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FLORISTICS AND STRUCTURE OF THE FALLOW VEGETATION IN THE ILE-IFE AREA OF SOUTHWESTERN NIGERIA.

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ABSTRACT

A study was made of the vegetation of seven fallow plots in Ile-ife Area of Southwestern Nigeria. The aim is to provide detailed information on the current state of the Secondary Low-land Forest Vegetation and on the various successional stages formed as a result of human activities. Results show that there are differences in species composition of the plots. Young plots (1-5 years old) had fewer woody species and individuals than the secondary forest plots. The secondary forest plot which is the oldest plot, had the highest mean basal area, mean crown area and greater number of trees in the height class ≥7m while the youngest plot had the lowest mean basal area, mean crown area and had no tree in the height class ≥7m. The woody basal and crown area of the plots depend entirely on the density and size of the woody species. The mean aerial cover of herbaceous plant was more than 100% in all the plots except the secondary forest plots where there was no herbaceous plant at all. The differences in species composition could be attributed to level of human activities on the plots. The knowledge of this species composition in the plots (Biological diversity) can be directed at protecting and preserving the plants for both perceived and economic benefits and for their aesthetic value.

INTRODUCTION

Fallowing is a major system of Agricultural land management in many tropical countries. It involves the use of natural Vegetation regeneration to restore soil fertility after cultivation. Recent rapid population rise in tropical countries has increased pressure on the land and in many areas fallow periods have been considerably shortened and the soil have become less

Table 1: *Indices of Similarity (IS) of Seven Study Plots in Ile-Ife Area of Southwestern Nigeria*

Plots	TC	TA	TB	R7	PH	AG	FR
TC	-						
TA	55.55%	-					
TB	32.26%	22.22%	-				
R7	21.62%	34 78%	16.68%	-			
PH	33.33%	25.00%	44.44%	43.90%	-		
AG	22.86%	09.52%	23.53%	46.67%	41.03%	-	
FR	09.52%	07.89%	39.22%	17.02%	28.57%	40.00%	-

productive. An understanding of the floristic and structure of fallow Vegetation ecosystem is thus desirable.

Floristics and structures of fallows have been used to describe the course of succession in West Africa and the Vegetation attributes could also be indicative of site potential in terms of land use (Hall and Okali, 1979). Restoration of soil fertility during bush fallow is one of the best documented instances of plants affecting the nutrient supplying power of the soil (Grubb, 1989). The floristic composition of Vegetation is both an indication of the course of succession and the rate of fertility restoration, thus underlying the importance of the study of fallow Vegetation in an area.

Most studies of Vegetation often involve mature systems or these that have not been disturbed for a long time. Such studies are important in that a knowledge of such natural systems serve as ideals for environmental managers towards which they always aim.

The effective management of such ecosystems requires the understanding of their functioning not only for their improvement but also to arrest their further degradation. One aspect of this understanding of the functioning of these system is the knowledge of their species composition and structures.

It is against the above background of the importance of woody shrubs and trees in conservation that the study of floristics and structure of the fallow Vegetation in Ile-Ife Area of Southwestern Nigeria was embarked upon.In this study, the Vegetation of these fallow plots will be analysed for their floristic composition and aspects of Vegetation Physiognomy.

Study Area

The study was carried out in seven plots located in Ile-Ife Area of Southwestern Nigeria between (Latitude 7° 31'N and 7° 33'N and Longitude 4° 31'E and 4° 34'E). The seven representative plots of 50 x 50m each designated plots TA, TB, TC, R7, PH, AG and FR. On the basis of an initial field reconnaissance survey of the Ile-Ife area, one plot (Plot FR) in a relatively undisturbed secondary regrowth forest and six other plots in disturbed area, each measuring approximately 50 x 50m were selected. These plots were selected on the basis of their vegetation and the apparent extent of deforestation. Plots TA and TC are one year old fallow, plot TB is a two year old fallow while plots R7 and PH are three year old fallow. Plot AG is a five year old fallow while plot FR is a forested plot.

