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Floristic Diversity in a Community Managed Forest of Kanchanpur District, Western Nepal

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Abstract

The present study describes the floristic diversity of Janahit Mahakali community forest in Kanchanpur district, Western Nepal. The forest comprises an area of 198.93 hectares. Altogether, 148 plant species belonging to 123 genera under 59 families were recorded from 72 different sampling plots. Among the recorded species, the herbaceous species were quite higher than shrubs and trees. There were total 117 dicots, 23 monocots and 8 pteridophytes recorded. The study area was found to be dominated by Fabaceae with 13 genera and 19 species followed by Lamiaceae with 8 genera and 9 species. The frequency distribution of *Shorearobusta* and *Terminaliaalata* was found highest among all recorded species. Similarly, *Mazus pumilis* and *Phyllodium pulchellum* were among the most dominant herb and shrub.

Keywords: Dominant, Frequency distribution, Herbaceous, Janahit Mahakali, Plant composition

Introduction

Nepal is well known for its rich plant biodiversity in terms of its size. The country occupies about 0.1 percent of the global area but possesses over three percent of the world's known flora (Ministry of Forest and Soil Conservation [MoFSC], 2014). There are 35 forest types, 75 vegetation units and 118 ecosystems ((MoFSC, 2014).Forest covers a total of 5.96 million hectares which is 40.36% of total area of the country (Department of Forest Research and Survey [DFRS], 2010–2014). Tarai (low land) physiographic region of Nepal occupies 13.7% of the total land area of the country. Out of total area of forest 6.90% lies in Tarai (DFRS, 2010–2014).Tropical forests consists the most diverse plant communities on earth (Givnish, 1999; Anitha et al., 2010).Such forest is suitable habitat for trees, shrubs, herbs, climbers, ferns (Pathak & Baniya, 2017). Species diversity in the tropics varies from place to place. The biological resources of the Tarai are mostly dominated by Sal trees (*Shorea robusta*), tropical deciduous riverine forest and tropical evergreen forest. Sal forest is an identity of the lowland Tarai, associated with *Terminalia alata, Syzgium cumini, Adina cardifolia, Lagerstroemia parviflora*. These ecosystems are of international importance in terms of the number of globally threatened floral species found in them as well as their diversity (DFRS, 2010–2014).

Floristic study is a systematic botanical survey using vegetation plots which provide information on the patterns of plant diversity (Stohlgren et al., 1997). It is a substantial basis for syntaxonomical and phytoecological investigations required for taking conservation measure (Georgievia, 2013). Floristic analyses are very useful for identifying spatial patterns in plant diversity and composition (Slik et al., 2003). Knowledge of plant composition and diversity supports understanding of forest ecosystem dynamics and the utility of forest resources (Hartshorn, 1990). The rapid loss in floristic diversity and changing pattern of vegetation due to various biotic and abiotic factors have necessitated the qualitative and quantitative assessment of vegetation (Sharma et al., 2014). So the study of floristic diversity should attain importance as knowledge on floral diversity of a particular area can reflect the total resources, their use and conservation status which is very helpful for making conservation strategies and policies (Bhatta & Chaudhary, 2009).

Since, the botanical exploration in Nepal done by F. Buchanan Hamilton in 1802–1803 the major floristic enumerations have been focusing in Central and Eastern part of Nepal. Little attention has been given to the floristic study of Western Nepal (Shrestha et al., 2006). Compared to high altitudes, the flora of plains is still under explored (Chaudhary, 1998; Sah

et al., 2002). The flora in far-western tarai is even very less surveyed because of its remoteness, relatively hot and dry climate (Sah et al., 2002). Few studies earlier conducted are limited to the documentation of ethno-medicinal knowledge and plant uses (Dhami 2008; Joshi & Singh, 2010; Pant &Yadav, 2013). Floristic study only focusing on the plant composition and diversity in the Western Nepal is still lacking. It has raised the fear that many species may go to be locally extinct prior to being reported as the component of Nepalese flora (Sah et al., 2002). Therefore, the present study has been undertaken to assess the plant diversity in one of the community forest of Kanchanpur district representing western Nepal.

