent, wounds, and leukorrhea | Decoction           |
| 5.    | Achyranthes aspera L.             | Amananthaceae     | Nayuruvi       | Herb           | Whole plant     | Alkalds and steroids | Stomach ache, piles, menstrual disorder, and dysentery | Extraction          |
| 6.    | Adenanthera pavonina L.           | Mimosaceae        | Ani kundumani  | Tree           | Leaves          | Fatty acids | Wound healing, injuries, and worms Skin diseases and wound healing | Juice               |
| 7.    | Adenostemma lavenia O. Kze.       | Asteraceae        | Vadakala       | Herb           | Leaves and root | Alkalds          | Skin diseases and wound healing                      | Extraction          |
| 8.    | Aerva lanata Juss.                | Amananthaceae     | Ciru-pulai     | Herb           | Roots           | Glycosides, saponins, and steroids | Snakebite, cough, asthma, and headache Skin diseases, jaundice, rheumatism arthritis, loose stool, herpes, and blood disorders | Decoction           |
| 9.    | Ailanthus excelsa Roxb.           | Simaroubaceae     | Peru           | Tree           | Bark            | Alkalds and flavonoids | Hemorrhoids, rheumatism, joint pains, and connective tissue disorders | Paste               |
| 10.   | Alangium salvifolium Wang.        | Alangiaceae       | Alandi         | Tree           | Root, seeds, and leaves | Flavonoids, glycosides | Hemorrhoids, rheumatism arthritis, loose stool, herpes, and blood disorders | Decoction and paste |
| 11.   | Albizia amara Boiv.               | Mimosaceae        | Onnjapattai    | Tree           | Bark and root leaves | Terpenoids, saponins and alkaloids | Inflammation, joint pains, skin diseases, jaundice, and fever | Decoction           |
| 12.   | Alysicarpus monilifer DC.         | Fabaceae          | Kasukkoti      | Herb           | Leaves, stem, and root | Alkalds and flavonoids | Antispasmodic, diaphoretic, rheumatic pain, dyspepsia, and colic Jaundice | Paste               |
| 13.   | Anisomeles malabarica R.Br.       | Lamiaceae         | Payemiratti    | Herb           | Whole plant and leaves | Alkalds and flavonoids | Antispasmodic, diaphoretic, rheumatic pain, dyspepsia, and colic Jaundice | Paste               |
| 14.   | Anodendron paniculatum A. DC.     | Apocynaceae       | Sarakkodi      | Climber        | Leaves and fruits | Alkalds and flavonoids | Diabetes, skin diseases, cough, astringent, and purgative | Powder              |
| 15.   | Argyreia cuneata Ker Gawl.        | Convolvulaceae    | Kanvalipoo     | Climber        | Leaves and fruits | Alkalds and flavonoids | Asthma and skin diseases | Decoction           |
| 16.   | Aristolochia indica Linn.         | Aristolochiaceae  | -              | Climber        | Whole plant and fruit | Alkalds and flavonoids | Asthma, fever, and diarrhea | Juice               |
| 17.   | Artocarpus hirsuta Linn.          | Moraceae          | Ajyinipilla    | Tree           | Root bark | Flavonoids, terpenoids and Alkalds | Rheumatism, joint pains, and connective tissue disorders | Decoction           |
| 18.   | Artocarpus integrifolia Linn.     | Moraceae          | Palamarum      | Tree           | Whole plant | Alkalds | Asthma and skin diseases | Extraction          |
| 19.   | Atalanta monophylla Correa.       | Rutaceae          | Kattuvelumeachi | Shrub          | Whole plant | Alkalds | Rheumatism, joint pains, and connective tissue disorders | Decoction           |

