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AN INVENTORY OF ANGIOSPERMIC FLORA OF AMBROSE ALLI UNIVERSITY MAIN CAMPUS, EKPOMA, EDO STATE, NIGERIA

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ABSTRACT
This study presents an inventory of angiospermic flora within Ambrose Alli University, Ekpoma, Nigeria, aimed at contributing to the understanding of plant biodiversity in the region. A systematic quadrat sampling technique was employed using 10m x 10m plots, spaced 20m apart along two major transects: a 4 km path from the Benin-Auchi Road to the campus boundary, and a 2 km path traversing the campus. To mitigate edge effects, sampling commenced 5m from the footpaths. Over a four-week period, a total of 152 quadrats were surveyed. Plant species were identified *in situ* when possible, with unidentified specimens taken to the university herbarium for taxonomic verification using standard floristic references. Data were analyzed using key biodiversity indices including abundance, density, frequency, and Simpson's diversity index. A total of 173 species from 59 families were recorded, encompassing trees (78 species), shrubs (39), herbs (23), climbers (23), grasses (5), lianas (4), and epiphytes (1). The Fabaceae family exhibited the highest species diversity (30 species), followed by Apocynaceae (12), Euphorbiaceae (9), and Moraceae (8). These findings provide critical baseline data for conservation efforts and future ecological studies within the region.

Key Words: Angiospermic flora, Biodiversity, Conservation, Ekpoma, Quadrat sampling

INTRODUCTION
The assessment of indigenous and naturalized angiospermic flora plays a pivotal role in understanding plant biodiversity, ecosystem services, and the pressing need for conservation. Taxonomic inventories are critical for documenting species diversity, providing baseline data essential for biodiversity conservation and sustainable management (Valdecasas and Camacho, 2003). In many regions, including Nigeria, natural ecosystems are rapidly being transformed by human activities, leading to the irreversible loss of valuable genotypes and local species extinctions (Kimmlins, 1987; Soladoye *et al*., 2005). The angiospermic flora of Ambrose Alli University, Ekpoma, Nigeria, faces a similar threat, as ongoing campus development projects disrupt natural habitats, potentially resulting in the permanent loss of genetic resources. Given that the re-creation of species post-extinction is beyond current scientific capabilities, an urgent need exists to catalog the flora of this area before further habitat destruction occurs (Lovejoy and Oren, 1981; Soladoye *et al*., 2005).

Nigeria's vegetation is shaped by climatic factors such as annual rainfall and the duration of wet seasons, resulting in two primary vegetation types: forest and savanna. Forest vegetation can be further classified into three distinct zones—mangrove/coastal swamp forest, freshwater swamp forest, and lowland rainforest (Okali, 1975; Soladoye *et al*., 2005; Hunter, 2007). Unfortunately, Nigeria's forests have been drastically altered by agricultural expansion, logging, and urbanization,

leaving only fragmented remnants of primary forest, largely confined to protected reserves (Gbile *et al*., 1984; Soladoye *et al*., 2011). This transformation poses a major threat to the country's biodiversity, with an estimated 300,000 hectares of forest lost annually (Ahmed and Olaitan, 2024). Given this context, biological inventories are indispensable for assessing biodiversity and informing conservation measures, particularly in areas like Ambrose Alli University, where rapid land use changes are taking place.

The compilation of angiospermic flora inventories is not only vital for understanding species composition and ecological dynamics but also for designing strategies to preserve genetic diversity and ensure ecosystem resilience. Previous studies globally have highlighted the importance of documenting plant species to guide conservation efforts. For instance, Hossain *et al*. (2005) cataloged 151 angiospermic species in the Lalmai Hills of Bangladesh, while Prasanjit and Ghosh (2015) reported 215 species in the aquatic and semi-aquatic ecosystems of Lohardaga. In Madagascar, Martin *et al*. (2011) provided a comprehensive survey of both endemic and non-endemic vascular plants, emphasizing the global significance of floristic surveys.

In Nigeria, numerous studies have contributed to the documentation of indigenous and naturalized flora. Gbile *et al*. (1981) reported 244 threatened plant species across 112 families, while Oguntala *et al*. (1996) identified 85 endangered tree species in Cross Rivers state. Similarly, Soladoye *et al*. (2005) reported 138 species at Olabisi Onabanjo University, and Soladoye *et al*. (2015) cataloged 110 species from Bowen University's campus. In Edo State, Ihenyen *et al.* (2011) documented 347 tree and shrub species in Edo South, and Ogwu *et al*. (2016) recorded 214 trees belonging to 20 species on the University of Benin campus. Ogie-Odia and Eseigbe (2022), conducted an inventory of angiosperms in the faculty of Life Sciences at Ambrose Alli University main campus, Ekpoma. Their study reported 96 species across 32 families with the poaceae family having the highest number of species. Despite these valuable contributions, there remains a significant gap in our understanding of the angiospermic flora within the Ambrose Alli University main campus, particularly given the rapid pace of environmental change.

