



Research Article

# Identification and Conservation Status of Medicinal Plants in Chengottumala Hills, Kerala

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The present study has been carried out in Chengottumala Hills, Kozhikode, Kerala, India to document the current conservation status of the study area and medicinal properties of plants. An extensive and intensive floristic survey was undertaken during December 2020 - Feb 2021 in Chengottumala Hills. The area was surveyed at every visit and periodical collection of plants made from each locality. Taxonomically a total number of 75 species of Angiosperms distributed belonging to 38 families has been recorded from the study area of Chengottumala hills. Out of these 68 families belongs to Dicotyledons and 7 families belong to Monocotyledons. In the life form category of plants the majority of the species were herbs (31 species) followed by shrubs (19 species), trees (17 species) and climbers (8 species). *Sida acuta* was the most abundant species when compared to other species in the study area. In the present study out of 75 species recorded no species is endangered, 2 species are vulnerable, 6 species are least concern. In the Chengottumalai Hills represents 19 invasive and 56 native species.

**Keywords:** Medicinal plants, Chengottumala Hills, Kerala, Dicotyledons, Monocotyledons.

## 1. Introduction

India is one of the 18th megadiversity country in the world, where the home for the medicinal plants. It is estimated that, around 46,000 plant species including higher plants such as angiosperms and gymnosperms and lower groups wise pteridophytes, bryophytes, fungi, lichen and algae are known to occur in India (1). According to World Health Organization, 80% of the world population of most developing countries depends on herbal medicines.

Out of 4, 22,000 flowering plant species reported from the world, more than 50,000 are used for medicinal purposes by 4,635 ethnic communities, which 90% are found in forest habitats. In India more than 43% of total flowering plants are reported for medicinal importance (2).

Human beings are dependent on plants for their different needs such as food, fodder, fuel, medicine, timbers, dyes, fibres, fruit etc. The traditional methods of using plants as medicines have played an important role in our ancient system of health care. The knowledge of wild plants as medicine is found in ancient Vedic literature, particularly in Rigveda, Charak Samhita and Shusruta Samhita. Traditional medicine and ethnobotanical information's play an important role in plant science research. Herbal medicine is still practiced about 75 - 80% of the world

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population mainly in the developing countries for their primary health care needs (1). The main aim of the present work is, to survey and document the medicinal plant species present in Chengottumala hills, Kerala, by field observation method.

## 2. Materials and Methods

The present study has been carried out in Chengottumala Hills, Kozhikode, Kerala, India. The study area Chengottumala hill is situated Kozhikode district in Kerala. Chengottumala located 45 Kms from the city of Kozhikode and only 10 Km from Naduvannur .It is situated at a latitude  $11^{\circ}30'25.539''N$  to  $11^{\circ}30'15.501''N$  and longitude  $75^{\circ}48'27.131''E$  to  $75^{\circ}48'05.537''E$ . An extensive and intensive floristic survey were undertaken during December 2020 - Feb 2021 in Chengottumala hillis. The area was surveyed at every visit and periodical collection of plants made from each locality. The voucher specimens were collected and identified by referring to standard floras (3 and 4).

## 3. Results and Discussion

The present study has been carried out in Chengottumala Hills, Kozhikode, Kerala, India to document the current conservation status of the study area and medicinal properties of plants. An extensive and intensive floristic survey were undertaken during December 2020 - Feb 2021 in Chengottumala Hills. The area was surveyed at every visit and periodical collection of plants made from each locality.

### 3.1. Plant species and their habit

Taxonomically a total number of 75 species of Angiosperms distributed belonging to 38 families has been recorded from the study area of Chengottumala hills and listed in table.1. Out of these 68 families belongs to Dicotyledons and 7 families belongs to Monocotyledons. Our finding revealed that the Angiospermic plant species are more abundant in the study area because flowering plants grow in virtually every habitable region compare to other group of plants.

In the life form category of plants the majority of the species were herbs (31 species) followed by shrubs (19 species), trees (17 species) and climbers (8 species) show in the table: 2 and figure: 2. This unanimity in result suggest that the herbs grows readily well in the

moderate climate and also that they can easily accessed.

