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Floristic Survey of Meethirigala Forest Reserve in Gampaha District

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Abstract

Meethirigala forest reserve consists of approximately 384 ha. It is the largest forest reserve in Gampaha District managed by the Forest Department. It has different topographic positions such as ridges, midslopes and valley areas close to the Kelani River. The present study was conducted to enumerate plant species found in all three topographic positions of the reserve. Plots were demarcated purposively to sample woody perennials equal or greater than 5 cm dbh (diameter at breast height) in 18 plots (5×100 m, rectangular shape). Seedlings greater than 1 m tall were sampled in 18 plots (5×5 m). Shannon diversity indices were calculated to compare dominance of particular species in different topographic positions. A total of 360 individuals of woody perennials belonging to 73 species in ridge, 368 individuals of woody perennials belonging to 100 species in midslope and 272 individuals of woody perennials belonging to 69 species in valley were recorded. And 132, 123 and 100 individuals of seedlings were enumerated in ridge, midslope and valley respectively. In ridge 58 generas, 28 families, in midslope 83 generas, 35 families and, in valley 68 generas, 29 families were observed. 28 species were found in all three different altitudes of the reserve. Forest species in study sites gave a total of 138 plant species belonging to 113 tree species, 11 climber species, 14 shrub species, 109 generas and 46 families. Of this total 138 species, 34 (25%) species are endemic to Sri Lanka. Highest endemism was recorded in the ridge (41.6%). Stratification of the ridge showed a very similar pattern to a Dipterocarp forest type. Highest diversity was recorded in midslope (1.7290) and lowest recorded in ridge (1.5626) of the forest. 18 threatened species were observed (3-Endangered and 15-vulnerable species). As a conclusion, Meethirigala forest reserve can be considered as an important refuge for wet zone forest species.

Keywords: forest reserve, ridge, midslope, valley, species

1. Introduction

Sri Lanka together with the Western Ghats in Southern India, is a one of the currently recognised, thirty five global hotspots for biological diversity (Ariyarathne et al., 2017). These 35 hotspots define regions where 43% of vertebrates (including 60% of threatened mammals and birds), and 80% of all threatened amphibians (Mittermeier et al., 2011; Williams et al., 2011) survive within habitat covering just 17.3% of the Earth's surface. To qualify as a hotspot, a region must meet two criteria: it must contain at least 1,500 species (>0.5 percent of the world's total) of vascular plants as endemics; and it must have lost at least 70% of its original habitat due to the impacts of human activities (Green et al., 2009). Studies on floristic composition is essential for the management of an area for habitat and ecosystem conservation.

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The present land form of Sri Lanka is the result of millions of years of weathering by rain and wind, as well as movement of the earth's crust. The topography of Sri Lanka is remarkably varied for itsmall area, with coastal plains, lowland hills and a mountainous interior. This variation is reflected in the complexity of the island's diversity of natural plant communities and crops (Ashton et al., 1997). Sri Lanka's forest cover is diminishing rapidly and now stands at less than 20% of its pre-colonial extent (Figure 1) (Mattsson et al., 2012; Perera, 2001). Legg and Jewell (1995), noted additionally that 23% of the island's forest cover consisted of 'sparse' (secondary) forest. Most recently, Perera and Tsuchiya (2009), in their study of forest cover in south-eastern Sri Lanka (an extent of 11,800 km^2 including the Yala National Park Complex and its surroundings), found that in the two decades spanning 1987-2006, forest cover halved (40.2% to 20.6%) while homestead vegetation doubled (16.4% to 30.1%) and mixed scrub-dominant vegetation increased by almost 20% (34.3% to 41.4%).

