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TREE DIVERSITY STATUS AND ABUNDANCE IN EHOR TROPICAL RAINFOREST RESERVE IN EDO STATE, NIGERIA

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ABSTRACT

This study assessed the status of biodiversity and the tree abundance investigated in BC areas 12/1, 15/1 and 16/1 of Ehor Forest Reserve, Edo State, Nigeria. Systemic line transect was employed for laying of plots. Two transects with a distance of 500m between them were laid at the centre of each of the three BC areas. Four sample plots (20m x 20m) per transect were laid. Within each plot, woody plant species with diameter at breast height (dbh) ≥ 5 cm were identified and their dbh and height measured. A total of 541 individual trees were measured within the sample plots. The results indicated that 206, 809 and 675 average number of trees per hectare were encountered in BC areas 12/1, 15/1 and 16/1 respectively. The mean basal area per hectare were 1.82 m^2 ha^{-1} for BC 12/1 area, 26.66 m^2 ha^{-1} for BC 15/1 area and 28.24 m^2 ha^{-1} for BC 16/1 area. The species richness indices computed were 6.92, 8.64 and 8.19 for BC areas 12/1, 15/1 and 16/1 respectively and the values of Shannon-Wiener diversity Index (H') for BC areas 12/1, 15/1 and 16/1 were 3.19, 3.54 and 3.40 respectively. These indices were very high, indicating that the forest is a potential biodiversity hotspot. The indices compared favourably with several protected tropical rainforest areas that are biodiversity hotspots. The most abundant tree species were Ceiba pentandra (19 stems/ha) and Mansonia altissima (19 stems/ha) found in BC 12/1. In BC 15/1, out of 49 tree species, Berlina coriacea, Celtis zenkeri, and Brachystegia kennedyi had the highest density with 75 stems, 63 stems and 50 stems per hectare respectively while in BC 16/1, the species with the highest density were Trichilia welwitschii (69 stems/ha), Celtis zenkeri (63 stems/ha) and Blighia sapida (47stems/ha). This research revealed the rich status of tree species diversity. Therefore, there is need to ensure sustainable management of the reserve in order to maintained and improved on its present status.

Keywords: Biodiversity status, tree species abundance, tropical rainforest, Ehor Forest Reserve

INTRODUCTION

Tropical forests are one of the main repositories of global biodiversity (Rennolls and Reynold, 2007) and exceptionally rich in and exclusive reservoirs of biodiversity (Imai *et al*., 2012). Unfortunately, these biodiversity is under threat as a result of forest degradation and deforestation. Unlike deforestation, forest degradation does not involve land-use change. Forest degradation is usually accompanied by reduction in biodiversity, loss of species, etc. (Onyekwelu *et al.,* 2007). About 14 - 16 million hectares of tropical forests are converted to agricultural use alone, through farming (Ogboi, 2011) with considerable implications on wildlife populations. WRM (1999) reported that about 200,000 ha of rainforest in Cameroon are degraded annually, with over 40 tree and wildlife species being threatened with extinction.

