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IDENTIFICATION AND ETHNO MEDICINAL DOCUMENTATION OF FLORA OF ANDHRA UNIVERSITY CAMPUS, ANDHRA PRADESH, VISAKHAPATNAM

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A Floristic survey for documentation of medicinal plants was conducted based on the participatory observations and field visit across Andhra University Campus, Visakhapatnam city during January, 2023 to April, 2023 with the aim of collecting and identifying medicinal flora and documentation of medicinal properties of plants occurring in this campus.The total area of the Andhra University is 200 hectares out of which a huge land is free from any kind of constriction of buildings that provide habit for many wild medicinal plant species. This study resulted in record of 101 medicinal plant species pertains to 90 genera under 48 families. The dominant family Fabaceae was represented by maximum number of 6 genera and 7 species followed by Malvaceae. All the plants have been described with their scientific names, family, medicinal value, habit, and habitat and voucher number. All the dried specimens were deposited to the herbarium collection of ICFRE-Coastal Ecosystem Centre (ICFRE-CEC), Visakhapatnam in the form of complete herbarium sheets for future reference. The data presented will be a valuable source of information for management of medicinal plant resources in the Andhra University campus.

Keywords: Andhra University, Fabaceae, Herbarium, Medicinal plants and Malvaceae.

Introduction

The World Health Organization (WHO) recognized medicinal plants as the plants whose organs contain substances suitable for therapeutic use or serve as precursors for synthesizing beneficial drugs[1]. Medicinal plants play a crucial role in maintaining human health. Throughout history, humans have recognized the significance of plants in promoting health and well-being through observation and experimentation. Plants stand as one of the foremost sources of medicines[2]. India boasts an abundance of medicinal plant knowledge and is renowned for its vast biodiversity of such plants, earning it the title of the botanical garden of the world. With a tradition spanning centuries, India has relied on medicinal plants and herbal remedies to treat various diseases and promote overall well-being[3]. It was officially recognized that nearly 2500 plant species have medicinal values, while over 6000 plants are estimated to be explored in traditional, folk and herbal medicines. The world health organization (WHO) has estimated that over 80% of the global populations rely chiefly on traditional medicines[4]. Medicinal plants are used as the medical resources in almost all cultures[5]. Ethno botanical studies hold significant importance in uncovering the cultural significance of plants both historically and

in contemporary contexts worldwide. However, the indigenous knowledge of utilizing medicinal plants to treat human ailments is at risk of fading away. This knowledge is typically transmitted orally from one generation to the next, without the

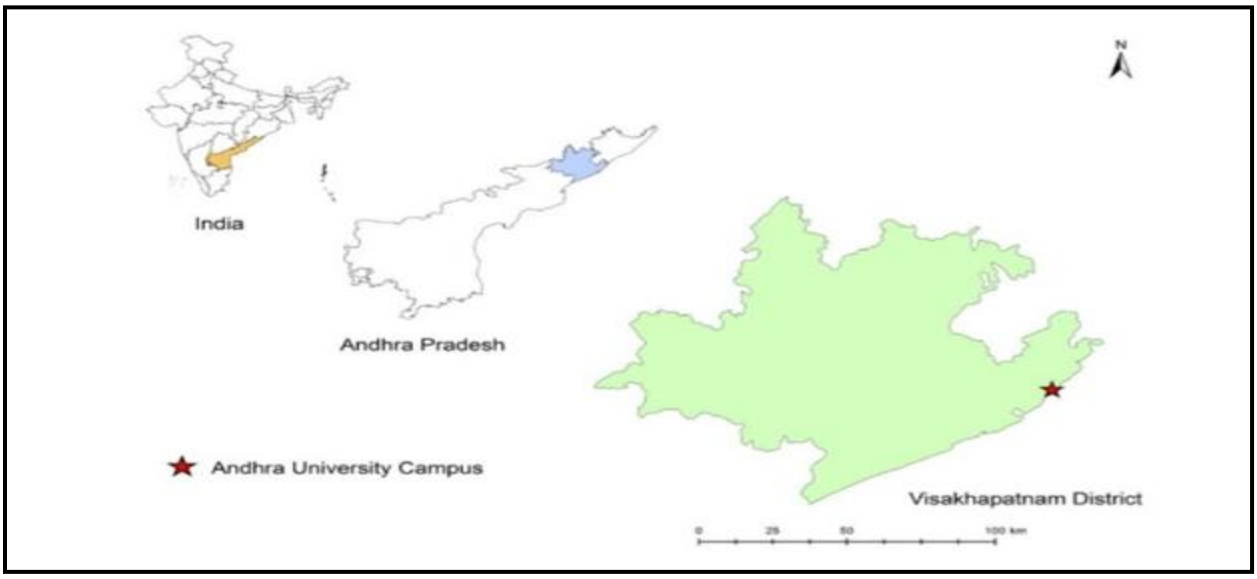

Fig 1: Map of the study area with the site of collections

support of a written language system. Additionally, many traditional healers do not maintain written records, further jeopardizing the preservation of this invaluable knowledge[6].

The ethno medicinal knowledge mainly resides within the older members of the community and their relatives, posing challenges in transferring this knowledge to the younger generation. This difficulty is compounded by factors such as modernization, population growth, escalating anthropogenic activities, and the consequent depletion of natural ecosystems containing medicinal plants. As a result, younger individuals often exhibit disinterest in traditional knowledge[7]. There is an urgent need to document this invaluable knowledge, as it is at risk of permanent loss.

Visakhapatnam has rich biodiversity including many angiosperms with so many medicinal uses. The documentation on existing flora of the urban environment is very important to determine existing resources and to set the target for future development. An understanding of the flora in the regional level must play an important role in elucidating the larger patterns of the distribution of biodiversity. However, in the last few years due to industrialization and urbanization of many plants have been cut down and many exotic species have been planted. Current study is to raise awareness among the youth about the significance of medicinal plants and the importance of conserving local plant species within their respective regions. By fostering understanding and appreciation among younger generations, we can work towards safeguarding this vital aspect of our cultural and natural heritage for the future. Such kind of documentation of existing medicinal plant diversity will be a valuable source of information for management of plant resources in the Andhra University campus. The information included in this study can be used to many people along with the students of the University.

Material and Methods

Study Area :

Andhra University was established in 1926 located between 17º 35' to 17º 40' N, 83º 20' to 83º 25' E with an elevation of 60m in the Visakhapatnam City with an area of 200 hectares. Campus has tropical humid climate with an average annual temperature between 18ºC and 45ºC and an average rain fall of 1000–1200 mm[8] (Figure1).