The mean rainfall at Ile-Ife is about 1400mm (five years mean). The rainy season lasts from mid March to late October and rainfall is bimodal with peak periods in July and September. Mean temperature in the area range from an annual minimum of 27°C to 34°C

The area is underlain by metamorphic rocks of the Precambrian Basement Complex. Those rocks show great variation in structure, Mineral composition and grain size (Smyth and Montgomery, 1962). The soils of the area have moderately to strongly leached soils of low to medium humus content, weekly acid to neutral surface layers and moderately to strong sub-soils (Smyth and Montgomery, 1962).

Table 2: *Density of woody species in seven study plots in Ile-Ife area of Southwestern Nigeria*

	Species	Plot TC	Plot TA	Plot TB	Plot R7	Plot PH	Plot AG	Plot FR
1.	*Albizia glaberrima*	-	-	4	-	-	-	4
2.	*Albizia zygia*	-	-	4	24	52	24	36
3.	*Alchornea cordifolia*	-	24	84	-	-	-	-
4.	*Alchornea laxiflora*	-	-	-	-	4	-	-
5.	*Alstonia boonei*	-	-	8		-	-	20
6.	*Antiaris africana*	-	-	-		-	-	20
7.	*Azadirachta indica*	-	-	-	4	-	-	-
8.	*Baphia nitida*	4	-	4	-	-	-	-
9.	*Bligha nitida*	-	-	-	-	4	-	16
10.	*Bligha sapida*	-	-	4	20	20	16	-
11.	*Bligha unijugata*	-	-	4	-	8	-	20
12.	*Bosqueia angolensis*	-	-	-	-	-	-	16
13.	*Theobroma cacao*	-	-	-	-	-	4	-
14.	*Carica papaya*	8	-	-	-	4	-	-
15.	*Cassia siamea*	-	-	-	-	8	-	-
16.	*Cassia sieberiana*	-	-	-	-	12	-	-
17.	*Celtis zenkeri*	-	-	4	-	-	-	-
18.	*Chrysophyllum albidum*	-	-	-	-	-	-	4
19.	*Milicia excelsa*	-	-	20	-	-	-	-
20.	*Cola acuminata*	-	-	-	-	-	-	20
21.	*Cola milleni*	4	-	-	-	-	-	36

Table 2: *(Cont.)*

	Species	Plot TC	Plot TA	Plot TB	Plot R7	Plot PH	Plot AG	Plot FR
22.	*Cola nitida*	24	-	4	-	-	-	20
23.	*Cnestis ferruginea*	-	-	-	-	4	-	-
24.	*Commiphora heudelotii*	-	-	4	-	-	-	-
25.	*Dialium guineensis*	-	-	-	-	-	-	4
26.	*Deintollia pinnata*	-	-	-	-	4	-	-
27.	*Draceana arborea*	-	-	-	-	-	-	8
28.	*Elaeis guineensis*	40	-	32	-	40	28	20
29.	*Fagara macrophylla*	4	-	4	-	-	-	-
30.	*Ficus cafensis*	-	-	-	16	20	-	-
31.	*Ficus exasperata*	-	-	-	116	24	12	-
32.	*Ficus eucuso*	-	-	4	4	-	-	-
33.	*Ficus leprierri*	-	-	-	-	4	-	-
34.	*Ficus sterculia*	-	-	8	-	-	-	-
35.	*Funtumia elastica*	-	-	-	12	8	24	288
36.	*Glypheae brevis*	-	-	12	-	4	-	52
37.	*Holarrhena floribunda*	-	-	-	-	-	-	8
38.	*Lecaniodiscus cupanioides*	-	-	4	-	-	-	16
39.	*Mallotus oppositifolius*	12	-	-	-	-	-	-
40.	*Manihot glaziovii*	92	92	-	8	-	-	-
41.	*Monodora tenuifolia*	-	-	-	-	-	-	28
42.	*Morinda lucida*	-	-	8	-	4	-	-

