

**DIVERSITY OF ANGIOSPERMS AT MACHIGAD FORT, HALASHI, KAHANAPUR,  
BELAGAVI, INDIA**

**ABSTRACT**

The study of phytodiversity of flora within the fort is important. Fort flora found within the historical forts of Karnataka, India are vital for their rich biodiversity, including many rare and endemic species. The study of fort flora reports 278 species only angiosperms belonging to 69 families, covering 113 herbs, 41 shrubs, 66 trees, 22 climbers, 15 climbing shrubs, 8 undershrubs, 13 lianas species. This fort flora also supports few useful medicinal plants. Therefore, there is an urgent need to protect the fort flora to sustain the biodiversity.

**KEY WORDS:** Belgavi, Dominant families, Fort flora, Karnataka, IUCN Status, Phytodiversity.

**INTRODUCTION**

Phytodiversity is important to understand the overall structure, function of any ecosystem, and provide all kinds of essential requirements. (Gairola *et al.*, 2010). Plants provide food and other life supporting commodities and important for survival of humans and other organisms besides they protect our environment and maintain nature. Plantdiversity includes trees, shrubs, herbs, climbers including medicinal, economical plants and wild edible plants. (Choudhary & Nama, 2014). The biotic factors mainly includes species interaction like competition, predation, community composition and abiotic factors like climate regulation, habitat heterogeneity. (Rawat & Khare, 2010). Conservation of phytodiversity involves a combination of strategies and practices aimed to protecting plant species, their genetic variation and ecosystem. (UNBL, 2022). Here fort flora is concept, forts are one of key features and provide a diverse range of habitats due to unique environment, which are include many endemic flora. They play important role in their respective ecosyemas they protect flora. (Jangam & Pawar, 2023).

Flora of Karnataka written by Saldanaha (1984 and 1996) has reported 170 families and 3400 species. Flora of Karnataka Analysis by (Sharma *et al.*, 1984) has reported the 3924 species under the 1323 genera these are belonging to 199 families of plant. Flora of Eastern Karnataka written by N. P. Singh (1988) reported the 140 families of plant this families contain 1421 species, 696 genera; Bidar fort flora reported 221 species belonging to 63 families, which records Algae 20 species, Lichens 2 species, Bryophytes 08 species, Pteridophytes 08 species, Gymnosperms 06 species, Angiosperms including Monocotyledons 27

species, 23 Genera, 04 family, and Dicotyledons 150 species, 121 Genera, 46 Families (Shrishail & Mathad, 2009). Flora of Karnataka A Checklist, Vol. 2: Gymnosperms and Angiosperms by Sanjappa & Sringeshwara (2019) have reported the 196 plant families and contain 4853 species, 1543 genera.

Studies on Phytodiversity of Mallikarjun hill adi: A Sacred grove in Karnataka, India by Varsha and Sanjay (2023) recorded 160 species, 133 genera and 58 families; Phytodiversity studies in Sri Ramathirth Sacred grove, Halasi, Khanapur taluk, Belagavi district, Karnataka by Yelvattimath and Kotresh (2011) reported 274 species, 215 genus, 80 species. Floristic Diversity of Raichur Fort Karnataka India reported 158 speceis s belonging to 39 families of Angiosperms, 04 species of Pteridophytes, 03 species of Bryophyte, 04 species of Algae were collected and recorded from the rocks and fort walls and ponds of Raichur fort.(Shrishail *et al.*, 2020).Floristic enumeration of Ballari Fort Karnataka reported 115 plant species belonging to 98 genera and 39 families of Angiosperms from fort (Siddeshwari, 2021). Flowering plants of Chikodi hills Belagavi, Karnataka, India by Dalavi *et al.*, (2021) recorded 584 species, 383 genus, 95 families.

## MATERIALS AND METHOD

Machigad is small village located between north latitudes 15.3115° and east longitudes 74.7366° according to the Survey of India. It is 41 kms from Belagavi, 16 kms from Khanapur taluk. Halsi, Nandhgad and Ramtheerth are villages surrounded by Machigad (Fig. 01). The geographical area is about 2.0284 km<sup>2</sup>. Collection of specimens four seasons were considered for study, they are pre-monsoon, monsoon, winter and summer. Pre-monsoon includes include April-June showers. Monsoon includes June-September showers. Winter December to January. Summer includes February-May. Specimen identification with the following flora (Cooke, 1906; Gamble, 1928; Saldanha and Nicolson, 1976; Saldanha, 1984 & 1996; Sharma *et al.*, 1984; Singh, 1988; Bhat, 2003; Manjunath *et al.*, 2004; Bhaskar & Kushalappa, 2014; Bhat, 2014; Kotresha and Kambhar, 2016; Seetharam *et al.*, 2018; Yoganarasimhan *et al.* 2018; Sanajappa and Sringeshwara, 2019) and herbarium preparation. Each specimen was pressed and dried according to the method of Ragvendra and Jain (1976). The dried specimens were previously stored in alcohol mixed with mercuric chloride (2%) to keep them away from fungal and insect attacks (Ravindrnath and Premnath, 1977). They were later deposited in the Herbarium of Karnatak Science College, Dharwad (HKSCD). As the names are updated as per KEW botanical Garden London (POWO, 2025).

## **RESULTS AND DISCUSSION**

Diversity of angiosperms of fort flora reports 278 species which is collected during the survey from December 2023 to October 2024. The species list is arranged alphabetically along with habit, IUCN status, flowering season, common name and nativity. Habit wise analysis shows that herbs are predominate with 113 species followed by trees with 66 species, shrubs with 41 species, climbers with 22 species, subshrubs with 8 species, climbing shrubs with 15 species, and lianas with 13 species (Fig. 02). Out of the 278 species found, the first ten dominant families constitute 154 species. Of these Fabaceae is most dominant family, comprising 34 species, followed by Malvaceae (19), Asteraceae (18), Orchidaceae (17), Apocynaceae (13), Acantaceae (12), Rubiaceae (10), Commelinaceae (09), Poaceae (08), Combretaceae and Lamiaceae 7 species each (Fig. 03). The remaining families are Menispermiaceae, Sapindaceae and Loranthaceae represented by 6 species each, followed by Vitaceae, Convolvulaceae, Asparagaceae and Phyllanthaceae represented by 5 species each. Cyperaceae, Dioscoreaceae, Colchicaceae represented by 4 species each. Six families are represented by 3 species each, they are Orobanchaceae, Anacardiaceae, Gentianaceae, Bignoniaceae, Moraceae and Rhamnaceae. Eleven families are represented by 2 species, they are Amaranthaceae, Meliaceae, Oxalidaceae, Salicaceae, Celastraceae, Rutaceae, Cucurbitaceae, Ebenaceae, Verbenaceae, Oleaceae and Santalaceae. There are 31 families represent single species each, Annonaceae, Araceae, Aristolochiaceae, Malpighiaceae, Nyctaginaceae, Solanaceae, Capparaceae, Lecythidaceae, Ranunculaceae, Boraginaceae, Hypoxidaceae, Zingiberaceae, Droseraceae, Costaceae, Ulmaceae, Molluginaaceae, Balsaminaceae, Crassulaceae, Lythraceae, Linaceae, Onagraceae, Euphorbiaceae, Melastomataceae, Passifloraceae, Apiaceae, Plumbaginaceae, Polygonaceae, Smilaceae, Myrtaceae, Zygophyllaceae and Cannabaceae (Fig.04-09).

## **CONCLUSION**

The Machigad fort forest need to be conserved for its endemic plants and for the future generation. Since the work was under taken for 9-10 months is not sufficient to come to through conclusions, future investigations on this Machigad fort forest is required. In addition, this need to be conserved by forest department from local cattle breeders and wood collectors from forest products. Some invasive weeds (*Duranta erecta* L., *Lantana camara* L.,) have destroyed the native flora, which should be conserved.