(Contd...)
| 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, anti-diabetic, anti-inflammatory, antioxidant, depurative, purgative, and tonic diseases, anorexia, and ascitis | Decoction         |
| 23.   | *Bauhinia racemosa* Lamk.      | Fabaceae        | Vellaimantarai      | Tree  | Whole plant| Phenols and flavonoids | Cough, abdominal diseases, anorexia, and ascitis                                | Juice and decoction |
| 24.   | *Begonia malabarica* Lamk.     | Begoniaceae     | -                   | Herb  | Leaves and whole plant | Phenoloids and steroids | Cough, abdominal diseases, anorexia, and ascitis                                | Decoction and paste |
| 25.   | *Bennara malabarica* Lamk. Tiveng. | Rubiaceae      | Sirukarai           | Thorny small tree | Leaves | Alkaloids and flavonoids | Abdominal pain and throat infection | Juice and paste |
| 26.   | *Blachia umbellata* Bail.      | Euphorbiaceae   | Aatthumanthai       | Shrub  | Leaves | Alkaloids and flavonoids | Wound healing, ulcers, nasal, asthma, throat inflammation, spleen disorders, diarrhoea, urinary disorder, kidney stone, and nervous disorders | Paste and tonic Decoction |
| 27.   | *Blepharis boerhaaviaefolia* Pers. | Acanthaceae    | -                   | Under shrub | Leaves, root, fruit, and seeds | Alkaloids and flavonoids | Abdominal pain and throat infection | Juice and decoction |
| 28.   | *Cadaba fruticosa* (L.) Druce. | Capparidaceae   | Chikondai           | Shrub  | Leaves | Alkaloids and glycosides | Antirheumatic, antihelmentic, antibacterial, and viral infection | Juice |
| 29.   | *Cadaba trifoliata* Wight. & Arn. | Capparidaceae  | Kattagatti          | Shrub  | Leaves, stem, and roots | Tannins | Antirheumatic, antihelmentic, antibacterial, and viral infection | Decoction and extraction |
| 30.   | *Calamus rotang* Linn.         | Arecaceae       | Pirambu             | Climber | Fruit and leaves | Flavonoids | Dysentery, diarrhoea, body pain, and poisonous bites | 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 diarrhoea | Extraction |
| 33.   | *Caralluma ascendens* R.Br.   | Asclepiadaceae  | Kallimudayan        | Herb  | Stem, root, and flower | Lipids | Ulcer, asthma, and anorexia | Extraction |
| 34.   | *Caralluma pauciflora* N. E.Br. | Asclepiadaceae | Pulyanprinadai      | 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.           | Caesalpinaceae  | Konari              | Tree  | Seeds and bark | Glycosides and flavonoids | laxative, antipyretic, fever, and emesis | Decoction |

(Contd...)
37. **Cassia occidentalis** Linn.  
**Caesalpiniaceae**  
Peyaverai  
Shrub  
Seeds, leaves, root, fruit, and whole plant  
Glycosides  
Cutaneous diseases, cough, asthma, sweetish, bitter, stomachic, fever, 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 cardi tonic  
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**  
Pullipanchelli  
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, appetite 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 Kodai  
Climber  
Leaves, fruit, and stem bark  
Terpenoids and flavonoids  
Pepic 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, hypotensivenes, and diuretic  
Decoction

52. **Crataeva adansonii** D.C.  
**Capparidaceae**  
Marvilingam  
Small tree  
Stem bark  
Phenols  
Joint pain  
Decoction

(Contd...)
| S. No. | Botanical name | Family name | Local name | Habit | Parts used | Active principle | Therapeutic uses | Mode of preparation |
|-------|----------------|-------------|------------|------|----------|-----------------|-----------------|-------------------|
| 53.   | *Crataeva religiosa* Forst. | Capparidaceae | Mavilaikai | 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 | Kluukiluppi | Shrub | Leaves | Alkaloids and flavonoids | Fever, cough, and anti-inflammation | Extraction |
| 56.   | *Cyrtococcum patens* A. Cam. | Poaceae | - | Herb | Leaves | Alkaloids | Nervous disorder | Decoction |
| 57.   | *Cyrtococcum trigonum* A. Cam. | Poaceae | Abbu karkai | Herb | Leaves and root | Alkaloids | Nervous disorder | Paste and decoction |
| 58.   | *Doezia 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 lanceolata* Linn. f. | Fabaceae | Ergai | 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.   | *Diplocisia glucoses* 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 Bark and leaves | 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 | Pimprī | 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 | Flavonoids and terpenoids | Purgative, vomiting, and mouth ulcer | Decoction |
| 71.   | *Ficus tiakela* Burm. | Moraceae | - | Tree | Leaves and stem | Phenols | 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, tonic, and infusion |
| 74.   | *Heliceres isora* Linn. | Sterculiaceae | Vadampiri | Large shrub | Root, bark, and stem bark | Flavonoids and terpenoids | Expectorant, demulcent, astrigent, intestinal worms, diarrhea, and dysentery | Decoction and juice |
| 75.   | *Heterostemma tanjorense* Wight. and Arn. | Apocynaceae | Palakeerani | Climber | Leaves | Alkaloids | Antiviral, antibacterial, skin diseases, and fever | Paste, tonic, and infusion |
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.