Tinospora cordifolia ***Abutilon indicum*** ***Sida acuta*** ***Tribulus terrestris***

Murraya koenigii ***Tamarindus indica*** ***Clitoria ternatae*** ***Mimosa pudica***

Senna occidentalis ***Terminalia catappa*** ***Lawsonia inermis*** ***Cissus quandrangularis***

Momordica charantia ***Oldenlandia herbacea*** ***Eclipta prostrate***

Andrographis paniculata ***Asystasia gangetica*** ***Barleria pronitis*** ***Phyllanthus niruri***

Plate 1. Some important medicinal plants documented from Andhra University Campus

Piper betle

Euphorbia hirta

Acalypha indica

Pteris vittata

Commelina benghalensis

Allium fitulosum

Jatropha gossypifolia

Antigonon leptopus

Mentha spicata

Ocimum americanum

Ocimum enuiflorum

Merremia tridentata

Evovulus nummularius

Hemidesmus indicus

Solanum xanthocarpum

Plate 2: Some important medicinal plants documented from Andhra University Campus

Field Survey and Plant Collection:
For the documentation of medicinal plants, inside the college campus survey was conducted across various sites of Andhra University Campus. Periodic field survey at regular intervals during Jan, 2023 to December, 2023 was aimed at collecting plant species from different localities of Andhra University Campus, Visakhapatnam. During these field trips the plant samples were identified by their local names which were noted in field notebook. Photographs were taken both in flowering and fruiting condition (Plate 1&2). Plant specimens were collected, carefully preserved, dried and mounted on herbarium sheets by following the standard practices of herbarium preparation[9, 10] and the accession number was given to each specimen. Then finally prepared herbarium sheets were deposited in the Herbarium collection of ICFRE-Coastal Ecosystem Centre, Visakhapatnam (under Institute of Forest Biodiversity, Hyderabad). Identification of all plant specimens was done with the help of experts at ICFRE-CEC and other institutes taxonomists and different regional flora of Visakhapatnam[11,12] as well as available online and offline literature.

Results and Discussion
A total of 101 medicinal plant species belongs to 90 genera and 48 families were collected from various localities of Andhra University Campus. The total list of all 101 medicinal plants with GPS data was presented in Table 1. The plant specimens were arranged according to the Bentham and Hooker's system of classification, which was followed by referring the Flora of Visakhapatnam[11, 12]. The medicinal uses and plant part used are presented in Table 3 and Figure 3,4,5.

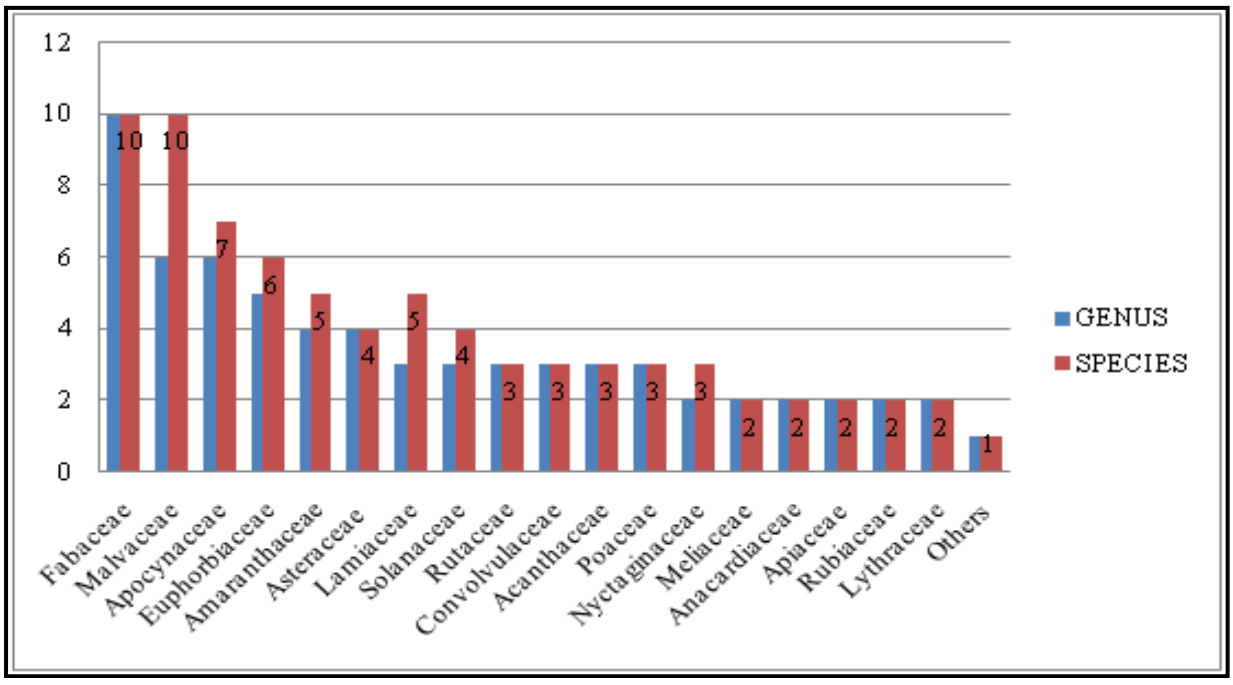

Fig 2: The Bar Graph representing the dominance of different families in the Study Area

