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Systematic survey and Ethnomedico of climbing species in the Sadhuragiri hills southern Western Ghats of India

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Abstract
Systematic surveys of climbing plants were investigated in the Sadhuragiri hills in the Southern Western Ghats of Tamil Nadu. Although, inventory and the study is primarily based on field surveys conducted throughout the hills, where native provided information on plant species used as medicine and the mechanisms of climbing of the climbers were studied. Several field trips were carried out in Sadhuragiri hills between Jan 2015 and March – 2016, Covering different seasons, in order to know the phenology of the plants and Intensive and extensive field surveys were made in Sadhuragiri hills and villages in Virudhunagar and Theni district *viz*. The data were collected through repeated field visits and the careful interaction with the village people and Paliyar tribes. A total of 102 plant species belonging to 59 genera comprising 28 families were identified. Convolvulaceae (13 species) the most species-rich plant families of climbers followed by Fabaceae (12 species), Oleaceae (11 species), Cucurbitaceae and Vitaceae each (7 species). Stem twinning formed the bulk (39%) of predominant climbing mechanism Twiners climber types followed by Tendril Climber (19%); Hook Climber (7%) and Prostrate Climber (7%); while root climbers were rare (2%). The Paliyar tribes are the main natives of these forests. During this survey documenting some climbing species used by tribes and rural peoples for all kinds of medicine and food additives were documented. This preliminary study focused on documenting most of the climbers used by the *Paliyars* tribes and rural communities in the southern Western Ghats of Tamil Nadu to facilitate conservation effort. There is a need to document the threats to local deciduous forests due to invasive climbers with increasing biotic interference and climatic change.

Keywords: inventory, medicinal, climbers, *Paliyars* tribe, western ghats, India

1. Introduction
Climbers are rooted in the ground but need support for their weak stems. They not only form an important structural component but also play an important ecological role in the forest dynamics and nutrient recycling within these ecosystems. However, in many forest inventories during the last decades, lianas are ignored in contrast to herb, shrubs and trees [1]. The overall low attention to lianas is most probably due to their low microeconomic importance. Also difficulties in delimiting individuals overall lower minimum size limit in enumerations and general lack of taxonomic studies resulted in the exclusion of lianas in many inventories. Climbers are the most threatened group of plants because they are first to be decimated in a silviculturally managed forest [2].
Climbers contribute substantially to the floristic, structural and functional diversity of tropical forests [3-8]. Where they can compete with other vegetation. For example, they compete with trees for both above and below-ground resources, considerably decreasing the growth rates, retarding regeneration of tree seedlings and saplings, and increasing the number of trees damaged and killed in tree falls [9-13]. Climbers can also have positive effects on forests, providing valuable food resources, habitat, and connections among tree canopies that are used as pathways by arboreal animals [14, 15]. Climbers may also play a role at the ecosystem level by contributing to the carbon budget of tropical forests, representing as much as 10% of fresh aboveground biomass [6].
Climbers play important ecological roles in the forest ecosystem dynamics and functioning [16, 17]. They contribute substantially to canopy closure after tree fall and help stabilize the microclimate underneath [18]. Lianas in particular add considerably to forest plant diversity and provide valuable habitat and connections among tree canopies that enable arboreal animals to traverse the tree tops [19]. The contribution of lianas to species richness of tropical forests can be impressively as high as 31% [20] lianas contribute substantially to the forest structure, the contribution of vines is only negligible due to the small number of species composing it [21]
Lianas are now increasing in tropical forest as a result of the recent climatologically trends and they higher frequency of lianas is not only caused by declining rainfall [22] but also by several other factors known to favour them such as an increase in disturbance [23-27] and an especially high responsiveness to elevated CO_2 [25, 26]. Climbing plants that germinate on the floor of the forest and grow, at least for part of their life, or when the forest closes up around them, by winding around, leaning on, or anchoring or adhering to other plants [28] to attain great stature [29].
They occur in many plant families with only a few families such as Dioscoreaceae, Cucurbitaceae and Convolvulaceae consisting completely of climbing plants. In Ghana, out of the 125 families of vascular plants in the forest flora, 66 have climbing species [29]. The most species rich climber families are Rubiaceae, Leguminosae, Celestraceae and Apocynaceae,

with each family containing more than 50 climber species.[7,18] Climbing plants also show great diversity in their climbing mechanisms [30, 28]. These include stem twiners, branch twiners, root/adhesive climbers, tendril climbers, scramblers and hook/thorn climbers.