Materials and Methods

Study area

The study was conducted in southwestern lowlands of Nepal, Kanchanpur district (28°32' – 29°8' N and 80°32' – 80°33' E) of Mahakali zone of Western Nepal which has the total area of 1,610 square kilometer (1,61,741 ha.). Topographically, the district is divided into three regions: Churia hills, Bhabar range and Tarai plain. The elevation ranges from 160 m to 1,528 m above sea level. The average annual rainfall of the district is 1,575 mm. The average maximum and minimum temperature is 43°C and 24°C during summer and 19°C and 2°C during winter (Joshi & Singh, 2010; Pant & Yadav, 2013). Janahit Mahakali community forest which extends up to the foothills of Siwalik in Krishnapur municipality with an area of 198.93 hectare was explored for its floral composition and diversity (Figure 1).

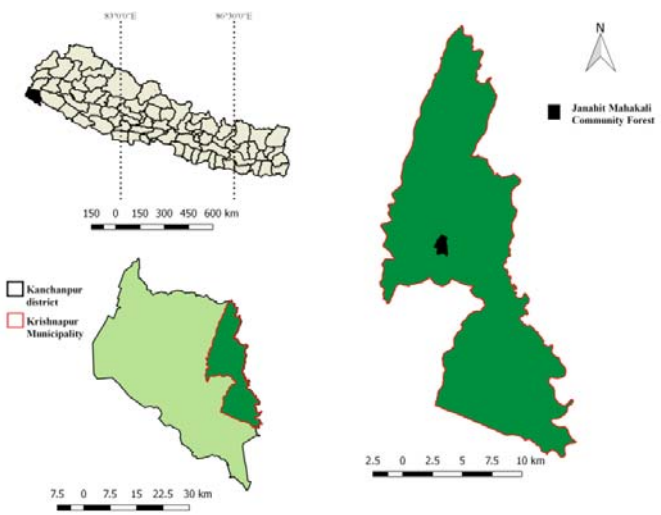

Figure 1: Map of the study area (Source: Department of Survey, GoN)

Data collection

The data collection was conducted during the month of November, 2018. The entire community forest was divided into six vertical transect lines considering the total forest area,each 1km long and 300 m apart for recording almost every plant occurring in the forest (Timilsina & Heinen, 2008; Webb & Sah, 2003). These transects covered whole forest area.On each transect, there were 6 sampling points, each at every 200m distance increment along the transect and each with paired quadrats spaced horizontally about 100 m apart (Swamy et al., 2000; Shrestha et al., 2007; Timilsina & Heinen, 2008). There were 12 plots of 10 m × 10 m size in each transect. A total of 72 sampling plots were employed for recording species presence data throughout the whole study area.

The species presence data were recorded and plant specimens were collected for theherbarium preparation following standard technique (Bridson & Forman, 1998). Plant species were identified as much as possible during field study and those which could not be identified in the field were later checked for identification with the help of relevant standard taxonomic literatures (Press et al., 2000; Rajbhandari et al., 2016), expertise consultation and tallying the specimens at National herbarium and Plant Laboratories, Godavari (KATH). The nomenclature and author citation of each species was validated by using different taxonomic literatures (Rajbhandari & Rai, 2017; Rajbhandari & Rai, 2019) and the online plant database, Catalogue of life (Roskov et al., 2019). All collected species were classified as dicot, monocot and Pteridophytes. Besides that, the dominant families and their broad life-form categories: trees, shrubs and herbs were also categorized. In addition, frequency of each individual species was calculated in order to find out their distribution in the study area (Singh et al., 2014).

$$\text{Frequency} = \frac{\text{Number of plots in which species occured}}{\text{Total number of plots studied}} \times 100\%$$

Results and Discussion

A total of 148 species were recorded within the 72 plots in the study area. Altogether, there were 59 families, 123 genera and 148 species (Figure 2). Among them, five foremost dominant familieswere Fabaceae (13 genera and 19 species) followed by Lamiaceae (8 genera and 9 species), Poaceae (7 genera and 8 species), Malvaceae (6 genera and 8 species) and Asteraceae (6 genera and 7 species) (Figure 3). Other families were Rubiaceae (6 genera and species each), Apocyanaceae (5 genera and species each), Acanthaceae (3 genera and 5 species) and Moraceae (2 genera and 5 species). Families with lesser number of species were represented by Amaranthaceae, Euphorbiaceae, Lythraceae, Anacardiaceae, Arecaceae and Asparagaceae (Table 1).

