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FLORISTIC SURVEY OF MEDICINAL PLANTS ALONG THE COASTAL REGIONS OF KANNIYAKUMARI DISTRICT, TAMIL NADU, INDIA.

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ABSTRACT

The coastal plant species of Kanniyakumari district bears high medicinal and ecological values. Now,due to the indiscriminate development of coastal tourism infrastructure and unscientific coastal protection are posing a serious threat to the biodiversity in the coastal areas. Present Study was conducted in the coastal Villages of Kanniyakumari district, Tamil Nadu, India to document the Medicinal plant wealth. Taxonomically, a total of 95 plant species belonging to 81 genera and 43 families were recorded. Of these 45 (47%) were herbs, 23 (24%) were shrubs, 16 (17%) were trees and 11 (12%) were climbers/creepers. The plant parts used for the preparation of medicine, whole plants were found to be most frequently used for the preparation of remedies. The mode of preparations is paste, juice, decoction and powder. The medicinal plants of the study area have been used to treat 53 illnesses. The 76 various ailments against which ethnomedicinal treatments have been recorded in the study area can be grouped into 12 major categories of symptomatically and organ-system related diseases/problems.

Key words: Medicinal plants, Ethnomedicine,Ailments,Coastal village

Introduction

Biodiversity is a part of our daily lives and livelihoods and constitutes the resources upon which families, communities, nations and future generations depend. Human society from the very beginning of its appearance on this earth has been indispensably associated with the plant kingdom for its survival. Plants provide our basic food crops, building materials and medicines. The World Health Organization (WHO) has estimated that 80% of the populations of developing countries still rely on traditional medicines, mostly plant drugs, for their primary health care needs. Demand for medicinal plant is increasingly felt, in both developing and developed countries due to growing needs of natural products being non-toxic and benefit of side-effects, apart from availability at affordable prices. In traditional medicine, plant is required as a major component to cure many diseases caused by bacteria, fungi and virus in human. Herbs are mainly used for disease prevention and treatment.

Ethnomedicinal survey is one of the reliable sources to natural and synthetic drug discovery. India has rich plant diversity and is one among the mega biodiversity countries of the world. Indians have been using medicinal plants since antiquity and the Ayurvedic

methods date back to 5000 B.C. These medicinal plants have a longstanding history in many indigenous communities and continue to provide useful tools for treating various diseases.

India is rich in its coastal population from the immemorial time with their traditional knowledge system which deals with the many significant aspects and the health problems of coastal communities. The coastal population has their own herbal homework to treat various diseases. The use of herbal medicines by coastal communities is inclined by distinct socio-cultural practices, support of traditional ability and services of traditional medicine. These people have much associated with their ambient environment and ecology and mainly depend on it for primary health care system, because of they live in remote areas as compared to modern facilities.

India has a coastline of about 7516.6 km long with 2.02 million km exclusive economic zone and 0.13 million km continental shelf (Khoshoo 1996) and it covers nine states and two union territories. It has numerous lagoons, beaches, estuaries and mangrove swamps, which is rich in living and non-living resources. Tamil Nadu coastal line has a length of about 1076 km, it constitutes about 15% of the total coastal length of India. The coastal zone is an important biogeographically habitats of the Indian subcontinent (Rodgers and Panwar 1998).

Kanniyakumari coastal line has a length of about 71.5 km. Coastal vegetation contains many species of specific flora and thus it is an ecological storehouse rich in biodiversity and also has high ecological values..

This report describes a number of plants still being used for medicinal purposes in three coastal Villages (Vallavilai, Marthandanthurai and Neerody) of Kanniyakumari district. Vallavilai, Marthandanthurai and Neerody are coastal Villages on the shore of the Arabian Sea in Kanniyakumari district, Tamil Nadu, India. It was situated near the border of Tamil Nadu and Kerala. These 3 villages are the part of Kollemcode Panchayat.

Hence the present study was undertaken to document the medicinal plant diversity of Coastal line of Kanniyakumari district and to enumerate information about morphologically useful parts of the medicinal plants to cure various ailments.

Materials and Methods

Study Area

Kanniyakumari district, the southernmost tip of Indian Peninsula, is divided into four taluks namely: Agastheeswaram, Kalkulam, Vilavancode and Thovalai. The first three taluks are in the coastal belt with a length of 71.5 km (India's total coast line is 8118 km), having 47 coastal villages. These coastal villages have a population of 1,48,539 fishermen, forming 19 percent of the total fisherman population (7,90,408) in Tamil Nadu.

The present study was conducted in the coastal villages of the Vallavilai, Marthandanthurai and Neerody. The above Villages comes under Kollemcode Panchayat of Vilavancode Taluk. These villages are coastal Villages on the shore of the Arabian Sea in

Kanniyakumari district, Tamil Nadu, India. It was situated near the border with Tamil Nadu and Kerala on north-west to Kanniyakumari and southwest to Trivandrum. Kanniyakumari district is situated in the Southernmost tip of Tamil Nadu, Southern Peninsular India (77° 15'-77° 30' E, 8° 30'-8° 15' N), located in the part of Southern Western Ghats. It occupies an area of about 1684 sq.km, which is 1.29 percent of the total geographical area of the state. Kanniyakumari coastal line has a length of about 71.5 km. The location of the Vallavilai 8.28 latitude and 77.11 longitude, Marthandanthurai 8.28 latitude and 77.11 longitude, and Neerody 8.29 latitude and 77.10 longitude.