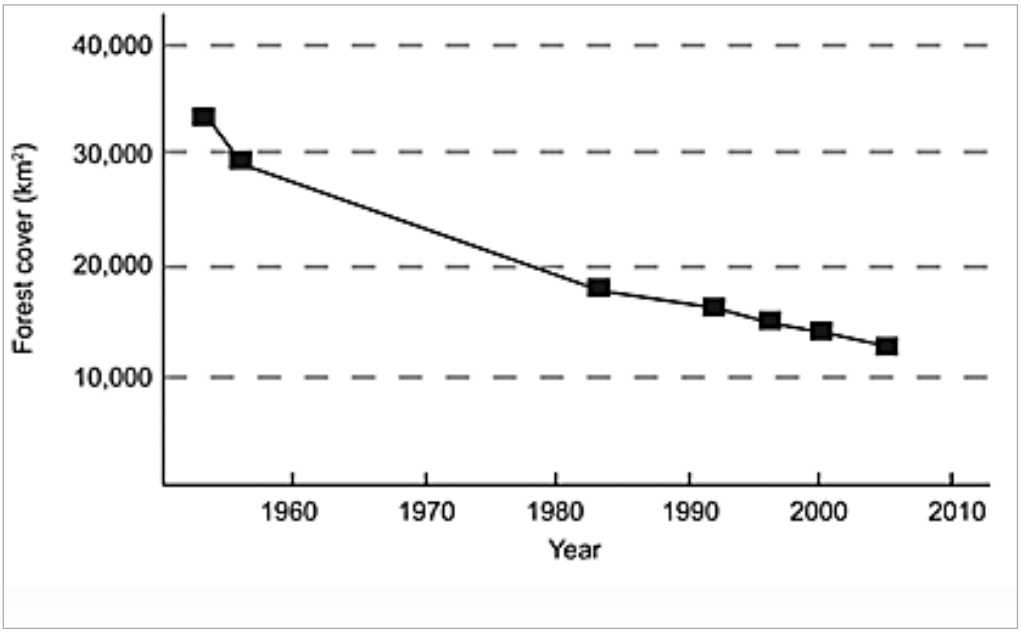

Figure 1. The decline of closed-canopy forest cover in Sri Lanka since 1950 **(**Mattsson et al., 2012).

Gampaha District, forest cover occupies approximately 0.56% of the total land area in Western province. It includes 428 ha (0.31%) of natural forest and 345 ha (0.25%) of plantations (Bambaradeniya, 2008). As per the National Red List of Sri Lanka (2012), this country has 3,154 species with 894 endemic species of Angiosperms. Those belongs to 185 families. Declines in populations, together with declines in areas of occupancy, extents of occurrence and/or the quality of habitat, determine the conservation status of the vast majority of the endemic Sri Lankan species that have been assessed as threatened as part of the IUCN's Red Listing process (IUCN, 2001). Currently Sri Lanka has over 1,385 flowering threatened plant species among the 3,154 species assessed so far (The National Red List, 2012). Information on the threatened status of species in other plant groups are lacking. Family Anacardiaceae has 46.7% of endemics was considered as nationally threatened during the National Red listing in 2012. The conservation of Sri Lanka's flora has received much less attention than its fauna, the data in Dassanayake and Fosberg (1980-1991), that as many as 61 endemic flowering-plant species (including 23 trees) had not been collected in the preceding 50 years, having passed almost unnoticed. The objectives of this study, to examine floristic composition and diversity of Meethirigala forest reserve and to record endemic and threatened plants of the Meethirigala forest reserve.

2. Methodology

2.1 Site selection

Study site was selected based on the reconnaissance survey. Selected forest is the largest forest reserve in Gampaha district managed by the Forest Department, Sri Lanka. Reason for the selection of this site was according to the available information this contain comparatively high amount of natural vegetation (Figure 2). Meethirigala forest reserve was declared by the Forest Department on 4th August 1973. This forest patch consists of approximately 384 ha according to the Survey Department. A public bus route runs across this reserve dividing the forest into two large portions. The Kelani river flows along the southern boundary of the Gampaha district and number of small tributaries flow within the Meethirigala forest reserve finally draining into the Kelani river. Meethirigala forest patch is surrounded by home gardens, public roads, paddy fields and rubber plantations. Within this reserve there is a Buddhist monastery that has been there since 1968. The monastery is occupied by the hermitage Buddhist monks and therefore not much human activities take place and hence with no illegal human encroachments. This forest reserve has been utilised by the villagers in many ways to collect fuel wood, medicines, chena cultivation etc. In the Meethirigala forest reserve, some areas can be recognised as disturbed while rest of the reserve is relatively undisturbed.

2.2 General geography and climate

Topographically, the area is divided into plains and highlands with an elevation ranging from 30-450 m, below 30m altitude is considered as the plains, with little undulating lands. The elevation ranging from 150-450 m of the Meethirigala and Kiridiwela are considered as highlands. The average rainfall of 2,000-2,500 mm and mean annual temperature is 32^{o} C with little fluctuations annually (Suraweera et al., 1999).

2.3 Data collection

Size of the plots were pre-determined based on reconnaissance survey. 5×100 m plots were laid out at each sampling location to sample woody perennials that equal or exceed 5 cm dbh. 5×5 m plots were laid out at each sampling location to sample seedlings greater than 1 m in height. Eighteen sample plots for both woody perennials and seedlings were sampled. Size of the plots were different for woody perennials (5×100 m) and seedlings (5×5 m). Sample plots distributed in disturbed and undisturbed sites are shown in Table 1. Plots were demarcated purposively to sample the vegetation. Plot is 100 m long and 5 m wide. It was measured along the center line using a nylon rope. Dbh and height of each plant species that equal or exceed 5 cm dbh was recorded. Dbh was recorded using dbh tape and height was visually estimated. Plants that have some special identification characters were identified with the help of field experts. The National Red List 2012 of Sri Lanka was used to find out the endemic species and No. 22 of 2009 Flora and fauna protection ordinance (amendment) was used to find out protected status of the recorded species.