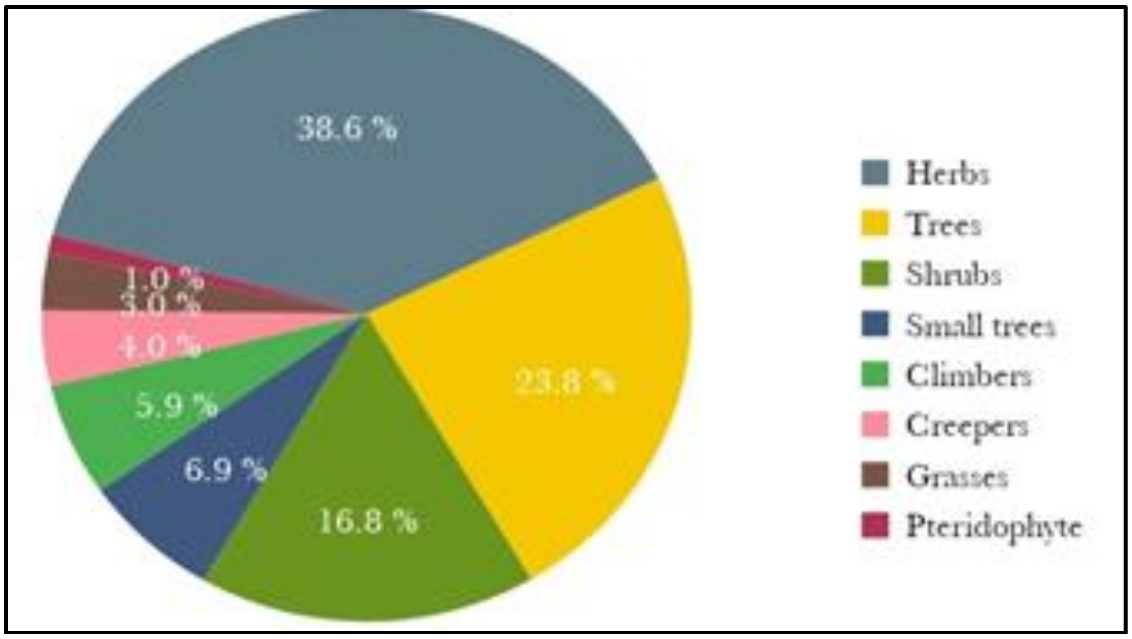

Fig 3: The pie chart represents the categorization of plant samples based on their habitat.

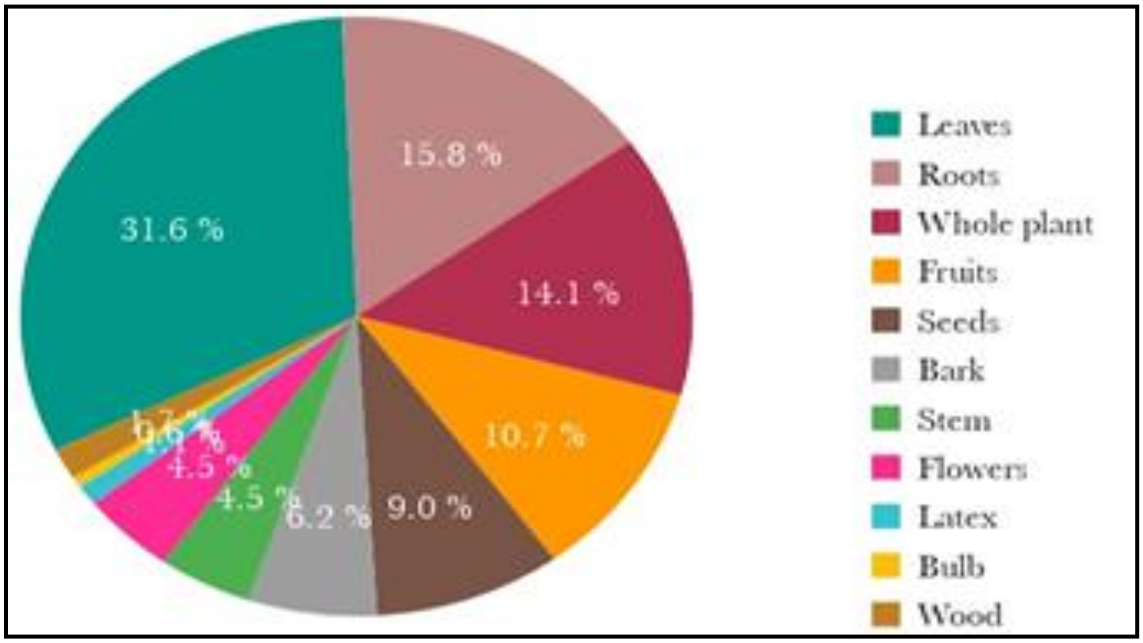

Fig 4: The pie chart represents the categorization of plant part used in the medicine field

A total of 101 medicinal plants samples were collected which belong to 90 genera with 48 families. Out of These 48 families, 44 were of dicotyledons (26 polypetalae, 10 gamopetalae, 8 monochlamydeae), 3 monocotyledons and 1 pteridophyte. Among dicotyledons the most represented families showing dominance are Fabaceae (10 genera, 10 species) followed by Malvaceae (6 genera, 10 species);

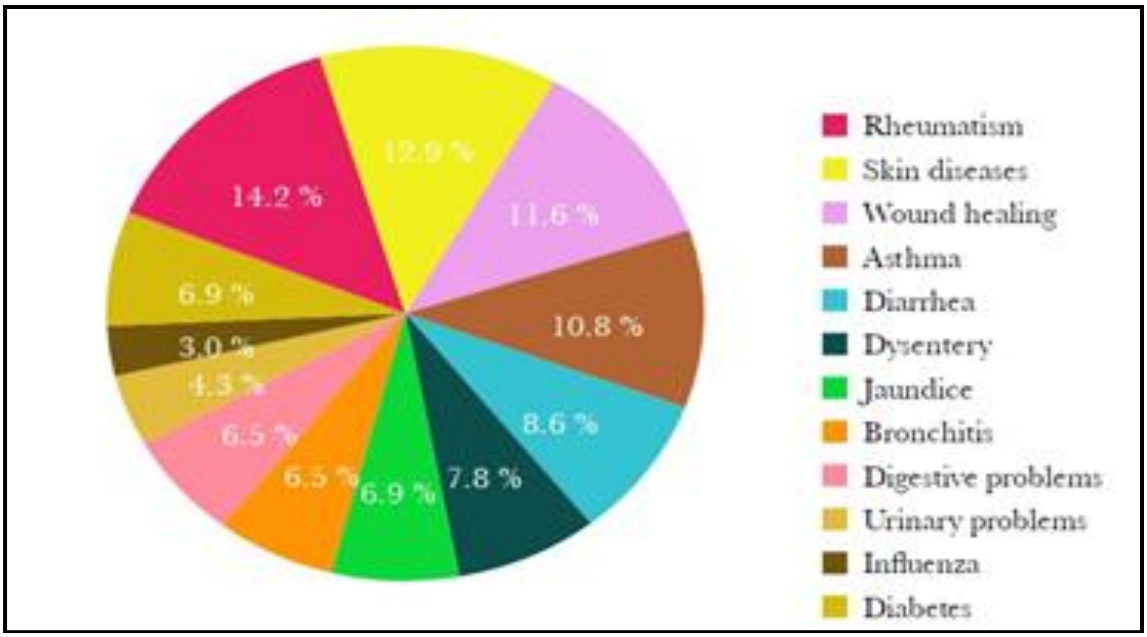

Fig 5:. The pie chart represents the categorization of the treating the diseases by using these plants

Apocynaceae (7 genera, 6 species) followed by Euphorbiaceae (5 genera, 6 species); Amaranthaceae (5 genera, 5 species); Asteraceae (4 genera, 4 species); Lamiaceae (3 genera, 5 species); Solanaceae (3 genera, 4 species); Rutaceae (3 genera, 3 species); Convolvulaceae (3 genera, 3 species); Acanthaceae (3 genera, 3 species); Poaceae (3 genera, 3 species) Nyctaginaceae (2 genera, 3 species); Meliaceae (2 genera, 3 species); Anacardiaceae (2 genera, 2 species); Apiaceae (2 genera, 2 species); Rubiaceae (2 genera, 2 species); Lythraceae (2 genera, 2 species) (Figure 2).