According to the 2011 census the Vallavilai village had a population of 10,282, Marthandanthurai 9,146 and Neerody village had a population of 7,231.

Climate and Soil

The climate of the district is warm and humid. The annual rainfall varies from 89-254 cm, and maximum and minimum temperatures were 24ºC - 28ºC in winter and 26ºC - 32ºC in summer respectively. Moisture content ranges from 65 to 75%. The soil of the district is broadly classified into two major groups namely, Red and Alluvial soil.

Data Collection

Regular field trips were made during the study period (November 2018 to March 2019). The information was collected from the coastal people. The information's obtained, mainly concerning their knowledge on medicine from the plants and their parts, local names etc. The biological information of the studied plant material was recorded in the field note book. Informants were asked to guide as to the places where these plants grow or to bring the drug they use. The medicinal uses of plants were checked through the literature available. The medicinal property of each plant was accepted as valid if atleast five separate informants had a similar opinion.

The prepared herbarium and the specimens were carefully examined for the morphology differences the different genera and the taxonomic characters that distinguished each species of the same genus. To identify the species taxonomically, regional and local flora were referred (Gamble 1915-1936; Matthew 1999; Matthew 1982, 1983; Nair 2006). The boucher specimens were processed in the customary way and deposited in the herbarium of Botany, Nesamony Memorial Christian college, Marthandam.

A systematic enumeration of medicinal plants has been arranged in alphabetical order. However botanical name, family, local name, common name where ever available, habit, growth form, useful parts followed by medicinal uses. The arrangement of families of angiosperms is based on APG IV system of classification with necessary alterations. All the species are arranged alphabetically under each family. Geographical maps are provided for the location of the Vallavilai, Marthandanthurai and Neerody Villages, Kanniyakumari district, Tamil Nadu, India.

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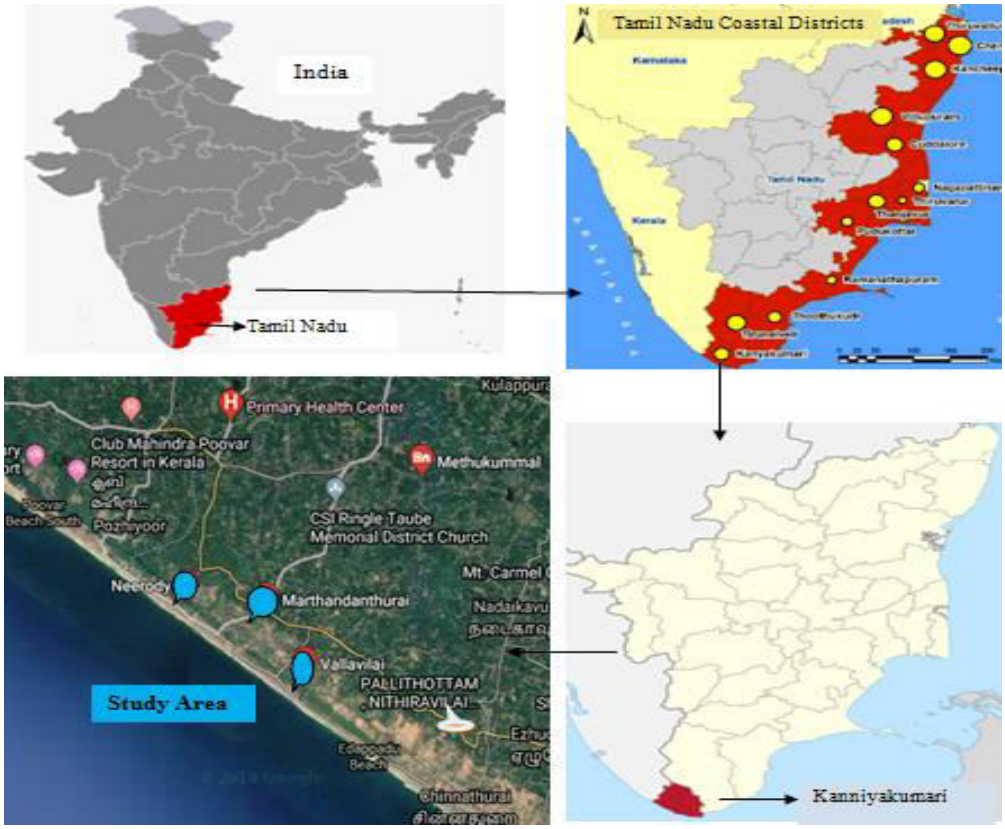
Plate 1: Map showing the Study Area



Results

The ecosystem of Coastal villages is rich in important medicinal plant species. These plants are not only valuable as herbal drugs but also significant as a source of food, fodder, spices etc. The ethnobotanical information gathered from the study area of Vallavilai, Marthandanthurai and Neerody Coastal villages of Kanniyakumari District.

Diversity of Ethnomedicinal Plants

Taxonomically, a total of 95 plant species belonging to 81 genera and 43 families were recorded. Of these 45 (47%) were herbs, 23 (24%) were shrubs, 16 (17%) were trees and 11 (12%) were climbers/creepers (Figure 1, Table 1). Plant species, which are used in traditional medicine, are enumerated alphabetically according to their binomial names, followed by family names (Table 2).

