

## SURVEY AND BOTANICAL DESCRIPTION OF SOME COMMON ORNAMENTAL PLANTS IN FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, BOSSO CAMPUS

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### ABSTRACT

A survey of ornamental plants was carried out around Federal University of Technology Minna (FUTM)Bosso campus Niger State in May 2021. The survey was intended to obtain critical information about the ornamental plants that are used within the campus. Standard procedures were followed for the identification and description of the common ornamental plants. Original coloured photographs of the ornamental plants were also taken for proper documentations. These ornamental plants were then classified based on their relative abundance, mode of propagation, habits, parts associated with aesthetic and other uses aside for beautification. Thirty-five (35) ornamental plant species were identified; from the results obtained, it was deduced that *Ixoracoccinea* has the highest number recorded (1366) with percentage relative abundance of 27.293 % while the lowest in number was *Cycasrevoluta* (1) with percentage relative abundance of 0.020 %. It was also recorded that there are different mode of propagations for the ornamental plant species which include stem cuttings, by seed, by fruits, air layering, root cuttings, grafting and offshoot. These ornamental plants that are propagated by stem cuttings had the highest number with percentage of 31.429 % and the least mode of propagation was by grafting (2.857 %). The ornamental plants encountered based on their habits include trees (51.429 %) shrubs (31.429 %) and the least was herbs (2.857 %). Therefore, it was concluded that FUTMBosso campus is endowed with numerous ornamental plants that cut-across different forms of habits.

**Keywords:** *Ornamental Plants, Documentations, Relative abundance, Propagation, Habits*

### INTRODUCTION

Ornamentals are plants that are cultivated for decorative reasons in gardens and landscape design project as houseplants, cut flowers and specimen display Oloyede (2012). The art and science of cultivating ornamental plants is called Floriculture (Dadang *et al.*, 2020). Accordingly, Jessica (2013) mentioned that ornamental plants are cultivated for decoration, rather than by product from plants and food. The cultivation of ornamental plants comes under floriculture and tree nurseries, which is a major branch of horticulture. Olaniyan (2017) expatiated that horticulture is a branch of Agriculture, which deals with the production, processing, storage and marketing of fruits, vegetables spices and ornamental plants (Olaniyan, 2017). Osawuru and Ogwu (2021) noted that all plants are considered necessary and can potentially serve to fulfil one or more of our basic needs, such as food, shelter, and clothing as well as environmental integrity (aesthetic values). Plant products refer to goods and services derivable from plants and may include whole plant or plant

part (used as ingredients and condiments). Ornamental plants have their ways in home gardens but their relative importance vary in different gardens and places and also depending on the researchers' interests. Thus, in certain works on home gardens, the ornamentals are excluded; for example, because its presence is considered temporary and hard to count (Vlkova *et al.*, 2010). Many studies about home gardens in rural area signify that food and medicinal plants are more abundant than ornamentals (Aworinde *et al.*, 2013). Various methods of cultivating and keeping ornamental plants have been identified; they may be cultivated in a flower bed, shaped into a hedge or placed in a sunny apartment window. They are most often intentionally planned for aesthetic appeal, but a plant that occurs naturally and enhances the landscape could also be considered ornamental. While the most widely use of ornamental plant is their visual effect, they serve obvious reason and are used in landscapes throughout the home to beautify the surrounding (Sani *et al.*, 2016). It has been further stressed that numerous

ornamental plants are chosen because they appeal to the sense of odour, in addition to their attractive appeals. Some fragrant plants (e.g. *Hiptissuaveolens*) have some beneficial effect at repelling outdoor pests such as anti-mosquitoes and flies (Sani *et al.*, 2016). Ornamental plants have provided an attractive environment for human enjoyment. Few places where ornamental plants have been of benefit for environmental improvement in Nigeria are: Lucky Fibres, Chevron in Lagos and International Institute for Tropical Agriculture (IITA) Ibadan, Muritala Muhammed Botanical Garden Epe Lagos and many more just to mention few. Thus, walking through a botanical garden can be very relaxing and healthy (Osawaru *et al.*, 2012). In the Bosso Campus of Federal University of Technology, Minna, Niger State, there is presence of different ornamental plants for beautification of the environment; in fact there is a botanical garden. However, no special care was given to appropriate selection as well as identifying the plant species that form these ornamentals. Hence, there is an urgent need to document and characterise the common ornamental plants in the premises of Federal University of Technology, Minna Niger State; this thought informed this project.

