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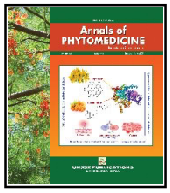

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Ethnobotanical study of medicinal climbers in Chengalpattu District of Tamil Nadu, India

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Abstract

Medicinal climbers are utilized as herbal treatments in various traditional Indian medical systems, such as Ayurveda, Siddha, and Unani. This research represents the initial documentation of the medicinal climbers, found in the Chengalpattu District of Tamil Nadu. Field surveys were undertaken to collect the medicinal climbers in the Acharapakkam, Chithamur, Kattankolathur, Lathur, and Madurantakam blocks of this District. A total of 54 species of medicinal climbing plants were found, representing 41 different genera from 27 families. The collected information indicates that climbers in the Vitaceae family dominate with six species, leaves being the most commonly utilized plant part at 33.30%, followed by roots at 13.00%. The majority of the collected species are native to Asia and they are perennial. Nine Least Concern (LC) species and two Near Threatened (NT) species were reported. The economical use of the collected climbers is pharmaceutical (66.70%), ornamental (16.70%), vegetables (11.10%), and vegetables and medicinal (5.60%). Overall, the study region is abundant in medicinal plants that play an important role in addressing numerous human and animal health issues. These climbers should undergo pharmacological assessments to determine their broader applicability for therapeutic purposes. Communities in the area could participate in the preservation and stewardship of plant resources along with their traditional knowledge.

1. Introduction

Novel chemical entities with advantageous pharmacological and therapeutic characteristics are derived from medicinal plants. These can be utilized directly, or their extracts have served as foundation material in the development of pharmaceutical drugs (Khan *et al.,* 2017). Numerous valuable species are often overlooked by individuals due to either a lack of awareness regarding their uses or more frequently, unawareness of their existence. For many years, medicinal plants have been employed to address various health issues, in rural communities and increasingly in urban settings across both developed and developing nations (Huai and Pei, 2002). Research and documentation of these plants have proven to be an effective method for comprehending how diverse indigenous populations engage with natural resources, especially for medicinal and pharmaceutical purposes (De-Albuquerque and Hanazaki, 2009). In India, there are roughly 54 million indigenous individuals belonging to various ethnic communities residing across diverse landscapes. The Botanical Survey of India states that out of around 18,000 species of angiosperms in the country, 8,000 are known to be medicinal plants, with many of them classified as climbers.

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According to estimates, 70% of Indians living in rural areas get their primary medical care from traditional plant-based therapies. This dependence on plants for medical purposes is in line with patterns commonly seen in the developing world, where between 65% and 80% of people utilize treatments made from medicinal plants. For ages, these botanical treasures have been crucial to the well-being of millions, offering holistic healing.Traditional Indian systems like Ayurveda, Siddha, and Unani harness native plants to address health concerns, emphasizing bodily balance (Sen *et al.*, 2011). Ayurveda, for example, focuses on doshas (Vata, Pitta, Kapha), using medicinal plants to harmonize these elements for wellness. In the contemporary era, medicinal plants maintain significance in scientific research and pharmaceutical development (Dubey *et al.*, 2004).

Tamil Nadu boasts a diverse range of plant life, representing almost one-third of India's total flora. The state is home to 5547 taxa, comprising 5239 species, 72 subspecies, and 548 varieties, distributed across 231 families within 1668 genera, including 212 taxa that are unique to the state (Irwin *et al.,* 2015). Furthermore, Tamil Nadu has a significant collection of medicinal plants, which face numerous threats. Among the 119 medicinal plants that are red-listed, 27 species have been assigned a global Red List (RL) status. Fourteen species are classified as Critically Endangered (CR), 27 species are categorized as Endangered (EN), 31 species are identified as Vulnerable (VU), and 10 species fall under Near Threatened (NT). According to Karuppusamy (2018), 18 of these red-listed medicinal plant species are involved in national level high-volume trade.

The Chengalpattu District in Tamil Nadu is home to a diverse range of biodiversity, despite undergoing rapid urban development. The forest areas in this District include Nanmangalam, Vallam, Tirukkazhukkunram, Thirutheri, and Angûr. There has been colossal exploitation of the natural medicinal flora from the forest area by the local traditional healers and tribals to meet the rising demand for herbal drugs to treat various diseases. In contrast to herbs and shrubs, climbing plants are at a higher risk of extinction due to their dependence on support structures and their method of cross-pollination. Although, Nehru *et al.* (2012) conducted a study of the Nanmangalam Reserve Forest (NRF) in Chengalpattu District, documenting 313 genera and 449 species of angiosperms across 83 families, there is still a need for further exploration of the District's natural resources.

Climbers are characterized as plants that do not derive all their structural support from their own tissues, which originate from the soil or a surface close to the ground, and whose climbing activities can elevate their leaves and flowering parts into the tree tops (Burnham, 2009). Numerous climbers hold medicinal value and are utilized as herbal treatments within traditional Indian medical systems, such as Ayurveda, Siddha, and Unani (Mazid *et al.,* 2012). Various bioactive phytochemicals extracted from different sections of these plants are utilized in medicine, either independently or in combination with other substances. Regrettably, a significant number of these plants face the risk of extinction due to habitat loss and over exploitation, making conservation measures essential for their long-term survival (Deepa *et al.*, 2020).