Of the 95 taxa, dicots were represented by 86 species belonging to 34 families and monocots by 9 species belonging to 9 families (Table 3). Based on the growth forms, medicinal plants of Vallavilai village consists of 27 annuals and 49 perennials. Medicinal plants in Marthandanthurai village consist of 13 annuals and 44 perennials. Medicinal plants in Neerody village consist of 8 annuals and 24 perennials. Most of the annual and perennial species are growing in the Vallavilai village. A total of 35 annuals species (37%) and 60 perennials (57%) were recorded from the study area (Table 4).

The Coastal village of the Vallavilai, consists of 76 medicinal plants belonging to 65 genera and 38 families. The Marthandanthurai village consists of 57 medicinal plants

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belonging to 51 genera and 34 families, and the Neerody village having 32 medicinal plants belonging to 31 genera and 23 families (Table 4).

Family wise distribution shows that Leguminosae was the dominant family represented by 9 species under 8 genera, followed by Compositae and Malvaceae having 7 species each, Amaranthaceae and Solanaceae having 6 species each, Euphorbiaceae and Lamiaceae having 5 species each, Acanthaceae, Apocynaceae, Cleomaceae and Cucurbitaceae having 3 species each, Combretaceae, Convolvulaceae, Lythraceae, Myrtaceae, Phyllanthaceae, Verbenaceae having 2 species each, whereas 26 families (Anacardiaceae, Annonaceae, Arecaceae, Caricaceae, Commelinaceae, Cyperaceae, Dioscoreaceae, Meliaceae, Molluginaceae, Moraceae, Moringaceae, Musaceae, Nyctaginaceae, Oleaceae, Pandanaceae, Passifloraceae, Pedaliaceae, Plumbaginaceae, Poaceae, Rubiaceae, Rutaceae, Sapindaceae, Sapotaceae, Talinaceae, Xanthorrhoeaceae, Zygophyllaceae) were monospecific (Figure 2).

Table 1: Habit wise distribution of plant species in the study area

Category	Species (n)	%
Herbs	45	47
Shrubs	23	24
Trees	16	17
Climbers	11	12

Fig 1: Habit wise distribution of plant species in the study area

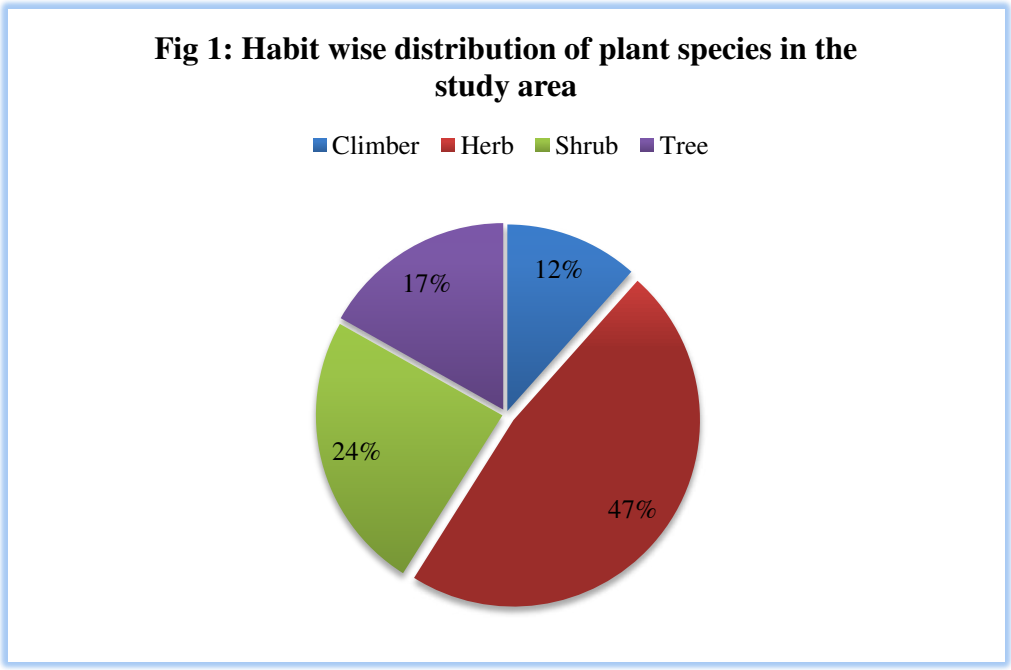

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Figure 2: Dominant Families with Number of Species

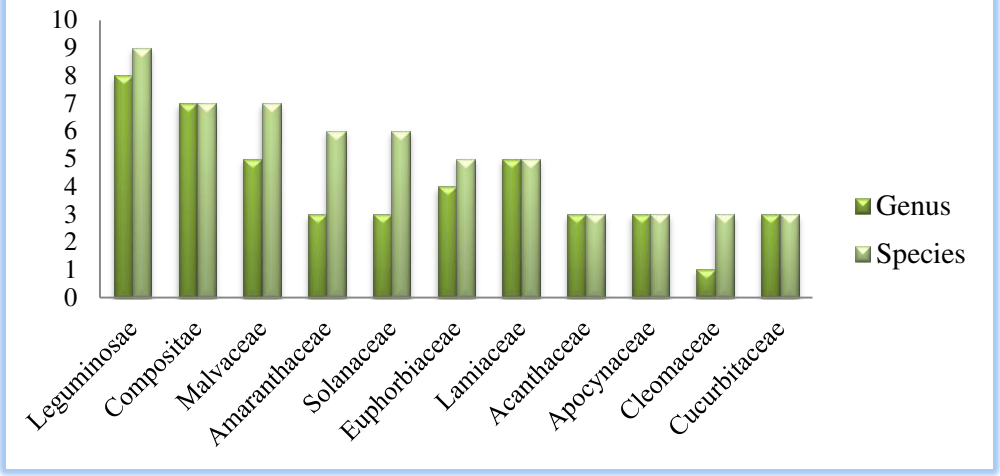

Table 3: Distribution of Families, Genera and Species under Dicots and Monocots

Category	Dicots (n)	%	Monocots (n)	%	Total (n)
Families	34	18	9	34	43
Genera	72	37	9	33	81
Species	86	45	9	33	95