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UNDER PEER REVIEW

**Table 1: Diversity of Angiosperms at Machigad Fort, Halshi, Khanapur, Belgavi, India:**

Sl.no	Botanical name	Habit	IUCN Status	Flowering and fruiting season	Common name	Nativity
<b>Acanthaceae</b>						
1	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees	H	NE	March-December	Green Chiretta, Nelabevu	I
2	<i>Asystasia gangetica</i> (L.) T.Anderson	H	NE	August-December	Ganges Primrose, Chinese violet, Lavangavalli	I
3	<i>Barleria prionitis</i> L.	S	LC	August-March	Porcupine Flower, Haladi gorate	I
4	<i>Blepharis maderaspatensis</i> (L.) B.Heyne ex Roth	H	NE	August-March	Creeping Blepharis, Koodali soppu	I
5	<i>Dicliptera foetida</i> (Forssk.) Blatter	H	NE	November-April	Stinking foldwing	I
6	<i>Eranthemum roseum</i> (Vahl) R.Br.ex Roem. & Schult.	S	LC	November-January	Kappukarni, Blue eranthemum	I
7	<i>Hygrophila ringens</i> (L.) R. Br. ex Steud.	H	NE	October-March	Erect Hygrophila	I
8	<i>Justicia adhatoda</i> L.	S	LC	October-March	Malabar nut, Karchi	I
9	<i>Neuracanthus tetragonostachyus</i> Nees	H	NE	June-September	Three veined neuracanthus, Nili huuvu kaddi	I
10	<i>Rungia muralis</i> Royle ex Nees	H	NE	November-April	Wall Rungia	I
11	<i>Strobilanthes pavala</i> (Roxb.)J.R.I.Wood	S	NE	Septmber-April	Shade loving coneflower	I
12	<i>Thunbergia fragrans</i> Roxb.	C	NE	Throughout year	Sweet clock-vine, Indrapushpa	I
<b>Amaranthaceae</b>						
13	<i>Alternanthera pungens</i> Kunth	H	NA	Throughout year	Paper Thron, Mullu honagonne	E
14	<i>Amaranthus viridis</i> L.	H	NE	December-April	Green Amaranth. Pigweed, Keresoppu	E
<b>Anacardiaceae</b>						
15	<i>Anacardium occidentale</i> L.	T	LC	December-May	Cashew, Godambi, Kaju	E
16	<i>Lannea coromandelica</i> (Houtt.) Merr.	T	LC	January-July	Indian Ash Tree	I

17	<i>Semecarpus anacardium</i> L.f.	T	LC	July-April	Marking Nut, Geru	I
<b>Annonaceae</b>						
18	<i>Annona squamosa</i> L.	T	LC	March-December	Sugar Apple	E
<b>Apiaceae</b>						
19	<i>Pimpinella heyneana</i> (DC.) Benth. & Hook.f.	H	NE	August-March	Selvanthachedi	I
<b>Apocynaceae</b>						
20	<i>Calotropis gigantea</i> (L.) W.T.Aiton	S	NE	Throughout year	Crown flower, Giant Milk-Weed, Ekke gida	I
21	<i>Carissa carandas</i> L.	S	DD	March-October	Kavali hoo/kai, Gariche	I
22	<i>Carissa spinarum</i> L.	S	LC	February-July	Wild karanda, Chikka kavali	I
23	<i>Catharanthus pusillus</i> (Murray) G.Don	H	NE	July-January	Tiny Periwinkle	I
24	<i>Ceropegia bulbosa</i> Roxb.	C	NE	July-December	Bulbous Ceropegia	I
25	<i>Cryptolepis buchananii</i> R.Br. ex Roem. & Schult.	Cs	NE	March-September	Wax Leaved Climber	I
26	<i>Cryptostegia grandiflora</i> Roxb. ex R.Br.	L	NE	Throughout year	Rubber vine	E
27	<i>Gymnema sylvestre</i> (Retz.) R. Br. ex Sm	L	NE	August-March	Cowplant, Sappe soppu	I
28	<i>Hemidesmus indicus</i> (L.) R. Br.	C	NE	August-February	Indian Sarsaparilla, Anantamula	I
29	<i>Holarrhena pubescens</i> Wall .ex G.Don	T	LC	March-October	Tellicherry tree, Ester tree	I
30	<i>Ichnocarpus frutescens</i> (L.) W.T.Aiton	L	NE	August-December	Black Creeper, Halugenasu	I
31	<i>Vincetoxicum rotundifolium</i> (Buch. Ham. ex Wight) Kuntze	H	NE	May-September	Roundleaf ipecac	I
32	<i>Wrightia tinctoria</i> (Roxb.) R.Br	H	LC	February-October	Sweet indrajao, Dyers's oleander	I
<b>Araceae</b>						
33	<i>Arisaema tortuosum</i> (Wall.) Schott	H	NE	May-November	Whipcord Cobra Lily	I

Aristolochiaceae						
34	<i>Aristolochia indica</i> L.	C	NE	July-February	Indian Birthwort, Duck flower, Ishwar balli	I
35	<i>Asparagus racemosus</i> Willd.	Cs	NE	July-December	Buttermilk root, Satawari	I
36	<i>Chlorophytum laxum</i> R.Br.	H	NE	May-December	Zebra Grass, False lily turf	I
37	<i>Chlorophytum nimmonii</i> Dalzell	H	NE	August-September	Lax-Flowered Chlorophytum	I
38	<i>Dipcadi montanum</i> (Dalzell) Baker	H	NE	June-October	Mountain Dipcadi	I
39	<i>Drimia indica</i> (Roxb.) Jessop	H	NE	December-May	Indian Squill	I
Asteraceae						
40	<i>Acanthospermum hispidum</i> DC.	H	NE	January-July	Bristly Starbur, Kadale mulu	E
41	<i>Acilepis heynei</i> (Bedd. Ex Gamble) H.Rob. & Skvarla	S	NE	November-May	Acilepis Plant	I
42	<i>Acmella calva</i> (DC.) R.K.Jansen	H	NE	February-December	Paracress, Toothache plant	I
43	<i>Ageratum conyzoides</i> L.	H	LC	Throughout year	Goat weed, Jangli pudina	E
44	<i>Bidens 9ivaricat</i> (Lour.) Merr. & Sheriff	H	NE	Throughout year	Yellow blackjack	I
45	<i>Blainvillea acmella</i> (L.) Philipson	H	LC	September-April	Spot-me flower	I
46	<i>Chromolaena odorata</i> (L.) R.M.King & H. Rob.	S	NE	October-May	Siam weed, Bitter bush	E
47	<i>Eclipta prostrata</i> (L.) L.	H	LC	Throughout year	False Daisy, Trailing eclipta, Kaadige garige	E
48	<i>Elephantopus scaber</i> L.	H	NE	August-January	Prickly leaved elephant foot, Hakkarike	I
49	<i>Epaltes divaricata</i> (L.) Cass.	H	LC	October-April	Narrow -Leaf Epaltes	I
50	<i>Eschenbachia stricta</i> (Willd.) Raizada	H	NE	September-April	Erect Horseweed	I
51	<i>Parthenium hysterophorus</i> L.	S	NE	Throughout year	Carrot grass, Congress grass	E
52	<i>Phyllocephalum phyllolaenum</i> (DC.) Narayana	H	NE	September-November	Broad-leaved phyllolaenum	I
53	<i>Senecio bombayensis</i> N.P.Balakr.	H	NE	August-	Sonki	I

				December		
54	<i>Senecio</i> spp L.	H	LC,NT,EN,CR,VU,EW,DD	August onwards		I
55	<i>Senecio tenuifolius</i> Burm.f.	H	NE	August-February	Slender-leaf senecio	I
56	<i>Tricholepis</i> sp.	S	DD,VU,NE	August-October		I
57	<i>Tridax procumbens</i> L.	H	NE	Throughout year	Tridax daisy, Addige soppu	E
58	<i>Xanthium strumarium</i> L.	Us	NE	August-September	Common cocklebur, Broad bur	I
<b>Balsaminaceae</b>						
59	<i>Impatiens rupicola</i> (Hook.f.) Bhaskar	H	NE	July-October	Rock Balsam	I
<b>Bignoniaceae</b>						
60	<i>Dolichandrone falcata</i> (Wall. ex DC.) Seem.	T	LC	January-November	Medhshingi, Goodumurki	I
61	<i>Heterophragma quadriloculare</i> (Roxb.) K. Schum	T	LC	December-February	Waras, Adavi nugge	I
62	<i>Tecoma stans</i> (L.) Juss. Ex Kunth	T	LC	Throughout year	Yellow bells, Trumpet flower	E
<b>Boraginaceae</b>						
63	<i>Cordia dichotoma</i> G.Forst.	T	LC	January-September	Indian cherry, Kaaduchalle	I
<b>Cannabaceae</b>						
64	<i>Trema orientale</i> (L.) Blume	T	LC	January-October	Indian Charcoal tree, Pigeon wood	I
<b>Capparaceae</b>						
65	<i>Capparis zeylanica</i> L.	Cs	NE	January-October	Ceylon caper, Govinda phala	I
<b>Celastraceae</b>						
66	<i>Celastrus paniculatus</i> Willd.	L	NE	March-December	Oriental bittersweet, Karigonne	I
67	<i>Gymnosporia senegalensis</i> (Lam.) Loes.	S	LC	September-February	Red Spike Thorn	I
<b>Colchicaceae</b>						
68	<i>Gloriosa superbL.</i>	C	LC	July-November	Glory Lily, Tiger claw, Agnisikhe	I
69	<i>Iphigenia indica</i> (L.) A. Gray ex Kunth	H	LC	July-September	Indian Grass Lily, Kaadu bellulli	I