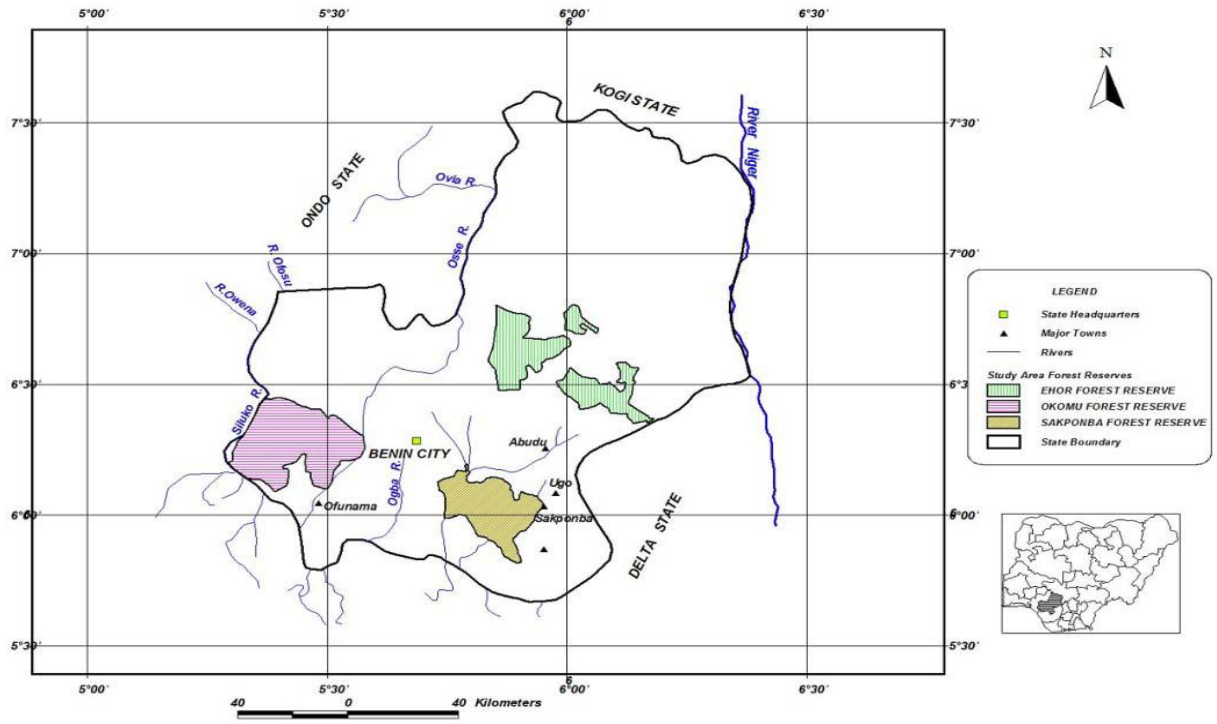
In Nigeria, out of the land mass of 997,936 km^2, only 10% is under forest reserve (Aruofor, 2001). These reserves are under intense pressure from anthropogenic activities that have led to alarming decrease in timber and wildlife species. Recent global forest resources assessment

revealed that Nigeria is one of the five countries in the world with the highest annual rate of deforestation for the period 2000 – 2010 (FRA, 2010). On the average the forest decreased at the rate of 0.4 million ha per year but the rate of reforestation was put at 0.032 per year (Nweze, 2002). A cumulative 47.5% of Nigeria's forests were lost to deforestation between 1990 and 2010 (FRA, 2010). As a result of these alarming threats and progressive clearance of tropical forests, which is the richest forests on the planet in terms of tree species diversity, there is a growing need in quantifying the status of biodiversity. One of the major ways of quantifying tropical tree biodiversity status is by assessing its diversity and abundance. This can also be a promising indicator for biodiversity monitoring. Hence, the tree diversity status and abundance of Ehor tropical rainforest was studied.

Methodology

Study sites

Ehor Forest Reserve which is made up of BC 16/1, BC 15/1 and BC 12/1 areas, occupies an area of 7,680 hectares of land in Uhunmwode Local Government Area of Edo State, Nigeria (Figure 1). It is located between latitudes 60^0 34' N and 60^0 38' N and longitudes 50^0 54' E and 50^0 58' E (Ihenyen *et al.,* 2010). The topography varies for the BC areas. The BC 12/1 is highly undulated and BC 15/1 has flat topography while BC 16/1 has sloppy, undulating and flat topography. The soil of Ehor Forest Reserve belongs to the class of rainforest soils which is well drained, moderately and very deep. It composed of sands, sandy loam and loamy sands.The average annual temperature in Ehor is 25.5^0C. Precipitation averages 1755mm. Precipitation is lowest in January with an average of 10mm (en Climate-data, 2015). Most precipitation falls in September with an average of 311mm. March is the hottest month of the year (en Climate-data, 2015). In August, the average temperature is 23.7 ^{0}C. It is the lowest average temperature of the whole year. Between the driest and wettest months, the difference in precipitation is 301 mm. The average temperature varies during the year by 3.4 ^{0}C (en Climate-data, 2015).