Table 1: Distribution of sample plots.

No of Plots	Disturbed			Undisturbed		
	Valley	Midslope	Ridge	Valley	Midslope	Ridge
18 (5×100 m)	1	2	0	5	4	6
18 (5×5 m)	1	2	0	5	4	6

Tree species diversity index by relating the total number of species to the total number of individuals in the sample. Shannon Wiener diversity index was used for comparative purposes (Dong and Ji, 2011).

Diversity:

$$H' = -\Sigma\, Pi \times log\ (Pi) \quad (1)$$

where: *Pi*=Proportional abundance

Pi=No. of individuals of a particular species/No. of all individuals of all species

Evenness:

$$(J') = H'/H'max \quad (2)$$

where: H' max=log *S*

S=No. of species found in the stand

$$Dominance = 1 - J' \quad (3)$$

Estimated Profile Diagrams were prepared for the three topographic positions. For this purpose, only vegetation up to 5 m on either side of the line was recorded. Seedlings of greater than 1 meter in height the extent and location of these groups of seedlings was noted rather than each individual. The names of all tree and shrub species was recorded. Total height was recorded to the nearest meter.

Figure 2. Forest interior of Meethirigala forest reserve.

3. Results

Clear Stratification was observed in forest ridge. Trees with average diameter of 15.7 cm (six 5×100 m plots) in ridge. Canopy layer occurs 35-40 m in height. Emergent layer was seen over the canopy layer. Below the canopy is lower story of medium sized trees principally comprised, between 25-30 m in height (sub-canopy layer). *Dipterocarpus zeylanicus* was found as most common species in ridge, other than that *Artocarpus nobilis*, *Chaetocarpus castanocarpus*, *Shorea* sp, *Myristica dactyloides*, *Garcinia quaesita*, *Gyrinops walla*, *Chrysophyllum roxburghii* and *Bridelia mooni*. *D. zeylanicus* was 9.8% from the total number of species found in ridge and major tree species contribute to form canopy layer. *Aporusa lanceolate*, *Mallotus rhamnifolius*, *Dillenia retusa* and *G. walla* was found as most common seedlings in ridge. Average dbh of trees in midslope was 16 cm (six 5×100 m plots).

The height of trees was low in midslope than ridge, but the dbh of trees was higher than the ridge. Most common tree species were *D. zeylanicus*, *A. nobilis*, *Bridelia retusa*, and *Vitex altissima*. Seedlings found in midslope were *Ixora coccinea*, *Osbeckia aspera*, *Pagiantha dichotoma*, *Gaertnera vaginans*, *Symplocos cochinchinensis*, *A. nobilis and Acronychia pedunculata*. Average dbh was 12.4 cm in valley (six 5×100 m plots). Valley has trees with lowest height and dbh compared to ridge and midslope. The most common species were, *S. cochinchinensis*, *Caryota urens*, *Macaranga peltata*, *Humboldtia laurifolia*, *Syzygium caryophyllatum* and *D. retusa*.

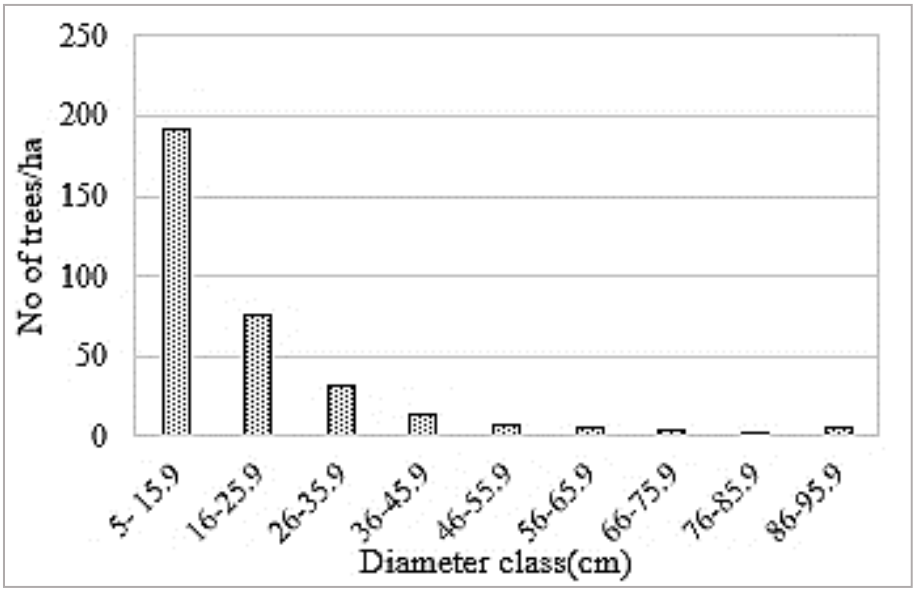

Figure 3. Diameter-class distribution of tree species.