Table 2: *(Cont.)*

	Species	Plot TC	Plot TA	Plot TB	Plot R7	Plot PH	Plot AG	Plot FR
43.	*Hypianthus arboreus*		-	-	-	20	4	4
44.	*Musa sapientum*		-	24	-	-	-	-
45.	*Newbouldia laevis*	8	20	4	76	28	-	-
46.	*Napoleana vogelii*	-	-	-	8	-	-	8
47.	*Phyllanthus discoideus*		-	-	-	-	-	4
48.	*Psidium guajava*	-	-	-	4	-	-	-
49.	*Rauvolfia vomitoria*	-	-	4	-	16	4	12
50.	*Ricinodendron heudelotii*	-	-	-	-	12	-	4
51.	*Solanum torvum*	-	-	-	-	-	4	-
52.	*Solanun verbascifolium*	-	-	-	5	-	-	-
53.	*Spondias mombin*	12	8	-	12	-	28	-
54.	*Pterocarpus milbreadii*	-	-	-	-	-	-	4
55.	*Prcantnus aneolensis*	-	-	-	-	-	-	4
56.	*Sterculia tragacantha*	-	-	-	-	-	-	12
57.	*Terminalia ivorensis*	-	-	-	-	-	-	4
58.	*Terminalia superba*	-	-	-	-	-	-	20
59.	*Trema crientalis*	8	4	-	12	8	12	-
60.	*Trichilia heudelotii*	-	-	-	12	68	12	12
61.	*Triplochiton scleroxylon*	-	-	-	-	-	4	8
62.	*Vernonia conferta*	-	-	-	68	4	-	-
63.	*Tabernaemontana pachysiphon*	-	-	-	-	12	-	-
	Total	216	176	224	401	392	192	732

MATERIALS AND METHODS

Tree density was estimated in each of the seven plots by complex enumeration. Every tree and shrub ≥1m was tagged with a number, counted and identified to species level. Indices of diversity and similarities of the plot to each other.

Girth of woody plants was measured at breast height (GBH) for species ≥3m high and at mid-point for those ≤3m. The girth measurements were used to calculate the basal area for each plant and for each species. Tree height was measured using an Haga altimeter. Tree crown area (Canopy) was measured by taking two diameters at right angles to each other across the plants, one of which was the maximum diameter for the plant. The area of each plant canopy was calculated from the formula $A = D^2/4$ where D is the average crown diameter.

The percentage cover of herbs, grasses or forbs was estimated both as basal and aerial cover. Percentage basal cover was estimated by dropping a pointed metal rod (Greig-Smith, 1983) perpendicularly and consistently on the same side at every meter point along a 50m central line transect and noting whether it hits the base of a herb, grass or forb.

Soil

The central line transects used for herbaceous plant and tree sampling were used for soil sampling. Five 50m central line transects were laid randomly within each 50 x 50m plot. Soil samples were collected systematically at every fifth meter point from the 0-5 and 5-10cm depth using a soil auger. The soil samples were air dried and passed through a 2mm sieve. They were analysed for particle size distribution using the hydrometer method (Bouyoucous 1961) after dispersion with sodium hexametaphosphate), P^H in 1:2 soil: 1N Kcl solution: organic matter content by the Walkey-Black Method (Black, 1965) and bulk density using core sampler to take undisturbed soil samples.

RESULTS

Floristics Composition of the Plots

Herbaceous Species: Species nomenclature in accordance with Hutchinson and Dalziel's Flora of West Tropical Africa (1954-1972). *Chromolaena Odorata* was common to all the plots except plot FR (forest plot). All the young plots (Plots TC, TA and TB) were mainly *Andropogon tectorum, Chromolaena Odorata* and *Aspilia africana.* The older plots (Plots R7, PH and AG) were also dominated by *Chromolaena odorata* but they did not have grasses.

The dominant herbaceous species in each of the plots were as follows:

Plot TC: *Andropogon tectorum, Ageratum conyzoides, Bracharia villosa, Calapagonium mucunoides, Centrosema pubescens, Chromolaena odorata.*

Plot TA: *Aspilia africana, Andropogon tectorum and Chromolaena odorata.*

Plot TB: *Andropogon tectorum, Aspilia africana* and *Chromolaena odorata.*

Table 3: *Vegetation Characteristics of the Seven Study Plots in Ile-Ife Area of Southwestern Nigeria*