Climbing or veining habit is a wonderful example of economy of nature. It allows a plant to attain maximum exposure to sunlight; water and nutrients with minimum expense in vegetation support. Climbers are also used by local people in many different ways. They may be especially important in remote areas where regular modern western medicines and various other products are not easily available and accessible. [31] Climbers form an essential part of the diet of many animals in times of scarcity of flowers and fruits [32]. This is critical for the survival of trees as many of these animals are essential for dispersal of trees seeds [33], including the majority of commercially interesting species [34]. In recent years some workers [35-46] have studied in various areas of climbers. However, no work has been attempted so far to ascertain the Systematic survey of climbers. The present study has been undertaken with the aim of recording the server details survey of climbers and utilization of Paliyar tribal and rural people of Sadhuragiri hills, Southern Western Ghats of India.

2. Materials and Methods

2.1 Study area

Sadhuragiri hills are situated in a part of Southern Western Ghats comes under The Srivilliputhur Grizzled Squirrel Wildlife Sanctuary Srivilliputhur talk, Virudhunagar district. Sadhuragiri is at 1200 meters (3,937.0 ft) mountain in the part of Western Ghats of South India. It lies between 9º. 42´- 9 º.44" West latitude and between 77 º.37 - 77 º. - 41" East longitude and it has an elevation of 881 meters above sea level. Sadhuragiri hills a Tropical, Semi evergreen and Mixed deciduous forest, only Hindu Paliyar tribes residing in this region (Figure: 1a).

Fig 1: View of the study region

2.2 Methods

Several field trips were carried out in Sadhuragiri hills between Jan 2015 and March – 2016, Covering different seasons, in order to know the phenology of the plants and Intensive and extensive field surveys were made in Sadhuragiri hills and villages in Virudhunagar and Theni district *viz*. The data were collected through repeated field visits and the careful interaction with the village people and Paliyar tribes. The collected specimens were identified taxonomically with the help of available Monographs, taxonomic revisions and floras and by using field keys [47-50]. Ethenomedicine information was gathered from all categories of village people such as the local healers' village leaders' elderly persons and paliyar tribes and the person having a through knowledge of enumeration, utilization, economic and distribution of climbing plants. The information gathered from one place was confirmed by different communities of village people, Paliyar tribals in different places of investigation. The collected plants specimens were deposited in the Department of Botany, National College (Autonomous), Tiruchirappalli, Tamil Nadu for future reference.

2.3 Paliyar Tribals

The indigenous people of the study area are called Paliyar/Paliyan. They are found in the hilly regions of Madurai, Dindigul, Theni, Thirunelveli, and Virudhunagar districts. It is belived that paliyars are indigenous people of Palani hills (Situated near to Kodaikanal a famous tourist place). In the Palani hills they are found at an altitude of up to 2200m. Generally Paliyars are illiterate and they speak Tamil (Mother tongue of Tamil Nadu). Paliyars when compared to various tribal communities in Tamil Nadu constitute relatively a small group.

Paliyars can be grouped into three categories based on their life styles, namely, Nomadic, Seminomadic and Settled Nomadic Paliyars don't built houses, they live temporarily in rock caves called "Pudai" Semi nomadic Paliyar build temporary house and confine themselves to small territories most of their huts are dark with no window or any other opening to admit air. Settled Paliyars are almost urbanized and live as agricultural laborers. Importance of traditional and folk medicine in the treatment of various human ailments is well recognized amongst these people [51]. (Figure: 1b).