88	<i>Argyreia</i> Lour.	C, S	NT,EN,DD,NE	June-September		I
89	<i>Ipomoea cairica</i> (L.) Sweet	Cs	LC	Throughout year	Cairo Morning Glory	I
90	<i>Ipomoea nil</i> (L.) Roth	C	NE	August-April	Blue morning glory	E
91	<i>Ipomoea obscura</i> (L.) Ker Gawl.	C	NE	September-March	Obscure Morning Glory	I
92	<i>Ipomoea rubriflora</i> O'Donell	C	NE	September-March	Redstar, Red morning glory	E
<b>Costaceae</b>						
93	<i>Hellenia speciosa</i> (J.Koenig) S.R.Dutta	H	LC	June-September	Crepe Ginger, Cane reed, Nayikabbu	I
<b>Crassulaceae</b>						
94	<i>Kalanchoe olivacea</i> Dalzell	H	NE	January-April	Indian Kalanchoe	I
<b>Cucurbitaceae</b>						
95	<i>Coccinia grandis</i> (L.) Voigt	C	NE	Throughout year	Ivy Gourd, Tondikayi	I
96	<i>Diplocyclos palmatus</i> (L.) C. Jeffrey	C	NE	August-January	Lollipop Climber, Shivalinga balli	I
<b>Cyperaceae</b>						
97	<i>Bulbostylis thouarsii</i> (Roem. & Schult.) Lye ex Veldkamp & Verloove	H	NE	July-November	Bulbostylis	I
98	<i>Cyperus mindorensis</i> (Steud.) Huygh	H	NE	June-September	White Water Sedge, Whitehead spikesedge	I
99	<i>Cyperus paniceus</i> (Rottb.) Boeckeler	H	LC	August-November	Poongorai	I
100	<i>Cyperus pulchellus</i> R.Br.	H	LC	October-November	Panicled flat-sedge	E
<b>Dioscoreaceae</b>						
101	<i>Dioscorea bulbifera</i> L.	C	NE	August-December	Air yam, Bitter yam, Wild yam	I
102	<i>Dioscorea oppositifolia</i> L.	C	NE	July-March	Cinnamon Vine, Hakki genasu	I
103	<i>Dioscorea pentaphylla</i> L.	C	NE	August-December	Five leaf yam, Kaadu gumbala	I
104	<i>Tacca leontopetaloides</i> (L.)Kuntze	H	LC	July-October	Fiji Arrowroot, Batflower	I

Droseraceae						
105	<i>Drosera indica</i> L.	H	LC	August-March	Flycatcher, Sundew, Dew plant	I
Ebenaceae						
106	<i>Diospyros melanoxylon</i> Roxb.	T	NE	January-June	Coromandel Ebony, Abasani, Balai	I
107	<i>Diospyros montana</i> Roxb.	T	NE	March-October	Bombay Ebony, Kalnandi	I
Euphorbiaceae						
108	<i>Mallotus philipensis</i> (Lam.) Mull.Arg.	T	LC	June-March	Kamala tree, Kunkumada mara	I
Fabaceae						
109	<i>Albizia odoratissima</i> (L.f.) Benth.	T	LC	May-February	Black Siris, Kaadu bage, Kala siris	I
110	<i>Bauhinia purpurea</i> L.	T	LC	February-December	Butterfly tree, Kanchuvaala	I
111	<i>Butea monosperma</i> (Lam.) Taub.	T	LC	January-July	Flame of forest, Muttuga	I
112	<i>Cassia fistula</i> L.	T	LC	March-December	Golden shower tree	I
113	<i>Chamaecrista absus</i> (L.) H.S.Irwin & Barneby	H	LC	August-February	Tropical Sensitive Pea, Pig's senna	I
114	<i>Chamaecrista mimosoides</i> (L.) Greene	H	LC	July-February	Feather-leaved Cassia, Nela tangadi	I
115	<i>Clitoria ternatea</i> L.	C	NE	March-October	Butterfly Pea, Shankha pushpi	E
116	<i>Dalbergia lanceolaria</i> L.f.	T	LC	March-July	Lanceleaf Rosewood, Bili beete, Belaga	I
117	<i>Dalbergia latifolia</i> Roxb	T	VU	July-February	Black Rosewood, Beete, Kala shisham	I
118	<i>Geissaspis cristata</i> Wight & Arn.	H	LC	July-January	Eyelashes Shell Beans	I
119	<i>Grona trifolia</i> (L.) H. Ohashi & K. Ohashi	H	NE	Throughout year	Creeping tick trefoil, Kaadu menthe	I
120	<i>Hultholia mimosoides</i> (Lam.) Gagnon & G.P.Lewis	Cs	LC	October-February	Mimosa thorn, Eejimullu	I
121	<i>Indigofera astragalina</i> DC.	H	NE	August-February	Silky Indigo	I
122	<i>Indigofera trifoliata</i> L.	H	NE	September-	Three-Leaf Indigo	I

				January		
123	<i>Indigofera tsiangiana</i> Metcalf	H	NE	July-January	Nine-Leaved Indigo, Chenna gida	I
124	<i>Mimosa pudica</i> L.	H	LC	November-May	Touch me not, Muttidare muni, Olamuccchiga	E
125	<i>Moullava spicata</i> (Dalzell ex Wight) Nicolson	Cs	NE	October-March	Candy Corn Plant	I
126	<i>Mucuna pruriens</i> (L.) DC.	L	LC	September-March	Velvet Bean, Cowitch	I
127	<i>Paracalyx scariosus</i> (Roxb.) Ali	L	NE	January-May	Indian husk pea, Kadlenaru	I
128	<i>Piliostigma malabaricum</i> (Roxb.) Benth.	T	LC	October-November	Malabar Bauhinia, Basavanapaada	I
129	<i>Polhillides velutina</i> (Willd.) H. Ohashi & K. Ohashi	Us	NE	September-June	Velvet-leaf desmodium	I
130	<i>Pongamia pinnata</i> (L.) Pierre	T	LC	February-October	Pongam tree, Honge mara	I
131	<i>Saraca asoca</i> (Roxb.) W. J. de Wilde	T	VU	March-October	Ashoka tree, True Ashoka	I
132	<i>Senegalia caesia</i> (L.) Maslin, Seigler & Ebinger	L	LC	June-April	Black catechu, Soap bark	I
133	<i>Senegalia torta</i> (Roxb.) Maslin, Seigler & Ebinger	L	LC	Throughout year	Twisted acacia, Kad siege	I
134	<i>Senna auriculata</i> (L.) Roxb.	S	LC	Throughout year	Tanner's Cassia, Tangadi	I
135	<i>Senna occidentalis</i> (L.) Link	S	LC	August-February	Coffee senna, Aanesogate	E
136	<i>Senna uniflora</i> (Mill.) H.S.Irwin & Barneby	S	NE	July-December	Oneleaf senna	E
137	<i>Smithia</i> spp	H, S, C	LC,NT,NE	November-February		I
138	<i>Tadehagi triquetrum</i> (L.) H. Ohashi	Us	LC	August-March	Winged-Stalk desmodium	I
139	<i>Tamarindus indica</i> L.	T	LC	April-December	Tamarind, Hunase, Imli	E
140	<i>Tephrosia purpurea</i> (L.) Pers.	Us	DD,LC,EN	Throughout year	Common tephrosia, Wild indigo	I
141	<i>Xylia xylocarpa</i> (Roxb.) w.Theob.	T	LC	April-January	Burma Ironwood	I