This study aimed to address this gap by providing a comprehensive inventory of the indigenous and naturalized angiospermic flora of Ambrose Alli University, Ekpoma. In doing so, it seeks to contribute critical data necessary for the conservation of local biodiversity and to offer insights into the species composition and ecological significance of the campus's flora. This research not only documents current species diversity but also underscores the urgent need for conservation measures to protect the genetic resources of this rapidly developing region.

MATERIALS AND METHODS

Study Area

The study was conducted within the main campus of Ambrose Alli University, located at KM 70 Benin-Auchi Road, Ekpoma, Edo State, Nigeria. Ekpoma, which serves as the administrative headquarters of Esan West Local Government Area, lies between latitudes 6°43′N and 6°45′N and longitudes 6°06′E and 6°08′E (Aziegbe, 2006; Obabori et al., 2006). The area is characterized by a tropical climate, and the vegetation is

predominantly secondary forest interspersed with patches of savanna.

Sample Collection

The flora sampling was conducted along two major footpaths originating from Benin-Auchi Road and extending approximately 4 km towards the end of the university campus. An additional footpath spanning approximately 2 km across the campus was also included in the study. Sampling began at a distance of 5 meters away from the footpaths to mitigate the edge effects associated with roadside disturbance.

A 10m × 10m quadrat was employed as the sampling unit, and quadrats were laid at 20-meter intervals along each transect. To avoid areas disturbed by ongoing construction activities, sampling was restricted to the right side of the footpaths when facing the campus. A total of 152 quadrats were established over the course of four weeks. Within each quadrat, all plant species were identified, and their growth habits (e.g., tree, shrub, herb) were recorded.

Plant Identification

While some plant species were identified *in situ*, species that could not be reliably identified in the field were collected and subsequently transported to the herbarium of the Department of Plant Science and Biotechnology at Ambrose Alli University for further identification. Standard taxonomic references, including Keay (1953), Hutchinson and Dalziel (1963), Keay *et al*. (1964), Hopkins (1974), Akobundu and Agyakwa (1987), Roland (2013), and Aigbokhan (2014), were used to confirm the identities of the collected species.

Data Analysis

The collected data were analyzed using four key quantitative metrics: density, frequency, abundance, and Simpson's Diversity Index (Shukla and Chandel, 1994; Simpson, 1949). Density was calculated as the total number of individuals of each species per unit area across all quadrats. Frequency was determined as the percentage of quadrats in which a particular species occurred, indicating its distribution across the study area. Abundance referred to the total number of individuals of each species per number of quadrats in which the species occurred. Simpson's Diversity Index 1-D was applied to assess species diversity, incorporating both species richness and the relative abundance of each species to account for the evenness in species distribution (Simpson, 1949). The equation used to calculate each of these parameters are as follows:

Density = Total number of individuals of a species / Total number of quadrats studied

Frequency = Number of quadrats in which a given species occurred / Total number of quadrats studied x 100%

Abundance = Total number of individuals of the species / Number of quadrats in which the species occurred

Simpson's Diversity Index =

$$1 - \frac{\sum n(n-1)}{N(N-1)}$$

where:

- n = number of individuals of each species,
- N = total number of individuals of all species

RESULTS

The floristic survey of Ambrose Alli University's main campus in Ekpoma identified a total of 173 angiospermic plant species across 59 families (Table 1). Comprehensive ecological parameters—such as botanical name, family, growth habit, population size, quadrat occurrence, density, frequency,

and abundance—were systematically documented for each species. The surveyed flora included 78 tree species, 39 shrubs, 23 herbs, 23 climbers, 4 lianas, 5 grasses, and 1 epiphyte (Figure 1). The high Simpson's Index of Diversity (1-D = 0.9891) underscores the biodiversity of the site, indicative of a highly diverse plant community.

Species Frequency and Density Analysis

Icacinia tricantha was the most frequently encountered species, with a frequency of 98.68%, highlighting its broad adaptability across campus landscapes. Other species with high frequency values (>80%) included *Newbouldia laevis* (90.13%), *Clerodendrum splendens* (89.47%), *Smilax anceps* (86.84%), *Combretum racemosum* (85.52%), *Dialium guineense* (82.9%), *Alchornea cordifolia* (82.24%), and *Rauvolfia vomitoria* (81.58%). In contrast, *Khaya ivorensis*, *Justicia flava*, *Allamanda cathartica*, and *Acanthus involucrata* were recorded in only one quadrat each (frequency of 0.66%), suggesting limited distribution or specific habitat requirements within the study area.

In terms of density, *Icacinia tricantha* again led with a value of 1.72 individuals per quadrat, indicating its numerical dominance in the surveyed plots. This was followed by *Synclisia scabrida* (1.33) and *Newbouldia laevis* (1.23). The lowest density values were observed for *Khaya ivorensis* (0.007) and a set of species including *Justicia flava*, *Allamanda cathartica*, *Ficus mucuso*, and *Bombax buonopozense* (0.013 each), which were sparsely represented. *Cordia millenii* and *Thaumatococcus danielli* recorded the highest abundance values at 4.5, suggesting these species have localized clusters where they dominate.