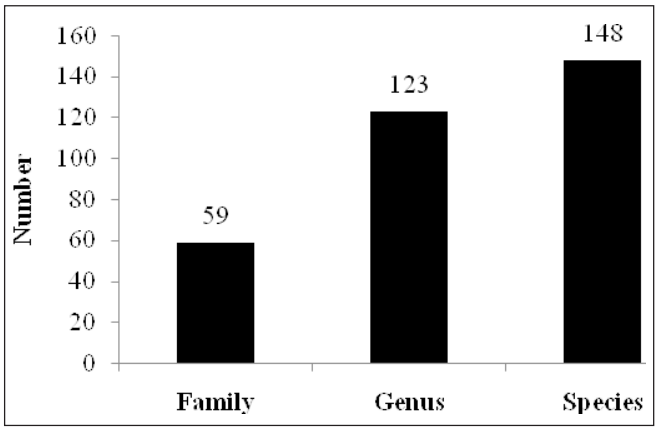

Figure 2: Distribution of families, genera and species recorded in the study plots

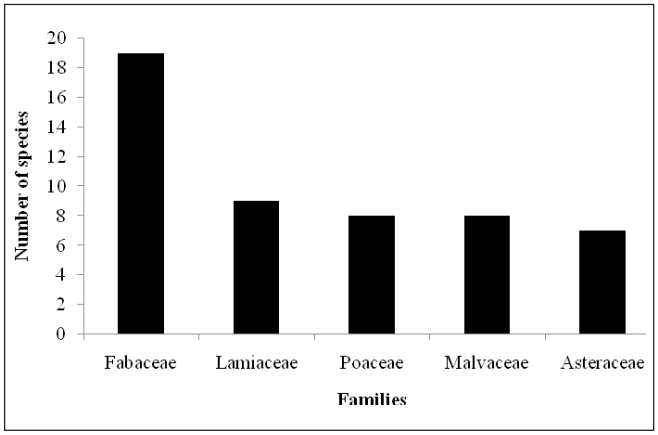

Figure 3: Families with highest species number

Based on the habit, dicots were dominating the study area (117 species), which was followed by the monocots (23 species) and Pteridophytes (8 species). Similarly, the life form categories showed the well representation of herbaceous flora (70 species) and less representation of shrubs (24 species), trees (36 species) and climber species (18 species).

Among the recorded species, *Shorea robusta* was found as the most frequently observed tree species (86.11% frequency), followed by *Terminalia alata* (73.61% frequency), *Lagerstroemia parviflora* (72.22% frequency), *Schleichera oleosa* (68.05% frequency) and *Litsea monopetala* (66.66% frequency). Similarly, *Phyllodium pulchellum* (65.27%) and *Woodfordia fruticosa* (63.88%) were dominant among shrubs, and *Mazus pumilis* (69.44%), *Achyranthes aspera* (62.5 %) were most dominant herbaceous species. In addition, *Milletia extensa* (73.61%), *Spatholobus parviflorus* (70.83%) and *Bauhinia vahlii* (61.11%) were frequently occurring climber species. Furthermore, *Lygodium flexuosum* (66.66% frequency) was the mostdominant Pteridophyte species. Among monocots, *Cynodon dactylon* (62.5%) was found as most dominant species (Table 2).