Plots	Age (years)	No of woody Species	Total density of woody species per ha^{-1} species.	Total Mean Basal Area of woody	Total Mean Grown Horizontal Area m^2 ha^{-1} m^2 ha^{-1}	Mean percentage Aerial and Basal cover of Herbaceous plants		Density of woody species in each of three height classes. ha^{-1}			Plots
						Aerial	Basal	3m	3-7m	7m	
1 (TC)	1	11	216	2.104±0.213	878.088±51.645	708.13±164	41.30	60	96	60	1
2 (TA)	1	7	176	0.041±0.002	176.406±17.095	823.75±132	39.14	48	128	0	2
3 (TB)	2	20	224	1.239±0.056	1001.408±33.927	825.63±115	15.85	68	116	56	3
4 (R7)	3	16	401	0.296±0.007	227.560±9.754	778.13±135	13.44	180	236	9	4
5 (PH)	3	25	392	1.563±0.101	657.828±11.594	745.25±150	10.46	136	140	64	5
6 (AG)	5	15	192	4.008±0.177	2226.128±78.543	828.25±137	6.21	36	140	64	6
7 (FR)	25	31	732	9.040±0.237	7796.328±91.129	-	-	48	504	184	7

Table 4: *Mean values ±95% Confidence Interval of soil properties at 0-5cm and 5-10cm soil depth in seven study plots in Ile-Ife Area of Southwestern Nigeria.*

	Soil Depth (cm)	Plot TC	Plot TA	Plot TB	Plot R7	Plot PH	Plot AG	Plot FR	Plot BK
% Sand	0-5cm	71.45±2.04	65.20±2.72	67.65±3.72	38.06±2.90	75.06±3.67	70.38±4.82	70.48±4.60	71.56±3.98
	5-10cm	72.10±1.90	66.21±1.08	73.20±3.04	33.20±2.97	76.96±2.95	71.60±5.20	70.18±3.73	71.95±2.97
% Silt	0-5cm	11.50±1.31	11.75±1.63	13.68±2.48	18.21±1.87	10.00±4.62	7.83±1.96	9.48±1.69	10.18±4.38
	5-10cm	11.40±0.77	11.40±0.77	9.79±2.19	19.44±1.26	8.79±2.21	8.33±1.50	10.73±1.58	9.70±2.27
% Clay	0-5cm	17.05±1.24	23.05±1.87	18.67±4.23	43.73±3.24	14.94±1.53	21.79±3.59	20.04±2.90	18.26±4.27
	5-10cm	16.50±1.47	22.39±1.89	17.01±1.59	47.36±3.22	14.25±2.19	2.07±4.25	19.09±2.66	18.35±2.38
Sand/ Clay ratio	0-5cm	4.24±0.40	2.88±0.35	3.76±0.75	0.88±0.12	5.28±0.50	3.47±0.67	3.88±0.86	3.92±0.87
	5-10cm	4.35±0.44	3.00±0.32	4.32±0.56	0.71±0.10	5.35±0.85	3.91±0.94	3.89±0.86	3.92±0.75
pH ($CaCl_2$)	0-5cm	6.3±0.20	5.8±0.2	5.9±0.2	6.2±0.1	6.1±0.1	5.7±0.2	6.1±0.1	6.2±0.1
	5-10cm	6.2±0.2	5.6±0.2	5.9±0.2	5.9±0.20	5.9±0.3	5.5±0.3	5.9±0.2	6.0±0.3
pH (H_2O)	0-5cm	6.9±0.20	6.5±0.2	6.7±0.2	6.7±0.1	6.6±0.3	6.4±0.2	6.7±0.1	6.5±0.2
	5-10cm	6.9±0.2	6.4±0.3	6.6±0.1	6.5±0.2	6.7±0.2	6.3±0.2	6.6±0.2	6.5±0.2
% Organic Matter	0-5cm	2.66±0.67	2.89±0.53	3.97±0.83	4.01±0.67	3.99±0.70	4.48±0.39	3.95±0.69	2.34±0.71
	5-10cm	2.34±0.44	2.70±0.36	2.74±0.45	3.55±0.21	2.64±0.42	2.41±0.58	2.38±0.3	2.13±0.44
Bulk Density	0-5cm	1.32±0.10	1.20±0.13	1.19±0.09	1.35±0.22	1.30±0.11	1.32±0.11	1.22±0.13	1.59±0.11
	5-10cm	1.50±0.10	1.29±0.12	1.37±0.11	1.55±0.11	1.39±0.06	1.53±0.10	1.45±0.15	1.69±0.11