Family Representation

Of the 59 families identified, 32 were represented by a single species, reflecting a lower prevalence or niche specialization for these taxa within the campus environment. These single-species families were Amaryllidaceae, Amplidaceae, Anacardiaceae, Boraginaceae, Capparidaceae, Celastraceae, Chenopodiaceae, Connaraceae, Convolvulaceae, Costaceae, Cucurbitaceae, Dioscoreaceae, Ebenaceae, Ericaceae, Hypericaceae, Irvingiaceae, Loranthaceae, Marantaceae, Melastomataceae, Myristicaceae, Myrtaceae, Orchidaceae, Oxalidaceae, Passifloraceae, Polygalaceae, Rutaceae, Sapotaceae, Simaroubaceae, Ulmaceae, Verbanaceae, Vitaceae, and Zingiberaceae. By contrast, Fabaceae emerged as the most diverse family, with 30 species, followed by Apocynaceae (12 species), Euphorbiaceae (9 species), and Moraceae (8 species). This pattern of family dominance indicates a favourable ecological niche for Fabaceae species, which may benefit from the climatic and soil conditions prevalent on campus. Figure 2 captures the number of species per family for families represented by two or more species.

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Table 1. Plant Species Enumerated on Ambrose Alli University, Ekpoma Campus, Edo State.

Plant species	Family	Habit	Total Number	Number of Quadrat Occurred	Density	Frequency %	Abundance
Abrus precatorius L.	Fabaceae	Climber	6	4	0.04	2.63	1.5
Abultilion asiaticum	Malvaceae	Tree	10	7	0.066	4.61	1.43
Abultilion mauritianum (Jacq.)Medik.	Malvaceae	Tree	14	8	0.092	5.26	1.75
Acacia ataxacantha DC.	Fabaceae	Shrub	18	8	0.118	5.26	2.25
Acanthus involucrata	Acanthaceae	Herb	4	1	0.026	0.66	4
Acanthus montanus (Nees) T. Anders.	Acanthaceae	Shrub	82	60	0.539	39.47	1.37
Aframonum granum	Zingiberaceae	Herb	28	12	0.184	7.90	2.33
Afzelia africana Sm.	Fabaceae	Tree	18	11	0.118	7.24	1.64
Ageratum conyzoides L.	Asteraceae	Herb	15	7	0.099	4.61	2.14
Aglaonema modestum	Araceae	Herb	6	4	0.04	2.63	1.5
Albizia ferruginea (Guill. and Perr.) Benth.	Fabaceae	Tree	150	120	0.987	78.95	1.25
Albizia lebbeck Benth.	Fabaceae	Tree	90	60	0.592	39.47	1.5
*Albizia zygia. (*DC.) J.F. Machr.	Fabaceae	Tree	112	99	0.737	65.13	1.13
Alchornia cordifolia (Schum. &Thonn.) Muell.Arg.	Euphorbiaceae	Shrub	180	125	1.184	82.24	1.44
Alchornia laxiflora (Benth.) Pax & K. Hoffm.	Euphorbiaceae	Shrub	160	82	1.053	53.95	1.95
Allamanda cathartica L.	Apocynaceae	Shrub	2	1	0.013	0.66	2
Allophylus africana P. Beauv	Sapindaceae	Shrub	10	5	0.066	3.29	2
*Alstonia boonei*De Wild	Apocynaceae	Tree	86	66	0.566	0.43	1.30
*Amphimas pterocarpoides*Harms	Fabaceae	Tree	8	8	0.053	5.26	1