Ethnobotanical knowledge has served as a foundation for many effective drug screening studies (Ralte *et al.*, 2024). Research in ethnobotany can facilitate the discovery of new therapeutic plants and aid in the creation of innovative drug compounds derived from herbs (Heinrich, 2013). Societies are increasingly turning from synthetic medications to herbal treatments in a trend of returning to natural remedies (Srinivasan *et al.,* 2022). The documentation of the uses of herbs and the traditional native names of plants offers significant potential social advantages. At present, indigenous cultures and their medicinal wisdom are fading away due to technological advances (Bagci, 2000; Fabricant and Farnsworth, 2001). Hence, the present study aims to document the ethnomedicinal climber species in Chengalpattu District of Tamil Nadu, which is important for the conservation of biological resources as well as for the discovery of new drug formulations and their sustainable utilization.

2. Materials and Methods

2.1 Study area

The Chengalpattu District is one of Tamil Nadu's 38 Districts, located in India. This District is positioned on the northeast coast of Tamil Nadu, covering a total geographical area of 2,945 square kilometers. It is bordered to the north by Chennai District, to the west by Kancheepuram and Thiruvanamalai District, and to the south by Vilupuram District. The District has a coastline that stretches for 57 kilometers, lying adjacent to the Bay of Bengal on the east. Chengalpattu experiences a tropical wet and dry climate.

The coordinates for Chengalpattu, Tamil Nadu, India are 12.693933 latitude and 79.975662 longitude. Situated in the country of India, Chengalpattu is categorized under cities, with geographic coordinates of 12° 41' 38.1588" N and 79° 58' 32.3832" E. Among the eight smaller administrative blocks of Chengalpattu District, the survey of medicinal climbers was done in Acharapakkam, Chithamur, Kattankolathur, Lathur, and Madurantakam (Figure 1).

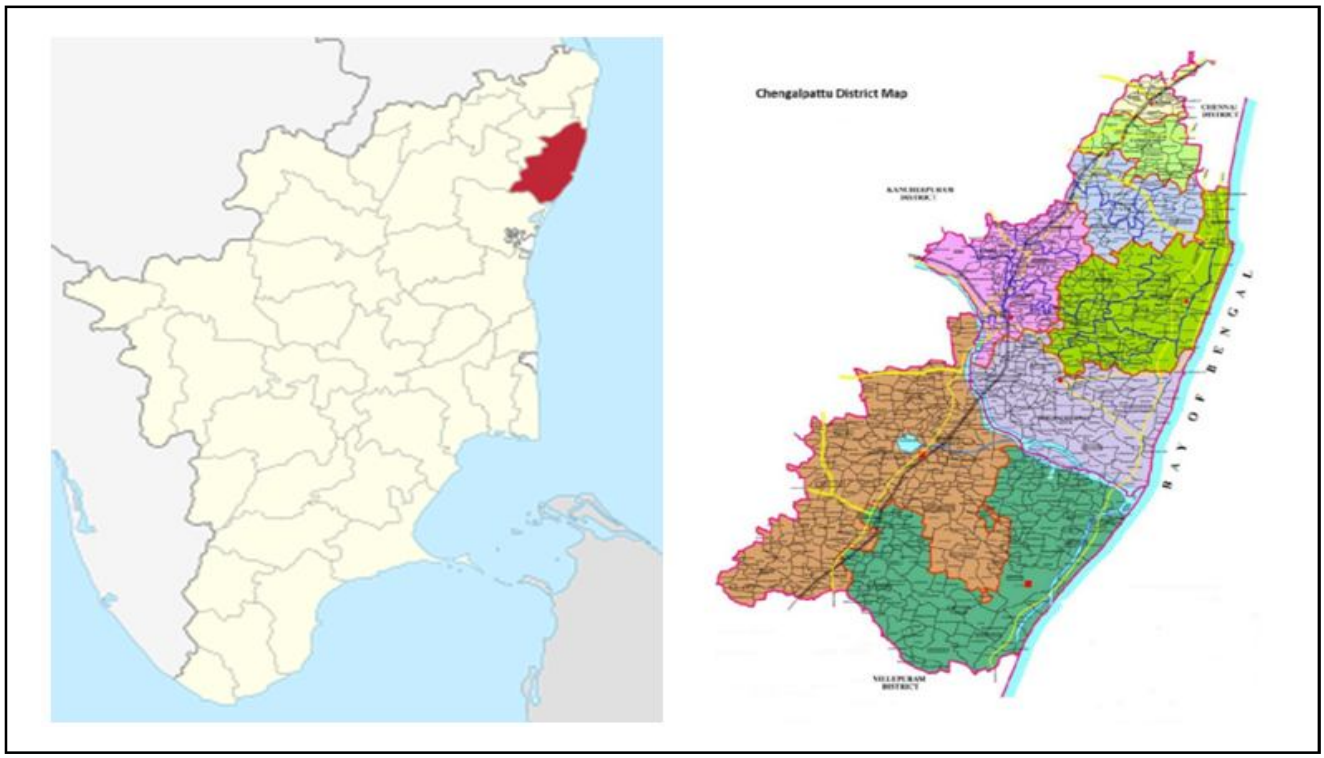

Figure 1: Map showing the study area.

2.2 Data collection

Frequent field surveys were undertaken between January, 2024 to October, 2024 in the five blocks of Chengalpattu District, *viz*., Acharapakkam, Chithamur, Kattankolathur, Lathur, and Madurantakam. The study was focused on collecting data and a floristic inventory was recorded of all plant species in the study area. Data were collected by using semi-structured interviews, group discussions, and guided field walks. The results were tabulated with a common name, family, origin, economic part, habit, IUCN status, and economic use.