### 3.2. Species, Family and Relative Dominance

*Sida acuta* was the most abundant species when compared to other species in the study area. The most species rich families include fabaceae (11 species) was the dominant family followed by Malvaceae and Acanthaceae (8 species), Euphorbiaceae (7 species), Asteraceae (6 species), Convolvulaceae Apocynaceae (5 species), Euphorbiaceae (4 species), Acanthaceae, Verbenaceae, Rubiaceae(3 Species), Amaranthaceae, Rutaceae, Meliaceae, Lauraceae, Zingiberaceae, Lamiaceae, Malvaceae(2 species) and Menispermaceae, Cappariaceae, Oxalidaceae, Sapindaceae, Anacardiaceae, Combretaceae, Myrtaceae, Melastomaceae, Apiaceae, Loganiaceae, Solanaceae, Scrophulariaceae, Bignoniaceae, Nyctagenaceae, Aristolochiaceae, Chloranthaceae, Santalaceae, Urticaceae, Amaryllidaceae, Arundinaceae, Liliaceae, Asparagaceae, Cyperaceae with one species each (Table:3; Figure:3).

### 3.3. Conservation status of taxa

Assessment of conservation status of the species level was performed using the International Union for conservation of Nature of red list criteria. In the present study out of 75 species recorded no species is endangered, 2 species are vulnerable, 6 species are least concern (Table: 4).

### 3.4. Geographic Origin of Taxa

The origin of recorded taxa was done based on the literature available from ENVIS. In the Chengottumalai Hills represents 19 invasive and 56 native species. In Fabaceae, 4 invasive species were recorded. Highest number of invasive species documented in the family Fabaceae (4 species) followed by Asteraceae (2 species), Sapindaceae, Lauraceae, Apiaceae, Solanaceae, Acanthaceae, Cyperaceae, Urticaceae, Caesalpinaceae, Euphorbiaceae and Malvaceae with one species each. The listed invasive species are *Cardiospermum halicacabum* Linn., *Cassythia filiformis* Linn., *Centella asiatica* Urb., *Chromolaena odorata* Linn., *Clitoria ternatea* Linn., *Datura metel* Linn., *Gliricidia sepium* Jacq., *Hemigraphis colorata* Blume., *Kyllinga brevifolia* Rottb., *Laportea interrupta* Linn., *Maranta*

arundinacea Linn., Mimosa pudica Linn., Plumeria alba Linn., Psidium guajava Linn., Scoparia dulcis Linn., Tamarindus indica Linn., Urena lobate Linn., and Vernonia cinerea Less (Table: 4). The presence of invasive species in the rangeland increase increases its biodiversity and species richness, it can decrease the health of the ecosystem (5 and 6). Document the geographic origin of the plant species bring out a valuable database, enable the better management and conservation of Chengottumala Hills.



Fig. 1. Map showing Chengottumala Hills

Table 1: Enumeration of Medicinal Plants in Chengottumala Hills, Kerala

S. No	Binomial Name	Family	Life Form	Medicinal Uses
1	<i>Abrus precatorius</i> Linn.	Fabaceae	Climber	Tuberculosis, migraine, leukaemia
2	<i>Achyranthes aspera</i> Linn.	Amaranthaceae	Herb	Cough, bronchitis, rheumatism
3	<i>Adhatoda beddomei</i> Cl.	Acanthaceae	Shrub	Asthma, fever, vomiting
4	<i>Aegle marmelos</i> Corr.	Rutaceae	Tree	Antimicrobial, anti viral, anticancer
5	<i>Aerva lanata</i> Juss.	Amaranthaceae	Shrub	Asthma, cough, headache
6	<i>Alstonia scholaris</i> R.Br.	Apocynaceae	Tree	Malaria, asthma, skin disorders
7	<i>Aristolochia indica</i> Linn.	Aristolochiaceae	Twiner	Boost immune system, treat

