Woody plants of the University of Eldoret: a Taxonomic Perspective

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Abstract

This study was conducted at the University of Eldoret for a period of one year ending March 2013.The primary objective was to develop a checklist with taxonomic key of the woody plants and ascertain their common usage including levels of diversity at extra genera level. The research design involved stratifying the study area into four blocks and several transects from each developed after a reconnaissance survey. Interlocking transects was used to ensure the taxonomic integrity of the data collected and reduce margins of error as data collected can't be extrapolated. The actual data collected was: Photographs, voucher specimens, diagnostic characters that remain on site and those volatile on specimens, Plant uses, and scientific names. To identify specimens, standard methods were used .To generate the identification key, a taxa character matrix was developed for identified species using botanic Latin vocabulary. The final compilation and analysis was achieved through use of several instruments, The Microsoft excels and PAST soft wares proved handy. Descriptive data was presented has been presented in tables, lists, graphs etc. One hundred and thirty six species in one hundred and fifteen genera representing forty two families were identified of which eight three and fifty three were of exotic and native origins respectively. The main life form was trees with pseudo arboreus being the least in representation. The ornamental use was most predominant and swamp block was most diverse in species composition but the residential area was the richest in species population most probably due to non-interference at the earlier and size (area) factors at the later. The final submissions of the investigator are that the findings of the study be adopted as part of the teaching and testing curriculum either in fully or in modified version. and to redesign the plant labels in the campus to in cooperate plant nomenclatural details , also the institution should subscribe to services like BRAHAMS, Global plants and virtual field herbarium to simplify plant taxonomy research, and lastly conservation measures in the so far only undisturbed ecosystem be instituted.

Key Words: Woody plants, University of Eldoret, Species diversity, Checklist

Introduction

Background Information

University of Eldoret is home to many plant sciences. Here, more often many students start interacting with plants on a more serious note while at the institution especially if their course involves plants. It happens that plants are within their immediate surrounding and also happen to be the choicest laboratory.

To a very large extent, plants are our environment. Places where plants are abundant tend to be where human life is successful, and where they are unavailable man has little hope of survival. An understanding of plant diversity is essential in the present struggle to reclaim deserts and degraded landscapes, breeding for pest resistance into our crops discover new sources of food, energy, medicine and other useful products. Plant names are vital for any research on plants .The names act as the handle on which to attach all other information about the plants in question. Correct identity is therefore very crucial. Referring to a plant by the correct name is primary in understanding the plant.

One of the most authoritative books about woody plants in Kenya [Kenya trees shrubs and lianas], was published in 1994. Today almost twenty years later the international code of Botanical nomenclature has agreed on several changes that affect Kenyan plant taxa. Systematic botanical Literature on woody plants within our environment that we can relied on for reference is conspicuously absent from our library shelves and nevertheless current publications do not address the taxonomy of this flora in particular as species have diverse originality as information about them is.

There has been a gap in the contemporary records of the tracheophytes in the campus. This project addresses identification, nomenclature and uses of woody perennials and suffrutices. Other higher plants studies need to be addressed by research too.

Plant taxonomy today is a highly versatile discipline unlike before when plant classification was based on morphology alone. Botanical names, ranking, position and circumscription have over time changed with advances in taxonomic studies. Some names and families of plants we find in many textbooks especially those published before 2000 may be obsolete. Some taxa have been upgraded and others downgraded. For example the genus *Acacia* was upgraded to the rank of tribe, Acaceae, in the subfamily Mimosoideae.

This University has many species of plants distributed in diverse taxa. A few species planted by dignitaries have been labeled. The labels show the person's name and date of planting. This information is important for commemoration purposes and can be used to estimate the growth rate of the trees. However to stimulate tree planting and conservation, and to get additional published information about these plants, an understanding of tree names and or their principle botanical features is primary. Identification keys can be developed to assist students and visitors to easily identify and name plants.

The main goal of this study is to compile a list of woody plants noting their taxa, uses, diversity and develop a single access key to aid in correct identification and naming of plants

within the University. Subsequently this will enable users to access published information about them. This will help to determine if they are poisonous or if they might be useful as medicine or edible then one can research on them to confirm identification as well as discover how other people connect with such plants elsewhere.