2.3 Preservation of plant materials

The voucher plant specimens collected from the field were prepared in the herbarium and are preserved in the Department of Floriculture and Landscape Architecture, SRM College of Agricultural Sciences, Chengalpattu.

2.4 Identification of plant species

The species identity was also verified with the help of regional and national floras, monographs, and revisions (Gamble and Fischer, 1915-1936; Sasidharan, 2004). The nomenclature of the plant species was verified using the Kew website, The Plant List 2010 online. Additionally, the IUCN threat category for the plant species was confirmed through the IUCN website.

3. Results

In this research, an ethnobotanical survey was conducted in the Chengalpattu District of Tamil Nadu, India. The findings regarding the medicinal climbing plants, their botanical families, the parts used, their medicinal applications, and their IUCN diversity status are presented in Table 1a and 1b. A total of 54 climbing species were gathered from the study area, representing 41 genera across 27 families (Figure 2).

Table 1a: Enumeration of different climbing plants collected at Chengalpattu District

S.No.	Scientific name	Common name	Family	Native	Botany
1	*Abrus precatorius* L.	Indian wild liquorice	Leguminosae	India	Perennial climber
2	*Allamanda cathartica* L.	Golden trumpet vine	Apocynaceae	Brazil	Perennial climber
3	*Antigonon leptopus* Hook. & Arn.	Coral vine	Polygonaceae	Mexico	Perennial climber
4	*Aristolochia indica* L.	Garudakkodi/Eswaramooli	Aristolochiaceae	India	Perennial climber
5	*Asparagus racemosus* Willd.	Thanneervittankizhangu/ Shatavari	Asparagaceae	India, Africa	Woody perennial climber
6	*Basella alba* L.	Malabar spinach	Basellaceae	India and Indonesia	Perennialtwiner
7	*Basella rubra* L.	Indian spinach	Basellaceae	India	Perennialtwiner
8	*Bougainvillea spectabilis* Willd.	Paper flower	Nyctaginaceae	South America	Climbing shrub
9	*Caesalpinia bonduc* (L.) Roxb.	Fever nut	Caesalpiniaceae	India	Scandent shrub
10	*Cardiospermum halicacabum* L.	Ballon vine/ Mudakathan	Sapindaceae	Subtropical and tropical America	Perennial vine
11	*Cayratia trifolia* (L.) Domin.	Fox grape	Vitaceae	India, Asia and Australia	Climbing shrub
12	*Cissus elongata* Roxb.	Five-finger Wild grape	Vitaceae	Asia	Perennial vine
13	*Cissus quadrangularis* L.	Adamant creeper/Pirandai	Vitaceae	Asia, Africa	Perennial vine
14	*Cissus quadrangularis* L.	Urutupirandai	Vitaceae	Asia, Africa	Perennial vine
15	*Cissus rotundifolia* Bl.	Ilaipirandai	Vitaceae	Eastern Africa and the Middle East	Perennial vine
16	*Cissus vitiginea* L.	South Indian treebine /Cempirandai	Vitaceae	India to Myanmar, Sri Lanka	Perennial vine
17	*Clitoria ternatea* L.	Butterfly pea	Fabaceae	Tropical Asia	Perennial vine
18	*Coccinia grandis* (L.) Voigt	Tindora/Kovaikkai	Cucurbitaceae	Tropical Asia, Africa, and Oceania	Perennial vine
19	*Cocculus hirsutus* (L.) Diels	Broom creeper /Sirukattukodi	Menispermaceae	South East Asia	Straggling shrub
20	*Combretum indicum* (L.) DeFilipps	Rangoon creeper	Combretaceae	India	Woody climber
21	*Cryptostegia grandiflora* Roxb. ex R.Br.	Rubber vine	Apocynaceae	Madagascar	Woodyperennial vine
22	*Cucumis maderaspatanus* L.	Muchumuchukkai	Cucurbitaceae	Tropical Africa	Climbing annual