Source:Azeez *et al,* (2010)

Figure 1: Map of Edo State showing the three BC areas of Ehor Forest Reserve

Method of Data Collection

Systemic line transect was employed for laying of plots. Two transects with a distance of 500m between them were laid at the centre of each of the three BC areas. Sample plots of size, 20m x 20m (0.04 ha) were laid in alternate direction along each transect at 250m interval and thus summing up to 4 sample plots per transect and a

total of 8 sample plots per study site. This method was used to ensure that the forest is relatively covered (Adekunle *et al*., 2013a). Within each plot, woody plant species with diameter at breast height (dbh) ≥ 5 cm were identified and their dbh and height measured. Trees were identified by their botanical names and family names by an experienced forest taxonomist. Some of the tree's that their botanical name was not immediately known on the field were identified by their common name. Trees that were not identified by botanical and common names in the field were designated "unknown", and samples of their part(s) (such as leaves, bark, fruits) were collected and used for identification in the laboratory.

Tree Species Diversity

The following were employed following Magurran (2004) and Lu *et al*. (2010):

(i) Shannon-Wiener Diversity Index (H')

The Shannon-Wiener diversity index has been the most widely used index in community ecology.

$$H' = \sum_{i=1}^{s} \text{pi} \ln(\text{pi}) \quad \text{---------- Equation 1}$$

Where:

H' = Shannon-Wiener diversity index

pi= proportion S (species in the family) made up of the i^{th} species

ln = natural logarithm

The values of Shannon-Wiener diversity index is usually found to fall between 1.5 and 3.5 and only rarely surpasses 4.5 (Magurran, 2004).

(ii) Species Evenness Index (E)

The ratio of the observed diversity (H') to the maximum diversity (H_{max}) is taken as a measure of evenness (E)

$$\text{Evenness} = \frac{H}{\log S} \quad \text{---------- Equation 2}$$

Where S is the total number of species.

E is constrained between 0 and 1.0 with 1.0 representing a situation in which all species are equally abundant.

(iii) Species Richness

The Margalef index is independent of the sample size, it is based on the relationship 'S' and the total number of individuals observed (N) which increases with increasing sample size.

Margalef' Index (d)

$$= \frac{S-1}{\ln(N)} \quad \text{---------- Equation 3}$$

Where S is the total number of species, 'N' is the total number of individuals and '*ln'* is the natural logarithm.

(iv) Similarity Index

The similarity of the three BC areas was determined using the Sorenson index (based on qualitative and quantitative data). The following equation was used to calculate Sorensen similarity index.

Sorenson index is expressed as

$$Cs = [\{2j/(a+b\}x100] \quad \text{---------- Equation 4}$$

Where:

j = number of species common to both sites being compared

a = number of species in site A

b = number of species in site B

Critical level of significance = 50% for similarity.

Statistical Analysis

Descriptive statistic was used to obtained mean values and the corresponding standard error. Student t-test were used to test for the presence of significant difference in tree species diversity indices variables. All statistical analysis was carried out using Microsoft Excel 2010 and SPSS version 17.0.

RESULTS AND DISCUSSION

Summary of tree growth attributes

24 sample plots from the three BC areas of Ehor Forest Reserve were sampled and a total of 541 individual trees measured within the sample plots. The results indicated that 206, 809 and 675 average number of trees per hectare were encountered in BC areas 12/1, 15/1 and 16/1 respectively (Table 1). More tree densities per hectare were encountered in BC areas 15/1 and 16/1 because there was evidence of farming activities in BC 12/1. The implication is that BC areas 15/1 and 16/1 had better tree stocking than BC area 12/1. When compared to some rainforests around the world, the sites

investigated could be considered to be species rich in terms of number of stem density per hectare, except BC area 12/1 that have 206 stems per hectare. Nwoboshi (1982), reported that the number of tree species ha^{-1}could be as high as 400 in very rich rainforests.