Knowledge of plant names, their principle botanic features as well as their uses is a defining step in ensuring conservation of our floral diversity. This literature review highlights aspects of plant collection, identification, development of identification keys, uses and diversity of plants as basis of supporting the stated objectives and methodology.

Collection Identification and Taxonomic key

Gerry, (2005) defines plant identification as the process of matching a specimen plant to known taxon and uses various methods most commonly the dichotomous key or the multi access keys. Principle features observed include general vegetative and reproductive parts.

Prior to identification exercise, Bridson and Leonard, (2005) reiterated that all collecting expeditions need to be carefully planned. The importance of collecting good specimen cannot be overemphasized, and thinks small number of really well preserved and annotated specimens is far more valuable than a large number of poor specimens.

When compiling keys for East African flowering plants, Kokwaro, (1993) clarified that several methods are used in constructing and presenting keys depending upon the creator's interest, and noted that naming through use of keys published floras and monographs is by all means the most convenient one.

However, dichotomous keys have limitations, for instance if an organism is not included in a key - it would never be found and the volume remains a work in progress (Walter and Winterton, 2007; Stevenson *et al.,* 2003). Whilst dichotomous keys have proved useful, they often offer dilemmas due to individual variations, so with any dichotomous key it helps to have two or three examples to improve sorting. Keys are useful but tend to become increasingly cumbersome as the lower levels are reached especially at genus level and below and therefore some experience and understanding of basic terminology is a pre-requisite.

Some authors like Christiane *et al.,* (2011) believe that to simplify determination of species, their description has not to follow the botanical system but are sorted by leaf division like leaf arrangement (phyllotaxy) and leaf shape in simple leaves, In compound leaves pinnation is used. The argument here is that the species are sorted first by their family and then by their scientific names in alphabetical order.

In Oregon state university, Patrick, (2013) has developed a woody plant identification system that uses a list of features but the identification is limited to the more than nine hundred woody species in the university landscape.

Plant Uses

Secretariat of the Convention on Biological Diversity, (2009) is of the opinion that plants are a vital component of biodiversity and healthy ecosystems. They provide a range of ecosystem

services, from production of oxygen and removal of atmospheric carbon dioxide emissions, creation and stabilization of soil, protection of watersheds and provision of natural resources including food, fibre, fuel, shelter and medicine.

A study by Suzane *et al.*, (2011) confirms that globally there is a growing awareness of the many services wooded areas provide. They refer to Africa as having many species in world market of medicinal plants for instance *Ancistrocladus abbreviatus* used in Human immune virus management from Cameroon and Ghana.

Beentje, (1994), a acknowledges that indigenous people of Kenya had for thousands of years made use of plants for a wide variety of needs and that one of the great gaps that remain to be filled in contemporary records is a comprehensive list of this traditional uses, a statement supported by Gachathi, (2007).

A study done by Amir, (1992) on socio-economic study on trees and shrubs, concluded that economic significance of trees and shrubs can be determined from the fact that they are hardy and can provide year-round fodder to be used as a supplement in lean periods. In mixed farming systems, trees and shrubs can have a stabilizing effect on prices as farmers have a longer holding capacity and are not forced into selling animals in periods of drought. Both trees and shrubs also provide multiple benefits (fuel, wood for furniture and other uses, leaves and shoots for use by animals, etc.). In addition, they also help to stabilize the soil and improve the environment habitats.

In a related study to determine the useful trees and shrubs of Kenya, Maundu, and Tengnas, (2005) noted that there is considerable scope to encourage the use of trees and shrubs by further educating farmers. Also in similar research Parnell and Zenroku (2007) were of the opinion that there is continuing importance of *Adansonia digitata* and *Tamarindus indica* due to their nutritional value and contribution to the health status of rural communities.

According to Gerry, (2005) of Botany Department at Manoa campus of Hawaii University, the institution is home to more than 750 species of trees and plants. They Intrigue campus visitors and provide students and professors with a living botanical laboratory. The campus also has developed a map and checklist of these species and is used in teaching and testing of students.