Fig 1.b: Author Interview with Paliyar's Tribes

3. Results and Discussion

The field expeditions of Sadhuragiri hills of wild vegetations gave us interesting results concerning floristic diversity and its contribution to the economic utility of the study area. The extensive and intensive field trips were conducted from Jan. 2015 - Sep.2016. A total of 102 angiosperm climbing plants belonging to 59 genera under 28 families were collected from the study site [28]. reported 746 species of climbers in Upper Guinean forests and the total number of climbing plant species that are found in Puerto Rico and the Virgin Islands amounts

to 386 [52-53] has reported to 175 climbers in Eastern Ghats of Tamil Nadu and Total of 156 climbing species and intraspecific taxa with vernaculars, mode of climbing medicinal and economical uses are documented for Southern Western Ghats Coimbatore District in Tamil Nadu [2].

The most species families in our sites include Convolvulaceae (14 Sps) the most dominant family, followed by Oleaceae (13 Sps), Fabaceae (12 Sps), Cucurbitaceae (7 Sps), Vitaceae (7 Sps), Asclepiadaceae (6 Sps), Aristolochiaceae (4 Sps), Mimosacae (4 Sps), Passifloraceae (4 Sps), Apocynaceae (3 Sps), Capparidaceae (3 Sps), Liliaceae (3 Sps), Menispermaceae (3 Sps), Rhamnaceae (3 Sps), Piperaceae (2 Sps), Ranunculaceae (2 Sps), Rutaceae (2 Sps), Sapindaceae (2 Sps), Smilacaceae (2 Sps). Rests of the families are represented by single species. The most abundant climbing species include the thorny stragglers *Pterolobium hexapetalum*, *Acacia caesia* Willd. *Lantana camara*, *Ziziphus oenoplia*, *Abrus precatorius* L., *Asparagus asiaticus* L., *Capparis zeylanica* L. etc. The rare taxa include *Aristolochia tagala* Lam., *Piper longum* L., *Smilax wightii* AD., *Gloriosa superba* L. (Endangered), *Grewia heterotricha* Mast., *Passiflora lascenaultii* DC. (Endemic to Western Ghats) all of which occurs as one or two specimen in the study area (Fig: 2).

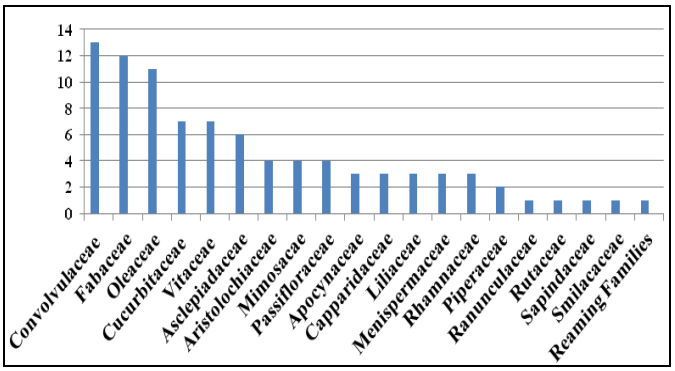

Fig 2: Family wise distributions of climbers

The enumerated climbing plants were classified into woody vines, the lianas and herbaceous vines. Six climbing modes of climbers were recognized (Stem twiner, Hook climber; Tendril climber; Root climber; Straggler): Twining Climber (39%) followed by Woody Climber (27%); Tendril Climber (19%); Hook Climber (7%); Prostrate Climber (7%); WV-Woody vines (3%); Herbaceous vines (2%) and Root Climber (2%) (Fig: 3). The climbing plants were classified into woody vines, the lianas (145 species) and herbaceous vines (30 species). Six climbing modes of lianas were recognized: stem twiners (46 %) followed by stragglers-armed (22 %), stragglers unarmed (17 %), tendril climbers (13 %), root climbers (1 %) and hook climber (0.5 %). Only one climbing mode, the grapnel-like climber (rattans) which was reported from Indian Western Ghats sites [54-56].

Most economic appraisals of tropical forests focus on timber as the major product. Large number of forest species provides a large variety of non-timber products that are used by millions of people around the world. A non-timber forest product includes all wild animal and plant products that are harvested from natural and planted forests. Climbers are used by local people in many different ways. The principle uses of lianas *viz.* medicine, food and artisan work construction of traditional houses, etc. It is clear that climbers are an important resource for local communities, particularly for medicinal reasons.