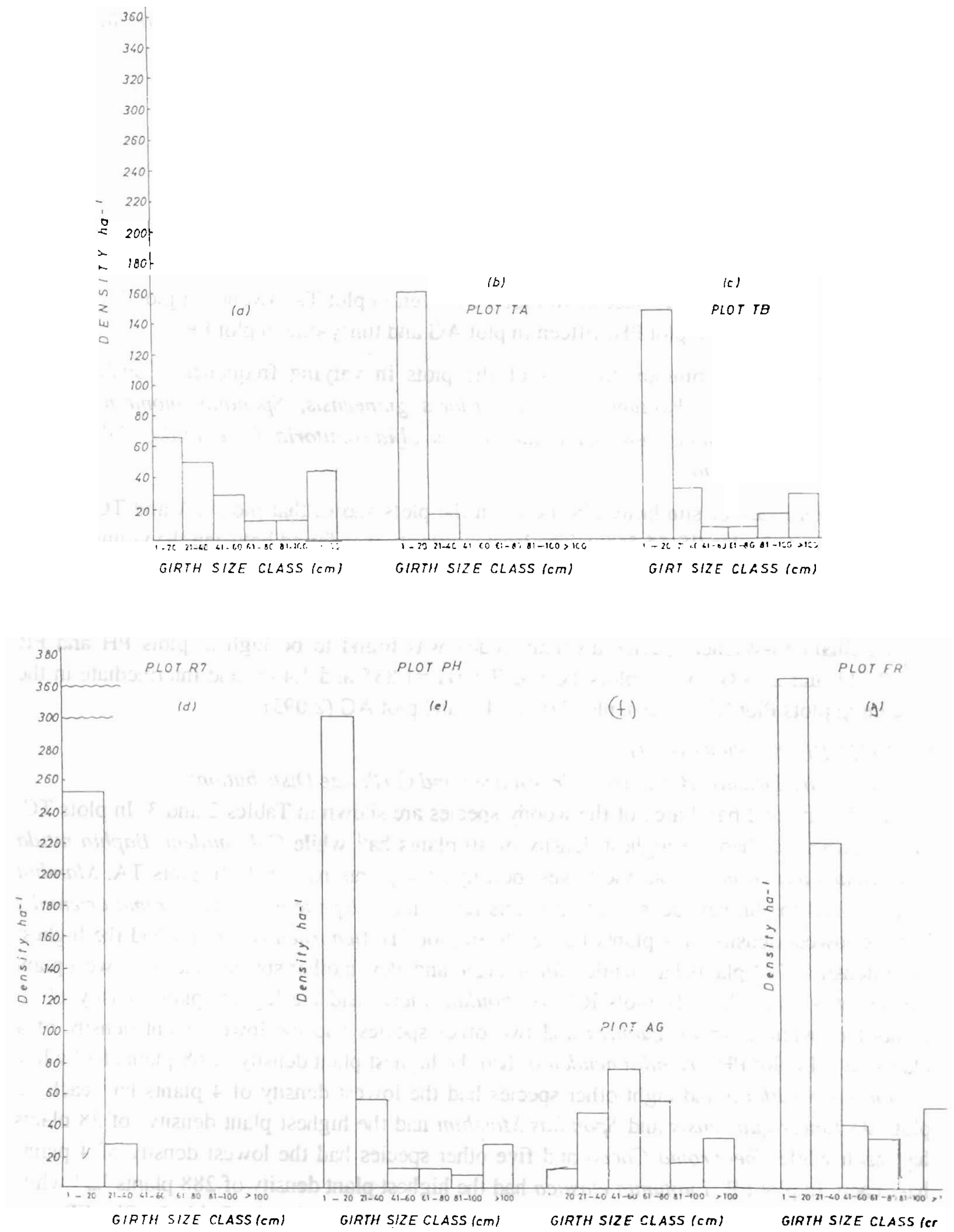

Fig. 1: Density of wood plant in various girth size classes (a - g) in seven study plots in Ile-Ife area of Southwestern Nigeria

Plot R7: *Ageratum Conyzoides, Aspilia africana, Chromolaena odorata, Euphorbia heterophylla.*

Plot PH: *Aspilia africana, Chromolaena odorata, Sida acuta.*

Plot AG: *Chromolaena odorata.*

Plot FR: No herbaceous plant.