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### 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 | Sutraamutti | Shrub | Leaves and roots, Seed, root, and leaves | Tannins and anthraquinones Alkaloids and steroids | Asthma, diuretic, and febrifuge Antihelmintic, diuretic, and laxative | Decoction |
| 77.    | *Ipomoea obscura* Ker-Gawl. | Convolvulaceae | Sutraalali | Climber | Leaves | Terpenoids | Antidiabetes and dysentery Anti-inflammatory, antiseptic, and dysentery | Juice |
| 78.    | *Kyllinga triceps* Rothb. | Cyperaceae | Veluttanirbasi | Herb | Leaves | Terpenoids and steroids | Bones of the nose and hard palate, syphilis, and cure earache | Juice |
| 79.    | *Lantana camara* Linn. | Verbenaceae | Unnrichedi | Shrub | Leaves | Terpenoids and steroids | Bones of the nose and hard palate, syphilis, and cure earache | Juice |
| 80.    | *Neptunia oleracea* Lour. | Mimosaceae | Sundaiikirai | 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 Fever, jaundice, gastritis, urinary difficulties, bone fractures, menorrhagia, leucorrhoea, asthma, endometritis, wound healing, and liver diseases | 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, leucorrhoea, 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 | Gastric irritable, dysentery, skin diseases, and gonorrhea | Tonic |
| 86.    | *Santalum album* Linn. | Santalaceae | Sandhanam | Tree | Leaves and stem | Fatty oils | Heart disease, ulcers, dysentery, and wounds | Paste |
| 87.    | *Terminalia arjuna* (Roxb.) Wight and Arn. | Combretaceae | Marudhamaram | 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, anti-diarrheal, 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 |

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

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 concern 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. 5.

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.    | Apiceae              | 1                     |
| 6.    | Apocynaceae          | 3                     |
| 7.    | Arecales             | 1                     |
| 8.    | Aristolochiaceae     | 1                     |
| 9.    | Asclepiadaceae       | 5                     |
| 10.   | Asteraceae           | 1                     |
| 11.   | Begoniaceae          | 1                     |
| 12.   | Boraginaceae         | 1                     |
| 13.   | Cactaceae            | 1                     |
| 14.   | Caesalpiniaaceae     | 2                     |
| 15.   | Camabaceae           | 1                     |
| 16.   | Capparidaceae        | 6                     |
| 17.   | Combretaceae         | 2                     |
| 18.   | Convolvulaceae       | 2                     |
| 19.   | Cucurbitaceae        | 1                     |
| 20.   | Cyparaceae           | 1                     |
| 21.   | Dioscoreaceae        | 2                     |
| 22.   | Ebenaceae            | 1                     |
| 23.   | Euphorbiaceae        | 4                     |
| 24.   | Fabaceae             | 8                     |
| 25.   | Lamiaeceae           | 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.   | Verbenaaceae         | 2                     |
| 42.   | Vitaceae             | 1                     |
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).

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].

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**Plate 1: Photograph of some of the surveyed ethnomedicinal plants**
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 being exploited 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.

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.     | Dolbergia lanceolata| LC                                                     |
| 6.     | Kyllinga triceps   | LC                                                     |
| 7.     | Neptunia oleracea  | LC                                                     |
| 8.     | Pongamia pinnata   | LC                                                     |
| 9.     | Santalum album     | V                                                      |

LC: Least concern, V: Vulnerable

CONFLICTS OF INTEREST

There are no conflicts of interest.

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