Most commonly used medicinal climbers viz., *Abrus precatorius* L. (Sexual disorders); *Aganosoma cymosa* G. Don. (Anthelmintic); *Aristolochia indica* L.(snake bites); *Asparagus racemosus* Willd. *Ceropegia juncea* Roxb. (Stomach problems); *Cissus quadrangularis* L.(Bone fractures), *Gloriosa superba* L. (Poisonous bite); *Gymnema sylvestre* R. Br. *ex.* Such., *Ichnocarpus frutescens* (L.) W.T.Aiton (Diabetes); *Merrimea quinquefolia* R. Br. *Naravelia zeylanica* (L.) DC. (Malaria, cuts and wounds); *Piper nigrum* L.(Asthma, fever and Cough), *Tinospora cordifolia* (Thunb.) Miers. (Rheumatism and urinary diseases), *Ipomoea staphylina* Roem. & Sch. *Jasminum wightii* Clark etc., which play an important role in the primary healthcare system of tribal community, *Paliyar*, who are residing in the study area. They are using these plants to cure diseases like skin diseases, cough, fever, ulcer, dysentery, headache, diabetes, rheumatism, dysentery, asthma, and poisonous bites.

It is evident from the study that, different plant parts of climbers were used as medicines, in which the leaves are most widely used for the treatment of ailments followed by Roots (18%), Fruits (12%), Seeds (12%), Flowers (11%), Whole plant (4%), Steam, Bark and Tuber (2%) each; Rhizome and Shoots (1%) each (Fig: 4). The document has reported 55 species belonging to 45 genera comprising 20 families of medicinally important climbers were identified.[2] *viz.*, *Passiflora edulis* Sims. *Citrullus lanatus* (Thunb.) Mat., *Momordica charantia* L., *Rhynchosia capitata* DC. And *Ziziphus oenoplia* (L.) Miller, *Passiflora subpeldata* L. which play an important role in primary healthcare system of tribal community Paliyar who are residing in the study region. The climber plants play a major role in the medical and healthcare needs of tribals people. This preliminary study focused on documenting most of the climbers used by the *Paliyar* community in Sadhuragiri hills in day to day life, a part of Western Ghats in Tamil Nadu to facilitate conservation efforts. However, destruction of habitat through deforestation and over exploitation for commercial purposes and changes in cultural attitude threatens to constrain many of these species into extinction.

Presently, many forest sites of southern Western Ghats are subjected to various anthropogenic pressures and the data of plant diversity, such as this on lianas will be useful in highlighting the importance of these forests in species conservation and forest management. Climbers contribute significantly to biodiversity and have high ecological significance in their respective ecosystems. They can constitute to the carbon budget of tropical forests with as much as 10% of fresh above-ground biomass. Therefore conserving the biodiversity of climber within their respective ecosystems is highly important for supporting healthy functioning of the forest ecosystems [6].