A total of 28 families represent only 1 genus with 1 species each, the families were Annonaceae, Menispermaceae, Brassicaceae, Papaveraceae, Capparidaceae, Zygophyllaceae, Geraniaceae, Rhamnaceae, Vitaceae, Sapindaceae, Moringaceae, Combretaceae, Myrtaceae, Caricaceae, Cucurbitaceae, Sapotaceae, Verbenaceae, Basellaceae, Polygonaceae, Piperaceae, Moraceae, Amaryllidaceae, Commelinaceae and Pteridaceae.

Based on the updated classification system of APG IV some families were merged with other families, the change position of genera and change name of family for some taxa has been listed in Table.2. Based on the updated APG system of classification, Andhra University Campus show dominance in family Fabaceae (10 genera, 10 species); Malvaceae (6 genera, 10 species); Apocynaceae (6 genera, 7 species) followed by Euphorbiaceae (5 genera, 6 species); Amaranthaceae (5 genera, 5 species)[13] (Figure 2).

Though Andhra University is rich in plant diversity with the members belonging to herbs, shrubs, trees, small trees, climbers, creepers, etc… Medicinal plants are the major source of therapeutic agents and are extensively utilized throughout the world in the indigenous agents and modern system of medicine. Plants are the richest source of renewable bioactive chemicals which acts as a medicine and plays a key role in the world health. The usage of plants

Table 1: List of medicinal plant species collected from Andhra University Campus with geo-referenced data.

S. No.	Scientific name	Family	Vernacular name	Latitude	Longitude	Vou. No.
1	*Pteris vittata*	Pteridaceae	Chinese brake	17.72307	83.32505	183
2	*Polyalthia longifolia*	Annonaceae	False Ashoka	17.72272	83.32523	190
3	*Tinospora cordifolia*	Menispermaceae	Giloy	17.71737	83.32443	185
4	*Brassica nigra*	Brassicaceae	Black mustard	17.72312	83.32495	130
5	*Argemone mexicana*	Papaveraceae	Mexican poppy	17.72276	83. 32452	165
6	*Cleome viscosa*	Capparadiaceae	Asian spider flower	17.717602	83.32474	187
7	*Abutilon indicum*	Malvaceae	Indian Abutilon	17.71749	83.32548	115
8	*Hibiscus rosa sinensis*	Malvaceae	Chinese hibiscus	17.72275	83.32521	127
9	*Hibiscus schizopetalus*	Malvaceae	Spider hibiscus	17.71755	83.32438	171
10	*Hibiscus tiliaceus*	Malvaceae	Sea hibiscus	17.72269	83.32461	167
11	*Pavonia odorata*	Malvaceae	Fragrant swamp mallow	17.72282	83.32466	152
12	*Sida acuta*	Malvaceae	Common wireweed	17.71721	83. 32577	154
13	*Sida cordata*	Malvaceae	Heartleaf fan petals	17.71719	83.32575	155
14	*Sida cordifolia*	Malvaceae	Heart leaf sida	17.71785	83.32524	156
15	*Thespesia populnea*	Malvaceae	Indian tulip tree	17.71763	83.324504	194
16	*Sterculia foetida*	Sterculiaceae	Wild Indian Almond	17.71751	83.32451	197
17	*Tribulus terrestris*	Zygophyllaceae	Puncture vine	17.71785	83.32525	170
18	*Oxalis corniculata*	Geraniaceae	Creeping wood sorrel	17. 722803	83.32518	182
19	*Aegle marmelos*	Rutaceae	Bael tree	17.718002	83.32472	160
20	*Citrus aurantiifolia*	Rutaceae	Acid lime	17.71751	83.32453	145
21	*Murraya koenigii*	Rutaceae	Curry leaf tree	17.71707	83.32581	148
22	*Azadirachta indica*	Meliaceae	Neem tree	17.71762	83.32454	141
23	*Melia azedarach*	Meliaceae	Chinaberry tree	17.72272	83.324903	122
24	*Ziziphus nummularia*	Rhamnaceae	Wild Jujube	17.71767	83.32548	176
25	*Cissus quadrangularis*	Vitaceae	Veldt grape	17.72307	83.32484	166
26	*Sapindus emarginatus*	Sapindaceae	Soapnut tree	17.71766	83.32535	191

27	*Anacardium occidentale*	Anacardiaceae	Cashew nut	17.718005	83.32475	168
28	*Mangifera indica*	Anacardiaceae	Mango tree	17.722803	83.32518	164
29	*Moringa oleifera*	Moringaceae	drumstick tree	17.72275	83.32451	192
30	*Clitoria ternatea*	Papilionaceae	Blue Bellvine	17.72305	83.32473	117
31	*Crotalaria verrucosa*	Papilionaceae	Blue rattle pod	17.71752	83.32451	173
32	*Pongamia pinnata*	Papilionaceae	Karanja tree	17.71753	83.32452	200
33	*Tephrosia villosa*	Papilionaceae	Hoary Tephrosia	17.71748	83.32457	174
34	*Peltophorum pterocarpum*	Caesalpiniaceae	Yellow flame tree	17.71725	83.32565	195
35	*Tamarindus indica*	Caesalpiniaceae	Tamarind	17.72277	83.32454	142
36	*Acacia auriculiformis*	Fabaceae	Ear leaf Acacia	17.71741	83.32558	178
37	*Mimosa pudica*	Fabaceae	Touch me not plant	17.72275	83.32477	108
38	*Senna occidentalis*	Fabaceae	Coffee senna	17.71954	83.324701	110
39	*Terminalia catappa*	Combretaceae	Indian almond	17.71758	83.32555	198
40	*Eucalyptus grandis*	Myrtaceae	Rose gum	17.71752	83.32455	184
41	*Lawsonia inermis*	Lythraceae	Henna	17.72299	83.32481	119
42	*Punica granatum*	Punicaceae	Pomegranate	17.72313	83.324904	149
43	*Carica papaya*	Caricaceae	Papaya	17.71633	83.32631	175
44	*Momordica charantia*	Cucurbitaceae	Bitter gourd	17.71757	83.32457	112
45	*Coriandrum sativum*	Apiaceae	Coriander	17.71748	83.32459	105
46	*Foeniculum vulgare*	Apiaceae	Common fennel	17.722709	83.32473	177
47	*Oldenlandia herbacea*	Rubiaceae	Slender diamond flower	17.71764	83.32457	189
48	*Morinda pubescens*	Rubiaceae	Indian mulberry	17.71768	83.32489	179
49	*Chromolaena odorata*	Asteraceae	Devil weed	17.722704	83.32484	137
50	*Eclipta prostrata*	Asteraceae	Bhringraj	17.71721	83.32577	103
51	*Tridax procumbens*	Asteraceae	Coat button	17.72275	83.32477	107
52	*Vernonia cinerea*	Asteraceae	Ironweed	17.72323	83.32468	120
53	*Manilkara zapota*	Sapotaceae	Sapota, Nose berry	17.72311	83.32471	135
54	*Pentalinon luteum*	Apocynaceae	Yellow Alamanda	17.717508	83.32452	196
55	*Catharanthus roseus*	Apocynaceae	Madagascar periwinkle	17.23049	83.32473	123
56	*Nerium oleander*	Apocynaceae	Pink/white oleander	17.72279	83.32486	118
57	*Thevetia peruviana*	Apocynaceae	Yellow oleander	17.71801	83.32471	180