It was observed that the older the Plot, the fewer the herbaceous species encountered.

Woody Species:

There were eleven woody species in Plot TC; seven in plot TA; twenty in plot TB; sixteen in plot R7; twenty five in plot PH; fifteen in plot AG and thirty-one in plot FR.

Some species are common to most of the plots in varying frequencies. Such species include: *Albizia zygia; Funtumia elastica, Elaeis guineensis, Spondias mombin; Trema guineensis; Blighia sapida; Newbouldia laevis; Rauvolfia vomitoria; Cola nitida; Cola milleni and Alchornea cordifolia.*

Sorensen's index of similarity (IS) between the plots shows that plots TA and TC (1 year old) to be most similar (IS 55.55%). The least similarity was found between the younger plots (TC and TA) and the forest plot (Plot FR) (IS =09.32% and 07.89%) while other similarities were intermediate (Table 1).

The Shannon-Wiener species diversity index was found to be high in plots PH and FR (H;=2.711 and 2.538); low in plots TC and TA (H'=1.835 and 1.445) and intermediate in the remaining plots Plot R7 (2.226). plot TB (2.349) and plot AG (2.093)

STRUCTURE PHYSIOGNOMY

Woody Species Density, Basal area, Crown area and Girth size Distribution:

The density and basal area of the woody species are shown in Tables 2 and 3. In plots TC, *Elaeis guineensis* had the highest density of 40 plants ha^{-1} while *Cola milleni, Baphia nitida* and *Fagara macrophylla* had the lowest density of 4 plants ha^{-1} each. In plots TA, *Manihot glaziovii* had the highest density of 92 plants ha^{-1} while *Glyphae brevis* and *Trema orientalis* had the lowest density of 4 plants ha^{-1} each. In plot TB,*Alchornea cordifolia* had the highest plant density of 84 plants ha^{-1} while *Albizia zygia* and eleven other species had the lowest plant density of 4 plants ha^{-1}. In plots R7, *Newbouldia laevis* had the highest plant density of 76 plants ha^{-1} while *Psidium guajava* and two other species had the lowest plant density of 4 plants ha^{-1}. In plot PH *Trichilia heudelotii* had the highest plant density of 68 plants ha^{-1} while *Alchornea cordifolia* and eight other species had the lowest density of 4 plants ha^{-1} each. In plot AG *Elaeis guineensis* and *Spondias Mombim* had the highest plant density of 28 plants ha^{-1} each while *Theobroma Cacao* and five other species had the lowest density of 4 plants ha-1 each. In plot FR, *Funtumia elastica* had the highest plant density of 288 plants ha^{-1} while *Albizia glaberrima* and eight other species had the lowest plant density(Table 2). Plot FR with the highest number of species (31) also had the highest plant density (732) while plot TA with the lowest number of species (7) also had the lowest plant density (176).

Elaeis guineensis contributed to the largest mean basal area of 1.064±0.76m^2ha^{-1} (51%) in plot TC. *Manihot glaziovii* 0.010±0.005m^2ha^{-1} (24%) in plot TA, *Elaeis guineensis* 0.422±0.14m^2ha^{-1} (34%) in plot TB, *Ficus mucuso* 0.048m^2ha^{-1} (16%) in plot R7. *Elaeis guineensis* 1.240±0.419m^2ha^{-1} (79%) in plot PH, *Triplochiton scleroxylon* 1.540±0.001m^2ha^{-1} (38%) in plot AG and *Pterocarpus mildreadii* 3.260±0.001m^2ha^{-1} (36%) in plot FR.