142	<i>Zornia gibbosa</i> Span.	H	NE	August-January	Grasslike Zornia	I
<b>Gentianaceae</b>						
143	<i>Canscora diffusa</i> (Vahl) R.Br. ex Roem.& Schult	H	NE	October-April	Spreading Canscora	I
144	<i>Canscora perfoliata</i> Lam.	H	NE	October-April	Pierced Leaf Canscora	I
145	<i>Exacum petiolare</i> Griseb.	H	NE	September-December	Stalked Persian Violet, Dodda chirayatha	I
<b>Hypoxidaceae</b>						
146	<i>Curculigo orchoides</i> Gaertn.	H	NE	April-December	Golden Eye Grass, Orchid palm grass	I
<b>Lamiaceae</b>						
147	<i>Clerodendrum infortunatum</i> L.	S	LC	December-February	Hill Glory Bower, Ibbane	I
148	<i>Coleus barbatus</i> (Andrews) Benth. ex G.Don	H	NE	October-February	Indian Coleus	I
149	<i>Coleus strobilifer</i> (Roxb.) A.J.Paton	H	NE	October-February	Thick leaf lavender, Doddapatre	I
150	<i>Gmelina asiatica</i> L.	T	LC	May-February	Asian Bushbeech, Oval-leaved gmelina	I
151	<i>Mesosphaerum suaveolens</i> (L.) Kuntze	S	NE	Throughout year	American Mint, Ganga tulasi	E
152	<i>Rothea serrata</i> (L.) Steane & Mabb.	S	NE	June-February	Blue fountain bush	I
153	<i>Tectona grandis</i> L.f.	T	EN	April-September	Teak wood, Sagvaan, Thega mara	I
<b>Lecythidaceae</b>						
154	<i>Careya arborea</i> Roxb.	T	NE	March-August	Wild Guava, Ceylon Oak	I
<b>Linaceae</b>						
155	<i>Linum mysorensse</i> B. Heyne ex Benth	H	NE	September-January	Mysore Flax, Kaadu agasebija	I
<b>Loranthaceae</b>						
156	<i>Dendrophthoe falcata</i> (L.f.) Ettingsh.	H	NE	December-May	Honey Suckle Mistletoe, Neem mistletoe	I

157	<i>Helicanthes elastica</i> (Desr.) Danser	H	NE	April-December	Rubberly Mango Mistletoe	I
158	<i>Helixanthera obtusata</i> (Wall. ex Wight & Arn.) Danser	H	NE	April-June	Bluntleaf Mistletoe	I
159	<i>Macrosolen trigonus</i> (Wight & Arn.) Tiegh.	S	NE	May-February	Three-angled mistletoe	I
160	<i>Scurrula parasitica</i> L.	S	NE	Throughout year	Cinnamon Mistletoe	I
161	<i>Taxillus cuneatus</i> (B.Heyne ex Roth) Danser	H	NE	March-December	Wedged-Leaf Mistletoe	I
<b>Lythraceae</b>						
162	<i>Lagerstroemia microcarpa</i> Wight	T	LC	June-February	Bean teak, Bilinandi	I
<b>Malpighiaceae</b>						
163	<i>Aspidopterys cordata</i> (B.Heyne ex Wall.) A.Juss.	Cs	NE	August-January	Bokadvel	I
<b>Malvaceae</b>						
164	<i>Azanza lampas</i> (Cav.) Alef.	H	LC	September-February	Wild cotton	I
165	<i>Bombax ceiba</i> L.	T	LC	January-May	Silk cotton tree, Kempu booraga	I
166	<i>Erinocarpus nimmonii</i> J.Graham	T	VU	September-January	Jangli Bhendi	I
167	<i>Grewia flavescens</i> Juss.	Cs	LC	June-February	Donkey Berry, Sandpaper raisin	I
168	<i>Grewia hirsuta</i> Vahl	S	LC	June-December	Nagbala Crossberry	I
169	<i>Grewia tiliifolia</i> Vahl	T	LC	Throughout year	Dhaman	I
170	<i>Helicteres isora</i> L.	S	LC	April-January	East-Indian srew tree, Murugikaayi gida	I
171	<i>Kydia calycina</i> Roxb.	T	LC	September-February	Kydia, Kolibende	I
172	<i>Melochia corchorifolia</i> L.	H	LC	July-April	Chocolate Weed, Bettadatutti mara	I
173	<i>Microcos paniculata</i> L.	S	LC	August-November	Elm-leaf grewia, Majjige soppu	I
174	<i>Sida acuta</i> Burm.f.	S	NE	Throughout year	Common wireweed, Bheemana kaddi	I

175	<i>Sida rhombifolia</i> L.	S	NE	July-February	Rhombic-leaf sida, Cuban jute	I
176	<i>Sterculia foetida</i> L.	T	LC	March-August	Java olive, Jangli badam	I
177	<i>Sterculia guttata</i> Roxb.	T	LC	Septmber-March	Spotted Sterculia	I
178	<i>Sterculia villosa</i> Roxb. ex Sm.	T	LC	January-June	Hairy Sterculia, Bilitaale	I
179	<i>Triumfetta pilosa</i> Roth	Us	NE	September-January	Hairy burr-bush	I
180	<i>Triumfetta rhomboidea</i> Jacq.	S	NE	August-January	Burr bush, Katavaani	I
181	<i>Triumfetta rotundofolia</i> Lam.	Us	NE	July-January	Roundleaf burr-bush	I
182	<i>Waltheria indica</i> L.	Us	LC	Throughout year	Sleepy Morning, Velvet leaf	E
<b>Melastomataceae</b>						
183	<i>Osbeckia muralis</i> Naudin	H	NE	August-November	Wall Osbeckia	I
<b>Meliaceae</b>						
184	<i>Azadirachta indica</i> A.Juss.	T	LC	January-April	Neem	I
185	<i>Cipadessa baccifera</i> (Roxb. ex Roth) Miq.	S	LC	March-November	Ranabili, Sidigolu	I
<b>Menispermaceae</b>						
186	<i>Cissampelos pareira</i> L.	C	NE	April-October	Velvet Bean, False Pareira Brava	I
187	<i>Cocculus hirsutus</i> (L.) W.Theob.	Cs	NE	Throughout year	Broom Creeper, Ink berry	I
188	<i>Coscinium fenestratum</i> (Gaertn.) Colebr.	L	DD	August-October	Flase calumba	I
189	<i>Cyclea peltata</i> (Burm.f.) Hook.f. & Thomson	C	NE	November-June	Indian moon seed	I
190	<i>Tinospora cordifolia</i> (Willd.) Hook.f. & Thomson	L	NE	Throughout year	Heartleaf Moonseed, Amritballi, Gulbel	I
191	<i>Tinospora sinensis</i> (Lour.) Merr.	L	NE	February-June	Malabar Moonseed	I
<b>Molluginaceae</b>						
192	<i>Hypertelis cerviana</i> (L.) Thulin	H	NE	August-March	Thread-Stem Carpetweed	E
<b>Moraceae</b>						
193	<i>Ficus arnottiana</i> (Miq.) Miq.	T	NE	June-September	Indian Rock Fig, Rock pipal, Kaadu aswatha	I

194	<i>Ficus benghalensis</i> L.	T	NE	Throughout year	Banyan tree, Aaladamara	I
195	<i>Ficus religiosa</i> L.	T	LC	November-February	Peepal Tree, Sacred fig, Aralimara	I
<b>Myrtaceae</b>						
196	<i>Syzygium cumini</i> (L.) Skeels	T	LC	February-October	Jamun, Nerale	I
<b>Nyctaginaceae</b>						
197	<i>Boerhavia diffusa</i> L.	H	NE	Throughout year	Red hogweed, Wineflower	I
<b>Oleaceae</b>						
198	<i>Jasminum malabaricum</i> Wight	Cs	NE	February-September	Malabar Jasmine, Wild Jasmine	I
199	<i>Jasminum sambac</i> (L.) Aiton	Cs	NE	January-July	Arabian Jasmine, Gundu Mallige	I
<b>Onagraceae</b>						
200	<i>Ludwigia adscendens</i> (L.) H.Hara	H	LC	December-July	Water Primrose, Neerdantu	I
<b>Orbanchaceae</b>						
201	<i>Centranthera indica</i> (L.) Gamble	H	LC	July-December	Indian Spur Anther flower	I
202	<i>Parasopubia delphinifolia</i> (L.) H.P.Hofrn. & Eb.Fisch.	S	NE	July-January	Common sopubia	I
<b>Orchidaceae</b>						
203	<i>Acampe praemorsa</i> (Roxb.) Blatt. &McC.	H	NE	April-December	Clipped acampe, Brittle orchid, Seete hoo	I
204	<i>Aerides maculosa</i> Lindl.	H	NE	June-October	Fox brush orchid, Cat's tail orchid, Draupadi hoo	I
205	<i>Cottonia peduncularis</i> (Lindl.) Rchb.f.	H	NE	March-August	Bee Orchid	I
206	<i>Dendrobium macrostachyum</i> Lindl.	H	LC	April-July	Fringed tree dendrobium, Large spike dendrobium	I
207	<i>Dendrobium ovatum</i> (L.) Kranzel.	H	NE	September-March	Green lipped dendrobium	I
208	<i>Eulophia nuda</i> Lindl.	H	NE	April-July	Spectacular eulophia	I