Anchomane difformis(Blume) Engl.	Araceae	Herb	72	24	0.474	15.79	3
Angraecum eichleranum	Orchidaceae	Herb	14	14	0.092	9.21	1
Annona senegalensis Pers.	Annonaceae	Shrub	25	15	0.165	9.87	1.67
Anodedron paniculatum A. DC.	Apocynaceae	Shrub	20	10	0.132	6.58	2
Anthocleista djalonenis A. Chev.	Loganiaceae	Tree	68	54	0.447	35.53	1.26
Anthocleista liebrechtsiana De Wild. & T. Durand	Loganiaceae	Tree	30	26	0.197	17.11	1.15
*Anthonotha macrophylla*P.Beauv.	Fabaceae	Tree	40	25	0.263	16.45	1.6
Antiaris africana Engl.	Moraceae	Tree	36	22	0.237	14.47	1.64
Artocarpus altilis (Parkinson) Fosberg.	Moraceae	Tree	17	16	0.112	10.53	1.06
Artocarpus communis (Parkinson) Fosberg.	Moraceae	Tree	20	18	0.132	11.84	1.11
*Aspilia africana (*Pers.) C.D. Adams	Asteraceae	Herb	20	8	0.132	5.26	2.5
Averrhoa bilimbi L.	Oxalidaceae	Tree	10	4	0.066	2.63	2.5
Bambusa vulgaris Schrad	Poaceae	Grass	80	60	0.526	39.47	1.3
Baphia nitida Lodd.	Fabaceae	Tree	143	100	0.941	65.79	1.43
Barteria fistulosa Mast.	Passifloraceae	Tree	20	18	0.132	11.84	1.11
Bauhimia tomentosa L.	Fabaceae	Tree	3	3	0.02	1.97	1
Blighia sapida Koenig.	Sapindaceae	Tree	60	40	0.395	26.32	1.5
Blighia unijugata Baker	Sapindaceae	Tree	28	20	0.184	13.16	1.4
Bombax buonopozense P. Beauv.	Bombacaceae	Tree	2	2	0.013	1.32	1
Bombax costatum Pellegr. & Vuill.	Bombacaceae	Tree	40	40	0.263	26.32	1
Bridelia ferruginea Benth.	Phyllanthaceae	Tree	26	22	0.171	14.47	1.18
Brunfelsia uniflora (pohl) D.Don.	Solanaceae	Shrub	48	32	0.316	21.05	1.5
Buchholzia coriacea Engl.	Capparidaceae	Shrub	68	50	0.447	32.90	1.36
Burkea africana Hook.	Fabaceae	Tree	28	28	0.184	18.42	1
Cajanus cajan (L.) Millsp.	Fabaceae	Shrub	12	4	0.079	2.63	3
Calapogonium mucunoides Desv.	Fabaceae	Climber	68	40	0.447	26.32	1.7
Canaga odorata (lam.) Hook..f. &Thomson	Annonaceae	Tree	8	6	0.053	3.95	1.33
Carapa procera DC	Meliaceae	Tree	43	41	0.283	26.97	1.05
Cardiospermum grandiflorum Sw.	Sapindaceae	Climber	20	16	0.132	10.53	1.25
Carpolobia lutea G. Don	Polygalaceae	Shrub	82	48	0.54	31.58	1.71
Cassia fistula L.	Fabaceae	Tree	52	38	0.342	25	1.37
Cassia/Senna podocarpa (Guill & Perr.) Lock	Fabaceae	Shrub	91	63	0.599	41.45	1.44
Cassia sieberiana DC.	Fabaceae	Tree	17	17	0.112	11.18	1
Celastrus paniculatus Willd.	Celastraceae	Climber	12	12	0.079	7.9	1
Centrosema pubescens Benth.	Fabaceae	Climber	87	60	0.572	39.47	1.45
Chasmanthera dependens Hochst.	Menispermaceae	Climber/	4	4	0.026	2.63	1

		Creeper					
Chenopodium ambrosoides L.	Chenopodiaceae	Herb	26	13	0.171	8.55	2
*Chromolaena odorata (*L.) R.M. King & Robinson	Asteraceae	Shrub	128	70	0.842	46.05	1.83
Chrysophyllum albidum D.Don	Sapotaceae	Tree	24	21	0.158	13.82	1.14
*Cissus populnea (*Guill. & Perr.)	Amplidaceae	Climber	4	2	0.026	1.32	2
*Cleistopholis patens (*Benth.) Engl. & Diels	Annonaceae	Tree	45	45	0.296	29.61	1
Clerodendrum splendens G. Don	Lamiaceae	Climber	182	136	1.197	89.47	1.34
Cnestis ferruginea DC	Connaraceae	Shrub	162	98	1.066	64.47	1.65
Cola acuminata (P. Beauv.) Schott & Engl.	Sterculiaceae	Tree	38	20	0.25	13.16	1.9
Cola millenii K. Schum	Sterculiaceae	Tree	9	9	0.059	5.92	1
Cola nitida (Vent.) Schott & Endl.	Sterculiaceae	Tree	16	16	0.105	10.53	1
Combretum dolichopetalum (Engl. & Diels)	Combretaceae	Liana	32	32	0.211	21.05	1
Combretum molle R.Br. ex G.Don	Combretaceae	Shrub	28	20	0.184	13.16	1.4
Combretum nigricans Lepr. ex Guill. & Perr.	Combretaceae	Shrub	38	35	0.25	23.03	1.09
Combretum platypterum (Welw.) Hutch. & Dalziel	Combretaceae	Liana	22	18	0.145	11.84	1.22
Combretum racemosum P. Beauv.	Combretaceae	Liana	136	130	0.895	85.53	1.05
Commelina benghalensis L.	Commelinaceae	Herb	26	14	0.171	9.21	1.86
Conopharyngia / Durissina crassa	Apocynaceae	Tree	12	8	0.079	5.26	1.5
Cordia millenii Bak.	Boraginaceae	Tree	36	8	0.237	5.26	4.5
Costus afer Ker Gawl.	Costaceae	Herb	18	10	0.118	6.58	1.8
Crinum jagus (Thomps.) Dandy	Amaryllidaceae	Herb	12	9	0.079	5.92	1.33
Culcasia spp	Araceae	Herb	20	12	0.132	7.9	1.67
Dalbergia saxatilis Hook. F.	Fabaceae	Climber	98	82	0.645	53.95	1.2
Deterium microcarpum Guill. & Perr.	Fabaceae	Tree	6	6	0.04	3.95	1
Deterium senegalense J. F. Gmel.	Fabaceae	Tree	14	10	0.092	6.58	1.4
Dialium guineense Willd.	Fabaceae	Tree	182	126	1.197	82.9	1.44
Dioclea reflexa Hook. F.	Fabaceae	Shrub	53	24	0.349	15.79	2.21
Dioscorea praehensilis Benth.	*Dioscoreaceae*	Climber	20	15	0.132	9.87	1.33
Dioscoreo phyllumcumminsii (Stapt.) Diels	Menispermaceae	Climber	56	48	0.368	31.58	1.17
Diospyros barteri Hiern	Ebenaceae	Tree	51	48	0.336	31.58	1.06
Discoglypremna caloneura (Pax) Prain	Euphorbiaceae	Tree	73	73	0.480	48.03	1
Dissotis erecta (Guill. & Perr.)	Melastomataceae	Herb	26	18	0.171	11.84	1.44
Elaeis guineensis Jacq.	Arecaceae	Tree	84	42	0.553	27.63	2
Eremospatha macrocarpa (G. Mann & Wendl.)	Arecaceae	Climber	14	7	0.092	4.61	2
Eugenia uniflora L.	Myrtaceae	Shrub	52	16	0.342	10.53	3.25