## MATERIALS AND METHODS

The study was carried out around the Federal University of Technology Minna, Niger State in May 2021. Geographically Minna is located in the North Central Zone of Nigeria, it covers a land area of 88 square kilometres. The geographical coordinates are 9<sup>0</sup>40' North and 6<sup>0</sup>33' East. Minna, Niger State is characterised by the presence of few scattered trees and dense grass cover. Hence, it has a vegetation type classified as Guinea Savannah. There are few rivers located within Minna and the regions near the river valley abound in plant cover. The points (red) on the map showed the sampling points within the campus (Figure1). The survey involved the collection, identification and description of various ornamental plants commonly found in the University Campus. The study area was divided into five (5) sites for accurate recording of different ornamental plants. Site A represent Boys Hostel, Site B represent Lecture theater, Site C represent Laboratories, Site D represent Masjid area and Site E represent University quarters. The ornamental plants were collected and identified using standard Floras and manuals of the region and with the help of plant taxonomist in the

Department of plants Biology, Federal University of Technology Minna. In addition, the survey involved taking numerical account by counting of number of available ornamental plants seen around the Federal University of Technology Minna, Bosso campus, Niger State. Other characters, of the ornamental plants encountered, such as habit, mode of propagation as well as their uses were also considered.

**Data Analysis:** Data obtained were analyzed using both descriptive and quantitative statistics such as bar chart, tables, and expressed as a percentage based on their relative abundance. All data were organized on Microsoft Excel (Batrinca and Treleaven, 2015).

## RESULTS

**Distribution of ornamental plants within F.U.T, Minna, Bosso Campus:** Federal University of Technology, Minna, Bosso Campus is endowed with different types of ornamental plants, which include both indigenous and exotic flora. A total of thirty-five (35) ornamental species were encountered in all areas selected for this study (Table 1). The highest in terms of numbers recorded (1366) and percentage relative abundance (27.293 %) was *Ixora coccinea*, while the lowest in terms of number (1) and percentage relative abundance (0.020 %) was *Cycas revoluta*. The second highest recorded was *Duranta erecta* with a total number of eight hundred and fifty-eight (858) plants and a relative abundance of 17.143 %. It is directly followed by *Berberia lupulina*, which was recorded to appear six hundred and sixty-three (663) times, with a percentage relative abundance of 13.247 %. The next in terms of numbers (381) and relative abundance (7.612 %) was *Tecoma stans*. In terms of numbers (280) and percentage relative abundance (5.594 %), the fifth ranked was *Voacanga africana*. (Table 1). In ascending order, *Cycas revoluta*, which is the least recorded in terms of numbers (1) was followed by *Euphorbia tirucalli*, with a total number of two (2) plants and percentage relative abundance of 0.040 %. The next is *Euphorbia milli*, which was recorded three (3) times and with a percentage relative abundance of 0.060 %. In an ascending order, other species whose relative abundance fall below 1 % include: *Phoenix dactylifera* (0.100 %), *Ficus religiosa* (0.120 %), *Cassia fistula* (0.140 %), *Plumeria rubra* (0.160 %), *Bougainvillea glabra* (0.180 %), *Thevetia peruviana* (0.220 %), *Albizia ferruginea* (0.239 %), *Ficus elastic* (0.280 %),