The present study suggested that the study area was rich in terms of flora comprising 148 plant species belonging to 59 different families. The study revealed that Fabaceae was the dominant family with 19 species which agreed the findings of Pathak & Baniya (2017) and Anbarashan et al. (2011). Dhami (2008) also revealed Fabaceae as most dominant family used by traditional healers for different medicinal purposes. This similarity may suggest that tropical lowland provides the suitable habitat for plants belonging to family Fabaceae which supports their dominancy. Further, herb was most dominant life form followed by tree and shrub. Similar kind of dominance was observed in a community managed tropical *Shorea robusta* forest in Nawalparasi, Nepal (Pathak & Baniya, 2017). The dicots were with highest number of species followed by monocots and pteridophytes which supported the dominance of dicots in the study area which is similar as observed by Vediya & Kharadi (2011). The study

Table 1: List of families with number of genera and species from 72 different sampling plots

S. N.	Families	Number of genera	Number of species
1	Fabaceae	13	19
2	Lamiaceae	8	9
3	Poaceae	7	8
4	Malvaceae	6	8
5	Asteraceae	6	7
6	Rubiaceae	6	6
7	Apocyanaceae	5	5
8	Orchidaceae	4	4
9	Convolvulaceae	3	4
10	Acanthaceae	3	5
11	Moraceae	2	5
12	Amarathaceae, Lythraceae and Rutaceae	3 each (9)	3 each (9)
13	Euphorbiaceae and Vitaceae	2 each (4)	3 each (6)
14	Menispermaceae, Ophioglossaceae, Primulaceae, Pteridaceae,	2 each (8)	2 each (8)
15	Combretaceae, Commelinaceae, Cyperaceae, Phyllanthaceae, Solanaceae and Zingiberaceae	1 each (6)	2 each (12)
16	Anacardiaceae, Arecaceae, Asparagaceae, Athyriaceae, Bixaceae, Costaceae, DioscoreaceaeDipterocarpaceae, Dryopteridaceae, Gentianaceae, Hypoxidaceae, Icacinaceae, Lauraceae, Lecythidaceae, Linderniaceae, Lygodiaceae, Mazaceae, Meliaceae, Myrtaceae, Nyctaginaceae, Onagraceae, Papaveraceae, Phrymaceae, Piperaceae, Plantaginaceae, Polygonaceae, Polygalaceae, Ranunculaceae, Rhamnaceae, Sapindaceae, Smilacaceae, Thelypteridaceae and Urticaceae.	1 each (33)	1 each (33)

also showed the highest frequency distribution of *Shorea robusta* which further indicated that *Shorea robusta* is the main component of vegetation composition of the lowland *Tarai,* as revealed by Bhadra et al. (2010) associated with *Terminalia alata, Lagerstroemia parviflora, Schleichera oleosa, Litsea monopetala*.

Conclusion

Thepresent work has documented the floristic composition and diversity of Janahit Mahakali Community Forest of Kanchanpur district, Western Nepal and helped to explore the flora and species diversity patterns of that particular area. The study had documented 148 plant species from that area with the dominancy of family Fabaceae and species like *Shorea robusta, Phyllodium pulchellum, Mazus pumilis*. The area was well represented by the herbaceous flora as compared to the shrub and tree species. The studyconcluded that more floristic studies are required to document the overall flora and patterns of species composition of Kanchanpur district as well as to deeply understand the availability of endemic and other endangered plant species in the Western lowlands of Nepal.

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Photoplate: Photographs of some plant species of the study area.

Solanum erianthum D. Don

Flemengia macrophylla (Willd.) Merr.

Zingiber chrysanthum Roscoe

Crotolaria albida Roth

Poranopsis paniculata (Roxb.) Roberty

Acilepis squarrosa D. Don

Table 2: List of recorded plant species with their family, habit, life form and frequency