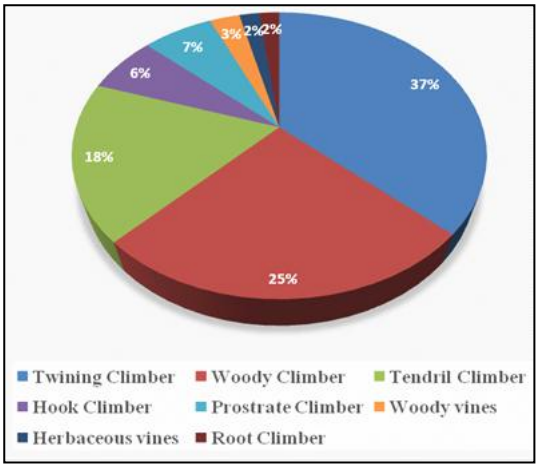

Fig 3: Habitat of different climbing plants of the study region

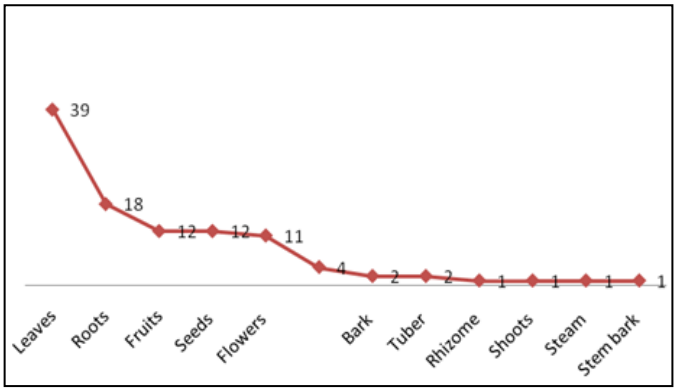

Fig 4: Parts wise used climbers in the study region

Table 1: List out Enumeration of climbers medicinal and their economic uses of Paliyar tribes in Sadhuragiri hills.

S. No.	Botanical Name	Family	Local Name	Mode of Climbing	Part used	Medicinal and Economic uses
1	*Abrus precatorius* Linn.	Fabaceae	Kundu Mani	HC	Seeds	Increase sperm count and stomach pain.
2	*Acacia caesia* Willd. Incha	Mimosaceae	Karuvalmkodi	WC	Stem bark	Cough and dysentery.
3	*Acacia sinuata* (Lour.) Merr. WV	Mimosacae	Siyakai	WC	Seeds	Used as shampoo
4	*Aerva scandens* Wall.	Amarathaceae	Kodokeera	TC	Leaves	Stomach ulcer
5	*Aganosoma cymosa* G. Don.	Asclepiadaceae	Seellakkodi	TC	Whole plant	Anthelmintic and ophthalmic.
6	*Ampelocissus tomentosa* (Heyne ex Roth) Planch	Vitaceae	Kattukodi	TLC	Leaves	Cutting wounds
7	*Argyreia involucrata* Cl.	Convolvulaceae	Kadalpala	WC	Latex	Heal crock
8	*Argyreia elliptica* (Roth) choisy.	Convolvulaceae	Thaalivendaankodi	TC	Leaves	Cure eye injuries and infections of cattle.
9	*Argyreia hirsuta* Wight & Arn.	Aristolochiaceae	Theathankodi	TC	Leaves	Cure headache, cold and fever.
10	*Aristolochia bracteolata* Lam.	Aristolochiaceae	Aaduthinnapaalai	TC	Whole plant	Dermatitis, allergic disorder, leprosy, jaundice.
11	*Aristolochia indica* L.	Aristolochiaceae	Isuramuli	TC	Leaves	Snake bite.
12	*Aristolochia tagala* Lam.	Aristolochiaceae	Aduthinnapuli	TC	Whole plant	Nose to cure, headache, cold and fever.
13	*Asparagus asiaticus* L.	Liliaceae	Thanneekizhangu	HC	Leaves	stomach ulcers and swellings