*Plumeria alba* (0.280 %), *Hura crepitans* (0.300 %), *Syzygium guineenses* (0.400), *Caryota urens* (0.420 %), *Acacia auriculiformis* (0.460 %), *Albizia lebbek* (0.519 %), *Thuja occidentalis* (0.759 %), and *Cassia siamea* with a percentage relative abundance of 0.779 %. In addition, *Caedium variagatum* (56) with percentage relative abundance of 1.119 %, *Delonix regia* (61) with percentage relative abundance of 1.219 %, *Jatropha integerrima* (62) with percentage relative abundance of 1.239 %, *Terminalia catappa* (66) with percentage relative abundance of 1.319 %, *Allamanda cathartica* (80) with percentage relative abundance of 1.598 %, and *Azadirachta indica* (87) with percentage relative abundance of 1.738 % were all recorded to have a percentage relative abundance greater than 1.000 % but less than 2.000 %. Similarly, *Cryptostegia madagascarensis* (250) with a percentage relative abundance of 4.995 % is the sixth highest, this was followed by *Caesalpina pulcherima* (163) with a percentage relative abundance of 3.257 %, then *Polyalthia longifolia* (152) with a percentage relative abundance of 3.037 % is the eighth. The ninth and tenth ranked plants in terms of number recorded are *Tradescantia pallid* and *Terminalia mantaly* with a total of one hundred and twenty (120) and one hundred and ten (110) plants and percentage relative abundance of 2.298 % and 2.198 % respectively.

**Distribution of ornamental plants in F.U.T, Minna, Bosso Campus with respect to family, mode of propagation, habits and plant parts associated with aesthetics:** In the survey carried out, thirty-five (35) ornamental plants belonging to seventeen (17) families were identified and recorded in the course of the study (Table 1). The families; Apocynaceae (with 7 plant species) and Fabaceae (with 7 Plant species) were most dominant and evenly distributed, representing 20 % each of the total plant population recorded on the campus, while the families Acanthaceae, Annonaceae, Bignoniaceae, Commeliaceae, Cupressaceae, Cycadaceae, Meliaceae, Myrtaceae, Nyctaginacea, Rubiaceae, and Verbanaceae were less dominant with one (1) plant species each and a percentage relative abundance of 2.857 % each (Table 1, Figure 2). Two Plant species were recorded for families; Arecaceae, Combretaceae, and Moraceae, each having a percentage relative abundance of 5.714 %. Family abundance of Euphorbiaceae was four (4) Plant species, indicating a percentage

relative abundance of 11.429 % (Table 1). Different modes of propagation were identified in the recorded plant Species, ranging from seed to stem cutting to grafting and other modes. The plant species propagated by stem cutting were eleven (11), representing 31.429 % of the plant population recorded. Ten (10) Plant species were propagated by seed. These plants represent 28.571 % of the total plant population. Some plants were found to be propagated by more than one means, i.e. by seed or other means, such as offsets, offshoot, stem cuttings or fruits. Eight (8) plants, representing 22.857 % of the total number of ornamental plant species are propagated seed or another means. Cutting as a mode of propagation was recorded in five (5) Plant species, which is 14.286 % of the total plant species. One (1) plant species was identified to employ grafting or air laying as a mode of propagation, representing a minute 2.857 % of the ornamental plants in Bosso Campus (Table 2).

The plant species recorded were categorized into trees, shrubs, herbs, woody shrubs and those intermediate between shrubs and trees. The trees (18) which are the most dominant and most abundant, represent 51.429 % of the total ornamental plants in Bosso campus, F.U.T, Minna. The second most populated plant species with respect to habit were the shrubs, which are eleven (11) and represent a percentage relative abundance of 31.429 %. Four (4) plants are intermediate between trees and shrubs and represent 11.429 % of the total ornamental plants. One Plant was recorded to be a herb and another one, a woody shrub. The plant species with these habits represent 2.857 % each, of the total ornamental plants in Bosso Campus (Table 2).

The uniqueness of ornamental plants is the aesthetics and beauty they add to the environment. As ornamental plants, all the plants (35) recorded all possess parts associated with aesthetics and beauty. For some of the plants, the floral parts serve this purpose, while it is the foliage in some of the plants. However, in some of these ornamental plants, the foliar and floral parts are both aesthetic. The plants which have their floral parts associated with aesthetics are most abundant and most dominant (23) with a relative abundance of 65.714 %. The plants where the foliar parts are associated with aesthetics are ten (10), having a percentage relative abundance of 28.571 %. 5.714 % of the total ornamental plant species in Bosso Campus have both the floral and foliar parts associated

with aesthetics. Some of the representatives of the ornamental plants are presented in Plates 1a-1e below.