Table 4: Comparison between Species Richness of Coastal Villages of Vallavilai, Marthandanthurai and Neerody

Category	Coastal villages		
	Vallavilai	Marthandanthurai	Neerody
Species	76	57	32
Genera	65	51	31
Family	38	34	23
Growth form			
Perennial	49	44	24
Annual	27	13	8

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Table2: List of Ethnomedicinal Plants Recorded From the Study Area

Sl. No.	Name of the Species	Family	Local Name	Useful Part	Therapeutic uses
1	Abutilon indicum (L.) Sweet	Malvaceae	Cheepu kai	Whole plant	Fever
2	Acalypha indica L.	Euphorbiaceae	Kupaimaeni	Leaves	Headache and skin diseases
3	Acanthospermum hispidum DC.	Compositae	Katu nerunchi	Whole plant	Fever and leprosy
4	Achyranthes aspera L.	Amaranthaceae	Nayuruvi	Whole plant	Toothache, wounds and snake bites
5	Aloe vera (L.) Burm.f.	Xanthorrhoeaceae	Kathalai	Leaves	Stomachache
6	Amaranthus blitum L.	Amaranthaceae	Keerai	Whole plant	Headaches
7	Amaranthus cruentus L.	Amaranthaceae	Keerai	Whole plant	Laxative and pains in the limbs
8	Amaranthus viridis L.	Amaranthaceae	Kuppaikkirai	Leaves	Fever and eye infections
9	Andrographis paniculata (Burm.f.) Nees	Acanthaceae	Nilavembu	Whole plant	Diarrhea, constipation, and stomach pain
10	Annona squamosa L.	Annonaceae	Munthiri maram	Leaves	Dysentery and urinary tract infection
11	Asystasia gangetica (L.) T.Anderson	Acanthaceae	Miti-kirai	Whole plant	Wounds, piles, stomach-ache, snakebites
12	Azadirachta indica A.Juss.	Meliaceae	Vepa maram	Leaves	Skin diseases like eczema and psoriasis
13	Barleria cuspidata F.Heyne ex Nees	Acanthaceae	Manchat-cemmulli	Leaves	Maceration and cracking
14	Bauhinia acuminata L.	Leguminosae	Vellai mandaarai	Whole plant	Asthma, bladder stones, skin diseases and leprosy
15	Boerhavia diffusa L.	Nyctaginaceae	Sarandai	Root	Heart diseases, skin disorders
16	Calotropis gigantea (L.) Dryand.	Apocynaceae	Eruku	Root and	Rheumatism

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Sl. No.	Name of the Species	Family	Local Name	Useful Part	Therapeutic uses
				leaves	
17	Capsicum annuum L.	Solanaceae	Milagu	Fruit	Cold, cough, fever and dyspepsia
18	Cardiospermum halicacabum L.	Sapindaceae	Ulinjai	Root and leaves	Rheumatism and amenorrhea
19	Carica papaya L.	Caricaceae	Papali maram	Leaf and fruit	Skin diseases, blood pressure and dyspepsia
20	Catharanthus roseus (L.) G.Don	Apocynaceae	Nithia kalyani	Whole plant	Diabetes, malaria and cancer
21	Centrosema pubescens Benth.	Leguminosae	Kattupayar	Leaf and seed	Skin diseases, scorpion and snake bites
22	Chloris barbata Sw.	Poaceae	Mayir-kontai pull	Leaves	Skin diseases, fever, diarrhea
23	Chromolaena odorata (L.) R.M.King & H.Rob.	Compositae	Kamyunist alai	Stem and leaves	Eye pains, antibiotic, anti-malarial
24	Cleome gynandra L.	Cleomaceae	Vellai chedi	Leaves	Cough, headache and rheumatism
25	Cleome rutidosperma DC.	Cleomaceae	Neelavela	Whole plant	Malaria, inflammation and deafness
26	Cleome viscosa L.	Cleomaceae	Naikkatuku	Leaves and seed	Wounds and ulcers
27	Clerodendrum infortunatum L.	Lamiaceae	Karukanni	Root and leaves	Diarrhea, malaria, skin diseases,
28	Clitoria ternatea L.	Leguminosae	Changu pushpam	Whole plant	Wounds
29	Coccinia grandis (L.) Voigt	Cucurbitaceae	Kovakai	Whole plant	Leprosy, bronchitis, joint pain
30	Cocos nucifera L.	Arecaceae	Thennai maram	Fruit	Pimples and black dots
31	Combretum indicum (L.)	Combretaceae	Irangun malli	Whole plant	Diarrhea and fever