58	*Calotropis gigantea*	Apocynaceae	Gaint Milkweed	17.71643	83.32623	143
59	*Calotropis procera*	Apocynaceae	Calotrope	17.71767	83.32552	147
60	*Hemidesmus indicus*	Apocynaceae	Indian sarsaparilla	17.72272	83.32523	188
61	*Evolvulus nummularius*	Convolvulaceae	Round leaf bindweed	17.71761	83.32459	186
62	*Ipomoea pes- caprae*	Convolvulaceae	Beach morning glory	17.74732	83.35035	159
63	*Merremia tridentata*	Convolvulaceae	Chinese moon creeper	17.71789	83.32506	181
64	*Capsicum annuum*	Solanaceae	Green chilli	17.72281	83.32465	144
65	*Datura metel*	Solanaceae	Devil's trumpet	17.71738	83.32562	111
66	*Solanum nigrum*	Solanaceae	Black nightshade	17.71745	83.32462	136
67	*Solanum xanthocarpum*	Solanaceae	Sticky or yellow nightshade	17.72275	83.32477	200
68	*Andrographis paniculata*	Acanthaceae	Bitter weed	17.722701	83.32484	121
69	*Asystasia gangetica*	Acanthaceae	Creeping foxglove	17.71765	83.32487	157
70	*Barleria prionitis*	Acanthaceae	Porcupine flower	17.71789	83.32506	150
71	*Lantana camara*	Verbenaceae	Shrub Verbena	17.72281	83.325201	116
72	*Mentha spicata*	Lamiaceae	Spearmint	17.71754	83.32448	104
73	*Ocimum americanum*	Lamiaceae	American basil	17.71768	83.32514	140
74	*Ocimum sanctum*	Lamiaceae	Tulsi	17.71754	83.32448	138
75	*Ocimum tenuiflorum*	Lamiaceae	Holy basil	17.71754	83.32448	102
76	*Plectranthus amboinicus*	Lamiaceae	Mexican mint	17.72269	83.32461	125
77	*Boerhavia diffusa*	Nyctaginaceae	Spreading hogweed	17.71711	83.32579	124
78	*Boerhavia erecta*	Nyctaginaceae	Erect Boerhavia	17.71746	83.32458	151
79	*Bougainvillea glabra*	Nyctaginaceae	Paper flower	17.72272	83.32465	133
80	*Achyranthes aspera*	Amaranthaceae	Prickly chaff flower	17.72278	83.32486	139
81	*Aerva lanata*	Amaranthaceae	Mountain knotgrass	17.72275	83.32477	106
82	*Alternanthera philoxeroides*	Amaranthaceae	Alligator weed	17.71769	83.32535	161
83	*Alternanthera sessilis*	Amaranthaceae	Sessile joy weed	17.71757	83.324601	146

84	*Amaranthus viridis*	Amaranthaceae	Green amaranth	17.71754	83.32448	131
85	*Basella alba*	Chenopodiaceae	Malabar spinach	17.72305	83.32473	163
86	*Antigonon leptopus*	Polygonaceae	Mexican creeper, Coral vine	17.71765	83.32487	153
87	*Piper betle*	Piperaceae	Betel vine	17.71754	83.32448	113
88	*Pterocarpus santalinus*	Santalaceae	Red Sandalwood	17.72272	83.32523	193
89	*Acalypha indica*	Euphorbiaceae	Indian Acalypha	17.72282	83.32466	101
90	*Croton bonplandianus*	Euphorbiaceae	Ban tulsi	17.71752	83.32451	132
91	*Euphorbia hirta*	Euphorbiaceae	Asthma plant	17.71721	83.32577	109
92	*Jatropha curcas*	Euphorbiaceae	Purging nut	17.71752	83.324504	199
93	*Jatropha gossypiifolia*	Euphorbiaceae	Bellyache bush	17.71754	83.32478	158
94	*Phyllanthus niruri*	Euphorbiaceae	Gale of the wind	17.72273	83.3249	126
95	*Ricinus communis*	Euphorbiaceae	Castor oil plant	17.72281	83.32465	114
96	*Ficus racemosa*	Moraceae	Cluster fig	17.71654	83.34984	162
97	*Allium fistulosum*	Liliaceae	Spring onion	17.72276	83.32505	129
98	*Commelina benghalensis*	Commelinaceae	Spiderworts	17.71754	83.32448	128
99	*Chloris barbata*	Poaceae	Swollen finger grass	17.71711	83.32579	134
100	*Dactyloctenium aegyptium*	Poaceae	Crowfoot grass	17.72266	83.32463	172
101	*Eragrostis unioloides*	Poaceae	Love grass	17.72312	83.32495	169

as a source of medicinal agents lies deep in our civilization and it is difficult to explain with what certainty that led a man to select certain plant material for the treatment of various ailments and diseases with a realization of certain root, leaves, bark, fruits and even plant exudations have some of the beneficial effects on human health. A total of 101 medicinal plants were studied and collected for the herbarium which belonged to 90 genera and 48 families. The majority of plant samples were herbaceous members. Hence to conclude, each and every plant on this earth has some or the other medicinal values in it and these properties should be carefully extracted from the plant with an example, *Lantana camara*, is of the poisonous plant but their medicinal uses were used in treating cancer, asthma, chicken pox, measles,, ulcers, skin itches,etc… *Ricinus communis*, *Nerium oleander*, *Solanum nigrum* etc. are few plant species included in the poisonous plants but also possess some medicinal values.