## DISCUSSION

In the present study, it was observed that different plant species have different aesthetic values and are used for different purposes including beautification and shades in the study area. The study identified thirty-five(35) ornamental plants belonging to 17 families within the campus of FUTM. Out of the plant families encountered, the highest species (7) encountered belonged to the family Fabaceae and Apocynaceae is line with the study of Ogwu *et al.* (2016) in their study on the Diversity and Abundance of Tree Species in the University of Benin, Nigeria. They reported that the family Fabaceae and Arecaceae were the most abundant with three (3) species belonging to the both family. The abundance of these families especially Fabaceae could be attributed to the great distribution of the plant family in tropical rainforest and dry forest of Africa and America which is greatly used for different aesthetic purposes including medicine (Burham and Johnson, 2004). The poor distribution of some families with only one species in the study area may be attributed to environmental conditions as it is reported in many studies that environmental factors including rainfall, temperature and wind contributes to the distribution of plant (Mohamed *et al.*, 2013). The poor distribution of some families in the area could also be attributed to human activities and selective nature of human beings who prefer one ornamental plant over others; this assertion was similar to that of Wardle *et al.*(2004) that human activities affect the abundance of species. The abundance of these species in the study area could be attributed to its attraction and pleasant appearance which led to its massive planting in the area. The different modes of propagation have been identified. The propagation mode of these plants encountered ranged from seed to stem cutting to grafting and other modes. The most abundant mode of propagation is stem cutting representing 31.42% of the total plant encountered. This is line with the study of Osawuru *et al.*(2014) in their study on the Survey of Ornamental Gardens in Five Local Government Areas of Southern Edo, Nigeria. They reported that the mode of propagation shows that about 56 % are propagated vegetative, especially from stem cutting. Stem cutting as the most abundant of

mode of propagation among the ornamental plants encountered could be attributed to the fact that it is the fastest mode of regenerating the plants among garden mature plants (Pal and Sarkar, 2009). Stem cutting propagation mode has an advantage as it helps reduce viability among the plants and retention of the phenotypic integrity of the plant (Osawuru *et al.*, 2014).

The study further revealed that floral is the most part used as aesthetic purposes. This is consistent with the study of Dania-Ogbe (2013) who reported that floral represented more than 60 % of the total plant part used as aesthetic purposes. Similarly, it is line with the work of Adekunle *et al.*, (2013) in their study on Field survey of indigenous and useful plants, Edo, Nigeria. They also reported that floral is the most abundant plant part used for aesthetic purposes which include for medicine and food for some animal species. The study also revealed several habits among the ornamental plants encountered with tree and shrubs recorded as the most abundant habit. This is in line with the work of El-Juhany and Al-Harby (2013) in their study on Status and Diversity of Ornamental Plants in King Saud University Campus at Riyadh, Saudi Arabia. They reported that trees and shrubs were the most abundant habit representing about 45% of the total number of ornamental plant species encountered in their study. The present study also observed that the ornamental plants encountered play different roles in the area, which include food sources, medicine, shelter, shading, etc. They are also found to provide relaxation spots and are useful for erosion control and as windbreaks, this is agree with the work of Arslan and Yanmaz (2010).

## CONCLUSION

It was therefore concluded that FUTM Bosso campus is endowed with numerous ornamental plants that cut-across different forms of habits; such plants have provided aesthetic as well as protection values to the community and its environment.