Plant diversity

An appraisal by Pausas *et al.*, (2001) on plant diversity trends came to the conclusion that most studies show tendency towards increase in species richness with temperature and water availability as well as increased environmental heterogeneity and disturbance factors.

Methodology

Study Area

University of Eldoret main campus is located in Uasin Gishu County which lies between longitudes 34^0 50‟ east and 35^0 37‟ west and latitudes 0^0 03‟ South and 0^0 55‟ North. It is about

20km from North of Eldoret town along Ziwa road (UGCIDP, 2013). The University lies within 0.43-44.26'' N and 35.18—21.82''E and has 1050 acres of land most of which is set aside for agricultural use. The average annual rainfall is between 900 to 1,200 mm per year and occurs between the months of March and September with two distinct peaks in May and August (Kibet *et al.,* 2011). Temperatures range between 8.4^{o} C and 26.1^{o} C (Korir, 2011).

Sampling design

Purposive sampling was employed to select the four sites where data was collected and systematic sampling methods were employed during the course of this study. The university compound was blocked into four units. Depending on land use practices that affect trees on site. The units are,-Arboretum, Agricultural areas (Farm), Wetland (Swamp) and settlement areas(Residential).Transects of 20 *100m were used to delineate study areas depending on site adjustments were made. Longer or shorter areas were used depending on site conditions .e.g. stand conditions, species diversity, area, etc. as the blocks were viewed on satellite images. The information to be collected was extended beyond the boundaries of the established transects where necessary to enhance the taxonomic integrity of collected data.

Collection and identification of woody plants species

In each unit the following was collected in regard to all species considered in this study. Photographs, Botanical names and block collected from. Uses, voucher specimen and species vegetative and reproductive parts information was recorded. Essential diagnostic characters at the site of collection which cannot be represented on herbarium specimen or those volatile were recorded. A taxa-character matrix was generated from this information to facilitate the development of dichotomous key. Characteristics were considered from general to specific and Microsoft excel was used to sort diagnostic characters at different levels of similarity and dissimilarity. Standard methods of plant identification were used. And these included but not limited to, Taxonomic keys, Floras, Photographs, Carpological specimens and peer reviewed publications.

Data analysis

Data collected was analysed using descriptive statistics using SPSS version 20. Results are presented using tables and figures. The final key was fabricated in simple English and botanic Latin vocabulary. Shannon Weigner and Simpsons' diversity indices were used to rate diversity at taxonomic rank of family.

The Shannon diversity index is calculated as follows:

$$H' = -\sum_{i=1}^{S} Pi \ \mathrm{In}Pi$$

Where H' is Shannon diversity index and pi is proportion of individuals found in the ith species. Value of the index (H usually lies between 1.5 and 3.5, however, in special cases, the value can surpass 4.5.The larger the Hvalue, the higher the diversity (Jost, 2010). Simpson's diversity (D) is calculated as

$$D = 1 - \sum pi^2$$

Where D is Simpson's diversity index and pi is proportion of individuals found in the ith species.

RESULTS

Plant Identification

(See appendix 1 for full list of all species identified.)