23	*Dioscorea alata* L.	Medicinal dioscorea /Peruvallikizhangu	Dioscoreaceae	Southeast Asia	Perennial climber
24	*Dioscorea bulbifera* L.	Air potato	Dioscoreaceae	Africa, Asia and northern Australia	Perennial vine
25	*Diplocyclos palmatus* (L.) C.Jeffrey	Striped cucumber/ Aivirali	Cucurbitaceae	Tropical and subtropical Asia	Perennial climber
26	*Epipremnum aureum* (Linden & André) G.S.Bunting	Goldon pothos	Araceae	Solomon Islands	Herbaceous climber
27	*Gloriosa superba* L.	Glory lily	Colchicaceae	Africa and Asia	Herbaceous perennial
28	*Gymnema sylvestre* (Retz.) R.Br. ex Sm.	Madhunashini	Asclepiadaceae	India, Africa, Australia	Twining subshrubs
29	*Hemidesmus indicus* (L.) R.Br.	Nannaari/Indian sarsaparilla	Asclepiadaceae	India	Prostrate or semi-erect climber
30	*Ipomoea obscura* (L.) Ker Gw.	Nallapachai	Convolvulaceae	Tropical Africa	Twining herbaceo-us climber
31	*Ipomoea pes-tigridis* L.	Tiger foot ipomoea	Convolvulaceae	Asia, Africa, and New Guinea	Herbaceous twinner
32	*Jasminum angustifolium* (L.) Willd.	Kattumalli	Oleaceae	Sri Lanka and India	Scrambling shrub
33	*Jasminum grandiflorum* L.	Spanish jasmine/Pitchi	Oleaceae	South Africa	Climbing shrub
34	*Momordica cymbalaria* Hook F. (MC)	Athalakkai	Cucurbitaceae	Tropical Africa, Pakistan to India	Perennial herba-ceous climber
35	*Mucuna pruriens* (L.) DC.	Poonaikkaali	Fabaceae	Africa and tropical Asia	Annual climber
36	*Operculina turpethum* (L.) Silva Manso	Indian jalap	Convolvulaceae	Africa and Asia	Perennial twinner
37	*Oxystelma secamone* (L.) H.Karst.	Ucippalai	Apocynaceae	South East Asia	Herbaceous twinner
38	*Passiflora foetida* L.	Siruppunaikkali	Passifloraceae	Southwestern United States	Perennial herbaceous climber
39	*Pentatropis capensis* (L.f.) Bullock	Irkolli/ Uppili	Apocynaceae	India	Climbing subshrub
40	*Pergularia daemia* (Forssk.) Chiov.	Velipparuthi	Asclepiadaceae	India	Perennial twining herb
41	*Piper betle* L.	Betel vine, Vetrilai	Piperaceae	Southeast Asia	Perennial vine
42	*Piper longum* L.	Long pepper	Piperaceae	India	Perennial vine
43	*Piper nigrum* L.	Black pepper	Piperaceae	Southern India	Perennial vine
44	*Plumbago auriculata* Lam.	Leadwort/Nilaccittiramulam	Plumbaginaceae	South East Asia	Woody scrambler
45	*Plumbago indica* L.	Venkodivelli/Indian leadwort	Plumbaginaceae	South East Asia	Woody scrambler
46	*Plumbago zeylanica* L.	Venkodivelli/Leadwort	Plumbaginaceae	South East Asia	Woody scrambler
47	*Sarcostemma acidum* (Roxb.) Voigt	Kodikkalli	Asclepiadaceae	India	Perennial twiner
48	*Smilax aspera* L.	Rough bind weed	Smilacaceae	Mediterranean region	Perennial climber
49	*Solanum trilobatum* L.	Thoothuvalai	Solanaceae	Southeast Asia	Perennial straggler
50	*Tiliacora racemosa* Colebr.	Perunkattukkoti	Menispermaceae	Africa, Asia and Australia	Climbing shrub
51	*Tinospora cordifolia* (Willd.) Hook.f. & Thomson	Seenthilkodi	Menispermaceae	India	Climbing shrub
52	*Vernonia elaeagnifolia* DC.	Curtain creeper	Asteraceae	Burma, India	Evergreen vine
53	*Wattakaka volubilis* (L. fil.) Stapf.	Perunkurinchan	Asclepiadaceae	Pakistan, China	Woody climber
54	*Ziziphus oenoplia* (L.) Mill	Jackal jujube	Rhamnaceae	Tropical Asia	Scrambling shrub

Table 1b: Conservation status, economic part and uses of the collected medicinal climbers

S.No.	Scientific name	Conservation status	Economic use	Economic part	Medicinal uses
1	*Abrus precatorius* L.	Not assessed	Medicinal	Seed	Abortifacient
2	*Allamanda cathartica* L.	Not assessed	Ornamental	Leaves	Antiinflammatory
3	*Antigonon leptopus* Hook. & Arn.	Not assessed	Ornamental	Leaves and flowers	Antidiabetic
4	*Aristolochia indica* L.	Not assessed	Medicinal	Leaves	Antiinflammatory
5	*Asparagus racemosus* Willd.	Not assessed	Medicinal	Root	Nervine tonic
6	*Basella alba* L.	Not assessed	Vegetable	Leaves	Demulcent
7	*Basella rubra* L.	Not assessed	Vegetable	Leaves	Demulcent
8	*Bougainvillea spectabilis* Willd.	Not assessed	Ornamental	Leaves	Antidiabetic
9	*Caesalpinia bonduc* (L.)Roxb. ·	Least concern (LC)	Medicinal	Fruit	Antipyretic
10	*Cardiospermum halicacabum* L.	Least concern (LC)	Vegetable and medicinal	Leaves	Rheumatism
11	*Cayratia trifolia* (L.) Domin.	Not assessed	Medicinal	Whole plant	Diuretic
12	*Cissus elongata* Roxb.	Not assessed	Medicinal	Whole plant	Rheumatism
13	*Cissus quadrangularis* L.	Near Threatened (NT)	Vegetable and medicinal	Stem	Bone strength
14	*Cissus quadrangularis* L.	Near Threatened (NT)	Vegetable and medicinal	Stem	Bone strength
15	*Cissus rotundifolia* Bl.	Least concern (LC)	Medicinal	Leaves	Bone strength
16	*Cissus vitiginea* L.	Not assessed	Medicinal	Whole plant	Cure wounds
17	*Clitoria ternatea* L.	Not assessed	Medicinal	Root, seed	Diuretic
18	*Coccinia grandis* (L.) Voigt	Not assessed	Vegetable	Leaves and fruit	Jaundice
19	*Cocculus hirsutus* (L.) Diels	Not assessed	Medicinal	Root	Skin disease
20	*Combretum indicum* (L.) De Filipps	Not assessed	Ornamental	Leaves and fruit	Anthelmintic
21	*Cryptostegia grandiflora* Roxb. ex R.Br.	Not assessed	Ornamental	Leaves	Analgesics
22	*Cucumis maderaspatanus* L.	Not assessed	Medicinal	Leaves and fruit	Sudorific
23	*Dioscorea alata* L.	Not assessed	Vegetable	Tuber	Sex hormone
24	*Dioscorea bulbifera* L.	Not assessed	Vegetable	Tuber	Cancer
25	*Diplocyclos palmatus* (L.) C.Jeffrey	Not assessed	Medicinal	Fruit	Antioxidant
26	*Epipremnum aureum* (Linden & André) G.S.Bunting	Not assessed	Ornamental	Leaves	Antimicrobial
27	*Gloriosa superba* L.	Least Concern (LC)	Medicinal	Seed	Gout
28	*Gymnema sylvestre* (Retz.) R.Br. ex Sm.	Not assessed	Medicinal	Leaves	Antidiabetic
29	*Hemidesmus indicus* (L.) R.Br.	Not assessed	Medicinal	Root	Blood purifier
30	*Ipomoea obscura* (L.) Ker Gw.	Not assessed	Medicinal	Leaves	Wounds
31	*Ipomoea pes-tigridis* L.	Not assessed	Medicinal	Whole plant	Antihypertensive
32	*Jasminum angustifolium* (L.) Willd.	Not assessed	Ornamental	Leaves	Digestive disorders
33	*Jasminum grandiflorum* L.	Not assessed	Ornamental	Leaves and flowers	Antimicrobial
34	*Momordica cymbalaria* Hook F. (MC)	Not assessed	Vegetable	Fruit	Antidiabetic
35	*Mucuna pruriens* (L.) DC.	Not assessed	Medicinal	Seed	Parkinson disease