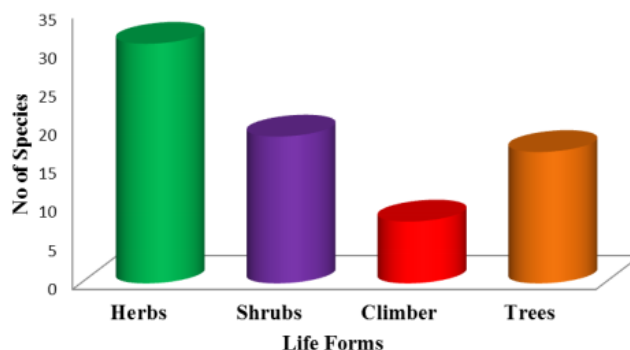
8	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Scandent	snake bite Stomach ulcer, constipation, anxiety
9	<i>Azadirachta indica</i> A. juss.	Meliaceae	Tree	Fever, diabetes, liver problems
10	<i>Bauhinia acuminata</i> Linn.	Fabaceae	Shrub	Asthma, digestive diseases
11	<i>Biophytum sensitivum</i> DC.	Oxalidaceae	Herb	Inflammation, arthritis, asthma, cough
12	<i>Boerhaavia diffusa</i> Linn.	Nyctaginaceae	Herb	Asthma, cough, eye diseases
13	<i>Caesalpinia sappan</i> Linn.	Caesalpineaceae	Tree	Antidiabetic
14	<i>Calotropis gigantea</i> R.Br.	Apocynaceae	Shrub	Stomach ulcer, toothache
15	<i>Cardiospermum halicacabum</i> Linn.	Sapindaceae	Climber	Antipyretic, antiinflammatory
16	<i>Cassia fistula</i> Linn.	Caesalpineaceae	Tree	Ulcers and wounds, antiseptic
17	<i>Cassytha filiformis</i> Linn.	Lauraceae	Herb	Treatment of cancer
18	<i>Centella asiatica</i> Urb.	Apiaceae	Herb	Skin disorders, fever
19	<i>Chromolaena odorata</i> Linn.	Asteraceae	Shrub	Skin infection, diabetics
20	<i>Cinnamomum zeylanicum</i> Bl.	Lauraceae	Tree	Diarrhoea, common cold
21	<i>Cleome viscosa</i> Linn.	Capparidaceae	Herb	Hypertension, wound healing
22	<i>Clerodendron infortunatum</i> Linn.	Verbenaceae	Shrub	Anti-dandruff, skin disease
23	<i>Clitoria ternatea</i> Linn.	Fabaceae	Climber	Antistress, sedative agent
24	<i>Curculigo orchiodes</i> Gaertn.	Amaryllidaceae	Herb	Arthritis
25	<i>Curcuma aromatica</i> Sal.	Zingiberaceae	Herb	Skin disease
26	<i>Datura metel</i> Linn.	Solanaceae	Herb	Analgesic, stomach pain
27	<i>Desmodium gangeticum</i> DC.	Fabaceae	Shrub	Asthma
28	<i>Desmodium triflorum</i> DC.	Fabaceae	Herb	Skin problems
29	<i>Desmostachya bipinnata</i> Stapf.	Poaceae	Herb	Diuretic
30	<i>Eclipta alba</i> Hassk.	Astaraceae	Herb	Asthma, fever
31	<i>Elephantopus scaber</i> Linn.	Asteraceae	Herb	Fever, cough, asthma
32	<i>Emilia sonchifolia</i> DC.	Asteraceae	Herb	Diabetes
33	<i>Gliricidia sepium</i> Jacq.	Fabaceae	Tree	Cough
34	<i>Gloriosa superba</i> Linn.	Liliaceae	Climber	Gout, Infertility