The respective mean dbh for BC areas 12/1, 15/1 and 16/1 were 10.27 cm, 18.17 cm and 21.48 cm while the mean total height for trees in the respective BC areas were 8.40 m, 12.61 m and 14.70 m. The mean basal area per hectare were 1.82 m^2ha^{-1} for BC 12/1 area, 26.66 $m^2ha^{-1}$for BC 15/1 area and 28.24 m^2ha^{-1} for BC 16/1 area (Table 1). BC area 12/1 had the lowest value of basal area when compared to basal areas of BC 15/1 and 16/1. This could be ascribed to greater number of trees/ha in BC areas 15/1 and 16/1. The implication for the values of average basal area per hectare for BC areas 15/1 and 16/1 is that the forest is well stocked when compared proportionally with report of Alder and Abayomi (1994), which stated that for a well-stocked tropical rainforest in Nigeria, the average basal area is $15m^2$. The value of basal area reported for other tropical rainforest include: 28 - 68 m^2ha^{-1} for Amazonia tropical rainforest (Campbell *et al.,* 1986); 23 m^2ha^{-1} for tropical rainforest of Jengka Reserve, Malaysia (Ho *et al*, 1987); 10 - 45 m^2ha^{-1} for equatorial forest of Kongo island, Zaire (Mosango, 1991).

Table 1: **Summary of tree growth attributes of the study area**

	Average number of trees/ha	Dbh Range/cm	Mean Dbh/cm	Ht Range/m	Mean Ht/m	Basal Area Range/m^2	Mean Basal Area/m^2
BC 12/1	206	6.68-18.40	10.27±0.33	3.90-15.30	8.40±0.33	0.36-2.61	1.82±0.083
BC 15/1	809	4.50-76.38	18.17±0.59	2.40-25.20	12.61±0.40	16.91-36.72	26.66±0.62
BC 16/1	675	5.73-47.74	21.48±0.57	2.70-25.50	14.70±0.39	18.16-49.20	28.24±0.70

Dbh-Diameter at breast height; Ht-Height
Source: Field Work, 2015

Biodiversity Status

Summary of the results of various diversity indices for BC areas 12/1, 15/1 and 16/1 are presented in Table 2. The species richness indices computed were 6.92, 8.64 and 8.19 for BC areas 12/1, 15/1 and 16/1 respectively. The t-test carried out at 95% probability level for species richness between the BC areas indicated that there is significant difference ($p \leq 0.05$) between BC 12/1 and 15/1 and also between BC 12/1 and 16/1 but no significant difference ($p \geq 0.05$) between 15/1 and 16/1 (Table 2). The results indicated that BC area 15/1 has higher tree species richness than BC areas 12/1 and 16/1. The values of the species richness compare favourably well with the values (7.19-10.64) for Bwindi forest, (4.71-10.51) for Budonga forest, (6.36-8.08) for Kibale forest and (7.54-8.20) for Kasyoha-Kitomi forest, all located in Albertine rift, Uganda (Eilu *et al.,* 2004). Several factors could influence why the present studies has high species richness when compared with other studies from tropical forests. Factors like anthropogenic activities and soil quality. The implication for high species richness for the three BC areas is that the forest environments are stable, thus there is high likelihood of sustainability if the forests are well managed.