S. N.	Plant species	Family	Habit	Life form	Frequency (%)
1	*Abrus precatorius* L.	Fabaceae	Climber	Dicot	40.27
2	*Achyranthes aspera* L.	Amaranthaceae	Herb	Dicot	62.5
3	*Acilepis squarrosa* D. Don	Asteraceae	Herb	Dicot	13.88
4	*Acmella calva* (DC.) R.K.Jansen	Asteraceae	Herb	Dicot	29.16
5	*Acmella paniculata* (Wall. ex DC.) R.K. Jansen	Asteraceae	Herb	Dicot	23.61
6	*Adiantum incisum* Forsk.	Pteridaceae	Herb	Pteridophyte	11.11
7	*Adina cordifolia (*Roxb.) Benth. & Hook. f. ex B.D. Jacks.	Rubiaceae	Tree	Dicot	29.166
8	*Aegle marmelos* (L.) Correa	Rutaceae	Tree	Dicot	20.83
9	*Aerva lanata* (L.) Juss.	Amaranthaceae	Herb	Dicot	51.38
10	*Ageratum houstonianum* Mill.	Asteraceae	Herb	Dicot	18.05
11	*Alstonia scholaris* (L.) R. Br.	Apocynaceae	Tree	Dicot	22.22
12	*Alternanthera sessilis* (L.) R.Br. ex DC.	Amaranthaceae	Herb	Dicot	30.55
13	*Ammannia auriculata* Willd.	Lythraceae	Herb	Dicot	23.61
14	*Ampelocissus latifolia* (Roxb.) Planch.	Vitaceae	Climber	Dicot	11.11
15	*Ampelopteris prolifera* (Retz.) Copel.	Thelypteridaceae	Herb	Pteridophyte	27.77
16	*Anisomeles indica* (L.) Kuntze	Lamiaceae	Herb	Dicot	23.61
17	*Ardisia elliptica* Thunb.	Primulaceae	Tree	Dicot	4.16
18	*Argemone maxicana* L.	Papaveraceae	Herb	Dicot	11.11
19	*Artocarpus lacucha* Buch.-Ham. ex D. Don	Moraceaea	Tree	Dicot	9.72
20	*Asparagus racemosus* Willd.	Asparagaceae	Climber	Dicot	27.77
21	*Barleria cristata* L.	Acanthaceae	Herb	Dicot	33.33
22	*Bauhinia vahlii* Wight and Arn.	Fabaceae	Woody climber	Dicot	61.11
23	*Bixa orellana* L.	Bixaceae	Tree	Dicot	11.11
24	*Boehmeria virgata* (G.Forst.) Guill.var. *canescens* (Wedd.) Friis & Wilmot-Dear	Urticaceae	Shrub	Dicot	8.33
25	*Boerhaavia diffusa* L.	Nyctaginaceae	Herb	Dicot	31.94
26	*Bombax ceiba* L.	Malvaceae	Tree	Dicot	5.55
27	*Calamus tenuis* Roxb.	Arecaceae	Tree	Monocot	12.5
28	*Calotropis gigantea* (L.) W. T. Aiton	Apocynaceae	Shrub	Dicot	13.88
29	*Canscora alata* (Roth) Wall.	Gentianaceae	Herb	Dicot	45.83
30	*Capillipedium assimile* (Steud.) A.Camus	Poaceae	Herb	Monocot	18.05
31	*Careya arborea* Roxb.	Lecythidaceae	Tree	Dicot	12.5
32	*Cassia fistula* L.	Fabaceae	Tree	Dicot	20.83
33	*Catunaregam spinosa* (Thunb.) Tirveng.	Rubiaceae	Shrub	Dicot	59.72
34	*Ceratopteris thalictroides* (L.) Brongn.	Pteridaceae	Herb	Pteridophyte	41.66
35	*Clausena heptaphylla* (Roxb.) Wight & Arn.	Rutaceae	Tree	Dicot	50
36	*Clematis zeylanica* Poir.	Ranunculaceae	Climber	Dicot	22.22
37	*Clerodendrum indicum* (L.) Kuntze	Lamiaceae	Shrub	Dicot	23.61
38	*Clerodendrum infortunatum* L.	Lamiaceae	Shrub	Dicot	34.72
39	*Colebrookea oppositifolia* Sm.	Lamiaceae	Shrub	Dicot	22.22
40	*Corchorus aestuans* L.	Malvaceae	Herb	Dicot	51.38
41	*Crotalaria albida* Roth	Fabaceae	Shrub	Dicot	50
42	*Crotolaria prostrata* Rottb. ex Willd.	Fabaceae	Herb	Dicot	34.72
43	*Curculigo orchioides* Gaertn.	Hypoxidaceae	Herb	Monocot	23.61