14	*Asparagus racemosus* Willd.	Liliaceae	Thanneervitankizhangu	HC	Tuber	A kidney disorder, increases milk secretion in nursing mothers and regulates sexual behaviors.
15	*Bauhinia vahlii* Wight & Arn.	Caesalpiniaceae	Kattumantharai	WC	Leaves	Dysentery
16	*Cardiospermum canescens* Wall.	Sapindaceae	Peareya mudakathan	TC	Leaves	Joint pain
17	*Capparis roxburghii* DC.	Capparidaceae	Thoratti	WC	Leaves	Wounds and cutting healing.
18	*Capparis sepiaria* L.	Capparidaceae	Karunjuri	WC	Leaves	Skin diseases
19	*Capparis zeylanica* L.	Capparidaceae	Adondai	WC	Roots	Snake bite and swelling
20	*Cardiospermum halicacabum* L.	Sapindaceae	Mudakathan	TC	Leaves	Diuretic, rheumatism and nervous disorders.
21	*Ceropegia juncea* Roxb.	Apocynaceae	Vaelipulichan	RC	Stem	Digestion and stomach problems.
22	*Cissus pallida* Planch.	Vitaceae	Kadukodi	TLC	Leaves	Skin diseases
23	*Cissus quadrangularis* L.	Vitaceae	Pirandai	TLC	Leaves	Wounds and bone fractures.
24	*Cissus rotundifolia* var.	Vitaceae	Puzhinarala	TLC		Used as ornamental purpose
25	*Cissus setosa* Roxb.	Vitaceae	Attallai	TlC	Leaves	Used for washing cattle and vessels
26	*Cissus trilobata* Lam. Vitaceae	Vitaceae	Neelachunnambuvalli	T LC	Shoots	Young shoot eatable and stomach pain
27	*Cissus vitiginea* L.	Vitaceae	Kattumunthri	T LC	Leaves	Wounds and cutting
28	*Citrullus lanatus* (Thunb.) Mat.	Cucurbitaceae	Thnnipallam	TLC	Fruits	Edible fruits
29	*Clematis gouriana* Roxb. ex DC.	Ranunculaceae	Nikidakodi	WV	Leaves	Skin disease
30	*Clitoria ternatea* L	Fabaceae	Sangupushapam	TC	Fruits	Insects and scorpion bites.
31	*Coccinia indica* W.	Cucurbitaceae	Kovaikai	TC	Leaves	Stomach internally for ulcer.
32	*Cocculus hirsutus* Diels.	Menispermaceae	Kattukkodi	TC	Leaves & root	Eczema, stomach problems and rheumatism.