The present study has revealed that the medicinal plants collected are utilized in treating a wide range of ailments including cancer, diabetes, poisonous bites, skin diseases, respiratory issues, wound healing,

Table 2: List of families with change in position from Bentham and hooker's to APG system of classification.

S. No.	Voucher. No.	Scientific Name	Bentham & Hooker's Classification	APG system of Classification
1.	187	*Cleome viscosa*	Capparadiaceae	Cleomaceae
2.	194	*Sterculia foetida*	Sterculiaceae	Malvaceae
3.	182	*Oxalis corniculata*	Geraniaceae	Oxalidaceae
4.	117	*Clitoria ternatea*	Papilionaceae	Fabaceae
5.	173	*Crotalaria verrucosa*	Papilionaceae	Fabaceae
6.	200	*Pongamia pinnata*	Papilionaceae	Fabaceae
7.	174	*Tephrosia villosa*	Papilionaceae	Fabaceae
8.	195	*Peltophorum pterocarpum*	Caesalpiniaceae	Fabaceae
9.	142	*Tamarindus indica*	Caesalpiniaceae	Fabaceae
10.	149	*Punica granatum*	Punicaceae	Lythraceae
11.	143	*Calotropis gigantea*	Asclepiadaceae	Apocynaceae
12.	147	*Calotropis procera*	Asclepiadaceae	Apocynaceae
13.	188	*Hemidesmus indicus*	Asclepiadaceae	Apocynaceae
14.	163	*Basella alba*	Chenopodiaceae	Basellaceae
15.	193	*Pterocarpus santalinus*	Santalaceae	Fabaceae
16.	126	*Phyllanthus niruri*	Euphorbiaceae	Phyllanthaceae
17.	129	*Allium fistulosum*	Liliaceae	Amaryllidaceae

Table 3: List of medicinal plants documented from Andhra University campus and their medicinal uses

S. No.	Scientific name	Family	Local Name	Habit	Plant part used	Medicinal uses
			Pteridophyte			
1	*Pteris vittata*	Pteridaceae	Chinese brake	Pteridophyte	leaves	wound healing, diabetes, etc.[15]
			Angiosperm			
2	*Polyalthia longifolia*	Annonaceae	Ashoka chettu	Tree	bark, leaves	fever, diabetes, cardiac problems, etc.[16]
3	*Tinospora cordifolia*	Menispermaceae	Tippa teega	Climber	stem, leaves	diabetes, high cholesterol, rheumatoid arthritis, ulcers,etc.[14]
4	*Brassica nigra*	Brassicaceae	Avallu	Shrub	mustard seeds, leaves	diabetes, cardiovascular diseases,,

						influenza, etc.[17]
5	*Argemone mexicana*	Papaveraceae	Pichi kusuma chettu	Herb	roots, seeds	skin diseases, gonorrhea, leprosy, rheumatism, jaundice, etc.[14]
6	*Cleome viscosa*	Capparadiaceae	Asian Spider flower	Herb	whole plant	rheumatic arthritis, malaria, wound healing, etc.[18]
7	*Abutilon indicum*	Malvaceae	Duveena kayalu chettu	Shrub	whole plant	jaundice, wounds, diarrhea, rheumatism, etc.[19]
8	*Hibiscus rosa sinensis*	Malvaceae	Mandaram	Small tree	flowers, leaves, roots	cardiac problems, diabetes, cancer, etc.[20]
9	*Hibiscus schizopetalus*	Malvaceae	Spider Hibiscus	Small Tree	leaves, flowers, fruits	urinary problems, pains, heart diseases, etc.[21]
10	*Hibiscus tiliaceus*	Malvaceae	Sea Hibiscus	Small tree	flowers, leaves	diarrhea, dysentery, typhoid, etc.[22]
11	*Pavonia odorata*	Malvaceae	Chitti Benda	Shrub	roots	hemorrhage, inflammation, fever, urinary disorder, etc.[23]
12	*Sida acuta*	Malvaceae	Nela Benda	Herb	roots, leaves	urinary diseases, fevers, diabetes, ulcers, asthma, rheumatism, etc.[14]
13	*Sida cordata*	Malvaceae	Benda Gayapaku	Herb	seeds, roots	urinary complaints, diarrhea, dysentery, fevers, asthma, inflammations, etc.[14]
14	*Sida cordifolia*	Malvaceae	Chiru Benda	Herb	seeds, roots	cough, cold, asthma, etc.[24]
15	*Thespesia populnea*	Malvaceae	Gangaravi	Tree	whole plant	dysentery, rheumatism,

						gonorrhea, etc. [25]
16	*Sterculia foetida*	Sterculiaceae	Adavi Badam	Tree	leaves, seeds	skin diseases, rheumatism, itches, etc.[26]
17	*Tribulus terrestris*	Zygophyllaceae	Palleru	Herb	fruit, root, leaves	rheumatism, hemorrhage, etc.[14]
18	*Oxalis corniculata*	Geraniaceae	Wood sorrel	Herb	leaves	wound healing, burns, etc.[27]
19	*Aegle marmelos*	Rutaceae	Maredu	Tree	leaves, fruits, root, bark	diarrhea, ulcer, sunstroke, jaundice, piles, etc. [14]
20	*Citrus aurantiifolia*	Rutaceae	Battayi	Tree	leaves, fruits	urinary diseases, heart and liver problems, etc. [28]
21	*Murraya koenigii*	Rutaceae	Karvepaku	Small tree	leaves	leprosy, skin diseases, dysentery, diarrhea, inflammations, ulcers, etc.[14]
22	*Azadirachta indica*	Meliaceae	Vepa chettu	Tree	whole plant	fever, piles, diabetes, eye diseases, jaundice, etc.[14]
23	*Melia azedarach*	Meliaceae	Konda vepa	Tree	root, bark, fruits	skin diseases, measles, abscess, etc.[29]
24	*Ziziphus nummularia*	Rhamnaceae	Regi kampa	Shrub	leaves	scabies, diarrhea, skin diseases, etc.[30]
25	*Cissus quadrangu-laris*	Vitaceae	Nalleru	Shrub	stem, leaves, roots	diabetes, high cholesterol, wounds, ulcers, cancer, etc.[14]
26	*Sapindus emarginatus*	Sapindaceae	Kunkudu chettu	Tree	bark, fruits	diarrhea, cholera, hair tonic, blood purifier, etc.[14]
27	*Anacardium occidentale*	Anacardiaceae	Munthama midi chettu	Tree	leaves, seeds	dysentery, diarrhea, piles, etc. [31]
28	*Mangifera indica*	Anacardiaceae	Mamidi chettu	Tree	whole plant	diarrhea, dysentery,

