VASCULAR PLANT DIVERSITY IN BENGUET STATE UNIVERSITY LA TRINIDAD MAIN CAMPUS, PHILIPPINES: A STATUS REPORT AND A DATABASE TO SUPPORT THE ATTAINMENT OF SUSTAINABLE DEVELOPMENT

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Abstract: Biodiversity is argued to be at the heart of sustainable development but insufficient data base hinders its accomplishment, thus the need for more biodiversity studies. This study has aimed to contribute in this regard by documenting the vascular plants in the La Trinidad main campus of Benguet State University, Philippines. The university harbors an aboundant array of species richness of 338 species belonging to 246 genera and 87 families. Asteraceae, Poaceae and Fabaceae are the most represented families with 21, 21, 20 species, respectively, followed by Euphorbiaceae with 16, Asparagaceae with 14, Araceae with 11 and Solanaceae with 10 species. Herb species dominate in the campus with 199 species. However, amidst the high species richness, the campus contributes little to biodiversity conservation since the majority of its vascular plants are the least concern (331) and the exotic species (200) that have been introduced rampantly as ornamentals with obvious neglect of its negative impact. Nonetheless, these findings show that university campuses pose a lot of potential for biodiversity conservation with sufficient mainstreaming of biodiversity considerations in economic sectors, and in cross-sectoral policies such as development plans and budgets.

Keywords: Benguet State University, biodiversity, sustainable development, vascular plants

Introduction:

Defined as the variability among living organisms from all sources, including diversity within species, between species, and of ecosystems, biodiversity is stressed to be at the heart of sustainable development (Secretariat of the Convention on Biological Diversity 2018). This is due to the fact that

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biodiversity underpins the provision of food, fibre and water; it mitigates and provides resilience to climate change; it supports human health, and provides jobs in agriculture, fisheries, forestry and many other sectors (OECD 2014). Thus, biodiversity supports the achievement of all Sustainable Development Goals (SDGs). The role of biodiversity and healthy ecosystems is reflected not only in SDG 14 (life below water), and SDG 15 (life on land), but also in many other goals and targets. For example, there are critical biodiversity dependencies for SDG 2 on zero hunger; SDG 6 on ecosystem providing reliable source of freshwater; SDG 7 on bio-energy from renewable biomass as clean and affordable energy; and, SDG 11, where the ecosystem providing clean water, air and resilience to climate change and natural calamities (www.cbd.int/development/doc/biodiversity-2030-agenda-technical-note-en.pdf - 2019).

Despite these important roles in sustainable development, biodiversity and ecosystem continue to be degraded and lost at unprecedented rates. The recent regional assessment reports by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) found that biodiversity is in decline in all regions of the world (IPBES 2018). This is arguably because its value as underpinning human well-being is neither fully understood nor adequately taken into account in public and private decision-making. In order to address this challenge, the Strategic Plan for Biodiversity 2011-2020 includes, as one of its five Strategic Goals, the need to "address the underlying causes of biodiversity loss by mainstreaming biodiversity across governments and society" (Secretariat of the Convention on Biological Diversity 2018). One of the identified likely main barrier for biodiversity conservation is insufficient knowledge base on biodiversity and insufficient mainstreaming of biodiversity considerations in economic sectors, and in cross-sectoral policies such as development plans and budgets. This highlights the need for more biodiversity studies and more efficient dissemination of biodiversity data to several sectors, particularly to those who need them but do not know they need them.

The Philippines, being a signatory in the United Nation SDGs, displays a strong interest in biodiversity and its conservation. The country is one of the top biodiverse countries but it is also a biodiversity hotspot due to fast rate of biodiversity loss (Philippine Biodiversity Conservation Priorities 2002). Consistent with global trend, insufficient data base and mainstreaming could be the major factors contributory to the ineffective biodiversity conservation in the country. A review paper by Langenberger (2004) showed the poor representation of Philippine vegetation in international research compared to other tropical rainforest areas. There is a recent spike of biodiversity researches in the country but still not enough to adequately account for its rich biodiversity (Napaldet and Buot 2019), hence the need for more biodiversity studies.