A total of 1,012 individuals (dbh≥5 cm) were recorded in eighteen 5×100 m plots. A total of 355 individuals (seedlings>1 m tall) were recorded in eighteen 5×5 m plots. 368, 360 and 272 individuals were recorded in 5×100 m plots and 132, 123 and 100 individuals were recorded in 5×5 m. It was found that there were 138 species in Meethirigala forest reserve and out of that 34 species are endemic. Endemic percentage of identified species was 25%. Ninety-seven species were indigenous, and seven species were exotic and three species were identified up to generic level. List (botanical name, family, life form, taxonomic status and conservation status) of plants found in the study area have been given in Appendix (1). Total 138 species distributed in three different altitudes of the reserve as follows. Only in ridge-13, only in midslope-28, only in valley-18, ridge and midslope-26, ridge and valley-4, midslope and valley-18, all three positions-29 species were observed. Eighteen threatened species (appendix 2) were found and out of that *Semicarpus marginata*, *Salacia oblonga* and *Zanthoxylum rhesta* was found as endangered species. Highest endemism (41.6%) was found in ridge and lowest (26.3%) found in valley. Diameter class distribution of selected tree species demonstrated various patterns of distributions. Low dbh classes have higher species density distribution than the higher dbh classes (Figure 3).

3.1 Estimated profile diagrams

Diverse vertical structure of forest provided a variety of environmental conditions from strata in the canopy to the forest floor shown in Figure 4-6. Diagrams clearly shows that different plant communities in three different altitudes of the forest.

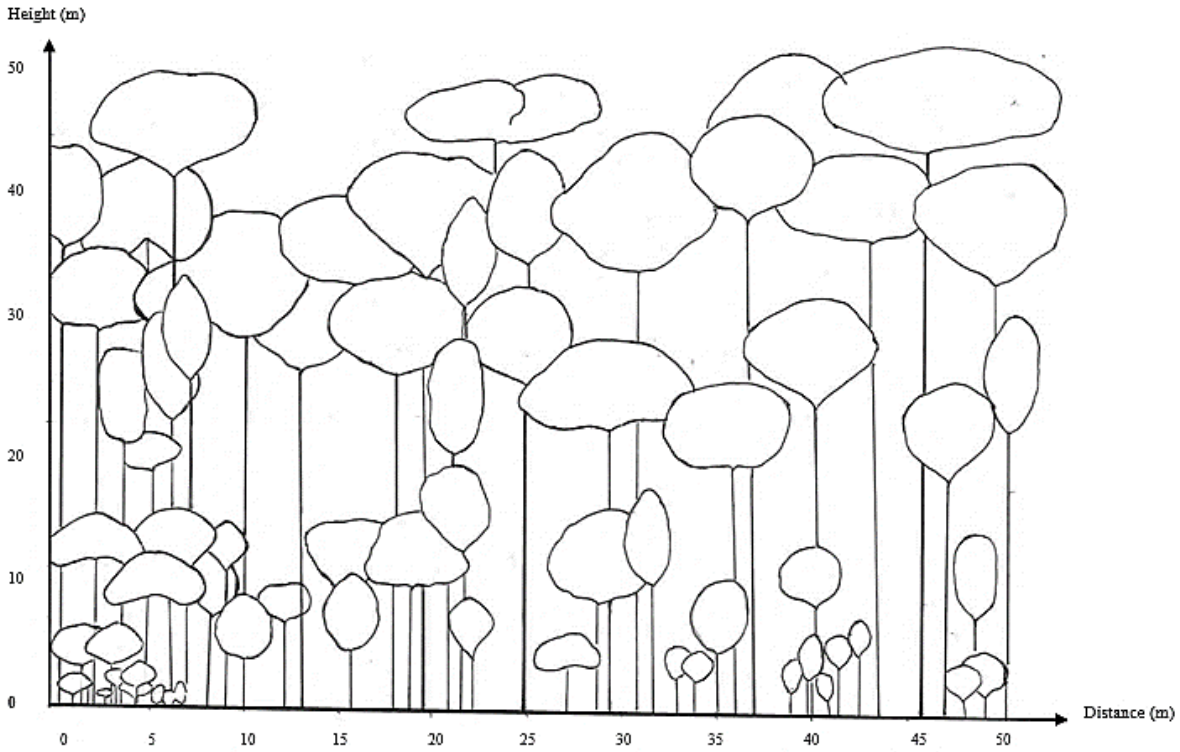

Figure 4. Vertical distribution of trees in ridge.