The values of Shannon-Wiener diversity Index (H^1) for BC areas 12/1, 15/1 and 16/1were 3.19, 3.54 and 3.40 respectively. The result of student t-test analysis carried out at 95% probability levels revealed that there is no significant difference ($p \geq 0.05$) in the species diversity index of the three BC areas (Table 2). The results of Shannon- Wiener diversity Index in the study area is higher compared to the 2.20–2.65 for the tropical forests of Kodayar in theWestern Ghats of southern India (Sundarapandian *et al,* 2000), 2.74 and 1.63 for South Nandi and North Nandi Forest, Kenyan respectively (Gebreselasse, 2011). More comparable values were reported from Afi River Forest Reserve and Oban Forest Reserve with diversity index values of 3.827 and 3.795 respectively (Aigbe *et al*., 2014 and Aigbe and Omokhua, 2015 respectively). Tree species diversity values in tropical forests of Kalakad Reserved Forests in Western Ghats were reported as 3.31and 3.69 (Parthasarathy *et al,*

1992), while in Strict Nature Reserve in south western state of Nigeria and Akure Forest Reserve, the values were 3.74 (Adekunle *et al.,* 2013a) and 3.037/3.16 (Adekunle *et al.,* 2013b) respectively. The difference in species diversity in other tropical forest communities from this present study area could be attributed to anthropogenic activities, soil factor, sample plot sizes and ecological sub region (Aigbe, 2014).

The evenness of species in BC 12/1 is 0.94; BC 15/1 is 0.91 while that of BC 16/1 is 0.89. The t-test carried out at 95% probability level for species richness between the BC areas indicated that there is significant difference ($p \leq 0.05$) between BC 12/1 and 15/1 and also between BC 12/1 and 16/1 but no significant difference ($p \geq 0.05$) between 15/1 and 16/1. The values of dominance index for BC areas 12/1, 15/1 and 16/1 were 0.05, 0.04 and 0.05 respectively. The t- test carried out at 95% probability level for dominance index between the BC areas indicated that there is significant difference ($p \leq 0.05$) between BC 12/1 and 15/1 and also between BC 12/1 and 16/1 but no significant difference ($p \geq 0.05$) between 15/1 and 16/1 (Table 2).

Table 2: Summary of the Various Diversity indices computed for BC areas 12/1, 15/1 and 16/1 in Ehor Forest Reserve

Index	BC 12.1	BC 15.1	BC 16.1
Species Richness (d)	6.92^{a}	8.64^{b}	8.19^{b}
Shannon Wiener (H^{l})	3.19^{a}	3.54^{a}	3.40^{a}
Species Evenness (E)	0.94^{a}	0.91^{b}	0.89^{b}
Dominance index (D)	0.05^{a}	0.04^{b}	0.05^{b}

Means followed by different superscripts are significantly different at 0.05 level of significance. Source: Field Work, 2015

The results of the qualitative (for species number) and quantitative (for abundance) Sorenson's similarity index, used to compare the floristic similarity of tree species in the three BC areas were presented in Tables 3 and 4 respectively. The Sorenson's qualitative similarity index value was 0.506 between BC 12/1 and 15/1, indicating that 50.6% of the species present in BC 12/1 are similar to those found in BC 15/1. Between (BC 12/1 and 16/1) and (BC 15/1 and 16/1), the qualitative similarity index values were 14.89% and 15.58% respectively. The Sorenson's quantitative similarity index value was 0.615 between BC 15/1 and 16/1, indicating that 61.5% of the species abundance present in BC 15/1 are similar to those found in BC 16/1. Between (BC 12/1 and 15/1) and (BC 12/1 and 16/1), the quantitative similarity index values were 22.77% and 27.65% respectively. The Sorenson's similarity index of the floristic comparison between the three BC areas varies from what was reported for some tropical rainforest ecosystems in Nigeria. For example, Onyekwelu *et al*. (2008) reported species similarity indices of 63.4%, 58.3% and 47.4% between Queen's and Elephant forests, Queen's and Oluwa forests, Oluwa and Elephant forests, respectively in tropical rainforest ecosystems of southwestern Nigeria. Also, Gebreselasse (2011) reported similarity indices range of 25% to 39% for some tropical forest ecosystems in Kenya.