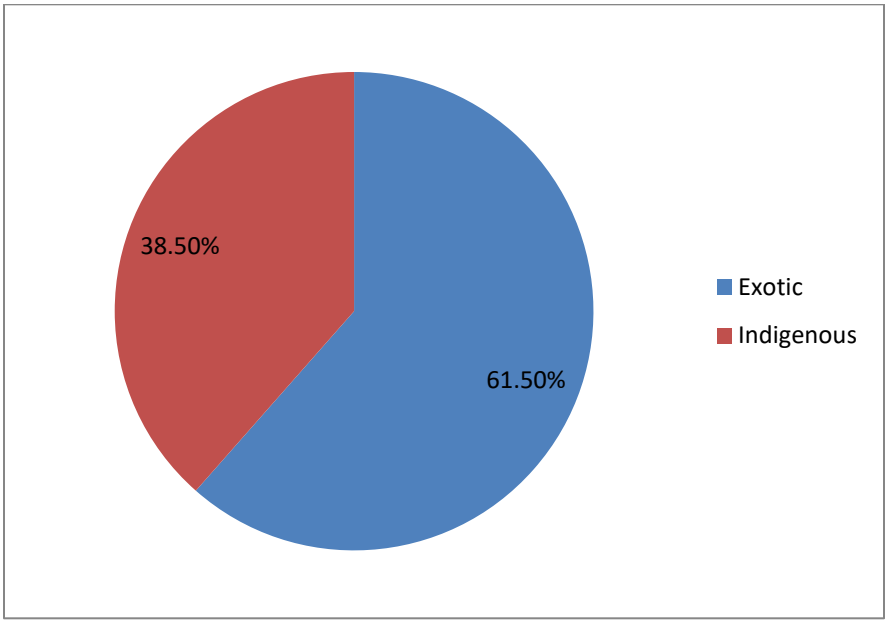

Figure 1: Proportion of origin of woody plants species the found in University of Eldoret

Results shows that the types of woody plants found in the study area included exotic and indigenous plants species where the common was exotic species with (61.5%) occurrence. Indigenous plant species were found in few areas with occurrence of 38.50%. This indicates that the indigenous species is slowing being eradicated to create space for exotic species.

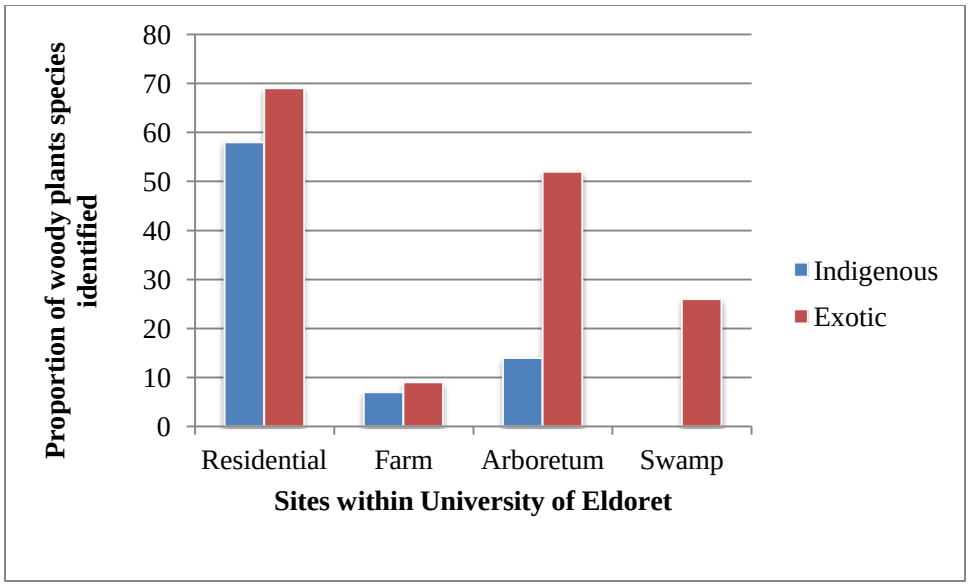

Figure 2: Proportion of exotic and indigenous woody plants species found at different sites within University of Eldoret

Figure 3 shows proportion of exotic and indigenous woody plants species found at different sites within University of Eldoret. Results shows that residential site had the highest number of exotic species with 69 woody plants found there followed by arboretum 52 , swamp 26 and lastly farm with 99. Residential, farm and arboretum had 58, 7 and 14 indigenous species respectively.

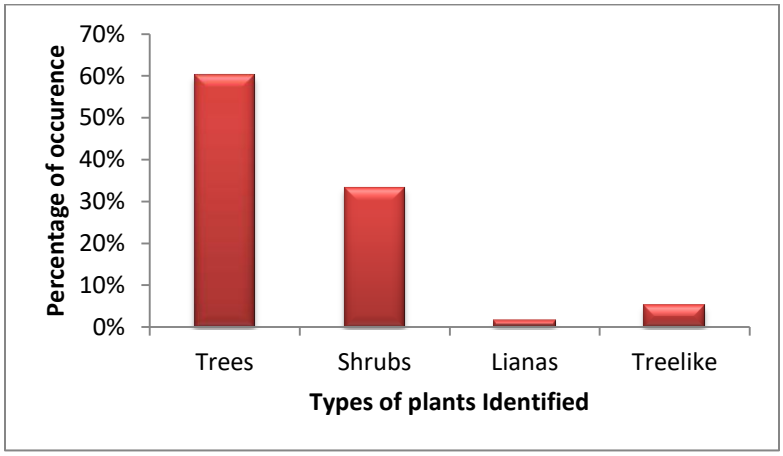

Figure 3: Proportion of the type's woody plants species found in University of Eldoret