209	<i>Habenaria furcifera</i> Lindl.	H	NE	August-November	Forked habenaria	I
210	<i>Habenaria grandifloriformis</i> Blatt. & McCann	H	NT	June-October	Single leaved hebenaria, Angel Orchid	I
211	<i>Habenaria marginata</i> Colebr.	H	NE	July-November	Golden yellow habenaria	I
212	<i>Luisia zeylanica</i> Lindl	H	NE	February-June	Cylindrical-leaf luisia	I
213	<i>Nervilia infundibulifolia</i> Blatt. & McCann,	H	NE	May-August	Funnel-leaf nervilia	I
214	<i>Nervilia plicata</i> (Andrews) Schltr.	H	NE	February-August	Pleated leaf nervilia	I
215	<i>Nervilia simplex</i> (Thouars) Schltr.	H	NE	May-June	Trembling Nervilia, Onde thaavare	I
216	<i>Oberonia falconeria</i> Hook.f.	H	NE	September-June	Limey oberonia	I
217	<i>Peristylus plantagineus</i> (Lindl.) Lindl.	H	NE	July-December	Plantain peristylus	I
218	<i>Rhynchosystylis retusa</i> (L.) Blume,	H	NE	May-December	Foxtail orchid, Blunt rhychostylis	I
219	<i>Vanda testaceae</i> (Lindl.) Rchb.f	H	NE	April-July	Small flowered vanda	I
<b>Orobanchaceae</b>						
220	<i>Aeginetia indica</i> L.	H	LC	July-December	Forest Ghost Flower	I
221	<i>Buchnera hispida</i> Buch.-Ham. Ex D.Don	H	NE	September-April	Karanji	I
222	<i>Sopubia trifida</i> Buch. -Ham. Ex D.Don	H	NE	November-May	Split leaf sopubia	I
<b>Oxalidaceae</b>						
223	<i>Biophytum sensitivum</i> (L.) DC.	H	NE	Throughout year	Tropical Little tree, Horamuchaka	I
224	<i>Oxalis corniculata</i> L.	H	NE	Throughout year	Creeping Wood Sorrel, Neerugoli	I
<b>Passifloraceae</b>						
225	<i>Passiflora foetida</i> L.	Cs	NE	June-December	Common Passion, Stinking passion flower	E
<b>Phyllanthaceae</b>						
226	<i>Breynia retusa</i> (Dennst.) Alston	S	LC	February-	Cup Saucer plant, Gurige	I



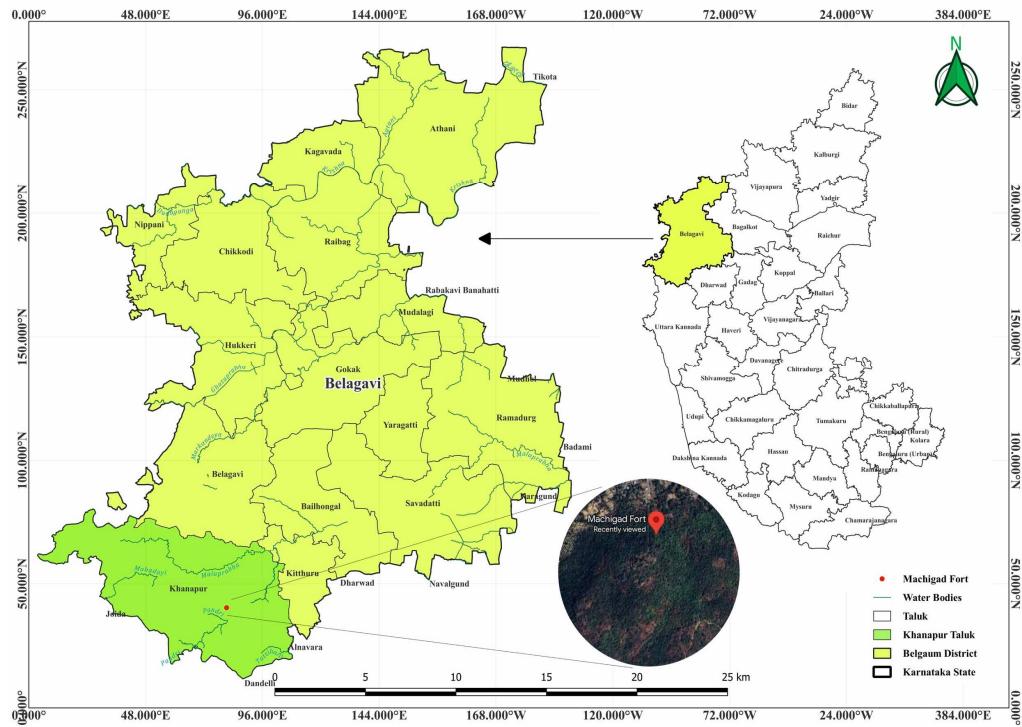
242	<i>Ziziphus horrida</i> Roth	T	LC	Septmber-February	Jujube	I
243	<i>Ziziphus mauritiana</i> Lam.	T	LC	December-April	Indian jujube, Bore	I
244	<i>Ziziphus rugosa</i> Lam.	Cs	LC	January-July	Wild Jujube	I
<b>Rubiaceae</b>						
245	<i>Adina cordifolia</i> (Roxb.) Brandis	T	LC	October-June	Yellow teak, Arisina tega	I
246	<i>Canthium coromandelicum</i> (Burm.f.) Alston	S	NE	April-June	Caray cheddie, Kaare gida	I
247	<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	S	LC	Throughout year	Mountain Pomegranate	I
248	<i>Hymenodictyon obovatum</i> Wall.	T	LC	August-December	Kadwa Sirid, Bogimara	I
249	<i>Meyna laxiflora</i> Robyns	T	NE	January-August	Muyna, Achura mullu	I
250	<i>Mitragyna parvifolia</i> (Roxb.) Korth	T	LC	March-December	True Kadamba, Kaim	I
251	<i>Pavetta crassicaulis</i> Bremek.	T	LC	June-December	Papari	I
252	<i>Pavetta indica</i> L.	T	LC	May-November	Indian pavetta	I
253	<i>Spermadictyon suaveolens</i> Roxb.	S	NE	August-March	Forest champa	I
254	<i>Tamilnadia uliginosa</i> (Retz.) Tirveng. & Sastre	T	LC	April-January	Divine Jasmine, Doddakaare	I
<b>Rutaceae</b>						
255	<i>Chloroxylon swietenia</i> DC.	T	VU	January-August	Ceylon Satinwood	I
256	<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	T	LC	March-October	Indian Prickly Ash	I
<b>Salicaceae</b>						
257	<i>Casearia tomentosa</i> Roxb.	T	LC	February-August	Toothed leaf chilli	I
258	<i>Flacourтия indica</i> (Burm.f.) Merr.	S	LC	December-August	Indian plum, Hettari mullu	I
<b>Santalaceae</b>						
259	<i>Viscum articulatum</i> Burm.f.	S	NE	November-June	Leafless mistletoe	I
260	<i>Viscum</i> sp.	T	NT,VU,LC,NE	November-March		I
<b>Sapindaceae</b>						
261	<i>Allophylus cobbe</i> (L.) Forsyth f.	T	LC	May-January	Indian Allophylus, Kasaballi	I