Plot FR had the highest mean basal area 9.040±0.237m^2ha^{-1} of the plots and it had the highest woody species density 732 trees ha^{-1} while plot TA had the lowest mean basal area 0.041±0.002m^2ha^{-1} and it also had the lowest woody species density 176 trees ha^{-1}. A look at the girth size class distribution of the woody species in the plots showed that plot FR had a higher number of trees (52 trees ha^{-1}) in the largest girth size class (size class ≥ 100cm) while plots TB and PH had the lower number of trees (28 trees ha^{-1}) than other plots (Fig. 1). Also plot FR had the higher number of trees (364 trees h^{-1}) in the smallest girth size class (girth size class 1-20 cm) than other plots while Plot AG had the lower number 12 trees ha^{-1} than other plots. (Table 3).

The occurrence of big *Elaeis guineensis* trees in plot TC had contributed to the larger basal area than other young plots. Plot TA with lowest basal area had all of its tree girth size falling within the girth classes 1-20cm and 21-40cm. The occurrence of big trees such as *Terminalia superba, Triplochiton scleroxylon, Pteroçarpus mildreadii* and *Albizia glaberima* in Plot FR had contributed to larger basal area. Table 3 shows the total mean crown cover of all the species in the seven plots. The big trees provided the highest mean crown horizontal area in each plot; *Elaeis gueneesis* 12.64% in plot TC, *Spondias mombin* 29.97% in plot TA, *Elaeis guinensis* and *Blighia sapida* 39.50% in plot TB, *Albizia zygia, Ficus exasperata* 37.01% in plot R7 and *Elaeis guinensis* 45.65% in plot PH. In plot AG *Triplochiton scleroxylon, Ficus exasperate, Blighia sapida* and *Myrianthus arboreus* provided 82.03% while in plot FR *Terminalia superba, Pterocarpus mildredii, Triplochiton scleroxylon* and *Albizia glaberrima* provided 77.96% of the mean crown horizontal area. This showed the amount of cover big trees can provide in areas where they are found.

A comparison of crown area distribution per girth size class with the density of plants in that girth class in each plot still highlights the amount of influence big trees can exert in the environment where they are found irrespective of their density. Plot FR with the greatest number of big trees had the highest mean total crown area followed by plot AG > Plot TB > Plot TC > Plot PH > Plot R7 > Plot TA (Table 3). The ground area covered by the total crown horizontal area in plot FR (forest plot) was greater than one hectare while others were less. This was mainly,due to the vertical packing of some species.

The general height distribution of woody species in the plots can be grouped as follows: trees above 7m high, those 3-7m and the others less than 3m (Table 3). Plot FR had a greater number of trees in the height class ≥ 7m (184 trees ha^{-1}) than other plots while plot TA had none in that height class. All the plots had more of the trees in the height class, 3-7m, than any other height classes. All the plots except FR had the least number of trees in height class ≥ 7m.

Herbaceous cover:

The mean aerial cover of herbaceous plants was more than 100% every month in all the plots except plots FR (forest plot) where there was no herbaceous plant at all. This amount of cover was a result of the overlapping foliage arrangement of the plants. The mean aerial cover of plot AG which was fully dominated by *Chromolaena odorata* and the oldest of the fallow plots had the highest mean annual aerial cover of 828.25±137.98% and closely followed by plot TB 825.63±114.21% while plot TC had the lowest mean annual aerial cover of 708.13±164.65% and except plot FR (forest plot) which had none and others had intermediate values (Table 3).

Soil

Table 4 shows the physical and chemical attributes of the soil in the study plots. The soil of the plots are slightly acidic (PH 6.3-6.9). Differences in soil particle size are most pronounced in the percentage sand and silt contents of the plots.

DISCUSSION

Species Composition:

Floristic composition of woody fallows has been described more often than structure, though species lists are almost always partial, little attention was being paid to non-woody plants. Richards (1952) in fact commented on the scarcity of information on secondary succession on tropical forest. Recent studies (e;g Ahn 1961; Cole 1968; Evrand 1968) showed that there is considerable regional variation in the composition of woody fallow Vegetation and that this can sometimes be related to environmental factors and ages.