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Sl. No.	Name of the Species	Family	Local Name	Useful Part	Therapeutic uses
	DeFilipps				
32	Commelina benghalensis L.	Commelinaceae	Kanan valai	Whole plant	Diarrhea and eye complaints
33	Crotalaria pallida Aiton	Leguminosae	Kilukilipai	Whole plant	Urinary problems, fever,
34	Crotalaria verrucosa L.	Leguminosae	Gilugiluppai	Root	Fever, stomach pains and skin diseases
35	Croton bonplandianus Baill.	Euphorbiaceae	Milakai poondu	Whole plant	Snake venom, high fever, jaundice
36	Cucumis sativus L.	Cucurbitaceae	Vellarikai	Leaf and fruit	Dyspepsia
37	Cucurbita maxima Duchesne	Cucurbitaceae	Poosanikai	Seed	Parasitic worms
38	Cyanthillium cinereum (L.) H.Rob.	Compositae	Citevi	Seed	Coughs, intestinal colic, leucoderma
39	Cyperus rotundus L.	Cyperaceae	Korai pul	Whole plant	Nausea, vomiting, diarrhea
40	Dioscorea alata L.	Dioscoreaceae	Peruvalli	Fruit	Fever, gonorrhea, leprosy
41	Eclipta prostrata (L.) L.	Compositae	Kaithoni	Whole plant	Liver complaints
42	Eucalyptus globulus Labill.	Myrtaceae	Eucalyptus	Leaves and resin	Diarrhea and bladder inflammation
43	Euphorbia heterophylla L.	Euphorbiaceae	Paal perukki	Whole plant	Stomach-ache, intestinal worms
44	Euphorbia hirta L.	Euphorbiaceae	Nilappala	Whole plant	Anticancer activity, skin diseases
45	Ficus religiosa L.	Moraceae	Arasa maram	Whole plant	Against bites of venomous animals
46	Glinus oppositifolius (L.) Aug.DC.	Molluginaceae	Thura poondu	Whole plant	Promote digestion
47	Gliricida sepium (Jacq.) Walp.	Leguminosae	Seemai agathi	Whole plant	Cough, fever, fractures, rheumatism
48	Gomphrena celosioides Mart.	Amaranthaceae	Neervadamalli	Whole plant	Skin diseases, worm infections

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Sl. No.	Name of the Species	Family	Local Name	Useful Part	Therapeutic uses
49	Gomphrena globosa L.	Amaranthaceae	Vaadamalli	Flower	Cough, diabetes, bronchial asthma
50	Hibiscus rosa-sinensis L.	Malvaceae	Chembaruthi	Leaves	Dandruff
51	Hibiscus surattensis L.	Malvaceae	Kashlikirai	Leaf and stem	Urethritis
52	Hyptis suaveolens (L.) Poit.	Lamiaceae	Pachilai	Leaves	Fungal infection and diarrhea
53	Ipomoea pes-caprae (L.) R. Br.	Convolvulaceae	Adapukodi	Whole plant	Rheumatism, colic, piles
54	Ipomoea triloba L.	Convolvulaceae	Kakattan	Whole plant	Stomach ache
55	Jasminum sambac (L.) Sol.	Oleaceae	Mullai	Leaf and flower	Intestinal worms, jaundice, cancer
56	Lantana camara L.	Verbenaceae	Unni chedi	Leaves	Rheumatism
57	Lawsonia inermis L.	Lythraceae	Mailanchi	Leaves	Skin diseases
58	Leucas aspera (Willd.) Link	Lamiaceae	Tumbai	Whole plant	Intestinal worm, scorpion bites and fevers
59	Mangifera indica L.	Anacardiaceae	Manga maram	Whole plant	Ulcer
60	Manilkara zapota (L.)P.Royen	Sapotaceae	Sapota maram	Whole plant	Fever, ulcers and diarrhea
61	Mimosa pudica L.	Leguminosae	Thotaal churungi	Root	Asthma, diarrhea, skin wounds
62	Moringa oleifera Lam.	Moringaceae	Murungai maram	Leaves and fruit	Indigestion, hair falling and eye diseases
63	Murraya koenigii (L.) Spreng.	Rutaceae	Curry vepilai	Leaves	Vomiting
64	Musa x paradisiaca L.	Musaceae	Vaazhai	Fruit	Stomach ache
65	Nerium oleander L.	Apocynaceae	Arali	Flower	Heel cracks
66	Ocimum tenuiflorum L.	Lamiaceae	Thulasi	Leaves	Cough and fever

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Sl. No.	Name of the Species	Family	Local Name	Useful Part	Therapeutic uses
67	Pandanus amaryllifolius Roxb.	Pandanaceae	Ramba	Leaves	Fever, relieve indigestion and flatulence
68	Parthinium hysterophorus L.	Compositae	Parthenium	Whole plant	Skin inflammation, rheumatic pain, diarrhea
69	Passiflora foetida L.	Passifloraceae	Chokkan kai	Leaves	Sleeping problems, itching
70	Pedalium murex L.	Pedaliaceae	Nerunji	Root and leaves	Gonorrhea and urethral stones
71	Phyllanthus acidus (L.) Skeels	Phyllanthaceae	Cheemai nellikai	Whole plant	Cathartic and blood-enhancer for the liver
72	Phyllanthus niruri L.	Phyllanthaceae	Keezhanelli	Whole plant	Chronic fever and jaundice
73	Physalis angulata L.	Solanaceae	Chodaku chedi	Whole plant	Rheumatic pain, muscular stiffness and pain
74	Plectranthus amboinicus (Lour.) Spreng.	Lamiaceae	Pachilai	Whole plant	Dyspepsia and snakebites
75	Plumbago zeylanica L.	Plumbaginaceae	Kodivaeli	Whole plant	Leprosy
76	Psidium guajava L.	Myrtaceae	Peraikai maram	Leaves and fruit	Diarrhea and diabetes
77	Punica granatum L.	Lythraceae	Madulai	Fruit	Diarrhea and stomachache
78	Ricinus communis L.	Euphorbiaceae	Aamanaku	Root and leaves	Inflammations, skin diseases and rheumatism
79	Senna occidentalis (L.) Link	Leguminosae	Payaverai	Seed	Rheumatism and diabetes
80	Sida cordifolia L.	Malvaceae	Arivalmukkan	Root and seed	Inflammation, asthmatic bronchitis
81	Sida rhombifolia L.	Malvaceae	Karisalanganni	Whole plant	Swelling, headache and rheumatism
82	Solanum americanum Mill	Solanaceae	Manathakali	Whole plant	Liver disorders, fever and dysentery
83	Solanum lycopersicum L.	Solanaceae	Thakali chedi	Whole plant	Burns, scalds, sunburn and toothache