Table 3: Sorenson's Qualitative Similarity Index of the three BC areas

	BC12.1	BC15.1	BC16.1
BC 12.1	-	50.633	14.894
BC15.1		-	15.579
BC16.1			-

Source: Field Work, 2015

Table 4: Sorenson's Quantitative Similarity Index of thethree BC areas

	BC12/1	BC15/1	BC16/1
BC 12/1	-	22.769	27.651
BC15/1		-	61.474
BC16/1			-

Source: Field Work, 2015

Tree Species Abundance

The numbers of species encountered in BC areas 12/1, 15/1 and 16/1 were 30, 49 and 45 species respectively. The dominant families in BC 12/1 were Caesalpinoideae (32/ha), Ulmaceae (26/ha) and Euphorbaceae (25/ha) while in BC 15/1 were Caesalpinoideae (178/ha), Sapindaceae (72/ha), Euphorbaceae (66/ha) and Ulmaceae (63/ha). BC area 16/1 was dominated with Meliaceae (131/ha), Caesalpinoideae (109/ha) and Sapindaceae (84/ha). Onyekwelu *et al* (2007) reported families with high number of species to include Euphorbiaceae, Sterculiaceae, Meliaceae, Mimosoideae and Apocynaceae in Queen's, Oluwa and Elephant forests of Omo and Oluwa Forest Reserve, Nigeria. The findings of this study is partially in agreement with work of Isichei (1995) who reported that the Nigerian rainforest is dominated by members of Sterculiaceae, Moraceae, Ulmaceae and Meliaceae families. The tree species with the highest density of 19 trees per hectare were *Ceiba pentandra* and *Mansonia altissima* found in BC 12/1. In BC 15/1, out of 49 tree species, *Berlina coriacea, Celtis zenkeri,* and *Brachystegia kennedyi* had the highest density with 75 trees, 63 trees and 50 trees per hectare respectively while in BC 16/1, the species with the highest density were *Trichilia welwitschii* (69 trees/ha), *Celtis zenkeri* (63 trees/ha) and *Blighia sapida* (47). Dominant species in the BC areas were different from those reported for some tropical rainforest ecosystems in other part of Nigeria. For example, Onyekwelu *et al*, (2007), reported *Diospyros mespiliformis, Strombosia pustulata, Drypetes paxii, Napoleonaea spp, Celtis zenkeri, Sterculia rhinopetalaand Cola millenii.* as the dominant species in Queen's, Oluwa and Elephant forests and Aigbe and Omokhua (2015), reported *Uapaca heudelotti, Carapa procera* and *Staudtia stipitata* as the dominant species in Oban Forest Reserve, which are different from the dominating species in the tree BC areas.

Table 5: Tree species Abundance of BC 12/1 in Ehor Forest Reserve

Family	**Tree species**	**No Stem/ha**
Annonaceae	*Cleistopholis patens*	13
Annonaceae	*Monodora brevipes*	6
Apocynaceae	*Funtumia elastic*	3
Bombacaceae	*Ceiba pentandra*	19
Burseraceae	*Canarium schweinfurthii*	3
Caesalpiniodeae	*Berlinia coriaceae*	6
Caesalpiniodeae	*Brachystegiaeurycoma*	10
Caesalpiniodeae	*Brachystegia kennedyi*	13
Caesalpinioideae	*Anthonotha macrophylla*	3
Euphorbiaceae	*Brideliamicrantha*	9
Euphorbiaceae	*Drypetes chevalieri*	10
Euphorbiaceae	*Marcaranga barteri*	6
Flacourtiaceae	*Scottellia coriaceae*	3
Irvingaceae	*Irvingia grandifololia*	3
Lauraceae	*Hypodaphnis zenkeri*	9
Lecythidaceae	*Combredendron marcrocarpum*	3
Lecythidaceae	*Petersianthus macrocarpus*	3
Meliaceae	*Trichilia welwitschii*	3