262	<i>Cardiospermum halicacabum</i> L.	C	LC	April-November	Balloon vine, Heart pea	I
263	<i>Sapindus emarginatus</i> Vahl	T	NE	February-December	Notched leaf soapnut, Antuvaala, Norekaayi	I
264	<i>Sapindus saponaria</i> L.	T	LC	November-February	Western soapnut	E
265	<i>Sapindus trifoliatus</i> Vahl	T	DD	October-December	South Indian soapnut, Soapberry	I
266	<i>Schleichera oleosa</i> (Lour.) Oken	T	LC	February-August	Ceylon Oak, Kusum, Kendala	I
<b>Smilacaceae</b>						
267	<i>Smilax ovalifolia</i> Roxb. ex D.Don	C	NE	August	Large-leaf smilax	I
<b>Solanaceae</b>						
268	<i>Brugmansia arborea</i> (L.) Sweet	S	EW	December-March	Angel's trumpet	E
<b>Ulmaceae</b>						
269	<i>Holoptelea integrifolia</i> (Roxb.) Planch.	T	LC	December-June	Indian Elm, Jungle cork tree, Tapasi mara	I
<b>Verbenaceae</b>						
270	<i>Duranta erecta</i> L	S	LC	Throughout year	Sky flower, Golden dew drop, Pigeon Berry	E
271	<i>Lantana camara</i> L.	S	NE	Throughout year	Lantana, Kasooti hoo, Chaduranga	E
<b>Vitaceae</b>						
272	<i>Ampelocissus indica</i> (L.) Planch.	C	NE	March-Septmber	Red-Stemmed Wild Grape-Vine, Chemballi	I
273	<i>Cissus repanda</i> (Wight & Arn.) Vahl	Cs	NE	February-September	Pani Bel, Mudi balli	I
274	<i>Cissus vitiginea</i> L.	C	NE	May-November	South ilndian Treebine	I
275	<i>Cyphostemma auriculatum</i> (Roxb.) P.Singh & B.V.Shetty	Cs	DD	May-October	Eared Cyphostemma	I
276	<i>Leea asiatica</i> (L.) Ridsdale	S	LC	June-September	Asiatic Leea	I
<b>Zingiberaceae</b>						
277	<i>Curcuma aromatic Salisb.</i>	H	NE	April-December	Wild turmeric, Aromatic turmeric	I

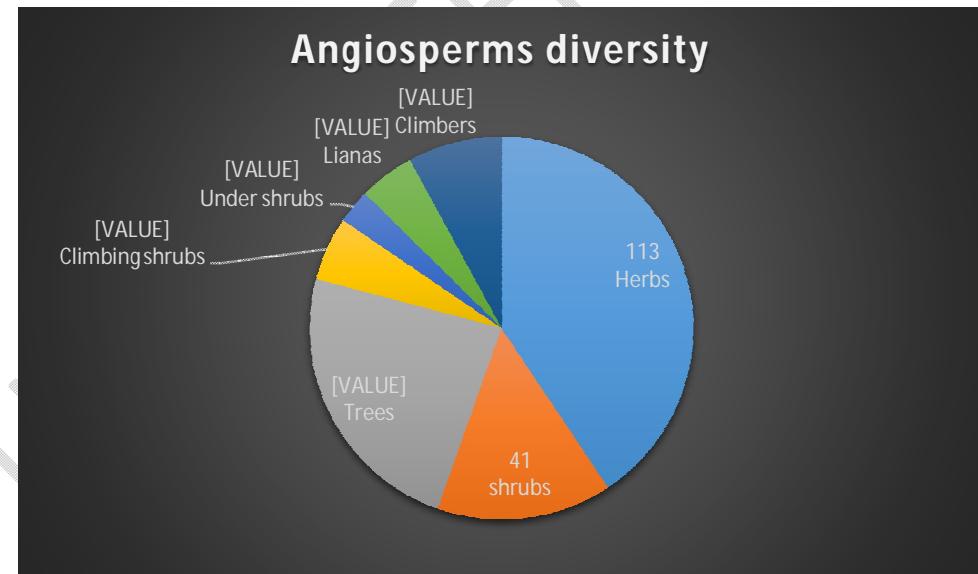
Zygophyllaceae						
278	<i>Tribulus terrestris</i> L.	H	LC	Throughout year	Puncture Vine, Negalmullu	I

SS- subshrub; T-Tree; H-Herb; Cs- Climbing Shrubs; S- Shrub; C- Climbers; LC-Least Concern; NT-Not evaluated; VU-Vulnerable; NE-Not Evaluated; DD- Data deficient; I-India; E-Exotic

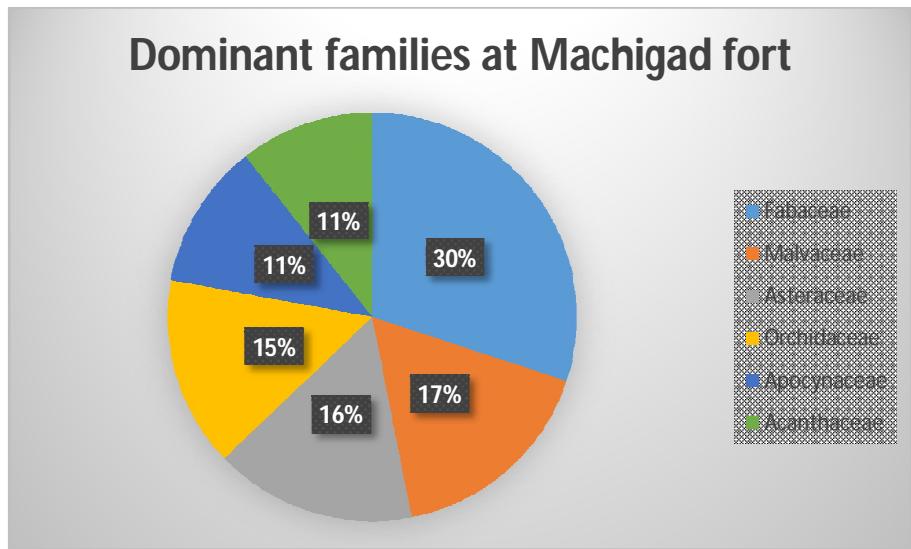
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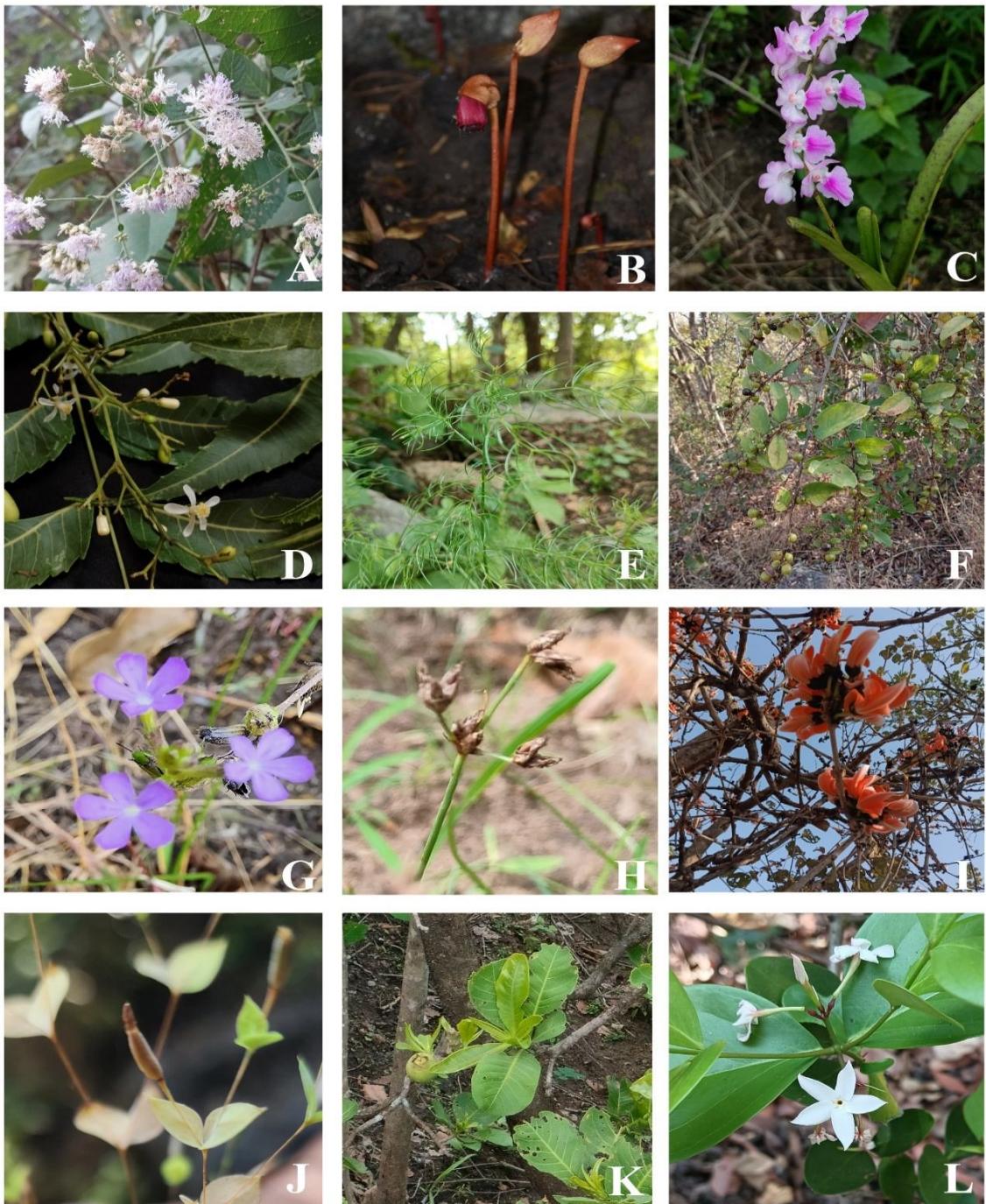
**Fig. 01.** Study area showing Machigad fort, Halshi, Khanapur, Belgavi