S. N.	Plant species	Family	Habit	Life form	Frequency (%)
44	*Cyanotis axillaris* (L.) D.Don ex Sweet	Commelinaceae	Herb	Monocot	29.16
45	*Cyanotis cristata* (L.) D.Don	Commelinaceae	Herb	Monocot	37.5
46	*Cynodon dactylon* (L.) Pers.	Poaceae	Herb	Monocot	62.5
47	*Cynodon radiatus* Roth	Poaceae	Herb	Monocot	43.05
48	*Cyperus mindorensis* (Steud.) Huygh	Cyperaceae	Herb	Monocot	30.55
49	*Cyperus rotundus* L.	Cyperaceae	Herb	Monocot	13.88
50	*Cyrtococcum patens* (L.) A. Camus var. *latifolium* (Honda) Ohwi	Poaceae	Herb	Monocot	37.5
51	*Dalbergia latifolia* Roxb.	Fabaceae	Tree	Dicot	4.16
52	*Desmodium gangeticum* (L.) DC.	Fabaceae	Shrub	Dicot	55.55
53	*Desmodium oojeinense* (Roxb.)H.Ohashi	Fabaceae	Tree	Dicot	40.27
54	*Desmodium triflorum* (L.)DC.	Fabaceae	Herb	Dicot	30.55
55	*Digitaria ciliaris* (Retz.) Koeler	Poaceae	Herb	Monocot	23.61
56	*Dioscorea belophylla* (Prain) Voigt ex Haines	Dioscoreaceae	Climber	Monocot	29.16
57	*Diplazium esculentum* (Retz.) Sw.	Athyriaceae	Herb	Pteridophyte	11.11
58	*Dryopteris cochleata* (D. Don) C. Chr.	Dryopteridaceae	Herb	Pteridophyte	9.72
59	*Eclipta prostrata* (L.) L.	Asteraceae	Herb	Dicot	38.88
60	*Elephantopus scaber* L.	Asteraceae	Herb	Dicot	30.55
61	*Emilia sonchifolia* (L.) DC. ex Wight	Asteraceae	Herb	Dicot	8.33
62	*Erythranthe tenella* (Bunge) G. L. Nesom	Phrymaceae	Herb	Dicot	36.11
63	*Eulalia mollis* (Griseb.) Kuntze	Poaceae	Herb	Monocot	31.94
64	*Euphorbia hirta* L.	Euphorbiaceae	Herb	Dicot	27.77
65	*Evolvulus nummularius* (L.) L.	Convolvulaceae	Herb	Dicot	50
66	*Ficus benghalensis* L.	Moraceae	Tree	Dicot	12.5
67	*Ficus palmata* Forssk.	Moraceae	Tree	Dicot	8.33
68	*Ficus religiosa* L.	Moraceae	Tree	Dicot	5.55
69	*Ficus rumphii* Blume	Moraceae	Tree	Dicot	31.94
70	*Flemingia macrophylla* (Willd.) Merr.	Fabaceae	Shrub	Dicot	33.33
71	*Flemingia strobilifera* (L.) W.T. Aiton	Fabaceae	Shrub	Dicot	50
72	*Grewia eriocarpa* Juss.	Malvaceae	Tree	Dicot	9.72
73	*Habenaria stenopetala* Lindl.	Orchidaceae	Herb	Monocot	1.38
74	*Hellenia speciosa* (J.Koenig) S.R. Dutta	Costaceae	Shrub	Monocot	12.5
75	*Helminthostachys zeylanica* (L.) Hook.	Ophioglossaceae	Herb	Pteridophyte	30.55
76	*Hemigraphis hirta* (Vahl) T.Anderson.	Acanthaceae	Herb	Dicot	27.77
77	*Holarrhena pubescens* Wall. ex G. Don	Apocynaceae	Tree	Dicot	50
78	*Hymenodictyon orixense* (Roxb.) Mabb.	Rubiaceae	Tree	Dicot	20.83
79	*Ichnocarpus frutescens* (L.) W. T.Aiton	Apocynaceae	Woody climber	Dicot	52.77
80	*Imperata cylindrica* (L.) P. Raeusch.	Poaceae	Herb	Monocot	37.5
81	*Ipomoea muricata* (L.) Jacq.	Convolvulaceae	Climber	Dicot	18.05
82	*Ipomoea quamoclit* L.	Convolvulaceae	Climber	Dicot	43.05
83	*Justicia diffusa* Willd.	Acanthaceae	Herb	Dicot	31.94
84	*Justicia gendarussa* Burm. f.	Acanthaceae	Herb	Dicot	5.55
85	*Justicia pectinata* L.	Acanthaceae	Herb	Dicot	23.61
86	*Knoxia sumatrensis* (Retz.) DC.	Rubiaceae	Herb	Dicot	56.94
87	*Lagerstroemia parviflora* Roxb.	Lythraceae	Tree	Dicot	72.22
88	*Leea aequata* L.	Vitaceae	Shrub	Dicot	22.22