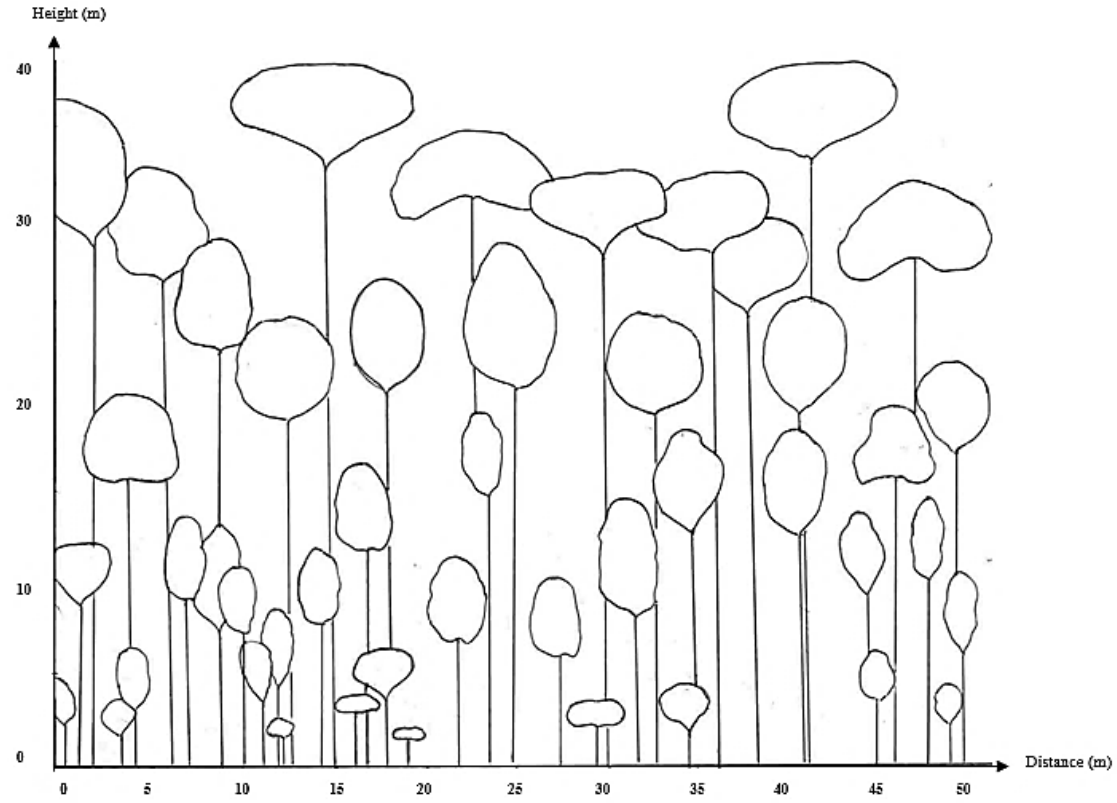

Figure 5. Vertical distribution of trees in mid-slope.

Figure 6. Vertical distribution of trees in valley.

4. Discussion

Stratification was clear in ridge of the forest. It has been recognised that the forest canopy has a complex structure that is significant for environmental interactions, regeneration, growth, and biotic habitat. Not only is the structure variously complex, but also there are many ways to conceptualise that complexity. Yet the persistent theme when considering the structure of canopies continues to be that of stratification. Oversized trees reaching heights of more than 45m tall was found in the Emergent Layer. Together, the top branches and leaves from emergent layer trees form a mushroom shape above the thick canopy layer below. The major tree species contribute to form canopy layer, *D. zeylanicus* and it was the dominant tree species in ridge area. Understory was quite dark. Because of the lack of sunlight that is able to penetrate into the forest floor. Ground was covered with leaf litter and few ground layer species was seen. In this study Dipterocarpaceae is the most dominat family followed by Annonaceae, Euphorbiaceae, Moraceae and Clusiaceae in ridge. Apocynaceae is the most dominant family in midslope followed by Moraceae, Dipterocarpaceae, Euphorbiaceae and Anacardiaceae. Altitude of Meeethirigala FR is affected the dominace of species while the aspect of vegetation affected only the distribution of the species. Natural regeneration is the process by which woodlands are restocked by trees that develop from seeds that fall and germinate in situ. Important factor in natural regeneration is the size of gaps created in forest. Good regeneration of primary forest species takes place in those small gaps created by naturally dying trees within the primary forest. Secondary species rarely invade those naturally formed gaps to compete successfully within the primary species (Gunatilleke and Gunatilleke, 1984). Natural regeneration has been occurred in ridge, because seedlings of woody perennials has been observed. Seedlings of *D. zeylanicus* and *G. walla* was observed.