The types of woody plants species found at the University of Eldoret were; Trees, shrubs, lianas and treelike with 60.0%, 33.3 %, 1.48 % and 5.19 % respectively. Trees had the highest percentage of occurrence compared to other species.

Table 1: Species distribution by family

Family	Species number
Fabaceae	22
Myrtaceae	17
Euphorbiaceae	11
Apocynaceae	6
Bignoniaceae	5
Malvaceae	5
Solanaceae	5
Asteraceae	4
Meliaceae	4
Rosaceae	4
Verbanaceae	4
Anacardiaceae	4
Araucariaceae	3
Arecaceae	3
Cupressaceae	3
Moraceae	3
Oleaceae	3
Salicaceae	3
Acanthacceae	2
Agavaceae	2
Casuarinaceae	2

Family	Species number
Pinaceae	2
Proteaceae	2
Sapindaceae	2
Annonaceae	1
Araliaceae	1
Canallaceae	1
Combretaceae	1
Convolvulaceae	1
Dracaenacaeae	1
Lamiaceae	1
Lauraceae	1
Melastomataceae	1
Lynthraceae	1
Nyctaginaceae	1
Pittosporaceae	1
Podocarpaceae	1
Rubiaceae	1
Rutaceae	1
Bombacaceae	1
Loganiaceae	1

A total of 138 woody species belonging to 41 families were gathered, identified, and recorded in different site in University of Eldoret (table 1). The highest number of woody species were; Fabaceae, Myrtaceae and Euphorbiaceae family, while Araliaceae, Convolvulaceae, Nyctaginaceae, Bombacaceae families just to mention a few had the lowest number of woody species (1each). Highest numbers of woody species were recorded at Residential site while lowest numbers of species were recorded at farm (figure 2).

Diversity indices

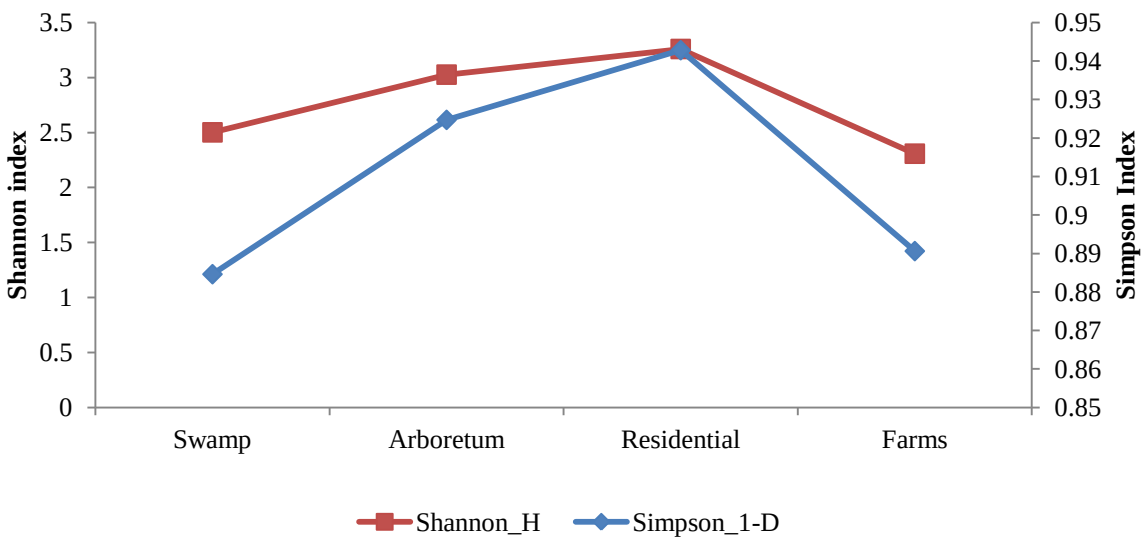

Figure 4: Diversity trend of the families in different blocks (Shannon and Simpson Diversity indices).