36	*Operculina turpethum* (L.) Silva Manso	Least Concern (LC)	Medicinal	Root	Scorpion sting and snake bite
37	*Oxystelma secamone* (L.) H.Karst.	Least Concern (LC)	Medicinal	Leaves	Diuretic
38	*Passiflora foetida* L.	Not assessed	Medicinal	Fruit	Antiinflammatory
39	*Pentatropis capensis* (L.f.) Bullock	Not assessed	Medicinal	Leaves	Antimicrobial
40	*Pergularia daemia* (Forssk.) Chiov.	Least Concern (LC)	Medicinal	Leaves	Diarrhea
41	*Piper betle* L.	Not assessed	Medicinal	Leaves	Antiseptic
42	*Piper longum* L.	Not assessed	Medicinal	Fruit	Asthma
43	*Piper nigrum* L.	Not assessed	Medicinal	Fruit	Antioxidant
44	*Plumbago auriculata* Lam.	Not assessed	Medicinal	Root	Leprosy
45	*Plumbago indica* L.	Not assessed	Medicinal	Root	Leprosy
46	*Plumbago zeylanica* L.	Not assessed	Medicinal	Root	Leprosy
47	*Sarcostemma acidum* (Roxb.) Voigt	Not assessed	Medicinal	Whole plant	Respiratory ailments
48	*Smilax aspera* L.	Least Concern (LC)	Medicinal	Roots and leaves	Demulcent
49	*Solanum trilobatum* L.	Not assessed	Medicinal	Leaves and fruit	Bronchitis
50	*Tiliacora racemosa* Colebr.	Not assessed	Medicinal	Leaves and bark	Antiinflammatory
51	*Tinospora cordifolia* (Willd.) Hook.f. & Thomson	Not assessed	Medicinal	Root, stemand Leaves	Jaundice
52	*Vernonia elaeagnifolia* DC.	Not assessed	Ornamental	Leaves	Cure malaria
53	*Wattakaka volubilis* (L. fil.) Stapf.	Not assessed	Medicinal	Leaves	Dyspepsia
54	*Ziziphus oenoplia* (L.) Mill	Least Concern (LC)	Medicinal	Fruit	Edible

Vitaceae is a prominent family of climbing medicinal plants, which has recorded six species, followed by Asclepiadaceae with five species, Cucurbitaceae and Apocynaceae with four species, Convolvulaceae, Piperaceae, Plumbaginaceae and Menispermaceae with three species and Basellaceae, Oleaceae, Dioscoreaceae, and Fabaceae with two species each and remaining families,*viz*, Nyctaginaceae, Araceae, Aristolochiaceae, Asparagaceae, Asteraceae, Caesalpiniaceae, Colchicaceae, Combretaceae, Leguminosae, Passifloraceae, Polygonaceae, Rhamnaceae, Sapindaceae, Smilacaceae, and Solanaceae have single plant species (Figure 6).