In the present study 34 endemic species was recorded, out of that 29 tree species, 4 shrub species and 1 climber species. Endemism represents a unique step in the process of evolution, which could be sustained only in the locality concerned depending on the environmental quality, habitat is very much

important. There was a large population of *Zeuxine regia* which is an endemic species belongs to the family Orchidaceae (Figure 7). It is an endangered medicinal plant. It has not been recorded earlier in the Gampaha District. During the ecological study in Kanneliya MAB reserve and peak wilderness sanctuary it was observed that the most common families associated with *Z. regia* were Ebanaceae, Anacardiaceae and Dipterocarpacea, and species associated with *Z. regia* were, *Anysophyllea cinnamoides*, *Mangifera indica*, *Shumacheria castaneifolia*, *Gnidia gaertn* and *S. cochinchinensis* (Hewage, 2011). In the present study it was observed that *A. cinnamoides* and *S. cochinchinensis* associated with *Z. regia*. The reason that certain species grow together in a particular environment will usually be, because they have similar requirements for existence in terms of environmental factors. Species diversity of lowland was slightly higher than sub montane and upper montane forests. Lowland diversity is higher and upper montane has lower diversity in peak wilderness sanctuary (Singhakumara, 1995). Floristic similarity between locations is closely related to the geographical distances of them. These slight differences of the diversity may be due to the elevation changes.

Alstonia macrophylla was observed in three topographic positions. It shows some invasive characteristic inside the forest. The source of introduction is mainly from wet and intermediate forests and affected to the secondary forests. Invasive species are generally exotic or alien species having the ability to compete with and replace native species in natural habitats, thereby threatening native biological diversity. They have special characteristics that enable them to spread rapidly and aggressively and compete with native flora and fauna, to form a dense population that interferes with the natural development of biotic communities. Meethirigala forest has cleared for several plantations is the main reason for spreading invasive species.

Figure 7. *Z. regia* in the Meethirigala forest reserve.

5. Conclusion

Meethirigala forest reserve is rich and diverse in floristic composition and distribution (a total of 138 floristic species) and it is an isolated fragmented forest patch that should be protected as a biodiversity refugium in the wet zone which could enhance the floristic diversity and also the viability of plant species population. Findings of the study could be useful in preparation of conservation plans for the Meethirigala forest reserve. Since this study has found endangered and threatened species in the forest. The finding from this study may help government and other stakeholders in providing baseline information, supported by scientific evidence, which can further contribute to more informed policy and decision-making processes. Soil also can have considerable influence on tree species composition in different topographic levels in the forest. Therefore, soil quality in each site can be used as an indicator of floristic composition. Analysis of population structures for each individual tree species could provide more realistic and specific information for conservation measure.