**Fig. 02.** Habit wise Angiosperm diversity at Machigad Fort, Halshi, Belgavi



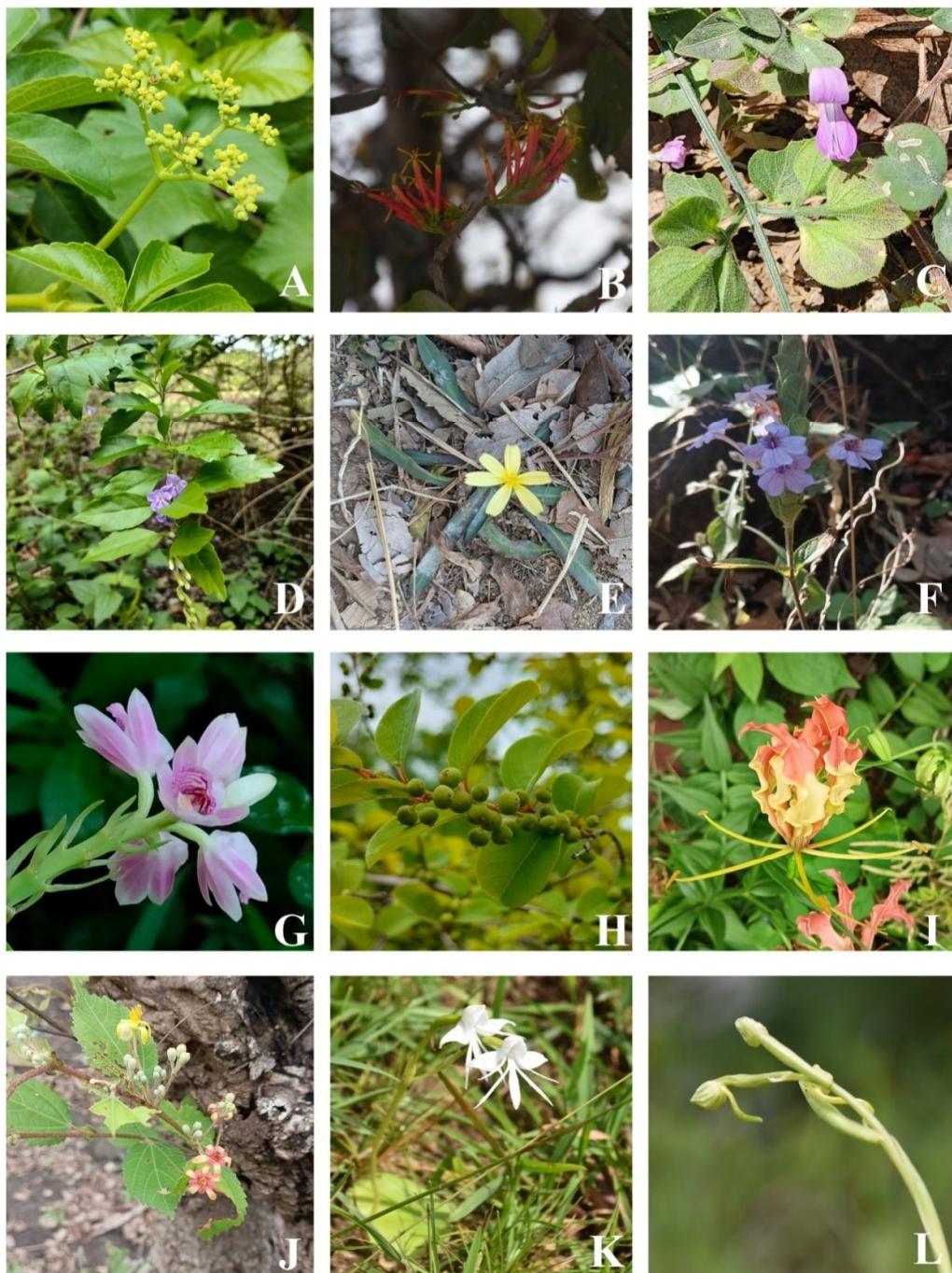
**Fig. 03.** Dominant families at Machigad Fort, Halshi, Belgavi



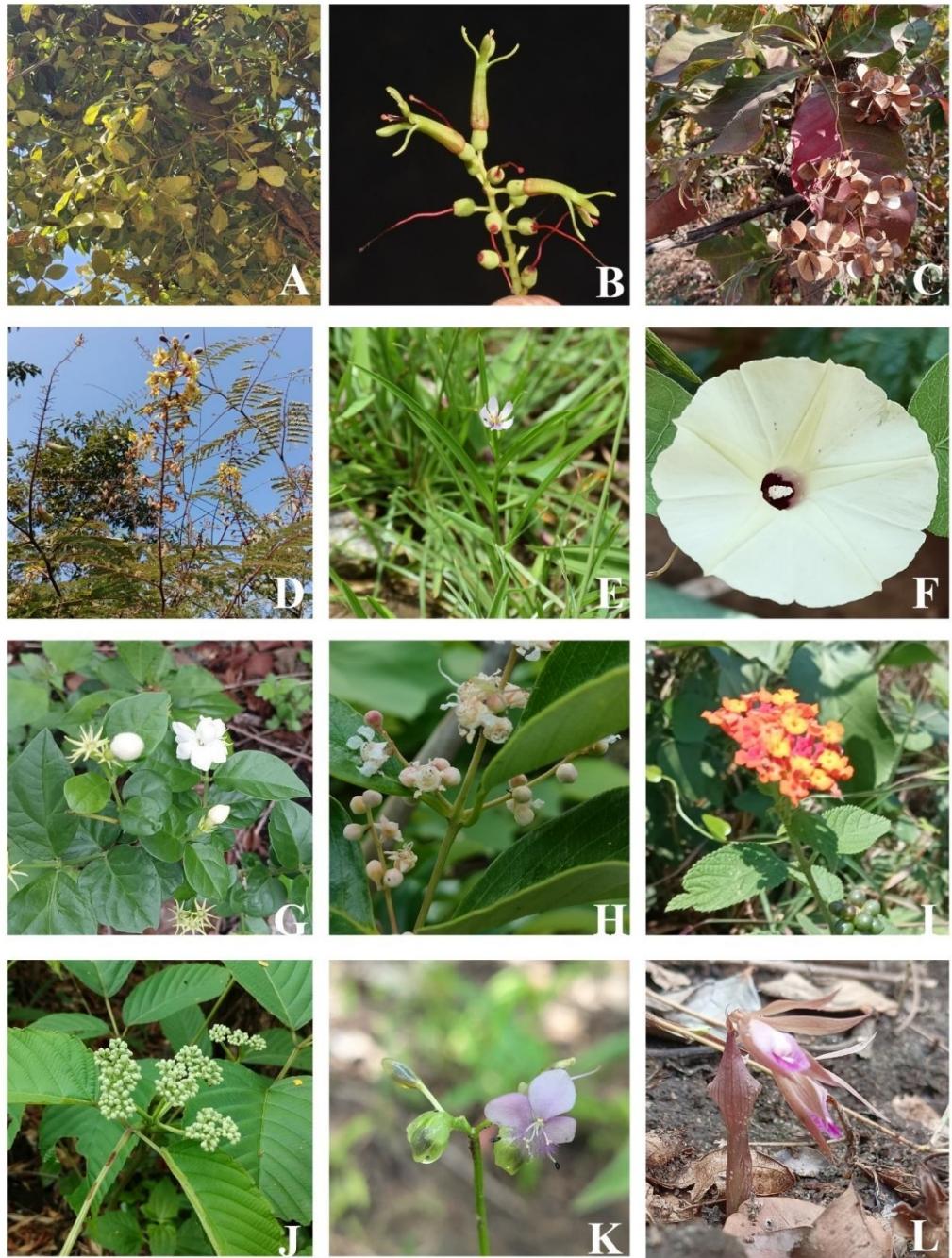
**Fig. 04:Habit:** **A.** *Acilepis heynei* (Bedd. Ex Gamble) H.Rob. & Skvarla; **B.** *Aeginetia indica* L.; **C.** *Aerides maculosa* Lindl.; **D.** *Azadirachta indica* A.Juss.; **E.** *Asparagus racemosus* Willd.; **F.** *Bridelia stipularis* (L.)Blume; **G.** *Buchnera hispida* Buch.-Ham. Ex D.Don; **H.** *Bulbostylis thouarsii* (Roem. and Schult.)Lye ex Veldkamp and Verloove; **I.** *Butea monosperma* (Lam.) Kuntze; **J.** *Canscra diffusa* (Vahl) R.Br. ex Roem. and Schult; **K.** *Careya arborea* Roxb.; **L.** *Carissa carandas* L.