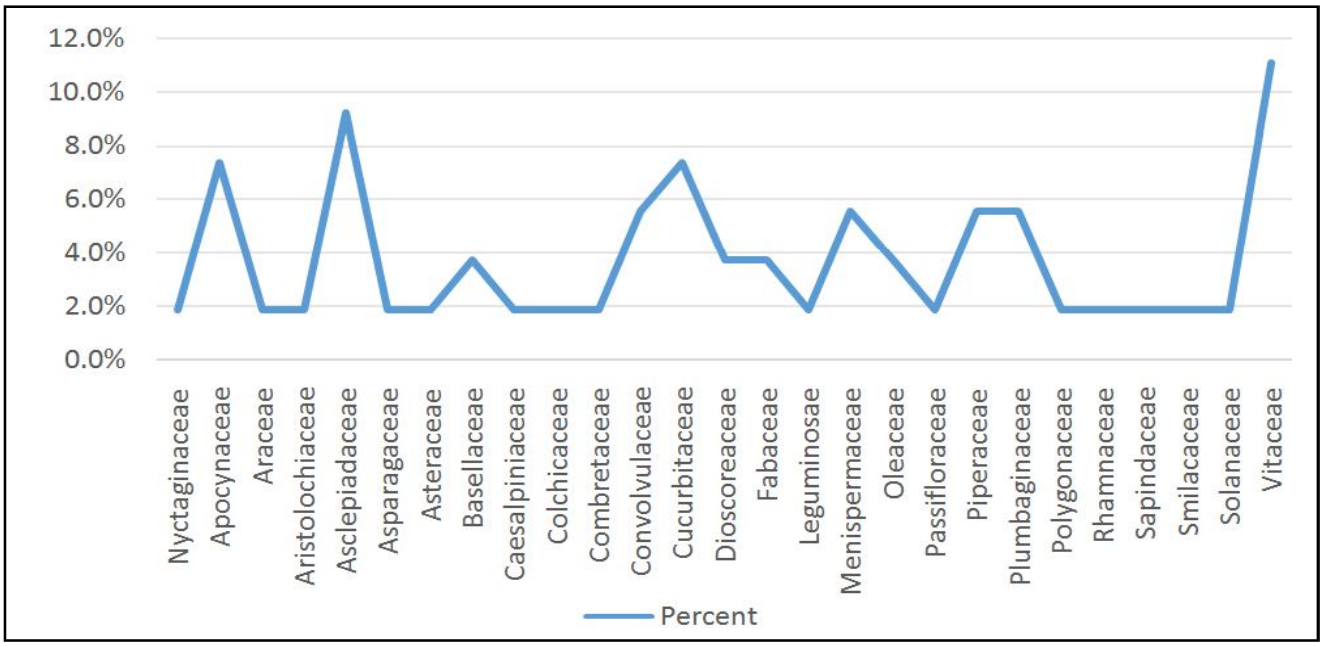

Figure 2: Species distribution of medicinal climbers among the families.

The plants recorded from the research area are classified based on their uses in Figure 3. It was demonstrated that the research area contains both medicinal and other economically important plants. Furthermore, a large proportion of the identified species from these families exhibit notable pharmaceutical properties (66.70%), while nine species are categorized as ornamental (16.70%), six species are used as vegetables (11.10%), and three species serve both as vegetables and medicinal (5.60%).

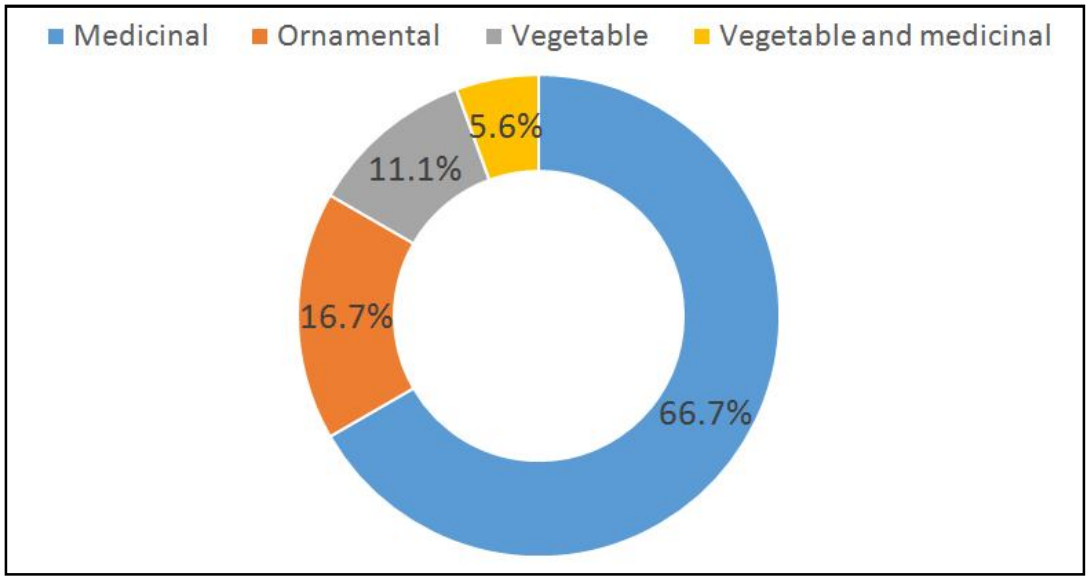

Figure 3: Economic uses of medicinal climbers.

The majority of the reported climbers (43 species) in this study are reported to be native to either Asia, India, South East Asia, or tropical Asia, while only 11 species are native to either Brazil, Africa, Mediterranean region, Mexico and Central America, Pakistan, China, Solomon Islands, Madagascar or America.

The IUCN Red List of Threatened Species serves as the international benchmark for evaluating the potential extinction risk that various species of animals, fungi, and plants encounter. The present author could collect nine Least Concern (LC) species and two Near Threatened (NT) species stated (Figure 4). *Caesalpinia bonduc* (L.) Roxb., *Cardiospermum halicacabum* L., *Cissus rotundifolia* Bl., *Gloriosa superba* L., *Oxystelma secamone* (L.) H.Karst., *Operculina turpethum* (L.) Silva Manso, *Pergularia daemia* (Forssk.) Chiov., *Smilax aspera* L. and *Ziziphus oenoplia* (L.) Mill Var. Pallets are under Least Concern (LC) and *Cissus quadrangularis* L. are under Near Threatened (NT) status at the global level (IUCN, 2015).