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Sl. No.	Name of the Species	Family	Local Name	Useful Part	Therapeutic uses
84	Solanum melongena L.	Solanaceae	Katharikai	Whole plant	Blood cholesterol and regulate high blood pressure
85	Solanum violaceum Ortega	Solanaceae	Thoothuvalai	Fruit	Diabetes and skin diseases
86	Spermacoce ocymoides Burm.f.	Rubiaceae	Nathaichuri	Leaves	Wounds, eczema, worms and ringworm
87	Stachytarpheta cayennensis (Rich.) Vahl	Verbenaceae	Seemai nayuruvi	Whole plant	Malaria
88	Tagetes erecta L.	Compositae	Marigold	Whole plant	Treat boils, skin diseases and laxative
89	Talinum fruticosum (L.) Juss.	Talinaceae	Pachai keerai	Whole plant	Measles and diabetes
90	Tamarindus indica L.	Leguminosae	Puli maram	Whole plant	Swellings
91	Terminalia catappa L.	Combretaceae	Vethavankai	Whole plant	Jaundice, indigestion and diarrhea
92	Thespesia populnea (L.) Sol. ex Correa	Malvaceae	Cheelaanthi maram	Leaves and flower	Skin disease
93	Tribulus terrestris L.	Zygophyllaceae	Nerunji	Leaves	Stomach ache
94	Tridax procumbens (L.) L.	Compositae	Odian pachilai	Leaves	Wounds, skin diseases and liver disorders
95	Triumfetta rhomboidea Jacq.	Malvaceae	Ottupullu	Whole plant	Diarrhea, dysentery and gonorrhea

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Plant Part Used for the Preparation of Medicine

In the present study the various plant parts used as medicines were whole plant (45), Leaves (19), fruits (6), Root and leaves (5), Leaves and fruits (4), Roots (3), Seed (3), flower (2), Leaves and flowers (2), Leaves and seed (2), Stem and leaves (2). Whole plants are largely used in the study area. Entire plants are extracted for medicinal purposes in case of herbs (Table 5, Figure 3).

The plant parts used for the preparation of medicine, whole plants were found to be most frequently used for the preparation of remedies. The mode of preparations is paste, juice, decoction and powder.

Table 5: Plant Parts Used for Medicinal Purposes

Sl. No.	Useful parts	No. of species
1	Whole plant	45
2	Leaves	19
3	Fruit	6
4	Root and leaves	5
5	Leaves and fruit	4
6	Root	3
7	Seed	3
8	Flower	2
9	Leaves and flower	2
10	Leaves and seed	2
11	Stem and leaves	2

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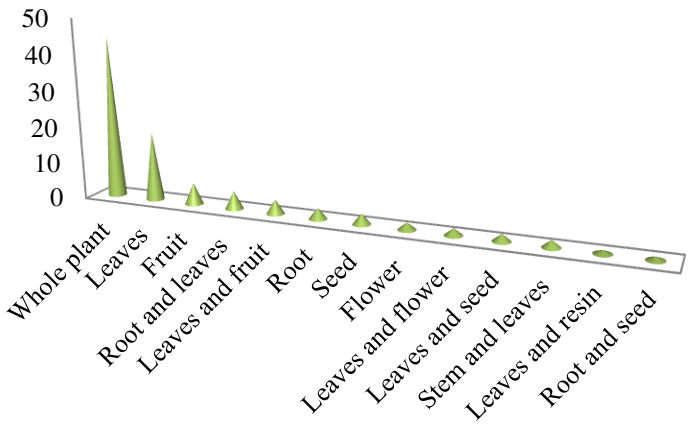
Fig. 3: Plant partwise Ethnomedicinal uses



Route of Administration and Dosage

Most of the medicinal plants were collected from wild habitats. The medicinal plants are mostly used in the form of decoction. Most of the remedies were taken orally. They were also used in direct application of the paste for ailments like skin diseases, wounds, heel cracks, poison bites, rheumatism, body pain and headache. Some of the ailments were treated by internal consumption as well as topical application such as poison bite, rheumatism and body pain and also, some of the ailments such as cold, cough, headache and fever were involved.