33	*Cucumis trigonus* Roxb. C	Cucurbitaceae	Kattukumatti	TLC	Fruits	Antitussive, digestive, diuretic, febrifuge, stomachic and vermifuge.
34	*Cyclea peltata* (Lam.) Hook.f.	Menispermaceae	Sindiakodi	TC	Roots	Snake bite
35	*Deguelia timoriensis* (DC.) Taub.	Fabaceae	Anaikattinar	HC	Roots	Muscle pain
36	*Dioscorea oppositifolia* L.	Dioscoreaceae	Vallikilangu	TC	Roots	Chronic diarrhoea, asthma, dry coughs and diabetes.
37	*Entada scanotens* Spreng.	Mimosaceae	IrukkiKodi	WC	Roots	Joint and muscle pains, stomach pains
38	*Gloriosa superba* L.	Liliaceae	Senganthal	TLC	Rhizome	Poisonous bite and skin diseases.
39	*Grewia heterotricha* Mast.	Tiliaceae	Periyachu	WC	Bark	Stomach ach
40	*Gymnema sylvestre* R.Br.ex.Sch.	Asclepiadaceae	Sakarakolli	TC	Leaves	Reduce blood sugar level.
41	*Hemidesmus indicus* R.Br.	Asclepiadaceae	Nannari	TC	Roots	Coolant and mouth ulcers.
42	*Hippocratea indica* willd.	Hippoerataceas	Odankodi	WC	Roots	Stomach troubles
43	*Hugonia mystax* L.	Linaceae	Mothirakodi	WC	Roots	Swellings and snake bites
44	*Ichanocarpus roxburghii*	Apocynaceae	Oothaikodi	TC	Leaves	Skin Diseases
45	*Ichnocarpus frutescens* (L.) W.T.Aiton	Apocynaceae	Udarkodi	TC	Roots	Diabetes
46	*Ipomoea batatas* (Linn.)	Convolvulaceae	Carkkaraivalli	TC	Tuber	Diabetics.
47	*Ipomoea eriocarpa* R.Br.	Convolvulaceae	Pulichavidu	TC	Roots	Rheumatism
48	*Ipomoea mauritiana* Jacq.	Convolvulaceae	Palmundamagi	PC	Roots	Diabetics.
49	*Ipomoea obscura* (L.) Ker-Gawl.	Convolvulaceae	Siruthali	TC	Leaves	Eye diseases
50	*Ipomoea pes-caprae* (L.)R.Br.	Convolvulaceae	Attukkal	PC	Leaves	Rheumatism
51	*Ipomoea pes-tigridis* L.	Convolvulaceae	Pulichakeerai	TC	Leaves	Stomach ulcers
52	*Ipomoea staphylina* Roem. &Schult.	Convolvulaceae	Oonankodi	TC	Roots	Snake-bite.
53	*Ipomoea wightii* (Wallich) Choisy	Convolvulaceae	Cakkaravartti kodi	TC	Leaves	Cooked in vegetables
54	*Jasminum angustifolium* L.	Oleaceae	Kattumalli	WC	Flowers	Uses as Ornamental
55	*Jasminum auriculatum* Vahl	Oleaceae	Uuchi	WC	Flowers	Ornamental and Flowers Extraction cure Urinary disorders hair-oil menstruation
56	*Jasminum azoricum* L.	Oleaceae	Perumalli	WC	Flowers	Uses as Ornamental
57	*Jasminum cordifolium* Wallich	Oleaceae	Anankamalli	WC	Flowers	Uses as Ornamental
58	*Jasminum cuspidatum* Rottl.	Oleaceae	Uchimallikai	WC	Flowers	Uses as Ornamental
59	*Jasminum grandiflorum* L.	Oleaceae	Jothimallikai	WC	Flowers	Leaves boiled with water and the extract is used to cure headache
60	*Jasminum malabaricum* Wight	Oleaceae	Kodimalli	WC	Flowers	Uses as Ornamental
61	*Jasminum sessiliflorum* Vahl.	Oleaceae	Kuruvilankodi	WC	Leaves	Diahhroea
62	*Jasminum trichotomum* Heyne.	Oleaceae	Mullai	WC	Flowers	Uses as Ornamental
63	*Jasminum wightii* Clark	Oleaceae	Kudumalli	WC	Flowers	Uses as Ornamental
64	*Kedrostis foetidissima* Cogn.	Cucurbitaceae	Karunkuvalai	TLC	Roots	Paste is taken internally to treat stomach problems.
65	*Lagenaria siceraria* (Molina) Standl.	Cucurbitaceae	Kattusurai	TLC	Fruits	Cooked curries
66	*Lantana camara* L.	Verbenaceae	Unnichedi	HC	Fruits	Edible fruits
67	*Merremia dissecta* Hall. f.	Convolvulaceae	Tirippana	PC	Leaves	Used as ornamental and leaf used as cure cold.
68	*Merrimea quinquefolia* R. Br.	Convolvulaceae	Tripanakodi	TC	Leaves & stem	Malaria, stomachache and headache. Leaf juice applied on cuts and wounds
69	*Mikania micrantha* Kunth.	Asteraceae	Malyankodi	TC	Leaves	Fodder
70	*Momordica charantia* L.	Cucurbitaceae	Kattupagal	TLC	Fruits	Used as vegetable
71	*Mucuna pruriens* Baker	Fabaceae	Poonakali	TC	Seeds	Dried pod powder is given to remove intestinal worms.
72	*Mukkia madraspatna* (L.) M.Roemer	Cucurbitaceae	Musumusukai	TLC	Leaves	Cough, Stomach ache.
73	*Naravelia zeylanica* (L.) DC.	Ranunculaceae	Mookeripan kodi	PC	Leaves	Rheumatic and painful conditions caused by inflammation.
74	*Neonotonia wightii* (Wight & Arn.) Lackey	Fabaceae		TLC	Seeds	Edible seeds
75	*Passiflora edulis* Sims.	Passifloraceae	Korangi passionpalm	TLC	Fruits	Fruits edible and ornamental purposes
76	*Passiflora foetida* L.	Passifloraceae	Gurangupalam	TLC	Leaves	Paste is applied topically on the forehead to cure headache.
77	*Passiflora lascenaultii* DC.	Passifloraceae	Malaikovai	TLC	Fruits	Edible fruits and Used as ornamental purpose.
78	*Passiflora subpeldata* L.	Passifloraceae	Basankodi	TLC	Fruits	Edible fruits and Used as ornamental