35	<i>Glycosmis pentaphylla</i> Corr.	Rutaceae	Shrub	Cough
36	<i>Hemidesmus indicus</i> R.Br.	Apocynaceae	Shrub	Fever, asthma, bronchitis
37	<i>Hemigraphis colorata</i> Blume.	Acanthaceae	Herb	Wound healing
38	<i>Ixora coccinea</i> Linn.	Rubiaceae	Shrub	Fever, headache
39	<i>Justicia gendarussa</i> Linn.	Acanthaceae	Shrub	Eye diseases
40	<i>Kaempferia galangal</i> Linn.	Zingiberaceae	Herb	Anti-inflammatory
41	<i>Kyllinga brevifolia</i> Rottb.	Cyperaceae	Herb	Diuretic
42	<i>Laportea interrupta</i> Linn.	Urticaceae	Herb	To aid in pregnancy
43	<i>Leucas aspera</i> Spr.	Lamiaceae	Herb	Anti-fungal, anti pyretics
44	<i>Mangifera indica</i> Linn.	Anacardiaceae	Tree	Asthma, cough, toothache
45	<i>Maranta arundinacea</i> Linn.	Arundinaceae	Herb	Urinary problems
46	<i>Melastoma malabathricum</i> Linn.	Melastomaceae	Shrub	Tooth ache, stomach ache
47	<i>Milletta pinnata</i> Linn.	Fabaceae	Tree	Diabetes, ulcer
48	<i>Mimosa pudica</i> Linn.	Caesalpineaceae	Herb	Small pox, fever
49	<i>Mussaenda frondosa</i> Linn.	Rubiaceae	Shrub	Skin infection, cough
50	<i>Naregamia alata</i> W & A.	Meliaceae	Shrub	Anaemia, cough, asthma
51	<i>Ocimum sanctum</i> Linn.	Lamiaceae	Shrub	Asthma, cough, fever, skin diseases
52	<i>Oroxylum indicum</i> Vent.	Bignoniaceae	Tree	Diuretic
53	<i>Peperomia pellucida</i> H.B & K.	Chloranthaceae	Herb	Gout, headache, acne
54	<i>Phyllanthus emblica</i> Linn.	Euphorbiaceae	Tree	Build up lost vitality
55	<i>Phyllanthus niruri</i> Linn.	Euphorbiaceae	Herb	Jaundice, diabetics
56	<i>Plumeria alba</i> Linn.	Apocynaceae	Tree	Cough, asthma, fever
57	<i>Premna serratifolia</i> Linn.	Verbenaceae	Shrub	Stomach disorders
58	<i>Pseudarthria viscida</i> W & A.	Fabaceae	Shrub	Asthma
59	<i>Psidium guajava</i> Linn.	Myrtaceae	Tree	Stomach ache, indigestion
60	<i>Rauwolfia serpentina</i> Benth.	Apocynaceae	Herb	Hypertension
61	<i>Santalum album</i> Linn.	Santalaceae	Tree	Cough, cold, bronchitis
62	<i>Scoparia dulcis</i> Linn.	Scrophulariaceae	Herb	Skin disorder

63	<i>Sebastiania chamaelea</i> M.Arg.	Euphorbiaceae	Herb	Tooth ache
64	<i>Cassia tora</i> Linn.	Fabaceae	Herb	Bronchitis
65	<i>Sida acuta</i> Burm.	Malvaceae	Herb	Blood disorder
66	<i>Spermacoce tenuior</i> Linn.	Rubiaceae	Herb	Skin disease
67	<i>Spilanthes paniculate</i> Linn.	Asteraceae	Herb	Tooth ache
68	<i>Strychnos nuxa-vomica</i> Linn.	Loganiaceae	Tree	Eye disease, Lung disease
69	<i>Tamarindus indica</i> Linn.	Caesalpineaceae	Tree	Respiratory problems
70	<i>Terminalia cattappa</i> Linn.	Combretaceae	Tree	Headache
71	<i>Tinospora cordifolia</i> Miers.	Menispermaceae	Climber	High cholesterol, allergic
72	<i>Tragia involucrate</i> Linn.	Euphorbiaceae	Climber	Inflammation
73	<i>Urena lobate</i> Linn.	Malvaceae	Shrub	Stomach ache, fever
74	<i>Vernonia cinerea</i> Less.	Asteraceae	Herb	Skin disease
75	<i>Vitex neugundo</i> Linn.	Verbenaceae	Shrub	Anti-diabetics, anticancer

**Table 2: Life Forms of Species under Family**

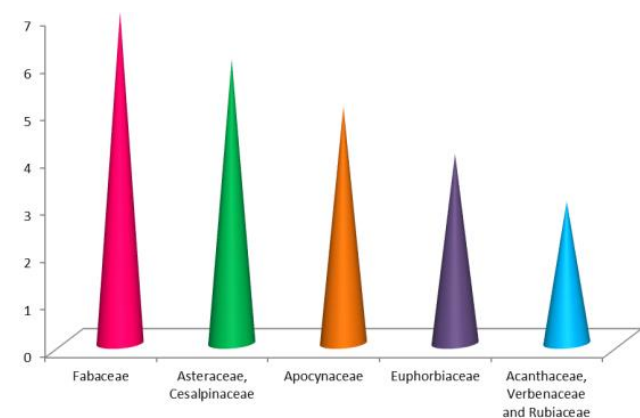
S. No	Life Forms	No of species
1	Herbs	31
2	Shrubs	19
3	Trees	17
4	Climber	8
	<b>Total</b>	<b>75</b>