Out of 95 plant species, particularly 20 species are used for fever, 11 species used for Cough, 11 species used for Rheumatism, 9 species used for stomach ache, 6 species used for jaundice, 5 species used for headache, 2 plants used for diarrhoea. Most of the collected medicinal plants have efficiency to fight against more than one disease. The most popular medicinal plants, in terms of the number of disease against which they are used, they are Gliricidia sepium, Cyperus rotundus (8 diseases each), Clerodendrum infortunatum (7), and Asystasia gangetica (6). 14 species (Andrographis paniculata, Bauhinia acuminate, Carica papaya, Coccinia grandis, Corymbia citriodora, Dioscorea alata, Eclipta prostrate, Ipomoea pes-caprae, Manilkara zapota, Parthinium hysterophorus, Physalis angulata, Ricinus communis, Senna occidentalis, Sida cordifolia) are used in the treatment of 5 diseases.

Ethnomedicinal Importance of the Plant Species

The medicinal plants of the study area have been used to treat 76 illnesses. The aliments such as scabies, eczema, leucoderma, skin tumours, skin inflammation, skin wounds, scalds, burns, psoriasis, pimples, black dots, heel cracks, itching, boils, measles, rheumatic pain, stomach-ache, swelling of joints, headache, joint pain, muscular stiffness and pain, hemorrhage, dysuria, urinary tract infection, urethral discharge, urethral stones, bladder stones, bladder inflammation. constipation/indigestion, dysentery, diarrhoea, intestinal gas, intestinal worms,

intestinal colic, piles, dyspepsia, ulcers, liver disorders, nausea, vomiting, cough, cold, asthma, bronchitis, sore throats, diphtheria, bowel complaints, scorpion bites, snake bites. fever, jaundice, diabetes, fractures, deafness, eye diseases, tooth problems, edema, cancer, malaria, fungal infection, sleeping problems, blood cholesterol, blood pressure, heart diseases, leprosy, anemia, limb pain, epilepsy, gonorrhoea, syphilitic affections, greying of the hair, hair falling, dandruff etc.

The 76 various ailments against which ethnomedicinal treatments have been recorded in the study area can be grouped into 12 major categories of symptomatically and organ-system related diseases/problems, such as 39 plants are used for Skin problems, 25 species are Body pain/Swelling, 8 species are Urino-genital problems, 42 plants used for Gastro-intestinal problems, 17 species used for Respiratory problems. 7 species used for Chronic infectious diseases, 2 species used for Peripheral artery disease, 1 species (Asystasia gangetica) used for Brain disorder (Epilepsy), 9 species used for Animal bites, 7 species used for Venereal disease, 3 plants used for Hair problems, 46 species used for Others diseases (Fever, jaundice, diabetes, fractures, deafness, eye diseases, tooth problems, edema, cancer, malaria, fungal infection, sleeping problems, blood cholesterol, blood pressure, heart diseases) (Table 6).

Table 6: Diseases Treated in the Ethnomedicine of Study Area

Category	Diseases/conditions included	No. of plant species
Skin problems	Scabies, eczema, leucoderma, skin tumours, skin inflammation, skin wounds, scalds, burns, psoriasis, pimples, black dots, heel cracks, itching, boils, measles.	39
Body pain/Swelling	Rheumatic pain, stomachache, swelling of joints, headache, joint pain, muscular stiffness and pain	25
Urino-genital problems	Hemorrhage, dysuria, urinary tract infection, urethral discharge, urethral stones, bladder stones, bladder inflammation	8
Gastro-intestinal problems	Constipation/ indigestion, dysentery, diarrhoea, intestinal gas, intestinal worms, intestinal colic, piles, dyspepsia, ulcers, liver disorders, nausea, vomiting	42
Respiratory problems	Cough, cold, asthma, bronchitis, sore throats, diphtheria, bowel complaints	17
Chronic infectious disease	Leprosy, anemia	7
Peripheral artery disease	Limb pain	2

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Brain disorder	Epilepsy	1
Animal bites	Scorpion bites, snake bites	9
Venereal disease	Gonorrhea, syphilitic affections	7
Hair problems	Graying of the hair, hair falling, dandruff	3
Others	Fever, jaundice, diabetes, fractures, deafness, eye diseases, tooth problems, edema, cancer, malaria, fungal infection, sleeping problems, blood cholesterol, blood pressure, heart diseases	46

Selected Medicinal Plants in the Study Area

Abutilon indicum

Achyranthes aspera

Amaranthus blitum

Boerhavia diffusa

Cleome gynandra

Cleome rutidosperma

Clitoria ternatea

Crotalaria verrucosa

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Euphorbia heterophylla

Euphorbia hirta

Hibiscus surattensis

Ipomoea pes-caprae

Leucas aspera

Parthinium hysterophorus

Pedalium murex

Plumbago zeylanica

Discussion

Medicinal plants have been used for millennia in virtually all cultures and serve both as a source of income and affordable healthcare. Worldwide, about 53,000 plant species are used for medicinal purposes (Hamilton 2004). According to an estimate of the World Health Organization (WHO), about 80% of the populations in the developing countries still rely on traditional medicine for their primary health care needs.

India is rich in its ethnic diversity of which many aboriginal cultures have retained traditional knowledge concerning the medicinal utility of the native flora. In the present investigation, a total of 95 medicinal plants belonging to 81 genera from 43 families were collected and recorded (Table 2). Similarly, Raafat et al (2008) recorded 121 medicinal species belonging to 96 genera and 37 families. The report is connected to the previous work

(Heindrickson et al 2010; Muthukumar and Selvin Samuel 2010; Sahu et al 2011; Bartwal et al 2011; Bhandary and Chandrashekar 2014; Qasim et al 2014; Jenisha and Jeeva 2014) etc.