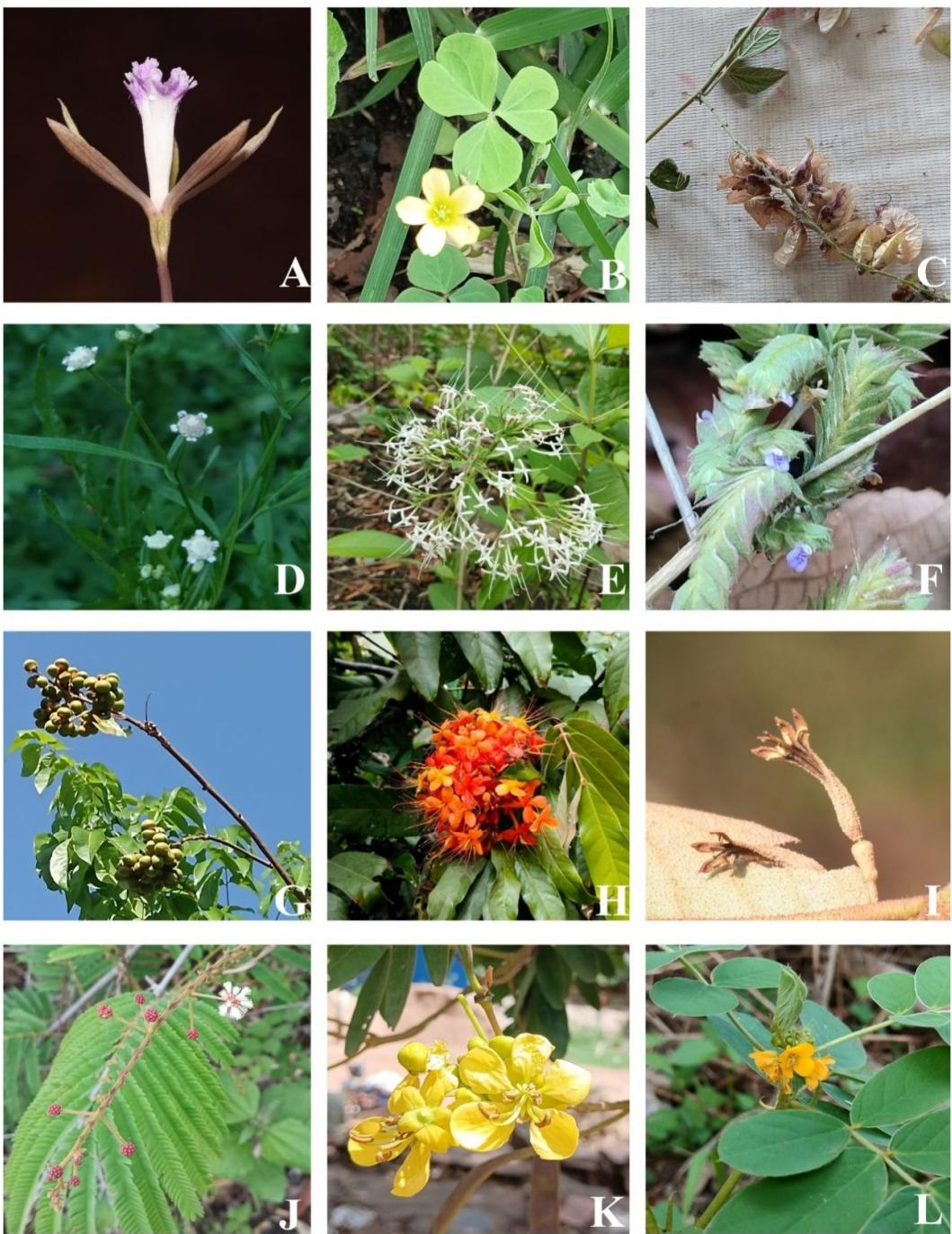
**Fig.05: Habit:** **A.***Cassia fistula* L.; **B.***Chlorophytum nimmonii* Dalzell; **C.** *Chromolaena ordata* (L.) R.M.King & H.Rob.; **D.** *Cipadessa baccifera* (Roxb. Ex Roth) Miq.; **E.** *Commelina benghalensis* L.; **F.** *Commelina suffruticosa* Blume; **G.** *Costus speciosus* (J.Koenig) Sm.; **H.** *Curculigo orchoides* Gaertn.; **I.** *Curcuma aromatica* Salisb.; **J.** *Cyclea peltata* (Burm.f.) Hook. f. & Thomson; **K.** *Cyperus paniceus* (Rottb.) Boeckeler; **L.** *Cyperus pulchellus* R. Br.



**Fig.06:** **A.** *Cyphostemma auriculatum* (Roxb.) P.Singh. and B.V.Shetty; **B.** *Dendrophthoe falcate* (L.f.) Ettingsh.; **C.** *Dicliptera foetida* (Forssk.) Blatt.; **D.** *Duranta erecta* L.; **E.** *Elephantopus scaber* L.; **F.** *Eranthemum roseum* (Vahl) R.Br. ex Roem. and Schult.; **G.** *Eulophia picta* (R.Br.) Ormerod; **H.** *Flueggea leucopyrus* Willd.; **I.** *Gloriosa superb* L.; **J.** *Grewia tiliifolia* Vahl **K.** *Hebenaria grandifloriformis* Blatt. & McCann; **L.** *Herbenaria longicorniculata* J.Graha;



**Fig. 07:** **A.** *Helicanthes elastic* (Desr.) Danser; **B.** *Helixanthera obtusata* (Wall. Ex Wight & Arn.) Danser; **C.** *Holoptelea integrifolia* (Roxb.) Planch.; **D.** *Hultholia mimosoides* (Lam.) Gagnon & G.P.Lewis; **E.** *Iphigenia pallid* Baker; **F.** *Ipomoea obscura* (L.) Ker Gawl.; **G.** *Jasminum sambac* (L.) Aiton; **H.** *Lagerstroemia microcarpa* Wight; **I.** *Lantana camera* L.; **J.** *Leea asiatica* (L.) Ridsdale; **K.** *Murdannia loriformis* (Hassk.); **L.** *Nervilia plicata* (Andrews) Schltr.;



**Fig. 08:** **A.** *Nervilia simplex* (Thouars) Schltr; **B.** *Oxalis corniculata* L.; **C.** *Paracalyx scariosus* (Roxb.) Ali; **D.** *Parthenium hysterophorus* L.; **E.** *Pavetta indica* L.; **F.** *Rungia muralis* Royle ex Nees; **G.** *Sapindus trifoliatus* L.; **H.** *Saraca asoca* (Roxb.) W. J. de Wilde; **I.** *Scurrula parasitica* L.; **J.** *Senegalia torta* (Roxb.) Maslin, Seigler & Ebinger; **K.** *Senna auriculata* (L.) Roxb.; **L.** *Senna uniflora* (Mill.) H. S. Irwin & Barneby.



**Fig. 09:** **A.** *Setaria flava* (Retz.) Veldkamp; **B.** *Sida rhombifolia* L.; **C.** *Spermadictyon suaveolens* Roxb.; **D.** *Sterculia foetida* L.; **E.** *Strobilanthes pavala* (Roxb.) J.R.I Wood; **F.** *Tacca leontopetaloides* (L.) Kuntze; **G.** *Tamarindus indica* L.; **H.** *Terminalia bellirica* (Gaertn.) Roxb.; **I.** *Terminalia catappa* L.; **J.** *Vanda testacea* (Lindl.) Rchb.f.; **K.** *Wrightia tinctoria* (Roxb.) R.Br.; **L.** *Ziziphus horrida* Roth.