Table 5: Continues

Family	Tree species	No Stem/ha
Mimosoidae	*Albizia ferruginea*	6
Mimosoides	*Pentaclethra marcrophylla*	3
Moraceae	*Trilepisium madagascariense*	3
Myristicaceae	*Staudtia stipitata*	9
Ochnaceae	*Lophira alata*	3
Rubiaceae	*Pausinystalia johimbe*	3
Rubiaceae	*Ricinodendron heudelotii*	3
Sapindeae	*Blighia sapinda*	3
Sterculiaceae	*Mansonia altissima*	19
Sterculiaceae	*Sterculia tragacantha*	3
Ulmaceae	*Celtis zenkeri*	13
Ulmaceae	*Trema guineensis*	13

Source: Field Work, 2015

Table 6: Tree species abundance of BC 15/1 in Ehor Forest Reserve

Family	Tree species	No Stem/ha
Anarcadaceae	*Lannea welwitschii*	3
Annonaceae	*Cleistopholis patens*	16
Annonaceae	*Xylopia aethiopica*	13
Apocynaceae	*Funtumia elastic*	6
Aquifoliaceae	*Musanga cecropioides*	19
Bombacaceae	*Ceiba pentandra*	10
Burseraceae	*Canarium schweinfurthii*	19
Caesalpiniodeae	*Anthonotha macrophylla*	31
Caesalpinoideae	*Berlinia coriacea*	75
Caesalpinoideae	*Berlinia grandiflora*	3
Caesalpinoideae	*Daniellia oliveri*	3
Caesalpinoideae	*Hylodendron gabunense*	6
Caesalpinoides	*Brachystegia kennedyi*	50
Ebenaceae	*Diospyros crassiflora*	3
Ebenaceae	*Diospyros dendo*	31
Ebenaceae	*Diospyros iturensis*	28
Euphorbiaceae	*Drypetes chevalieri*	47
Euphorbiaceae	*Marcaranga barteri*	9
Euphorbiaceae	*Tetrorchidium didymostemon*	9
Flacourtiaceae	*Scottellia coriacea*	9
Irvingaceae	*Irvingia grandifolia*	16
Lauraceae	*Pycnanthus angolensis*	6
Lecythidaceae	*Petersianthus macrocarpus*	6
Meliaceae	*Carappae procera*	6
Meliaceae	*Guarea cedrata*	16
Meliaceae	*Lovoa trichiloides*	3
Miliaceae	*Trichilia welwitschii*	22
Mimosoideae	*Albizia ferruginea*	9

Table 6 Continues

Family	Tree species	No Stem/ha
Mimosoideae	*Albizia lebbeck*	19
Mimosoideae	*Albizia zygia*	6
Moraceae	*Treculia africana*	6
Moraceae	*Trilepisium madagascariense*	16
Olacaceae	*Strombosia pustulata*	3
Papilionoideae	*Baphia nitida*	19
Papilionoideae	*Pentaclethra macrophylla*	6
Papilionoideae	*Pterocarpus osun*	3
Rhamnaceae	*Maesopsis eminii*	9
Rubiaceae	*Fagara zanthoxyloides*	6
Rubiaceae	*Pausinystalia johimbe*	25
Rubiaceae	*Porterandia cladantha*	6
Rubiaceae	*Ricinodendron heudelotii*	16
Sapindaceae	*Blighia sapida*	38
Sapindaceae	*Lecaniodiscus cupanioides*	34
Simaroubaceae	*Hannoa klaineana*	10
Sterculiaceae	*Cola hispida*	9
Sterculiaceae	*Nesogordonia papaverifera*	13
Sterculiaceae	*Sterculia oblonga*	9
Sterculiaceae	*Sterculia tragacantha*	19
Ulmaceae	*Celtis zenkeri*	63