Family wise distribution shows that Leguminosae was the dominant family represented by 9 species under 8 genera, followed by Compositae and Malvaceae having 7 species each in the study area. The report is connected to the previous work (Arefin et al 2011; Sahu et al 2011; Noman et al 2013; Bhandary and Chandrashekar 2014; Qasim et al 2014; Jenisha and Jeeva 2014; Atikullah et al 2016) etc.

A total of 35 annuals species (37%) and 60 perennials (57%) were recorded from the study area (Figure 6). Raafat et al (2008) recorded medicinal plants of North Sinai consists of 39 annuals and 82 perennials. The medicinal plants of the study area have been used to treat 76 illnesses. Heindrickson et al (2010) recorded 73 illnesses from the fishing communities of South Brazil. Muthukumar and Selvin Samuel (2010) reported 30 illness coastal areas of Tuticorin district. According to Bhandary and Chandrashekar (2014) recorded 42 ailments from the coastal Karnataka.

All the plants were able to cure different human ailments such as diabetes, cough, body ache, eye diseases, fever etc. Most of these plants are being used directly by the people or to prepare decoction or with slight preparation like applying the paste, boiling the useful parts of these plants, simply chewing leaves making extract of the plant and using it etc. The report is connected to the previous work (Rao et al 2002; Bhattacharya 2002; Singh 2002; Gupta 2000; Khan 2004; Dhar et al 2003; Heindrickson et al 2010; Muthukumar and Selvin Samuel 2010; Qasim et al 2014) etc. The method of preparation of medicine and use is same or different from place to place.

Majority of the work revealed that leaves were predominantly used than the other parts. Bourdy et al (2000) registered an overwhelming use of leaves in one Amazon community; Medeiros et al (2004) obtained the same results with a group of ranchers in the state of Rio de Janeiro; Pinto et al (2006) cited the predominant use of leaves in rural communities in the Atlantic Forest; Heindrickson et al (2010) also registered the leaves are predominantly used in Fishing communities of Southern Brazil; Muthukumar and Selvin Samuel (2010) obtained the same results in Coastal area of Tuticorin district; Sahu et al (2011) cited the predominant use of leaves in Coastal district of Odisha; Jenisha and Jeeva (2014) registered an overwhelming use of leaves in Keezhakrishnanputhoor- A coastal village of Kanniyakumari district. But my study revealed that whole plants are dominantly used from the study area.

The plants such as Annona squamosa and Sida cordifolia were used to cure scorpion bite, stomach ache and fever. In the present study also same plants were used to cure particular diseases. They were reported by Viswanathan 2000; Rajendran et al 2002; Sharma & Mujundar 2003. So the present study was consistent with the previous work. Mangifera indica and Carica papaya were used to treat indigestion and stomach problems. It was reported by Kamble et al

2008. The plants such as Ricinus communis, Boerhavia diffusa, Tridax procumbens, Lawsonia inermis, Cocos nucifera and Tamarindus indica were used to cure wound, jaundice, improves hair growth, urinary difficulty, dissolves bladder stones, eczema, heart diseases, snake bite and poisonous insect bite. In the present study also, same plants were used to cure particular diseases. They were reported by Ayanar et al 2010; Hitesh and Patel 2013; Datta et al 2014.

The plants such as Lantana camara, Moringa oleifera, Mimosa pudica, Passiflora foetida and Thespesia populnea were used to cure muscle pain, rheumatism, headache, scabies, leucoderma, itching of the skin, asthma, and ulcer. They were reported various author such as Moorthy et al 2002; Rana et al 2002; Arya and Prakash 2000.

The crude drug is obtained from medicinal plants. Due to the influence of modern medicine, the usage of traditional medicine becomes decreased day by day. When the people need small plant parts, but they pullout the whole plant. So the wealth of medicinal plants decreases, so we have to conserve the medicinal plants and utilize the crude drugs obtained from medicinal plants.

Conclusion

The coastal plant species of the coastal villages of Vallavilai, Marthandanthurai and Neerody are extremely important, which play a vital role in the medicinal and social life of people. Findings of the present investigation revealed that, the coastal villages of Vallavilai, Marthandanthurai and Neerody have a very rich diversity of medicinal plants. Medicinal plants are still an important resource utilized for health maintenance of families of the fishing community of the study area. All together 95 medicinal plants, used for treating 73 different human ailments were recorded in the study area. Of these 45 (47%) were herbs, 23 (24%) were shrubs, 16 (17%) were trees and 11 (12%) were climbers/creepers belonging to 43 different families were recorded.

Among the recorded species mostly whole plants are utilized as medicines. Other useful parts include Root, Stem, Leaves, Flower, Fruits and Seeds. The crude drug obtained from medicinal plants can be used in the treatment of various diseases. The noteworthy findings stand out from this work, data suggests that people in the more isolated village know and consume more plants than people in the more accessible village. Conservation and judicious utilization of this coastal plant wealth is important because they have become threatened by over-exploitation.

The findings of this study reveal that common plant species seen around us also play an important role in the treatment of various ailments. Due to the impact of urbanization, partial modernization and over exploitation of plant species for medicinal purposes there is chance for disappearance of some plant species in near future. Therefore, appropriate measures should be taken to conserve these plants for healthy and disease free life.

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