The results of this study indicate that Plot FR (forest plot) had more woody species and no herbaceous plant than the younger plot. Similar observations have been made by Richard (1952) that in closed forest, there are few species of ground herbs as compared with several hundred of woody plants. Few species were dominant in the various plots. This was very clearly shown by the woody species composition of the plots where few species contributed a very high percentage to woody tree densities. The closer similarity in woody species composition between younger plots especially with reference to presence of *Manihot glaziovii* was because they are more recently distributed than older plot. Isichei *et al* (1986) also noted that exotics such as *Manihot glaziovii* are usually indicative of early succession.

In the lowland West African forest Zone, fallow Vegetation is of the two kinds. One kind is dominated by *Musanga Cecropioides* for the first 20 years or so of the succession period. *Musanga Cecropioides* is of negligible importance in the other kind. The use of *Musanga Cecropioides* for primary division is appropriate because of its ability to assume dominance, combined with its habitat, short life-span and association with early stages in secondary succession which appear to be unmatched by any other African tree. Fallows in which *Musanga Cecropioides* seem to be virtually limited to regions where the mean annual rainfall exceeds 1500mm and the soil fertility has not been drastically lowered through intensive farming (Jones 1955; Lane, 1962). These conditions are not satisfied in the Ile-Ife area and the fallows studied fall into the group in which *Musànga cecropioides* is of little importance. Clayton (1958) considered *Trema orientalis* to be rare in the Ibadan area, contrary to the view of Keay (1962) as well as to general observations made in the present study. The distribution of *Rauvolfia vomitoria* is a reflection of moderately intense past land-use.

Cousens (1946) and Grove (1951) working in Eastern Nigeria, noted the abundance of *Acioa barteria, Dialium guineense, Barteria nigritiana* and *Dalbernia saxalis* in fallows on soils derived from sedimentary formation, while Aweto (personal communication as cited by Hall and Okali, 1979) in the Ijebu-Ode area of Western Nigeria observed *Dialium guineense, Anthonotha macrovilla* and *Macaranya barteri* to be important in fallows on similar soils. Our fallows vegetation on soils derived from Basement Complex rock differs from the above in the absence of species mentioned.

All the dominant species, *Albizia zygia, Funtumia ekastica, Ficus exasperita* and *Spendia mombin* found in the present study have been listed by one or more authors (e.g Aubreville, 1947; Jones, 1955; Ahn, 1961; Hall and Okali, 1979) as constituents of the early stages of secondary forest regrowth and all very widely characteristic of fallow in the African forest region but the abundance of *Newbouldia laevis* is a distinctive feature of this particular type. *Terminalia superba* is poorly represented probably because the area receive too little rainfall. *Triplochiton scleroxylon*, however, would be expected in some quantity but is rare presumably because of excessive removal of mother trees. *Ricinodendron heudelotti* is equally infrequent. This tree occurs throughout the Nigerian forest Zone (Hall, 1977) but, in contrast to *Triplochiton scleroxylon* is little exploited for timber. It is abundant in the nearest area of high forest and is known to be an early entrant to the succession in other places (Allison, 1941; Ahn, 1961). Clayton (1958) refers to this species as a constituent of secondary forest. From the height reports for the tree it is likely that he was dealing with Vegetation more mature than the fallows of the present study.

The principal floristic contrast between fallows and mature forest however, was the frequency of trees planted or otherwise dispersed by human agency. Often these exotic fruit trees for example *Carica papaya, Mangifera indica, Psidium guajava* and *Musa sapientum* were not found in the mature forest. The occurrence of *Elaeis guineensis, Baphia nitida, Cola nitida* and *Cola acuminata* in the young plots is a reflection of recent cultivation and previous land-use of these plots (Ross, 1954). However, the occurrence of *Cola nitida* and *Musa sapientum* is an evidence of settlement in the recent past.

The comparison with other studies emphasizes the presence of marked regional variation and the need for detailed investigations in fallow Vegetation of other types, before a comprehensive understanding is attained. The present study, however, has yielded the assessment of site condition at Ile-Ife and areas with fallow vegetation of the same type. Understanding the causes of variation in structure and floristic of fallow vegetation is a prerequisite to any meaningful modification in shifting cultivation to improve efficiency of

land-use. The analysis made above has attempted to interprete the vegetations studied in terms if their ages and environment and the previous land-use.

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