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Appendix 1

Botanical name	Family	Life form	Taxonomic status	Conservation status
Strobilanthes adenophora	Acanthaceae	Shrub	Endemic	VU
Trichadenia zeylanica	Achaceaeria	Tree	Endemic	LC
Mangifera zeylanica	Anacardiaceae	Tree	Endemic	LC
Semicarpus gardneri	Anacardiaceae	Tree	Endemic	LC
Semicarpus acuminata	Anacardiaceae	Tree	Endemic	VU
Semicarpus marginata	Anacardiaceae	Tree	Endemic	EN
Semicarpus sp	Anacardiaceae	Tree		
Nothopegia beddomei	Anacardiaceae	Tree	Indegenous	LC
Anacardium occidentale	Anacardiaceae	Tree	Indegenous	
Lannea coremandelica	Anacardiaceae	Tree	Indegenous	LC
Mangifera indica	Anacardiaceae	Tree	Exotic	
Camponosperma zeylanica	Anacardiaceae	Tree	Endemic	LC
Uvaria zeylanica	Annonaceae	Climber	Indegenous	LC
Cyathocalyx zeylanica	Annonaceae	Tree	Indegenous	LC
Polyalthia cerasoides	Annonaceae	Tree	Indegenous	LC
Polyalthia korinti	Annonaceae	Tree	Indegenous	LC
Xylopia paviflora	Annonaceae	Tree	Indegenous	LC
Desmos elegans	Annonaceae	Tree	Endemic	VU
Goniothalamus gardneri	Annonaceae	Shrub	Endemic	VU
Miliusa indica	Annonaceae	Shrub	Indegenous	LC
Alstonia macrophylla	Apocynaceae	Tree	Exotic	
Alstonia scolaris	Apocynaceae	Tree	Indegenous	LC
Ochrosia oppositifolia	Apocynaceae	Tree	Indegenous	VU
Pagiantha dichotoma	Apocynaceae	Tree	Indegenous	LC
Leptadenia reticulate	Apocynaceae	Climber	Indegenous	LC
Caryota urens	Arecaceae	Tree	Indegenous	LC
Areca sp	Arecaceae	Tree		
Areca catechu	Arecaceae	Tree	Indegenous	
Phoenix pusilla	Arecaceae	Tree	Indegenous	LC
Calamus thwaitesii	Arecaceae	Climber	Indegenous	VU
Canarium zeylanicum	Burseraceae	Tree	Endemic	VU
Bhesa ceylanica	Celastraceae	Tree	Endemic	LC
Calophyllum inophyllum	Clusiaceae	Tree	Indegenous	LC
Calophyllum bracteatum	Clusiaceae	Tree	Endemic	NT
Calophyllum walker	Clusiaceae	Tree	Endemic	VU
Garcinia quaesita	Clusiaceae	Tree	Endemic	LC
Garcinia echinocarpa	Clusiaceae	Tree	Indegenous	VU
Combretum albidum	Combretaceae	Climber	Indegenous	
Terminalia arjuna	Combretaceae	Tree	Indegenous	LC
Connarus championii	Connaraceae	Climber	Endemic	NT
Dillenia retusa	Dilleniaceae	Tree	Indegenous	LC
Dillenia triquetra	Dilleniaceae	Tree	Indegenous	LC
Schumacheria castaneifolia	Dilleniaceae	Tree	Endemic	LC
Tetracera sarmentosa	Dilleniaceae	Climber	Indegenous	LC
Dioscorea pentaphylla	Dioscoreaceae	Climber	Indegenous	LC
Dipterocarpus zeylanicus	Dipterocarpaceae	Tree	Endemic	NT
Shorea sp	Dipterocarpaceae	Tree		
Shorea sp.	Dipterocarpaceae	Tree		

Diospyros insignis	Ebenaceae	Tree	Endemic	NT
Diospyros walkerea	Ebenaceae	Tree	Indegenous	VU
Diospyros hirusta	Ebenaceae	Tree	Endemic	VU
Elaeocarpus serratus	Elaeocarpaceae	Tree	Indegenous	LC

Botanical name	Family	Life form	Taxonomic status	Conservation status
Hevea brasiliensis	Euphorbiaceae	Tree	Indegenous	
Bridelia mooni	Euphorbiaceae	Tree	Endemic	LC
Bridelia retusa	Euphorbiaceae	Tree	Indegenous	LC
Macaranga peltata	Euphorbiaceae	Tree	Indegenous	LC
Aporusa lanceolata	Euphorbiaceae	Tree	Endemic	LC
Chaetocarpus castanocarpus	Euphorbiaceae	Tree	Endemic	LC
Mallotus rhamnifolius	Euphorbiaceae	Tree	Indegenous	LC
Sauropus androgynous	Euphorbiaceae	Shrub	Indegenous	LC
Aporusa lindleyana	Euphorbiaceae	Tree	Indegenous	
Erythrozylum zeylanicum	Erythoroxylaceae	Tree	Endemic	LC
Adenanthera pavonina	Fabaceae	Tree	Indegenous	LC
Entada pusaetha	Fabaceae	Climber	Indegenous	LC
Humboldtia laurifolia	Fabaceae	Shrub	Indegenous	LC
Albizia lebbeck	Fabaceae	Tree	Indegenous	NT
Acacia mangium	Fabaceae	Tree	Exotic	
Archidendron bigeminum	Fabaceae	Tree	Indegenous	LC
Hydnocarpus venenata	Flacourtiaceae	Tree	Endemic	LC
Salacia oblonga	Hippocrateaceae	Tree	Indegenous	EN
Stemonurus apicalis	Icacinaceae	Tree	Endemic	NT
Litsea longifolia	Lauraceae	Tree	Endemic	LC
Cinnanmomum cassia	Lauraceae	Tree	Indegenous	LC
Cryptocarya wightiana	Lauraceae	Tree	Indegenous	NT
Pterospermum suberifolium	Malvaceae	Tree	Indegenous	LC
Osbeckia aspera	Melastomataceae	Shrub	Indegenous	NT
Osbeckia octandra	Melastomataceae	Shrub	Endemic	LC
Aphanamixis polystacha	Meliaceae	Tree	Indegenous	VU
Chukrasia tabularis	Meliaceae	Tree	Indegenous	NT
Swieteniav mahogoni	Meliaceae	Tree	Exotic	
Dysoxylum ficiforme	Meliaceae	Tree	Indegenous	NT
Coscinium fenestratum	Menispermaceae	Climber	Indegenous	LC
Artocarpus nobilis	Moraceae	Tree	Endemic	LC
Ficus benghalensis	Moraceae	Tree	Indegenous	LC
Artocarpus incises	Moraceae	Tree	Exotic	
Artocarpus heterophyllus	Moraceae	Tree	Indegenous	
Ficus exasperate	Moraceae	Tree	Indegenous	LC
Horsfieldia iryaghedhi	Myristicaceae	Tree	Endemic	VU
Myristica dactyloides	Myristicaceae	Tree	Indegenous	LC
Horsfieldia irya	Myristicaceae	Tree	Indegenous	LC
Syzygium amphoracecarpus	Myrtaceae	Tree	Endemic	NT
Syzygium caryophyllatum	Myrtaceae	Tree	Indegenous	LC
Syzygium rubicundum	Myrtaceae	Tree	Indegenous	NE
Syzygium sp.	Myrtaceae	Tree		
Cleistocalyx operculatus	Myrtaceae	Tree	Endemic	LC
Syzygium gardneri	Myrtaceae	Tree	Indegenous	LC
Syzygium cumini	Myrtaceae	Tree	Endemic	LC
Gomphia serrate	Ochnaceae	Tree	Indegenous	LC
Olax zeylanica	Oleaceae	Tree	Indegenous	LC
Ochlandra stridula	Poaceae	Shrub	Endemic	LC
Piper sylvestre	Piperaceae	Climber	Indegenous	LC