Ficus benghalensis L.	Moraceae	Tree	19	14	0.125	9.21	1.36
Ficus exasperate Vahl.	Moraceae	Tree	89	71	0.586	46.71	1.25
*Ficus mucuso*Welw. ex. Ficalho	Moraceae	Tree	2	2	0.013	1.32	1
Funtumia africana (Benth.)Sapf.	Apocynaceae	Tree	48	46	0.316	30.26	1.04
*Funtumia elastic (*Preuss) Stapf	Apocynaceae	Tree	40	40	0.263	26.32	1
Gomphrena globose L.	Amaranthaceae	Herb	41	27	0.27	17.76	1.52
Gongronema latifolium Benth.	Apocynaceae	Climber	108	94	0.711	61.84	1.15
Harungana madagascariensis Lam. ex Poir.	Hypericaceae	Tree	54	32	0.355	21.05	1.69
Heinsia crinita (Afzel.) G.Taylor	Rubiaceae	Shrub	39	39	0.257	25.66	1
Hibiscus tiliaceus L.	Malvaceae	Shrub	27	21	0.178	13.82	1.29
Hylodendron gabunense Taub.	Fabaceae	Tree	12	12	0.079	7.9	1
Icacinia trichanta Oliv.	Icacinaceae	Shrub	262	150	1.724	98.68	1.75
Ipomoea involucrata P.Beauv.	Convolvulaceae	Climber/ Creeper	26	19	0.171	12.5	1.37
Irvingia gabonensis (Aubry -Lecomte ex O'Rorke) Baill.	Irvingiaceae	Tree	51	51	0.336	33.55	1
Justicia flava (Forssk.) Vahl.	Acanthaceae	Herb	2	1	0.013	0.66	2
Khaya ivorensis A. Chev.	Meliaceae	Tree	1	1	0.007	0.66	1
Lagenaria breviflorum (Benth.) Roberty	Cucurbitaceae	Climber	18	14	0.118	9.21	1.29
Landolphia owariensis P.Beauv.	Apocynaceae	Liana	62	47	0.408	30.92	1.32
Lasianthra africana P.Beauv.	Icacinaceae	Shrub	84	51	0.553	33.55	1.65
Leea guineensis G.Don	Vitaceae	Shrub	56	39	0.368	25.66	1.44
Loranthus spp.	Loranthaceae	Epiphyte	19	19	0.125	12.5	1
Maesobotrya bateri (Baill.) Hutch.	Euphorbiaceae	Tree	72	63	0.474	41.45	1.14
Mallotus oppositifolius (Geiseler) Mull. Arg.	Euphorbiaceae	Shrub	59	44	0.388	28.95	1.34
*Manniophyton fulvum*Mull.Arg.	Euphorbiaceae	Shrub	62	38	0.408	25	1.63
Mareya micrantha (Benth.) Mull.Arg.	Euphorbiaceae	Shrub	4	4	0.026	2.63	1
Margaritaria discoidea (Baill.) G.L. Webster	Phyllanthaceae	Tree	12	12	0.079	7.9	1
Megathyrsus maximus (Jacq.) B. K. Simon & S. W. L. Jacobs	Poaceae	Grass	60	28	0.395	18.42	2.14
Melia azadirachta L.	Meliaceae	Tree	78	63	0.513	41.45	1.24
Microdesmis puberula Hook. F. ex Planch	Euphorbiaceae	Shrub	8	4	0.053	2.63	2
Millettia arboreus	Fabaceae	Tree	124	106	0.816	69.74	1.17