S. N.	Plant species	Family	Habit	Life form	Frequency (%)
89	*Leea asiatica* (L.) Ridsdale	Vitaceae	Shrub	Dicot	31.94
90	*Leucas cephalotes* (Roth) Spreng.	Lamiaceae	Herb	Dicot	16.66
91	*Leucosceptrum canum* Sm.	Lamiaceae	Tree	Dicot	33.33
92	*Litsea monopetala* (Roxb.) Pers.	Lauraceae	Tree	Dicot	66.66
93	*Ludwigia hyssopifolia* (G. Don) Exell	Onagraceae	Herb	Dicot	45.83
94	*Luisia tristis* (G.Forst.) Hook.f.	Orchidaceae	Herb	Monocot	18.05
95	*Lygodium flexuosum* (L.) Sw.	Lygodiaceae	Climber	Pteridophyte	66.66
96	*Lysimachia arvensis* (L.) U. Manns&Anderb.	Primulaceae	Herb	Dicot	16.66
97	*Mallotus nudiflorus* (L.) Kulju&Welzen	Euphorbiaceae	Tree	Dicot	31.94
98	*Mallotus philippensis* (Lam.) Müll.Arg.	Euphorbiaceae	Tree	Dicot	48.61
99	*Mazus pumilus* (Burm. f.) Steenis	Mazaceae	Herb	Dicot	69.44
100	*Melia azedarach* L.	Meliaceae	Tree	Dicot	20.83
101	*Mesosphaerum suaveolens* (L.) Kuntze	Lamiaceae	Shrub	Dicot	36.11
102	*Millettia extensa* (Benth.)Baker	Fabaceae	Woody climber	Dicot	73.61
103	*Mitragyna parvifolia* (Roxb.) Korth.	Rubiaceae	Tree	Dicot	20.83
104	*Murraya koenigii* (L.) Spreng.	Rutaceae	Tree	Dicot	36.11
105	*Natsiatum herpeticum* Buch.-Ham. exArn.	Icacinaceae	Climber	Dicot	9.72
106	*Ophioglossum reticulatum* L.	Ophioglossaceae	Herb	Pteridophyte	40.27
107	*Oplismenus compositus* (L.) P.Beauv.	Poaceae	Herb	Monocot	20.83
108	*Pelatantheria insectifera* (Rchb.f.) Ridl.	Orchidaceae	Herb	Monocot	25
109	*Persicaria barbata* (L.) H.Hara	Polygonaceae	Herb	Dicot	38.88
110	*Phyllanthus emblica* L.	Phyllanthaceae	Tree	Dicot	11.11
111	*Phyllanthus urinaria* L.	Phyllanthaceae	Herb	Dicot	43.05
112	*Phyllodium pulchellum* (L.) Desv.	Fabaceae	Shrub	Dicot	65.27
113	*Piper longum* L.	Piperaceae	Herb	Dicot	40.27
114	*Platostoma hispidum* (L.) A.J.Paton	Lamiaceae	Herb	Dicot	22.22
115	*Pogostemon benghalensis* (Burm.f.) Kuntze	Lamiaceae	Shrub	Dicot	26.38
116	*Polygala crotalarioides* Buch.-Ham. ex DC.	Polygalaceae	Herb	Dicot	37.5
117	*Poranopsis paniculata* (Roxb.) Roberty	Convolvulaceae	Climber	Dicot	25
118	*Rauvolfia serpentina* (L.) Benth. ex Kurz	Apocynaceae	Herb	Dicot	23.61
119	*Schleichera oleosa* (Lour.) Merr.	Sapindaceae	Tree	Dicot	68.05
120	*Scleromitrion diffusum* (Willd.) R.J.Wang	Rubiaceae	Herb	Dicot	15.27
121	*Scoparia dulcis* L.	Plantaginaceae	Herb	Dicot	33.33
122	*Semecarpus anacardium* L. f.	Anacardiaceae	Tree	Dicot	4.16
123	*Senegalia catechu* (L.f.) P.J.H. Hurter & Mabb.	Fabaceae	Tree	Dicot	25
124	*Senegalia rugata* (Lam.) Britton & Rose	Fabaceae	Woody climber	Dicot	34.72
125	*Senna occidentalis* (L.)Link	Fabaceae	Shrub	Dicot	22.22
126	*Senna tora* (L.) Roxb.	Fabaceae	Herb	Dicot	36.11
127	*Shorea robusta* Gaertn.	Dipterocarpaceae	Tree	Dicot	86.11
128	*Sida acuta* Burm. f.	Malvaceae	Subshrub	Dicot	52.77
129	*Sida cordata* (Burm. f.) Borss.Waalk.	Malvaceae	Herb	Dicot	22.22
130	*Sida cordifolia* L.	Malvaceae	Subshrub	Dicot	30.55
131	*Smilax ovalifolia* Roxb. ex D.Don	Smilacaceae	Climber	Monocot	16.66
132	*Solanum erianthum* D. Don	Solanaceae	Shrub	Dicot	11.11
133	*Solanum virginianum* L.	Solanaceae	Herb	Dicot	13.88
134	*Spatholobus parviflorus* (DC.)Kuntze	Fabaceae	Woody climber	Dicot	70.83