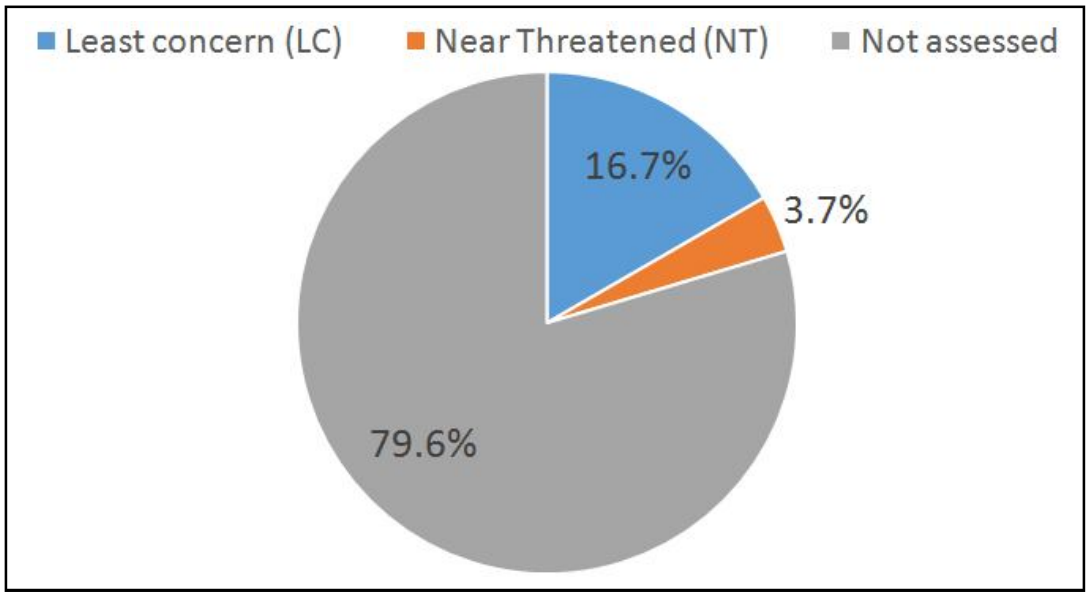

Figure 4: RET status of collected medicinal climbers.

Among the plant parts used, leaves are the most useful part of climbing medicinal species (33.30%), followed by roots (13.00%), fruits (13.00%), whole plant (9.30%), seed (5.60%), stem (3.70%), and bark (1.90%) (Figure 5).

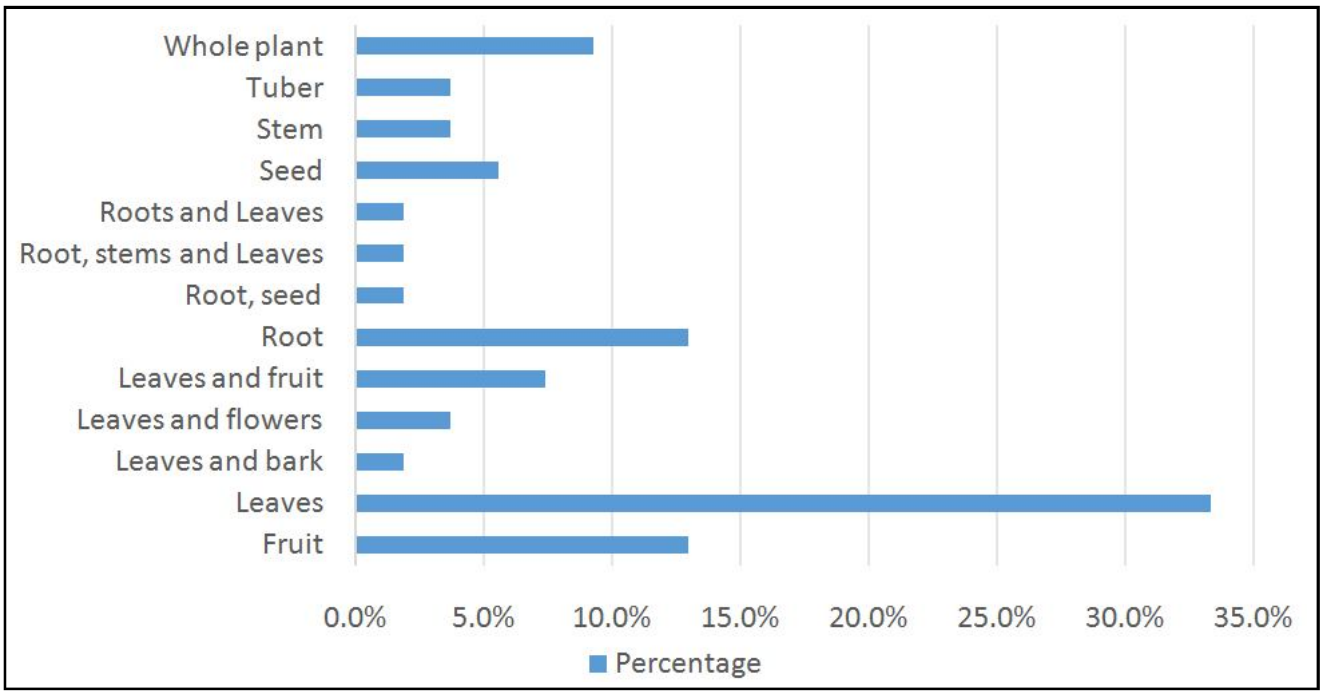

Figure 5: Economic part of the collected medicinal climbers.

Mucuna pruriens (L.) DC.

Tiliacora acuminata (Lam.) Hook. f. & Thoms.

Hemidesmus indicus (L.) R.Br.

Cissus rotundifolia Bl.

Gloriosa superba L.

Plumbago zeylanica L.

Tinospora cordifolia (Willd.) Hook.f. & Thomson

Diplocyclos palmatus (L.) C. Jeffrey.