Millettia pinnata (L.) Panigrahi	Fabaceae	Tree	67	67	0.441	44.08	1
Mimosa pudica L.	Fabaceae	Shrub	64	61	0.421	40.13	1.05
Morinda lucida Benth.	Rubiaceae	Tree	42	22	0.276	14.47	1.91
Mucuna flagellipes Hook.F.	Fabaceae	Climber	44	26	0.29	17.11	1.69
Musanga cecropioides R. Br.	Moraceae	Tree	50	50	0.329	32.9	1
Myrianthus arboreus P. Beauv.	Moraceae	Tree	24	16	0.158	10.53	1.5
Nauclea latifolia Smith	Rubiaceae	Shrub	57	57	0.375	37.5	1
Newbouldia laevis (P. Beauv.) Seeman ex. Bureau	Bignoniaceae	Tree	187	137	1.230	90.13	1.37
Occumum gratissium L.	Lamiaceae	Shrub	18	8	0.118	5.26	2.25
Oxydendrum arboretum (L.) DC.	Ericaceae	Tree	4	4	0.026	2.63	1
Palisota hirsuta (Thunb.) K.Schum.	Commelinaceae	Herb	49	37	0.322	24.34	1.32
Pandiaka involucrata (Moq.) B.D.Jacks.	Amaranthaceae	Herb	53	38	0.349	25	1.4
Paullinia pinnata Linn.	Sapindaceae	Climber	98	81	0.645	53.29	1.21
Pennisetum purpureum Schumach.	Poaceae	Grass	20	5	0.132	3.29	4
Pentaclethra macrophylla Benth.	Fabaceae	Tree	45	30	0.296	19.74	1.5
Phyllanthus amarus Schum. &Thonn.	Phyllanthaceae	Herb	70	61	0.461	40.13	1.15
Phyllanthus muellerianus (Kuntze) Exell	Phyllanthaceae	Shrub	78	75	0.513	49.34	1.04
Physalis angulata Linn.	Solanaceae	Herb	18	18	0.118	11.84	1
Piptadeniastrum africanum (Hook.f.) Brenan	Fabaceae	Tree	56	48	0.368	31.58	1.17
Plumeria rubra L.	Apocynaceae	Shrub	13	13	0.086	8.55	1
Pterospermum heterophyllum Hance	Malvaceae	Tree	5	5	0.033	3.29	1
Pycnanthus kombo	Myristicaceae	Tree	59	58	0.388	38.16	1.02
Quassia africana (Baill.) Baill.	Simaroubaceae	Climber	99	73	0.651	48.03	1.36
Rauwolfia vomitoria Afzel.	Apocynaceae	Shrub	176	124	1.158	81.58	1.42
Ricinodendron heudelotti (Baill.) Pierre	Euphorbiaceae	Tree	20	20	0.132	13.16	1
Secamone afzelii (Roem. & Schult.) K. Schum.	Apocynaceae	Climber	96	73	0.632	48.03	1.32
Senecio biafrae (Oliv. & Hiern) C. Jeffrey	Asteraceae	Climber	3	3	0.02	1.97	1
Setaria barbata (Lam.) Kunth	Poaceae	Grass	51	51	0.336	33.55	1
Setaria verticillata (L.) P. Beauv.	Poaceae	Grass	28	20	0.184	13.16	1.4
Sida acuta Burm. F.	Malvaceae	Shrub	33	15	0.217	9.87	2.2
Sida cordifolia L.	Malvaceae	Shrub	13	11	0.086	7.24	1.18
Smilax anceps Willd.	Smilacaceae	Climber	156	132	1.026	86.84	1.18
Smilax kraussiana Meisn.	Smilacaceae	Climber	86	64	0.566	42.11	1.34
Solanum torvum Swatz.	Solanaceae	Shrub	20	9	0.132	5.92	2.22
Sphenocentrum jollyanum Pierre	Menispermaceae	Shrub	103	80	0.678	52.63	1.29

Spigelia anthelmia	Loganiaceae	Herb	62	36	0.408	23.68	1.72
Spathodea companulata P. Beauv.	Bignoniaceae	Tree	4	3	0.026	1.97	1.33
Spondias mombin Linn.	Anacardiaceae	Tree	6	6	0.04	3.95	1
Sterculia setigera	Sterculiaceae	Tree	12	12	0.079	7.9	1
Sterculia tragacantha Lind.	Sterculiaceae	Tree	69	64	0.454	42.11	1.08
Synclisia scabrida Mier.	Menispermaceae	Climber	202	121	1.329	79.61	1.67
Syndrella nodiflora Geartn.	Asteraceae	Herb	64	52	0.421	34.21	1.23
Tabernaemontana crassa Benth.	Apocynaceae	Tree	78	71	0.513	46.71	1.1
Terminalia glaucescens Planch. Ex Benth.	Combretaceae	Tree	81	62	0.533	40.79	1.31
Terminalia macroptera Guill. & Perr.	Combretaceae	Tree	55	48	0.362	31.58	1.15
Tetrapleura tetraptera (schumach.) Taub.	Fabaceae	Tree	43	26	0.283	17.11	1.65
Thaumatococcus daniellii (Benn.) Benth.	Marantaceae	Herb	36	8	0.237	5.26	4.5
Trema guineensis (Schum. & Thonn.) Ficalho	Ulmaceae	Tree	9	9	0.059	5.92	1
Tridax procumbens Linn.	Asteraceae	Herb	16	11	0.105	7.24	1.46
Vitex doniana Sweet.	Verbanaceae	Tree	18	16	0.118	10.53	1.13
Waltheria indica Linn.	Sterculiaceae	Shrub	24	19	0.158	12.5	1.26
Xylopia aethiopica (Dunal) A. Rich	Annonaceae	Tree	6	6	0.04	3.95	1
Xylopia parvifolia (A. Rich.) Benth.	Annonaceae	Tree	22	20	0.145	13.16	1.1
Zanthoxylum zanthoxyloides (Lam.) Zepern. & Timler	Rutaceae	Tree	27	25	0.178	16.45	1.08