Shannon-Wiener's diversity index indicated that the residential and arboretum blocks present highest levels of diversity in species composition and population than farm, swamp and arboretum (Table 4). A similar trend was noticed in terms of Simpson's diversity index.

Discussion

University of Eldoret has a woody species diversity of approximately 138 (so far identified) distributed in 41 families. 61.5% of these plants are exotic in origin and are scattered in different parts of the studied blocks. Trees dominate the population of woody perennials at 60% .Non woody arborescents like the, palms, cactuses, *Euphorbia* and *Yucca* constitute less than 5.5% of the species population. Shrubs are also more than lianas at 33.3% and 1.45% respectively. The woody species richness of the study area was comparable with another study by Omoro *et al.*, (2007*)* who recorded 58 species in Taita hills forests while in Kakamega forest, Fashing, (2003) captured 64 in Kakamega forest in Oban forest in Nigeria and Molla and Kewessa, (2015) while assessing woody species diversity in traditional agro forestry practices of Dellomenna District 55 woody species. On the other hand Abebe, (2015) while assessing diversity in home garden agro forestry systems in Southern Ethiopia recorded 120 trees and shrubs from Sidama in Southern Ethiopia.

The plants occur neither in the four blocks regularly i.e. there is no relationship between species origin and the block in which it is found nor with its growth habit. However the arboretum and areas bordering the swamp appear to have relatively higher representation of

indigenous species than residential/campus compound and farmlands. This can be attributed to the lack of interest in intensive human activities in these blocks. Also the many exotic species in the residential block is due to the proximity to Centre of management and therefore planting of ornamentals is prioritized.

Fabaceae, Myrtaceae, Euphorbiaceae are the most represented families accounting for 36.8% of the entire population. Despite the fact that Asteraceae is the largest plant taxon on the planet it is represented by only four members (2.9%) This can be attributed to the growth habit of most members as they are herbaceous, while the majority of Fabaceae emanates from the recent taxonomic changes which saw the downgrading of three families Caesalpiniaceae, Mimosaceae and Papilionaceae as recognized by the cronguist system of 1968 to one family (Fabaceae) in the new system of classification called APG III of 2009 (Angiosperm phylogeny group lll). Also it can be linked to their wide use as ornamentals and in agro forestry. A study done by Otieno and Analo, (2012) on local indigenous knowledge about some medicinal plants in and around Kakamega forest in western Kenya documented that the most dominant families were Asteraceae, Fabaceae and Lamiaceae, each representing 10.3% of all species collected and also indicated that *Euphorbiaceae* family 5% of the total families documented.

The dominance of trees over other life forms especially the pseudo arboreus can be linked to the ceremonial importance of tree planting on special occasions and when prominent dignitaries make visits. The planting of other woody perennials is usually minimal and is of no much concern beyond aesthetics. Shrubs are common a long walk ways and pavements with *Bouganvillea* and *Duranta sp.* are most used.

Shannon's diversity index of woody species in this study in traditional agroforestry systems was comparable to the study on Kerala garden in India, ranging from 1.12 to 3 (Molla and Kewessa, 2015). Tolera, (2006) while assessing Woody species diversity of agricultural land scapes in Arsi Negelle District, Ethiopia recorded Shannon diversity index and Simpson index to be 2.22 and 0.83 respectively which was similar to our study. The Simpsons diversity index of the residential block is highest, considering that this index measures the probability that if two species are randomly selected from a population they will belong to the different taxa then here diversity is highest .The ecological amplitude of the species present is also very high, the presences of species like *leptospermum scoparium* from as far as New Zealand and the primitive *Michelia champaca* native from Indomalaya ecozone attests to this. The deliberate introduction of foreign species during yesteryears was due to the common trend by then to regard native species as of inferior attributes compared to exotic counterparts. However with increasing research on indigenous species the reverse could be true.