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**Table 1: Distribution of ornamental plants in Bosso Campus, FUTMINNA, with respect to Family, Mode of Propagation, Habit and Plant parts associated with aesthetics**

S/N	Scientific Name	Family Name	Common Name	Mode of propagation	Habit	Parts Associated with Aesthetic
1	<i>Acacia auriculiformis</i>	Fabaceae	Earleaf acacia	Stem cutting	Tree	floral
2	<i>Albizia ferruginea</i>	Fabaceae	False thorn	By seed	Tree	floral
3	<i>Albizia lebeck</i>	Fabaceae	Womans tongue or lebeck	By seed	Tree	floral
4	<i>Allamanda cathartica</i>	Apocynaceae	Allamanda or golden trumpet	Stem cutting	Shrub	floral
5	<i>Azadirachta indica</i>	Meliaceae	Neem	Seeds and cuttings	Tree	floral
6	<i>Berleria lupulina</i>	Acanthaceae	Hophead philipino violet	Stem cutting	Shrub	floral
7	<i>Bougainvillea glabra</i>	Nyctaginaceae	Paper flower	Stem cutting	Shrub	floral
8	<i>Caedum variagatum</i>	Euphorbiaceae	Crotons or gold dust	Stem cutting and air layering	Woody	floral
9	<i>Caesalpinia pulcherrima</i>	Fabaceae	Pride of Barbados	Seed	Shrub	floral
10	<i>Caryota urens</i>	Arecaceae	Jaggary palm or fish tail palm	Seeds	Tree	foliage
11	<i>Cassia siamea</i>	Fabaceae	Golden shower	Stem cutting	Tree	floral
12	<i>Cassia fistula</i>	Fabaceae	Cassia tree	Seed or stem cutting	Shrub	Floral
13	<i>Cryptostegia madagascariensis</i>	Apocynaceae	Purple rubber vine	By seed	Shrub	Floral
14	<i>Cycas revoluta</i>	Cycadaceae	Cycas	Seed or by offsets	Tree	Foliage
15	<i>Delonix regia</i>	Fabaceae	Flamboyant tree or flame of forest	By seed	Tree	Floral
16	<i>Duranta erecta</i>	Verbanaceae	Golden dewdrop	Stem cutting	Shrub	Floral
17	<i>Euphorbia milli</i>	Euphorbiaceae	Crown of thorns	Fruits or seeds	Shrubs	Floral
18	<i>Euphorbia tirucalli</i>	Euphorbiaceae	Milk bush	Cuttings	Shrub or small tree	Floral
19	<i>Ficus elastica</i>	Moraceae	Rubber figure	Cutting	Tree	Foliage
20	<i>Ficus religiosa</i>	Moraceae	Pepal	Cuttings from any part	Tree	Foliage
21	<i>Huracrepitans</i>	Apocynaceae	Sand box tree	Grafting or air laying	Tree	Floral
22	<i>Ixora coccinea</i>	Rubiaceae	Ixora	Stem cutting	Shrub	Floral
23	<i>Jatropha integrifolia</i>	Euphorbiaceae	Spicy jatropa	Seed or by stem cutting	Shrub	floral/foilage
24	<i>Phoenix dactylifera</i>	Arecaceae	Date palm tree	Seed or off shoot	Tree	Foliage
25	<i>Plumeria alba</i>	Apocynaceae	White fragipan	Seed	Shrub or tree	Floral
26	<i>Plumeria rubra</i>	Apocynaceae	Red frangipani	Seed or rooting	Shrub or tree	Foliage
27	<i>Polyalthia longifolia</i>	Annonaceae	Masquerade tree	By seed	Tree	Foliage
28	<i>Syzygium guineenses</i>	Myrtaceae	Water berry	Stem cuttings	Tree	Foliage
29	<i>Tecomastans</i>	Bignoniaceae	Yellow elder	Seed or stem cutting	Shrub	flora/foilage
30	<i>Terminalia catappa</i>	Combretaceae	Indian almond tree	Seed	Tree	floral
31	<i>Terminalia mantaly</i>	Combretaceae	Madagascar or umbrella tree	Stem cutting	Tree	floral
32	<i>Thevetia peruviana</i>	Apocynaceae	Yellow oleander	Root cutting	Tree or shrub	foilage
33	<i>Thuja occidentalis</i>	Cupressaceae	Northern white cedars	Stem cutting, seed layering	Tree	floral
34	<i>Tradescantia pallida</i>	Commelinaceae	Purple heart	Cutting from any part of the plant	Herb	foilage
35	<i>Voacanga africana</i>	Apocynaceae	Small fruit wild frangipani	By seed	Tree	floral