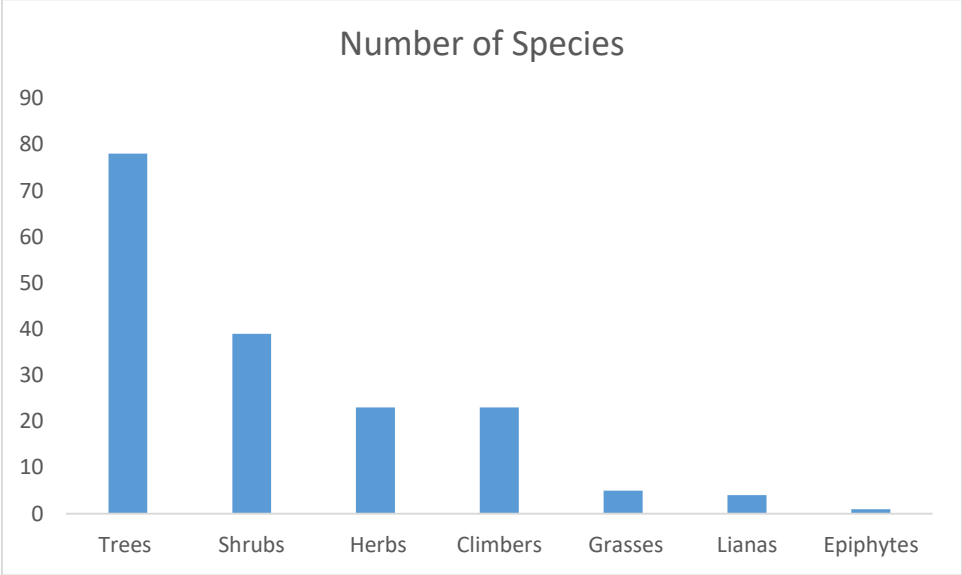

Figure 1: Growth habits of species enumerated in the study

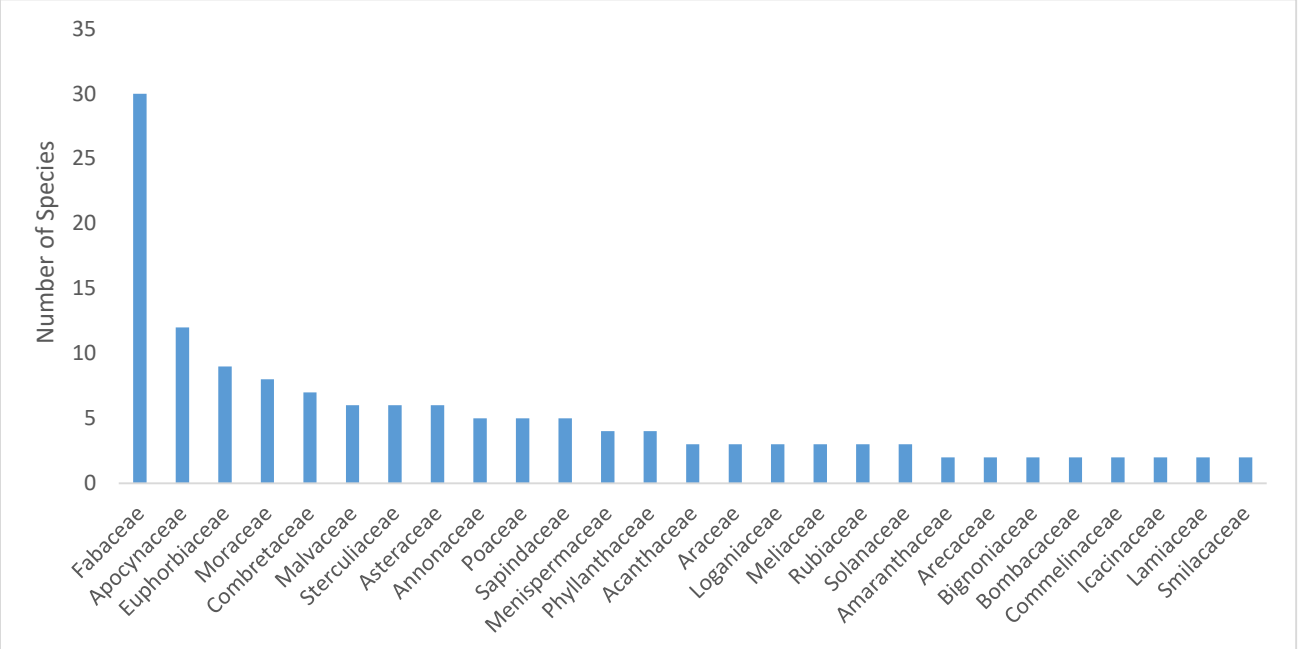

Figure 2: Number of species per family

DISCUSSION

The diversity of angiospermic flora on Ambrose Alli University's Ekpoma campus reflected a complex and dynamic ecosystem influenced by diverse environmental parameters, including soil composition, canopy cover, and seasonal rainfall. The study's identification of 173 species across 59 families exceeded findings from comparable regional studies. For instance, Chukwuma *et al.* (2023)