Pergularia daemia (Forssk.) Chiov. | *Cardiospermum halicacabum* L. | *Wattakaka volubilis* (L. fil.) Stapf. | *Jasminum angustifolium* (L.) Willd.

Passiflora foetida L. | *Piper longum* L. | *Solanum trilobatum* L. | *Aristolochia indica* L.

Figure 6: Medicinal climbers collected during the study.

All 27 families were identified as contributing to different ethnobotanical resources utilized by the local community for addressing a variety of health issues like abortifacient, analgesics, anthelmintic, antidiabetic, antiinflammatory, antimicrobial, antioxidant, antipyretic, antiseptic, asthma, blood purifier, bone strength, bronchitis, cancer, malaria, demulcent, diarrhea, digestive disorders, diuretic, dyspepsia, gout, jaundice, leprosy, nervine tonic, parkinson disease, respiratory ailments, rheumatism, scorpion sting and snake bite, sex hormones, skin diseases, sudorific, wounds, *etc.*

4. Discussion

The traditional medicinal systems developed over the years within different communities continue to serve as a valuable repository of knowledge regarding herbal remedies (Mukherjee and Wahil, 2006). This rich heritage of knowledge pertaining to herbal medicines has traditionally been transmitted orally from one generation to the next, without any written records, and is still preserved by numerous indigenous groups globally (Samy and Ignacimuthu, 2000). The growing need for chemical variety in drug screening initiatives has led to an increased focus on natural products, particularly ethnomedicinal plants, which has gained worldwide interest (Saranraj and Sujitha, 2015).

In the present study, 54 climbing species belonging to 41 genera with 27 families were collected during the ethnobotanical survey in Chengalpattu District, Tamil Nadu, India. The prevalence of these families could be attributed to their plentifulness and ease of access in the research area. Kolar *et al.* (2021) also reported the occurrence of species belonging to Cucurbitaceae (*Coccinia grandis* (L.) Voigt, *Mukia maderaspatana* (L.) M. Roem.), Solanaceae (*Solanum trilobatum* L.), Apocynaceae (*Hemidesmus indicus* (L.) R. Br.), Fabaceae (*Abrus precatorius* L., *Clitoria ternatea* L.), Menispermaceae (*Tinospora cordifolia* (Willd.) Miers.), Passifloraceae (*Passiflora foetida* L.) in ethnobotanical study in Chengalpattu District.

The study revealed that the area is home to both medicinal and other economically valuable plants. Additionally, most of the species noted from these families exhibit important pharmaceutical characteristics, mirroring the findings of Rahman and Keya (2014) and Gowramma *et al.* (2020). Many researchers has documented the pharmaceutical properties of medicinal climbers like *Clitoria ternatea* L. (Gobika *et al.*, 2024), *Cissus quadrangularis* L. (Singh *et al.*, 2024), *Mukia maderaspatana* L. (Mohammad *et al.,* 2024), *Piper nigrum* L. (Vasantharaj *et al*., 2024), *Ipomoea pes-tigridis* L. (Sameemabegum *et al.,* 2023 and Rajni *et al.,* 2023).

Among the 43 climbing species, 74 % are native to Southeast Asia, with India being the region that hosts the highest number of endemic climbers, highlighting their ecological importance. The study by Pandi *et al.* (2022) aligns with these findings, indicating that of the 2,624 climbing species in India, 20 % are native to the country, particularly in the Western Ghats and Eastern Himalayas, reinforcing their ecological importance.

The IUCN Red List of Threatened Species serves as the worldwide benchmark for evaluating the extinction risk that various species of animals, fungi, and plants encounter. The species ranked as Least

Concern and Near Threatened by IUCN are most likely to be lost due to habitat destruction, over-exploitation, alien flora, *etc*. Further, these plants are to be recognized separately for their proper *in situ* or *ex situ* conservation (Balakrishnan *et al.,* 2009) and studied for commercial cultivation similar to *Gloriosa superba* (Anandhi *et al.,* 2013).

Among the various parts of plants utilized, leaves are the most commonly employed part due to their capacity to store significant amounts of chemical compounds produced during photosynthesis, which enhances the concentration of active ingredients (Guevara and Garcia, 2018). The formation of numerous secondary metabolites takes place in the leaves of plants, which accounts for their prevalent use as compared to other plant parts (Hamel *et al.,*2018). Additionally, utilizing leaves is a sustainable method in the long run and promotes a healthier ecological balance relative to the collection of other parts such as roots, which can lead to the species' extinction (Khan *et al.,* 2014). Therefore, the use of leaves for medicinal purposes aids in conservation efforts and also encourages sustainable harvesting practices while preserving biodiversity and ecological balance.

It became apparent that each of the 27 families contributed to the ethnobotanical values that the locals utilized to treat various illnesses. The medical applications of the plant specimens and the conditions for which they were employed are cross-checked (Verma *et al.,* 2015). In order to create and characterize new natural medications with improved screening techniques from these prospective plants, more advanced research is needed.

5. Conclusion

This ethnobotanical survey has confirmed the existence of numerous medicinal climbers of pharmaceutical importance. In pharmacologically uncharted regions of India, these plants can be employed as medications that could improve human health. The importance of ethnobotanical information to start the process of finding new drugs. Effective *in situ* or *ex situ* conservation techniques should be used to preserve the endangered plants. Traditional knowledge is not passed on to the next generation of tribal people because the younger generation is uninterested in it. According to the current study, medicinal plants continue to be essential to people's basic healthcare.

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Conflict of interest

The authors declare no conflict of interest relevant to this article.

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