						purpose
79	*Pergularia daemia* (Forssk) Chior.	Asclepiadaceae	Veliparuthi	TC	Leaves	Headache, joint pain and asthma.
80	*Piper longum* L.	Piperaceae	Thippili	TC	Seeds	Asthma, fever and Cough.
81	*Piper nigrum* L.	Piperaceae	Mellakku	TC	Seeds	Cough cold, asthma hoarseness and hiccup.
82	*Rhynchosia capitata* DC.	Fabaceae	Kaliyanthuvarai	TC	Seeds	Seed used as food preparation
83	*Rhynchosia densiflora* DC.	Fabaceae	Thuraivakodi	TC	Leaves	Dried root powder mixed with honey is taken orally for dysentery
84	*Rhynchosia minima* (L.) DC.	Fabaceae	Kattukollkodi	TC	Seeds	Cooked and eaten as food
85	*Rhynchosia vicosa* (Roth.) DC.	Fabaceae	Thurai	TC	Seeds	Cooked and eaten as food
86	*Rivea hypocrateriformis* Choisy.	Convolvulaceae	Musuttaikodi	WC	Leaves &Stem	Extract is taken internally to relieve cough and headache.
87	*Rubia cordifolia* L.	Rubiaceae	Chevvalikodi	HC	Leaves &Roots	Scorpion sting and dizziness.
88	*Sageretia parviflora* Var.	Rhamnaceae	Manjalnarkodi	TC	Fruits	Edible fruits
89	*Sarcostemma brunonianum* W. & A.	Asclepiadaceae	Usipalai	RC	Latex	Snake bite
90	*Secamone emetica* R. Br.	Asclepiadaceae	Angaravalli,	TC	Leaves	Juice given along with milk to treat joint pains.
91	*Smilax wightii* AD.C	Smilacaceae	Kareelanchi	HV	Roots	Used in prescriptions for venereal diseases.
92	*Smilax zeylanica* L.	Smilacaceae	Valiyakanni	HV	Leaves	Decoction, used for abscesses, boils, swellings and rheumatism
93	*Thunbergia fragrans* Roxb.	Acanthaceae	Indrapushpam	TC	Roots	Roots and leaves are used to treat rheumatism and cough.
94	*Tinospora cordifolia* (Thunb.) Miers.	Menispermaceae	Kottukodi	WC	Whole plant	Whole plant juice is taken orally to treat rheumatism and urinary diseases.
95	*Toddalia asiatica* (L.) Lam.	Rutaceae	Kodalikodi	HC	Leaves	Used powder is taken orally for indigestion and cough
96	*Vigna aconitifolia* (Jacq.) Marechal.	Fabaceae	KattuPatchapayaru	PC	Seeds	Used as food production
97	*Vigna radiata* (L.) Wilczok.	Fabaceae	Patchapayaru	TC	Seeds	Used as food production
98	*Vigna trilobata* (L.) Verd.	Fabaceae	Thatampayaru	TC	Seeds	Used as food production
99	*Ximenia americana* L.	Oleaceae	Chiru-illantai	WC	Fruits	Fresh fruit juice is taken to treat rheumatism.
100	*Zanthoxylum ovalifolium* Wight	Rutaceae	Tumpunalu	WC	Bark	The bark is pungent and used to clean teeth
101	*Ziziphus oenoplia* (L.) Miller	Rhamnaceae	Pulicham	WV	Fruits	Edible fruits
102	*Ziziphus rugosa* Lam.	Rhamnaceae	Illanthai	WV	Fruits	Edible fruits

Key: HC- Hook Climber; HV: Herbaceous vines; PC- Prostrate Climber; RC- Root Climber;
TLC- Tendril Climber; TC- Twining Climber; WC- Woody Climber and WV-Woody vines.

4. Conclusion

Many climbing species play a major role in healthcare needs of these tribal people. This preliminary study focused on documenting most of the climbers used by the *Paliyars* tribes and rural communities in the southern Western Ghats of Tamil Nadu to facilitate conservation effort. There is a need to document the threats to local deciduous forests due to invasive climbers with increasing biotic interference and climatic change. Over exploitation of some climber species particularly collection of roots and underground parts from the climbers e.g. *Asparagus racemosus* L., *Asparagus racemosus* Willd. *Gloriosa superba* L. *Hemidesmus indicus* R.Br. *Tinospora cordifoli*a L. etc. cause severe damage to these plants. Therefore, there is a need to create awareness among the local people for the sustainable utilization as well as conservation of these climbers in their original habitat.

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