Conclusion and Recommendation

University of Eldoret has a woody species diversity of approximately 136 (so far identified) distributed in 42 families. 61.5% of these plants are exotic in origin and are scattered in different parts of the studied blocks. Different levels of disturbance and management regimes of land have different effects on plant diversity. Swamp block depicts only indigenous species

with high levels of species evenness due to non-artificial disturbance. The residential block is superior in species richness due to its comparatively large area and frequent ceremonial planting activities. Therefore it is recommended that plant labels at the campus should be redesigned to include nomenclatural details for easy access to plant information also this report is adopted in the teaching curriculum either in full or in modified version for botany and plant science related courses. The institution should subscribe to services like BRAHAMS, Global plants and virtual field herbarium to simplify plant taxonomy research. The undisturbed swamp block should be conserved for research and education. Further comprehensive studies should be carried out for the herbaceous species as there is high plant species diversity in the campus.

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Appendix 1: Single access key (Summary)

LAMINA DIVISION	PHYLLOTAXY	MARGINS/PINNATION
Simple 96	Alternate	Entire
		Serrated
		Lobed
		needle like
	Opposite	Entire
		Serrated
Compound 40		Paripinnate- 12
		Digitate -1
		Trifoliate -2
		Imparipinnate- 13
		Bipinnate - 12

Appendix 2: Plant Identification Checklist

Species	Family	Timber	Food/medicine	Agroforestry	Ornamental
Acacia mearnsii	Fabaceae	X	X	x	X
Acacia melanoxylon	Fabaceae	X		x	X
Acalypha wilkesiana	euphorbiaceae				X
Acanthus arboreus	Acanthaceae				X
Acrocarpus fraxinifolius	Fabaceae	X	X	x	X
Agave Americana	Agavaceae				
Albizzia gummifera	Fabaceae	X	X	x	X
Albizzia sp.	Fabaceae	X	X	x	X
Angophora maculate	Myrtaceae	x			
Annona sp.	Annonaceae		X		
Araucaria angustifolia	Araucariaceae				X
Araucaria heterophylla	Araucariaceae				X
Arecastrum ramanzoffianum	Arecaceae				X
Artemisia annua	Asteraceae		X		
Arundinaria alpine	Arecaceae	x			X
Bauhinia sp.	Fabaceae	x	X		X
Bischofia javonica	Euphorbiaceae	x		x	X
Bouganvillea spectabilis	Nictarginaceae				x
Bridelia micrantha	Euphorbiaceae	x			
Brunfelsia hopeana	Solanaceae				X
Buddleia polystachya	Loganiaceae	x			X
Calliandra callothysus	Fabaceae		X	x	

Callistemon citrinus	Myrtaceae	x			X
Callistemon rigidus	Myrtaceae	x			X
Carissa edulis	Apocynaceae		X		
Cassia dydimobotrya	Fabaceae		X	x	
Casuarina cunnighamiana	Casuarinaceae	x			X
Casuarina equisetifolia	Casuarinaceae	x			X
Cestrum noctonum	Solanaceae				x
Chorisia speciosa	Bombacaceae				
Citrus sinensis	Rutaceae		X		
Cordial Africana	Boraginaceae	x			
Corymbia ficifolia	Myrtaceae				
Cotoneaster pannossus					x
Croton macrostachys	Euphorbiaceae	x	X		
Croton megalocarpus	Euphorbiaceae	x			
Cupressus lustanica	Cupressaceae	X			x
Cyphomandra betacea	Solanaceae		X		
Datura suaveolens	Solanaceae				x
Dodonea angustifolia	Sapindaceae	x			x
Dombeya burgassiae	salicaceae	x		x	
Dovyalis abyssinica	Salicacaeae				x
Dracaena fragrans	Dracaenaceae				x
Duranta variegate	Verbanaceae				x
Ekebergia capensis	Meliaceae	x	X		
Eryobotrya japonica	Rutaceae		X		
Eucalyptus paniculata	Myrtaceae	x			
Eucalyptus saligna	Myrtaceae	X			
Euphorbia candelabrum	Euphorbiaceae				x
Euphorbia pulcherrima	Euphorbiaceae				x
Euphorbia tirucalii	Euphorbiaceae				x
Euphorbia milii	Euphorbiaceae				x
Ficus benjamina	Moraceae				X
Ficus sp.	Moraceae				x
Ficus variegate	Moraceae				x
Filicium decipiens	Sapindaceae				X
Flacourtia indica	Salicaceae		X		
Flueggea virosa	Euphorbiaceae				
Fraxinus pennyslyvanica	Oleaceae	x			X
Gliricidia sepium	Fabaceae			x	
Grevillea robusta	Proteaceae	x		X	