						hemorrhage, asthma, etc. [14]
29	*Moringa oleifera*	Moringaceae	Munaga chettu	Tree	whole plant	asthma, skin diseases, bronchitis, diarrhea, rheumatism, digestive problems,etc .[14]
30	*Clitoria ternatea*	Fabaceae	Sankam puvvulu	Climber	fruit, leaves, flowers	mental disorders, eye diseases, etc.[14]
31	*Crotalaria verrucosa*	Fabaceae	Blue Rattle pod	Herb	whole plant	jaundice, cough, fever, etc. [32]
32	*Pongamia pinnata*	Fabaceae	Kaanuga chettu	Tree	leaves, bark	wounds, ulcers, cough, etc.[14]
33	*Tephrosia villosa*	Fabaceae	Vempali	Herb	roots	leprosy, tumors, ulcers, etc[33]
34	*Peltophorum pterocarpum*	Fabaceae	Konda Chinta	Tree	bark, leaves, wood	dysentery, skin diseases, insomnia, etc .[34]
35	*Tamarindus indica*	Fabaceae	Chinta chettu	Tree	root, fruit, leaves	bark is used to treat burns[14]
36	*Acacia auriculiformis*	Fabaceae	Minnuman nu	Tree	wood, roots	rheumatism, sore eyes, pains, etc.[35]
37	*Mimosa pudica*	Fabaceae	Athipathi	Creeper	whole plant	piles, dysentery, wounds, etc.[14]
38	*Senna occidentalis*	Fabaceae	Kasvinda	Shrub	seeds, leaves, roots	liver problems, malaria, rheumatism, diabetes, etc.[36]
39	*Terminalia catappa*	Combretaceae	Badam chettu	Tree	leaves, bark, fruits	dysentery, leprosy, diarrhea, skin diseases, diabetes, etc [37]
40	*Eucalyptus grandis*	Myrtaceae	Neelagiri	Tree	leaves	asthma, cough, bronchial infections, etc [38]
41	*Lawsonia inermis*	Lythraceae	Gorintaku	Small tree	leaves	dandruff, eczema, scabies, wounds, ulcers, etc.[14]
42	*Punica granatum*	Lythraceae	Danima chettu	Tree	leaves, flowers, fruits	diarrhea, heat problems, eye

						problems, high blood pressure, cholesterol, etc.[14]
43	*Carica papaya*	Caricaceae	Papaya	Tree	fruits, leaves	wounds, indigestion, diabetes, dengue fever, etc [39]
44	*Momordica charantia*	Cucurbitaceae	Kakara	Climber	roots, stem, fruits	gout, ulcer, skin diseases, wounds, etc
45	*Coriandrum sativum*	Apiaceae	Kothimeera	Herb	leaves, dried roots	stabilizes blood sugar levels, skin inflammations, etc[41].
46	*Foeniculum vulgare*	Apiaceae	Pedda Jilakara	Herb	edible fruits, seeds	digestive problems, respiratory problems, etc.[42]
47	*Oldenlandia herbacea*	Rubiaceae	Chiriveru	Herb	whole plant	for elephantiasis, fever, ulcers, asthma, etc. [43]
48	*Morinda pubescens*	Rubiaceae	Maddi chettu	Tree	roots, leaves, fruits	dysentery, gout, ulcers,etc.[43]
49	*Chromolaena odorata*	Asteraceae	Kampurodda	Shrub	leaves	wound healing, burns, skin diseases, etc[44]
50	*Eclipta prostrata*	Asteraceae	Bhringraj	Herb	whole plant	wounds, jaundice, cough, skin diseases, etc.[14]
51	*Tridax procumbens*	Asteraceae	Gaddi Chamanthi	Herb	leaves, stem, flowers	liver diseases, diarrhea, dysentery, wounds, etc[14]
52	*Vernonia cinerea*	Asteraceae	Sahadevi mokka	Herb	leaf, stem, roots	asthma, bronchitis, fevers, etc.[14]
53	*Manilkara zapota*	Sapotaceae	Sapota	Tree	fruit, leaves	diarrhea, dysentery, hemorrhage, ulcers, coughs etc.[45]
54	*Pentalinon*	Apocynaceae	Yellow	Climber	whole plant	jaundice, cough,

	luteum		Alamanda			wounds, malaria, etc.[46]
55	*Catharanthus roseus*	Apocynaceae	Billa Ganneru	Herb	leaf, root, stem	wound healing, etc.[47]
56	*Nerium oleander*	Apocynaceae	Ganneru	Shrub	whole plant	asthma, indigestion, malaria, cancer, heart conditions, etc.[48]
57	*Thevetia peruviana*	Apocynaceae	Pacha Ganneru	Tree	bark, seeds	leprosy, fevers, eye infections, etc.[49]
58	*Calotropis gigantea*	Apocynaceae	Tella Jilledu	Shrub	bark, leaves, roots	indigestion, skin diseases, asthma, wounds, ulcers, diarrhea, dysentery, etc.[14]
59	*Calotropis procera*	Apocynaceae	Erra Jilledu	Shrub	leaves	snake bites, rheumatism, jaundice, mumps, etc.[50]
60	*Hemidesmus indicus*	Apocynaceae	Sugandha pala	Climber	root	rheumatism, leprosy, skin infections, etc.[14]
61	*Evolvulus nummularius*	Convolvulaceae	Musakarni	Creeper	whole plant	fever, wounds, burns, scabies, etc.[51]
62	*Ipomoea pes caprae*	Convolvulaceae	Balbanda	Creeper	leaves	ulcers, wounds, rheumatism, ulcers, etc.[52]
63	*Merremia tridentata*	Convolvulaceae	Chinese moon creeper	Perennial Herb	whole plant	rheumatic affections, urinary infections, etc.[53]
64	*Capsicum annuum*	Solanaceae	Koora Mirapa	herb	fruit	rheumatoid arthritis, pains, etc.[54]
65	*Datura metel*	Solanaceae	Ummetha	Shrub	seeds, leaves, fruits	ulcers, wounds, asthma, rheumatism, ulcers, etc. [14]
66	*Solanum nigrum*	Solanaceae	Kamanchi	Shrub	whole plant	eye diseases, skin diseases, fever, diarrhea, etc .[14]
67	*Solanum*	Solanaceae	Kantakari	Shrub	fruits, seeds	cough, fever,