**Fig. 2. Life Forms of Species under Family**

**Table 3: Distribution of Species under Family**

S. No	Family	No of species
1	Fabaceae	7
2	Asteraceae, Cesalpinaceae	6
3	Apocynaceae	5
4	Euphorbiaceae	4
5	Acanthaceae, Verbenaceae and Rubiaceae	3
6	Amaranthaceae, Rutaceae, Meliaceae, Lauraceae, Zingiberaceae, Lamiaceae and Malvaceae	2
7	Aristolochiaceae, Asparagaceae, Oxalidaceae, Nyctagenaceae, Sapindaceae, Apiaceae, Capparaceae, Amaryllidaceae, Solanaceae, Poaceae, Liliaceae, Cyperaceae, Urticaceae, Anacardiaceae, Arundinaceae, Melastomaceae, Bignoniaceae, Chloranthaceae, Myrtaceae, Santalaceae, Scrophulariaceae, Loganiaceae, Combretaceae and Menispermaceae	1



**Fig. 3. Distribution of Species under Family**

**Table 4: Conservation Status and Geographic Origins of Recorded Species in Chengottumala Hills, Kerala**

S. No	Binomial Name	Family	IUCN RED List	Category
1	<i>Abrus precatorius</i> Linn.	Fabaceae	NE	Native
2	<i>Achyranthes aspera</i> Linn.	Amaranthaceae	NE	Native
3	<i>Adhatoda beddomei</i> Cl.	Acanthaceae	VU	Native
4	<i>Aegle marmelos</i> Corr.	Rutaceae	NE	Native

5	<i>Aerva lanata</i> Juss.	Amaranthaceae	NE	Native
6	<i>Alstonia scholaris</i> R.Br.	Apocynaceae	LC	Native
7	<i>Aristolochia indica</i> Linn.	Aristolochiaceae	NE	Native
8	<i>Asparagus racemosus</i> Willd.	Asparagaceae	NE	Native
9	<i>Azadirachta indica</i> A. juss.	Meliaceae	NE	Native
10	<i>Bauhinia acuminata</i> Linn.	Fabaceae	LC	Native
11	<i>Biophytum sensitivum</i> DC.	Oxalidaceae	NE	Native
12	<i>Boerhaavia diffusa</i> Linn.	Nyctagenaceae	NE	Native
13	<i>Caesalpinia sappan</i> Linn.	Caesalpineaceae	LC	Native
14	<i>Calotropis gigantea</i> R.Br.	Apocynaceae	NE	Native
15	<i>Cardiospermum halicacabum</i> Linn.	Sapindaceae	NE	Invasive
16	<i>Cassia fistula</i> Linn.	Caesalpineaceae	NE	Native
17	<i>Cassytha filiformis</i> Linn.	Lauraceae	NE	Invasive
18	<i>Centella asiatica</i> Urb.	Apiaceae	LC	Invasive
19	<i>Chromolaena odorata</i> Linn.	Asteraceae	NE	Invasive
20	<i>Cinnamomum zeylanicum</i> Bl.	Lauraceae	NE	Native
21	<i>Cleome viscosa</i> Linn.	Capparidaceae	NE	Native
22	<i>Clerodendron infortunatum</i> Linn.	Verbenaceae	NE	Native
23	<i>Clitoria ternatea</i> Linn.	Fabaceae	NE	Invasive
24	<i>Curculigo orchhioides</i> Gaertn.	Amaryllidaceae	NE	Native
25	<i>Curcuma aromatica</i> Sal.	Zingiberaceae	NE	Native
26	<i>Datura metel</i> Linn.	Solanaceae	NE	Invasive
27	<i>Desmodium gangeticum</i> DC.	Fabaceae	NE	Native
28	<i>Desmodium triflorum</i> DC.	Fabaceae	NE	Native
29	<i>Desmostachya bipinnata</i> Stapf.	Poaceae	NE	Native
30	<i>Eclipta alba</i> Hassk.	Astaraceae	NE	Native
31	<i>Elephantopus scaber</i> Linn.	Asteraceae	NE	Native
32	<i>Emilia sonchifolia</i> DC.	Asteraceae	NE	Native
33	<i>Gliricidia sepium</i> Jacq.	Fabaceae	NE	Invasive
34	<i>Gloriosa superba</i> Linn.	Liliaceae	LC	Native