Grewia similis	Malvaceae			x	
Hakea saligna	Proteaceae				
Hibiscus rosasinensis	Malvaceae				X
Hibiscus sp.	Malvaceae				x
Ipomoea arboreus	Convolvulaceae				X
Jacaranda mimosifolia	Bignoniaceae	x			x
Jasminum fluminense	Oleaceae				
Juniperus procera	Cupressuceae				
Lantana camara	Verbanaceae				X
Leptospermum lanceolata	Myrtaceae				x
Leptospermum scoporium	Myrtaceae				x
Lophostemon confetus	Myrtaceae	x			x
Makaya bella	Acanthaceae				X
Mangifera indica	Anacardiaceae	x	X	x	X
Melaleuca lanceolata	Myrtaceae				X
Melia azedarach	Meliaceae	x			x
Milletia dura	Fabaceae	x		x	x
Michelia chapaca	Magnoliaceae	x			x
Mytenus undatus	Salicaceae		X		
Nerium oleander	Apocynaceae				x
Newtonia buchananii	Fabaceae	x		x	x
Ocimum sp.	Lamiaceae		X		
Olea Africa	Oleaceae	x	X		
Olea welwitschii	Oleaceae	x			
Paudianthria hookeri	Fabaceae				
Persea Americana	Anacardiaceae		X		
Phoenix reclinata	Arecaceae				x
Pinus patula	Pinaceae	x			
Pinus radiate	Pinaceae	x			
Pittosporum viridiflorum	Pittosporaceae	x			x
Plectranthus sylvestris	Lamiaceae				
Plumeria rubra	Apocynaceae				x
Podocarpus falcatus	Podocarpaceae	x			x
Polyscias fulva	Araliaceae	x			x
Prunus Africana	Rosaceae	x	X		
Psydium guajava	Myrtaceae		X		
Punica granatum	Myrtaceae		X		x
Pyrecantha angustifolia	Rosaceae				x
Rauvolfia caffra	Apocynaceae				x

Rhus vulgaris	Anacardiaceae		X		
Ricinus comunis	Euphorbiaceae		X		
Rosa sp.	Rosaceae				x
Schinus molle	Anacardiaceae				x
Schinus terebenthifolius	Anacardiaceae				x
Senna spectabilis	Fabaceae	x			x
Sesbania sesban	Fabaceae		X	x	
Solanum aculeastrum	Solanaceae		X		
Solanum incanum	Solanaceae		X		
Spathodea campanulata	Bignoniaceae	x			x
Sterculia aceralifolia	Malvaceae				x
Syzygium cordatum	Myrtaceae		X		
Syzygium cuminii	Myrtaceae		X		x
Tecoma stans	Bignoniaceae				x
Tecomaria capensis	Bignoniaceae				x
Tephrosia vogelii	Fabaceae		X	X	
Terminalia mentalis	Combretaceae				x
Thevetia thevetioides	Apocynaceae				x
Thuya orientalis	Cupressaceae				x
Tibouchina Semidecandra	Melastomataceae				x
Tipuana tipu	Fabaceae				x
Tithornia diversifolia	Asteraceae		X	x	
Toona ciliate	Meliaceae	x			x
Trichilia emetic	Meliaceae	x			x
Vangueria infausta	Rubiaceae		X		
Vechellia abyssinica	Fabaceae	x	X	x	x
Vechellia polyacantha	Fabaceae	x	X	x	x
Vechellia xanthophloea	Fabaceae	x	X		x
Vernonia auriculifera	Asteraceae	x			
Vernonia lasiopus	Asteraceae	x			
Vitex keniensis	Verbanaceae	x		x	x
Vitex trifolia	Verbanaceae				x
Warburgia ugandensis	canallaceae	x	X		x
Yucca sp.	agavaceae				x