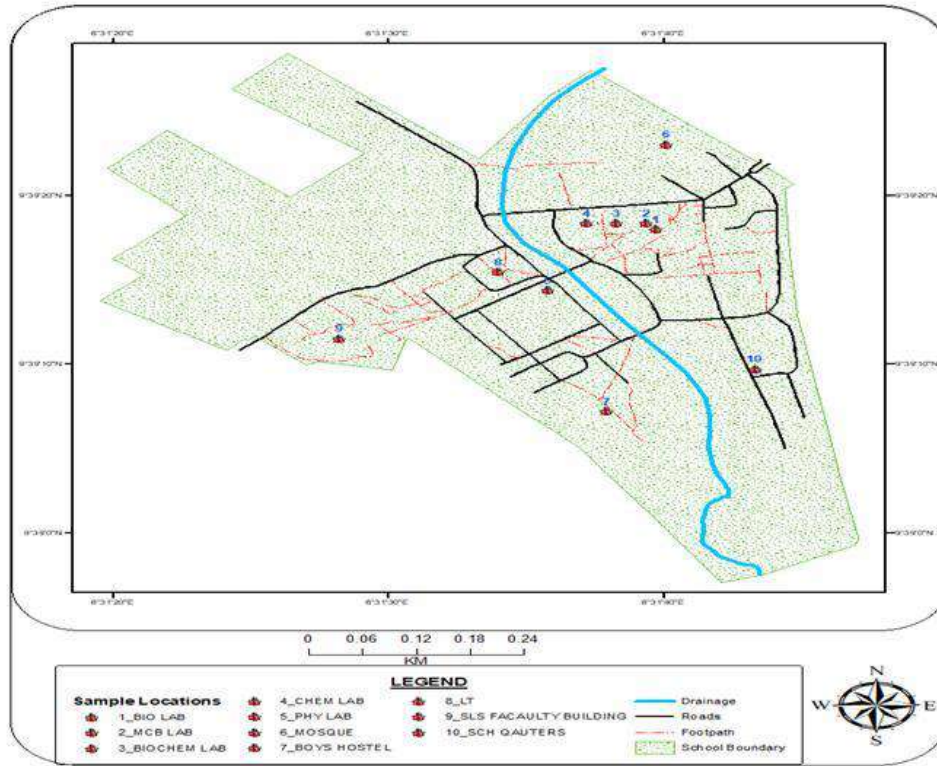


Figure 1: Map of Bosso campus showing sample area

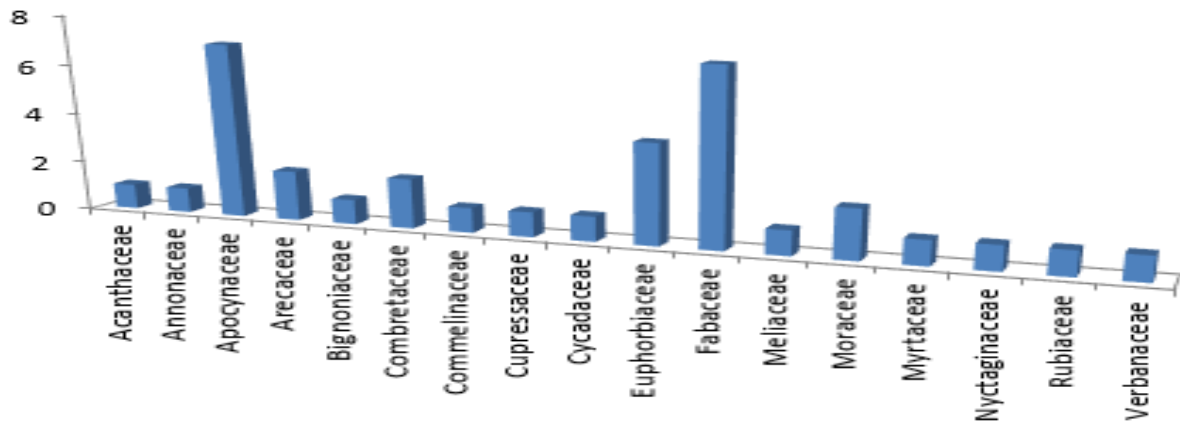


Figure 2: Family Abundance of the Ornamental Plants within F.U.T. Minna, Bosso Campus