S. N.	Plant species	Family	Habit	Life form	Frequency (%)
135	*Stephania pierrei* Diels	Menispermacxweae	Climber	Dicot	27.77
136	*Syzygium cumini* (L.) Skeels	Myrtaceae	Tree	Dicot	19.44
137	*Terminalia alata* Heyne ex Roth	Combretaceae	Tree	Dicot	73.61
138	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Tree	Dicot	15.27
139	*Tinospora sinensis* (Lour.) Merr.	Menispermaceae	Climber	Dicot	12.5
140	*Triumfetta rhomboidea* Jacq.	Malvaceae	Subshrub	Dicot	45.83
141	*Uraria lagopodioides* (L.) DC.	Fabaceae	Herb	Dicot	41.66
142	*Urena lobata* L.	Malvaceae	Subshrub	Dicot	52.77
143	*Vanda tessellata* (Roxb.) Hook. ex G.Don	Orchidaceae	Herb	Monocot	38.88
144	*Vandellia anagallis* (Burm. f.) T. Yamaz.	Linderniaceae	Herb	Dicot	25
145	*Woodfordia fruticosa* (L.) Kurz	Lythraceae	Large shrub	Dicot	63.88
146	*Zingiber capitatum* Roxb.	Zingiberaceae	Herb	Monocot	29.16
147	*Zingiber chrysanthum* Roscoe	Zingiberaceae	Herb	Monocot	59.72
148	*Zizyphus mauritiana* Lam.	Rhamnaceae	Shrub	Dicot	36.11