Source: Field Work, 2015

Table 7: Tree species Abundance of BC 16/1 area in Ehor Forest Reserve

Family	Tree species	Stem/ha
Anarcardiaceae	*Lannea nigritana*	13
Anarcardiaceae	*Lannea welwitschii*	3
Annonaceae	*Cleistopholis patens*	9
Annonaceae	*Monodora myristica*	3
Apocynaceae	*Funtumia elastica*	6
Aquifoliaceae	*Musanga cecropioides*	22
Bombacaceae	*Ceiba petandra*	19
Burseraceae	*Canarium schweinfurthii*	19
Caesalpiniodeae	*Anthonatha macrophylla*	6
Caesalpiniodeae	*Berlinia coriacea*	9
Caesalpiniodeae	*Hylodendron gabunense*	31
Caesalpinoideae	*Berlinia grandifolia*	9
Caesalpinoideae	*Brachystegia eurycoma*	3
Caesalpinoideae	*Brachystegia kennedyi*	41
Caesalpinoideae	*Daniella oliveri*	6
Dipterocarpaceae	*Lophira alata*	3
Ebenaceae	*Diospyros iturensis*	6
Euphorbiaceae	*Drypetes chevalieri*	9
Euphorbiaceae	*Marcaranga barteri*	6
Euphorbiaceae	*Tetrorchidium didymostemon*	3

Table 7 Continues

Family	Tree species	Stem/ha
Flacourtiaceae	*Scottellia coriaceae*	16
Irvingaceae	*Irvingia grandifolia*	3
Lauraceae	*Pycnanthus angolensis*	19
Lecythidiaceae	*Petersianthus macrocarpus*	13
Meliaceae	*Carappae procera*	3
Meliaceae	*Guarea cedrata*	41
Meliaceae	*Guarea thompsonii*	3
Meliaceae	*Lovoa trichilioides*	16
Meliaceae	*Trichilia welwitschii*	69
Mimosoideae	*Albizia ferruginea*	13
Mimosoideae	*Albizia lebbeck*	9
Mimosoideae	*Piptadeniastrum africanum*	6
Moraceae	*Antiaris toxicaria*	6
Olacaceae	*Strombosia grandifolia*	6
Olacaceae	*Strombosia pustulata*	3
Papilioniodeae	*Pterocarpus osun*	3
Rubiaceae	*Fagara zanthoxyloides*	9
Rubiaceae	*Pausinystalia johimbe*	13
Rubiaceae	*Ricinodendron heudelotii*	16
Sapindaceae	*Lecaniodiscus cupanioides*	38
Sapindeae	*Blighia sapida*	47
Simaroubaceae	*Hannoa klaineana*	6
Sterculiaceae	*Sterculia oblonga*	9
Sterculiaceae	*Sterculia tragacantha*	19
Ulmaceae	*Celtis zenkeri*	63

Source: Field Work, 2015

CONCLUSION

Ehor tropical rainforest is a hotspot for plant biodiversity and also important destination point for rich timber resources. BC areas 15/1 and 16/1 is well stocked with timber resources going by the value of the average basal area per hectare as reported by Alder and Abayomi (1994), which stated $15m^2$ per hectare for a well-stocked tropical rainforest in Nigeria. The prevalent logging and farming activities in BC 12/1 affected the density of tree per hectare which is not well stocked when compared to BC areas 15/1 and 16/1. The values of species richness and diversity indices indicate that Ehor forests environment is relatively stable.

The commonest timber species in BC 12/1 were *Ceiba Pentandra, Mansonia altissima,Cleistopholis patens, Celtis zenkeri, Trema guineensis* and *Brachystegia kennedyi* while in BC 15/1, the commonest tree species were *Berlinia coriacea, Celtis zenkeri,* and *Brachystegia kennedyi.* BC 16/1 had *Trichilia welwitschii* and *Celtis zenkeri* as commonest tree species. The species diversity of the three BC areas of Ehor Forest Reserve were quite high, hence should be considered important biodiversity hotspot in the rainforest region of Nigeria. The implication is that, the biodiversity status is of high conservation value.

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