reported 150 species in 47 families at Federal University Oye-Ekiti, where shrubs were dominant, and Soladoye *et al*. (2005) recorded 138 species across 55 families at Olabisi Onabanjo University. Such variability in species richness suggests that local ecological conditions, disturbance history, and management practices significantly shape biodiversity across campuses.

The high representation of Fabaceae, comprising 30 species, underscores its adaptability to Ekpoma's ecological conditions. In particular, this family's wide range of dispersal and germination strategies may facilitate its prevalence in both disturbed and undisturbed campus habitats. Other notably diverse families, such as Apocynaceae, Euphorbiaceae, and Moraceae, also displayed efficient dispersal and rapid colonization strategies that supported their establishment across diverse habitats. The widespread occurrence of *Chromolaena odorata* and *Megathyrsus maximus* in the quadrats where they occurred, further suggests a competitive advantage, possibly due to invasive tendencies that may impact native species dynamics.

Icacinia tricantha, recorded in 98.68% of quadrats, reflected high adaptability and competitive success within the campus, potentially due to traits such as drought tolerance and resilience to varying soil conditions (Che *et al.*, 2016). This species' high density (1.72 individuals per quadrat) and frequency suggest that it plays a key role in the local ecosystem. In contrast, species such as *Khaya ivorensis*, *Justicia flava*, *Allamanda cathartica*, and *Acanthus involucrata*, which were observed in only one quadrat each, may be vulnerable to environmental shifts or competitive displacement, indicating a potential need for conservation measures to maintain local biodiversity.

The calculated Simpson's Index of Diversity (1-D = 0.9891) is indicative of a complex, heterogeneous plant community capable of supporting diverse fauna, enhancing ecosystem stability, and providing resilience against environmental perturbations (Kiernan, 2024). These results align with Ogie-Odia et al. (2010), who conducted a weed survey at the Emaudo campus of Ambrose Alli University and recorded a lower species richness dominated by Poaceae (grasses). The reduced representation of Poaceae on the Ekpoma campus in this study is likely due to extensive canopy cover, favoring the establishment of broad-leafed tree species over grasses, which generally require open, sunlit conditions to proliferate. This pattern is consistent with findings from Burcu and Sadik (2005) in Turkey's Kirmi Valley, where dense forest cover limited grass diversity while supporting a wide variety of angiospermic species.

The structural complexity and high diversity of trees, shrubs, climbers, and other plant forms on the Ekpoma campus contribute to a multi-layered ecosystem with benefits extending to carbon sequestration, soil stabilization, and habitat provision. Preserving this biodiversity is essential for sustaining ecological health, especially in light of ongoing urbanization and campus expansion, which pose risks to sensitive species and habitats. In addition to the ecological value, many documented species have significant ethnobotanical and economic value, providing opportunities for research and sustainable uses. Given these multifaceted benefits, conserving the plant diversity at Ambrose Alli University's Ekpoma campus is of both ecological and cultural importance.

CONCLUSION

This study provides a detailed inventory of angiospermic flora at the main campus of Ambrose Alli University, identifying 173 species across 59 families. The analysis of species distribution, density, and

abundance reveals important aspects of the ecological structure and diversity of the campus landscape. The considerable range of plant forms—encompassing trees (78 species), shrubs (39 species), herbs (23 species), climbers (23 species), as well as grasses, lianas, and epiphytes—underscores the ecological complexity and resilience of this environment. Beyond their ecological roles, many of these plants hold significant economic and ethnobotanical value, being used for medicinal, culinary, and ornamental purposes by local communities. Such diversity is not only vital for supporting local ecosystems and wildlife but also enhances the educational, aesthetic, and socioeconomic value of the campus. This study emphasizes the need to conserve campus flora as both an ecological and cultural resource, integral to environmental sustainability and community well-being.

RECOMMENDATIONS

To further conserve and sustainably manage plant diversity on campus, it is recommended that a dedicated botanical garden be established, with a focus on propagating rare and under-represented species, such as *Justicia flava* and *Bauhinia tomentosa*, which have ethnobotanical relevance. Such a garden could serve as a conservation tool and a living resource for students, researchers, and the public to learn about local biodiversity and traditional plant uses. Additionally, regular monitoring of species diversity, along with research on the effects of human activities, seasonal changes, and ethnobotanical practices on campus flora, is crucial. This would provide critical data to inform policies for sustainable campus development, ensuring that future growth respects both the ecological and ethnobotanical significance of Ambrose Alli University's natural landscape.

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