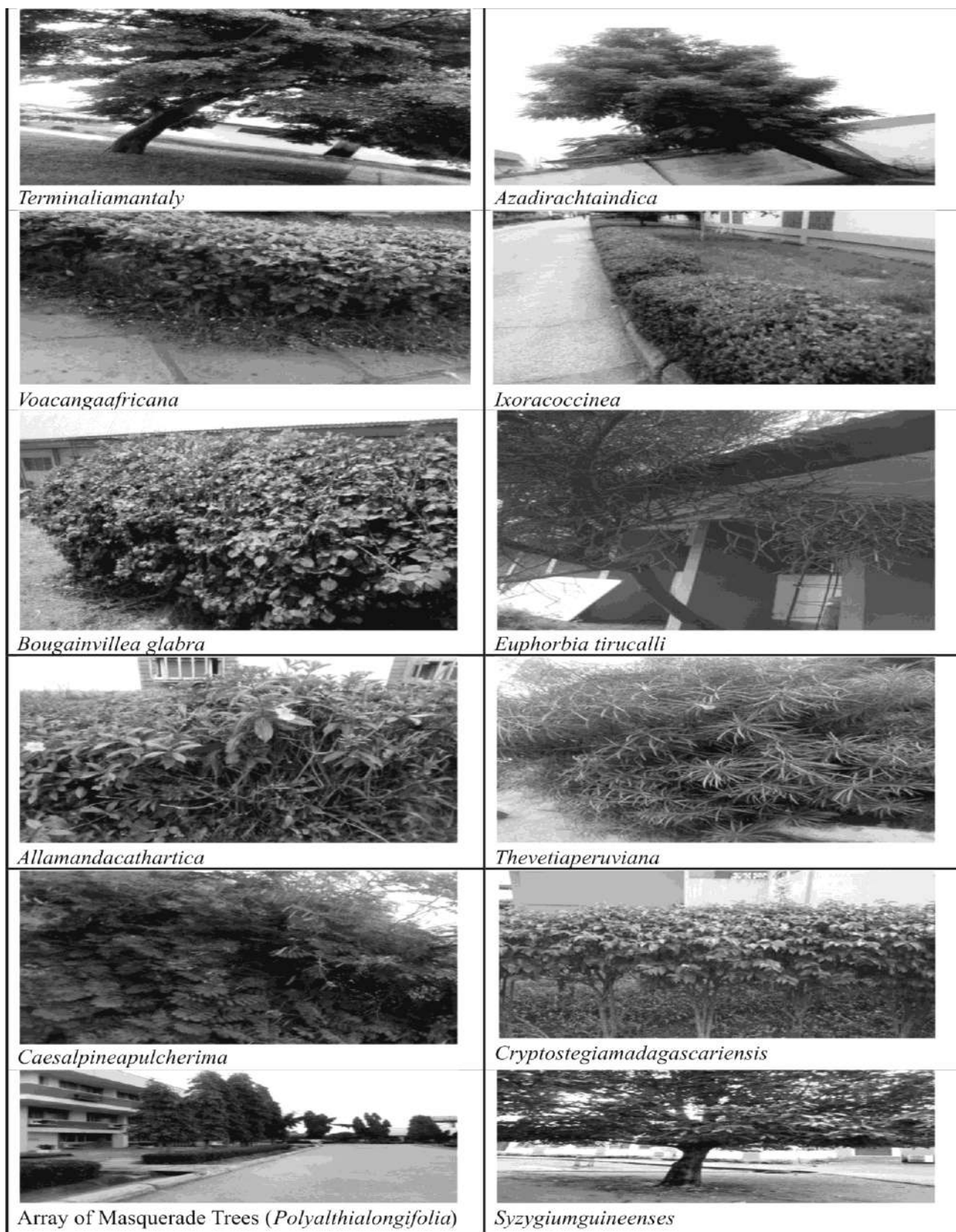
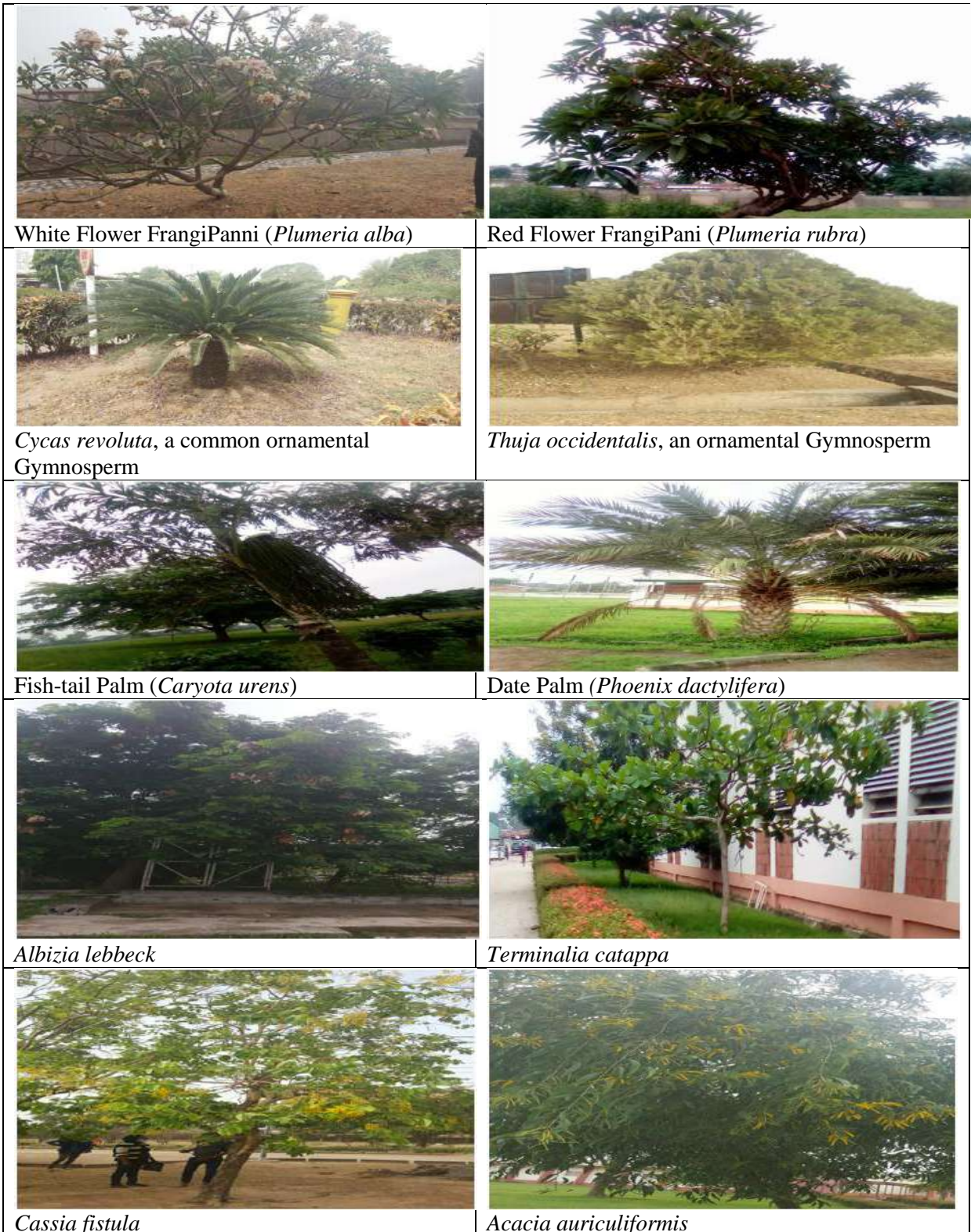


Plate 1 A: Representatives of the Common Ornamental Plants within F.U.T. Minna, Bosso Campus





**Plate 1B: Representatives of the Common Ornamental Plants within F.U.T. Minna, Bosso Campus**