Ziziphus oenoplia	Rhamnaceae	Shrub	Indegenous	LC
Anisophyllea cinnamomoides	Rhizophoraceae	Tree	Endemic	NT
Carallia brachiate	Rhizophoraceae	Tree	Indegenous	NT
Canthium rheedii	Rubiaceae	Tree	Indegenous	NT
Botanical name	Family	Life form	Taxonomic status	Conservation status
Gaertnera vaginans	Rubiaceae	Shrub	Indegenous	LC
Morinda citrifolia	Rubiaceae	Tree	Indegenous	LC
Ixora coccinea	Rubiaceae	Tree	Indegenous	LC
Psychotria sarmentosa	Rubiaceae	Climber	Indegenous	NT
Wendlandia bicuspidate	Rubiaceae	Tree	Endemic	LC
Acronychia pedunculata	Rutaceae	Tree	Indegenous	LC
Melicope lunu-ankenda	Rutaceae	Tree	Indegenous	LC
Zanthoxylum rhesta	Rutaceae	Tree	Indegenous	EN
Thoddalia asiatica	Rutaceae	Climber	Indegenous	LC
Micromelum minutum	Rutaceae	Tree	Endemic	LC
Flacourtia indica	Salicaceae	Tree	Indegenous	LC
Filicium decipiens	Sapindaceae	Tree	Exotic	LC
Dimocarpus longan	Sapindaceae	Tree	Indegenous	LC
Nephelium lappaceum	Sapindaceae	Tree	Exotic	
Sapindus trifoliata	Sapindaceae	Tree	Indegenous	NT
Harpullia arborea	Sapindaceae	Tree	Indegenous	VU
Pometia pinnata	Sapindaceae	Tree	Indegenous	LC
Chrysophyllum roxburghii	Sapotaceae	Tree	Indegenous	NT
Mimusops elengi	Sapotaceae	Tree	Indegenous	NT
Madhuca longifolia	Sapotaceae	Tree	Indegenous	NT
Smilax perfoliata	Smilacaceae	Climber	Indegenous	LC
Symplocos cochinchinensis	Symplocapaceae	Tree	Indegenous	LC
Gyrinops walla	Thymelaeaceae	Tree	Indegenous	VU
Grewia carpinifolia	Tiliaceae	Tree	Indegenous	LC
Grewia orientialis	Tiliaceae	Tree	Indegenous	LC
Microcos paniculata	Tiliaceae	Tree	Indegenous	LC
Clerodendrum infortunatum	Verbanaceae	Tree	Indegenous	LC
Stachytarpheta urticaefolia	Verbanaceae	Shrub	Indegenous	
Vitex altissima	Verbanaceae	Tree	Indegenous	NT
Ampelocissus indica	Vitaceae	Climber	Indegenous	NT
Unidentified 1				
Unidentified 2				
Unidentified 3				

Appendix 2

Conservation status	Species name
Endangered	*Semicarpus marginata*, *Salacia oblonga*, *Zanthoxylum rhesta*
Vulnerable	*Semicarpus acuminate*, *Desmos elegans*, *Goniothalamus gardneri*, *Ochrosia oppositifolia*, *Calamus thwaitesii*, *Canarium zeylanicum*, *Garcinia echinocarpa*, *Diospyros walkerea*, *Diospyros hirusta*, *Strobilanthes adenophora*