	xanthocarpum					wounds, liver problems, etc.[55]
68	*Andrographis paniculata*	Acanthaceae	Nelavemu	Herb	whole plant	fever, snake bite, hemorrhage, fevers, etc.[14]
69	*Asystasia gangetica*	Acanthaceae	Mukka mungera	Herb	leaves	wounds, piles, rheumatism, asthma, etc. [56]
70	*Barleria prionitis*	Acanthaceae	Gobbi chettu	Shrub	whole plant	respiratory diseases, jaundice, gastro intestinal disorders, inflammations, etc[57]
71	*Lantana camara*	Verbenaceae	Palambrala chettu	Shrub	leaves	skin itches, leprosy, asthma, ulcers, etc.[58]
72	*Mentha spicata*	Lamiaceae	Pudina	Herb	leaves	cough, asthma, fever, obesity, jaundice, etc.[59]
73	*Ocimum americanum*	Lamiaceae	Kukka tulsi	Herb	leaves	fever, malaria, dysentery, coughs, respiratory problems, etc [60]
74	*Ocimum sanctum*	Lamiaceae	Lakshmi tulsi	Herb	whole plant	coughs, respiratory problems, rheumatism, etc. [61]
75	*Ocimum tenuiflorum*	Lamiaceae	Krishna tulsi	Herb	whole plant	bronchitis, malaria, skin diseases, dysentery, diarrhea, etc.[14]
76	*Plectranthus amboinicus*	Lamiaceae	Vammu	Herb	seeds, leaves	diarrhea, tumors, piles, asthma, bronchitis, etc.[14]
77	*Boerhavia diffusa*	Nyctaginaceae	Punarnava	Prostrate herb	leaves, roots	intestinal problems like indigestion, gastro intestinal problems etc.[62]

78	*Boerhavia erecta*	Nyctaginaceae	Punarnava	Erect herb	roots	jaundice, gonorrhea, inflammations, asthma, etc.[63]
79	*Bougainvillea glabra*	Nyctaginaceae	Kagithapu puvvu	Shrub	flowers	hepatitis, joint pains, etc.[64]
80	*Achyranthes aspera*	Amaranthaceae	Uttarani	Herb	whole plant	piles, skin diseases, wounds, eye diseases, etc.[14]
81	*Aerva lanata*	Amaranthaceae	Kondapindi	Herb	roots, leaves	jaundice, cough, asthma, etc.[65]
82	*Alternanthera philoxeroides*	Amaranthaceae	Ponagantikura	Prostrate herb	whole plant	influenza, hemorrhagic fever, etc.[66]
83	*Alternanthera sessilis*	Amaranthaceae	Ponaganti akku	Herb	leaves, roots	hepatitis, tight chest, bronchitis, asthma, etc.[14]
84	*Amaranthus viridis*	Amaranthaceae	Chilaka thota kura	Herb	whole plant	inflammation, ulcer, diabetes, ulcers, cholesterol, etc.[67]
85	*Basella alba*	Chenopodiaceae	Bachali	Herb	leaves	burns, ulcers, gonorrhea, hemorrhage, etc.[14]
86	*Antigonon leptopus*	Polygonaceae	Mexican Creeper	Creeper	roots, leaves	treat flu, cough, pains, diabetes, etc.[68]
87	*Piper betle*	Piperaceae	Tamalapaku	Climber	leaves	lowers cholesterol, asthma, diabetes, etc.[69]
88	*Pterocarpus santalinus*	Fabaceae	Yerra Chandanam	Tree	bark, wood	ulcers, eye diseases, dysentery, hemorrhage, etc.[70]
89	*Acalypha indica*	Euphorbiaceae	Kuppi chettu	Herb	whole plant	skin diseases, wound healing, etc.[14]
90	*Croton bonplandianus*	Euphorbiaceae	Galivana mokka	Herb	leaves, seeds	skin diseases, wounds, ulcers,

						bronchitis, asthma, jaundice, etc.[71]
91	*Euphorbia hirta*	Euphorbiaceae	Nanabalu	Herb	leaves	breathing disorders, diarrhea, jaundice, asthma, etc.[14]
92	*Jatropha curcas*	Euphorbiaceae	Nepalamu	Small Tree	seeds, leaves	influenza, cancer, etc.[72]
93	*Jatropha gossypiifolia*	Euphorbiaceae	Nepalamu	Shrub	leaves, roots, stem, fruits	itches, boils, influenza, etc. [73]
94	*Phyllanthus niruri*	Euphorbiaceae	Nela Usiri	Herb	whole plant	skin diseases, ulcers, etc.[14]
95	*Ricinus communis*	Euphorbiaceae	Avadam chettu	Small tree	whole plant	Rheumatism, insomnia, arthritis, etc.[14]
96	*Ficus racemosa*	Moraceae	Medi chettu	Tree	bark, fruit	pains, hemorrhage, diabetes, jaundice, etc.[14]
97	*Allium fistolum*	Liliaceae	Ulli kada	Herb	tunicated bulb, altered stem	influenza, heart diseases, etc[74].
98	*Commelina benghalensis*	Commelinaceae	Amruta kada	Herb	leaves	diarrhea, fever, malaria, rheumatism, leprosy, etc.[75]
99	*Chloris barbata*	Poaceae	Uppa Gaddi	Grass	leaves	rheumatism, skin diseases, etc.[76]
100	*Dactyloctenium aegyptium*	Poaceae	Ganuka Gaddi	Grass	seeds	wounds, ulcers, etc.[77]
101	*Eragrostis unioloides*	Poaceae	Uddara Gaddi	Grass	Roots	asthma, jaundice,etc.[78]

menstrual problems, sperm motility, and hair growth, among others[14]. The documented records from this study provide valuable and enduring insights into the medicinal properties of these plants. This information not only helps in preserving indigenous knowledge regarding the medicinal plant usage but also has the potential to draw the interest of younger generations towards traditional healing practices. Moreover, the inhabitants of the study area exhibit commendable ethno medicinal knowledge, contributing to the collection of high-quality information in this investigation.

Conclusion

Due to increasing significance of ethno botanical studies, it is imperative to gather information about traditional medicine knowledge preserved in tribal and rural communities across different regions of

India before it disappears forever. The future of medicinal plants holds great promise in addressing both present and future health care needs. Consequently there is a vast potential for further exploration, analysis and documentation of tribal medicines derived from plant products. This uncharted territory presents an immense opportunity for future research and discovery in the field of herbal medicine.

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