35	<i>Glycosmis pentaphylla</i> Corr.	Rutaceae	NE	Native	64	<i>Cassia tora</i> Linn.	Fabaceae	NE	Native
36	<i>Hemidesmus indicus</i> R.Br.	Apocynaceae	NE	Native	65	<i>Sida acuta</i> Burn.	Malvaceae	NE	Native
37	<i>Hemigraphis colorata</i> Blume.	Acanthaceae	NE	Invasive	66	<i>Spermacoce tenuior</i> Linn.	Rubiaceae	NE	Native
38	<i>Ixora coccinea</i> Linn.	Rubiaceae	NE	Native	67	<i>Spilanthes paniculate</i> Linn.	Asteraceae	NE	Native
39	<i>Justicia gendarussa</i> Linn.	Acanthaceae	NE	Native	68	<i>Strychnos nuxa-vomica</i> Linn.	Loganiaceae	NE	Native
40	<i>Kaempferia galangal</i> Linn.	Zingiberaceae	NE	Native	69	<i>Tamarindus indica</i> Linn.	Caesalpineaceae	NE	Invasive
41	<i>Kyllinga brevifolia</i> Rottb.	Cyperaceae	LC	Invasive	70	<i>Terminalia cattappa</i> Linn.	Combretaceae	NE	Native
42	<i>Laportea interrupta</i> Linn.	Urticaceae	NE	Invasive	71	<i>Tinospora cordifolia</i> Miers.	Menispermaceae	NE	Native
43	<i>Leucas aspera</i> Spr.	Lamiaceae	NE	Native	72	<i>Tragia involucrate</i> Linn.	Euphorbiaceae	NE	Native
44	<i>Mangifera indica</i> Linn.	Anacardiaceae	NE	Native	73	<i>Urena lobate</i> Linn.	Malvaceae	NE	Invasive
45	<i>Maranta arundinacea</i> Linn.	Arundinaceae	NE	Invasive	74	<i>Vernonia cinerea</i> Less.	Asteraceae	NE	Invasive
46	<i>Melastoma malabathricum</i> Linn.	Melastomaceae	NE	Native	75	<i>Vitex neugundo</i> Linn.	Verbenaceae	NE	Native
47	<i>Milletta pinnata</i> Linn.	Fabaceae	NE	Native	<b>NE – Not evaluated, LC – Lest concern, VU – Vulnerable</b>				
48	<i>Mimosa pudica</i> Linn.	Caesalpineaceae	LC	Invasive					
49	<i>Mussaenda frondosa</i> Linn.	Rubiaceae	NE	Native					
50	<i>Naregamia alata</i> w & A.	Meliaceae	NE	Native					
51	<i>Ocimum sanctum</i> Linn.	Lamiaceae	NE	Native					
52	<i>Oroxylum indicum</i> Vent.	Bignoniaceae	NE	Native					
53	<i>Peperomia pellucida</i> H.B & K.	Chloranthaceae	NE	Native					
54	<i>Phyllanthus emblica</i> Linn.	Euphorbiaceae	NE	Native					
55	<i>Phyllanthus niruri</i> Linn.	Euphorbiaceae	NE	Native					
56	<i>Plumeria alba</i> Linn.	Apocynaceae	NE	Invasive					
57	<i>Premna serratifolia</i> Linn.	Verbenaceae	NE	Native					
58	<i>Pseudarthria viscida</i> W & A.	Fabaceae	NE	Native					
59	<i>Psidium guajava</i> Linn.	Myrtaceae	NE	Invasive					
60	<i>Rauwolfia serpentine</i> Benth.	Apocynaceae	NE	Native					
61	<i>Santalum album</i> Linn.	Santalaceae	VU	Native					
62	<i>Scoparia dulcis</i> Linn.	Scrophulariaceae	NE	Invasive					
63	<i>Sebastiania chamaelea</i> M.Arg.	Euphorbiaceae	NE	Invasive					



**Fig. 4. Medicinal Plants in Chengottumala Hills**

#### 4. Conclusion

The present study has been carried out to document the current conservation status of the study area and medicinal properties of plants. An extensive and intensive floristic survey were undertaken during December 2020 - Feb 2021 in Chengottumala Hills. The area was surveyed at every visit and periodical collection of plants made from each locality. Out of 75

species recorded no species is endangered, 2 species are vulnerable, 6 species are least concern. In the Chengottumalai Hills represents 19 invasive and 56 native species.

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