A similar trend is consistent at the local levels even though the importance of biodiversity is seemingly understood. For example, a review paper by UP Baguio (on press) showed that despite the presumed rich biodiversity in Cordillera Central Range owing to its unique environmental and biotic conditions, there is a dearth of biodiversity data information available to the public because very few are published. The same case is observed at Benguet State University (BSU). Despite envisioning it as "a premiere state university promoting sustainable development amidst climate change", appreciation for biodiversity is seemingly superficial. This could be hinted at by the very minimal number of published biodiversity studies from the university amidst the rich diversity of its immediate environ. This makes the study very timely and appropriate. We have conducted a complete inventory of all vascular plants in BSU La Trinidad Main Campus as an important database which, as argued above, could help attain the sustainable development vision of the university. Moreover, the results of the study are an important instructional material and

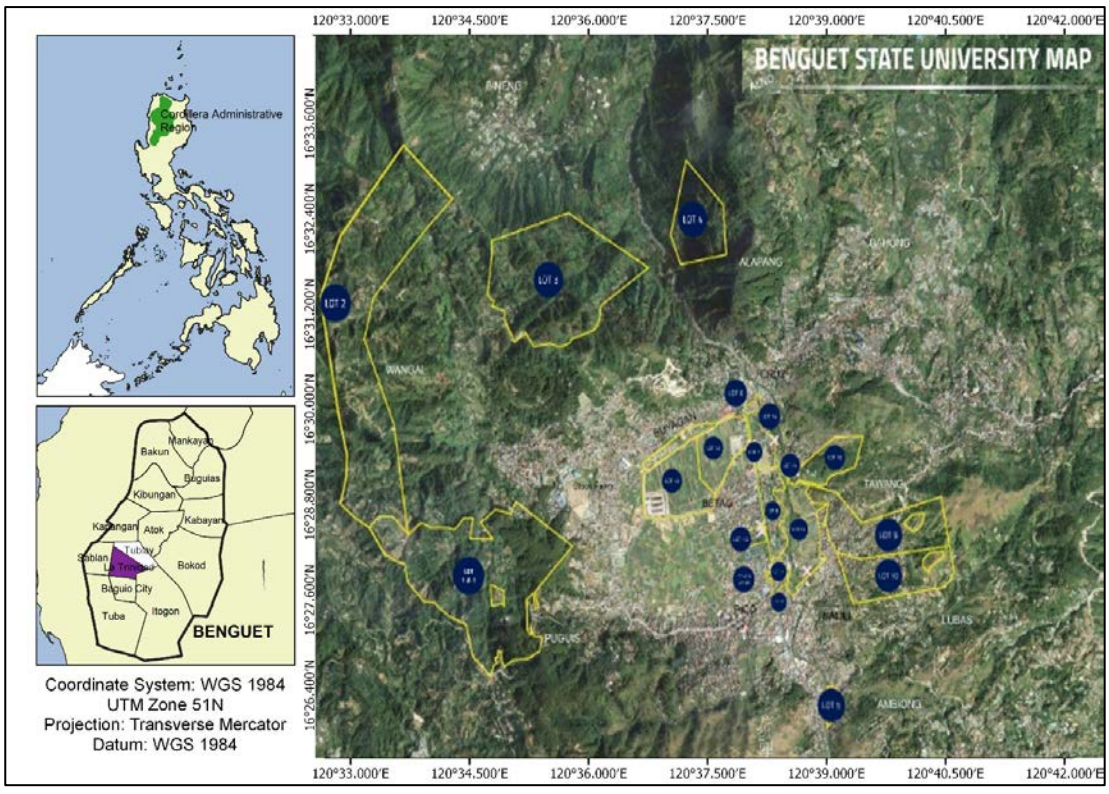
guide for plant identification which could help mainstream biodiversity information to the general public. This could foster development of appreciation for biodiversity from the public, which, in turn, could help greatly in biodiversity conservation.

Materials and methods:

The Study Area. The Benguet State University is a chartered university located at the center of La Trinidad municipality in the province of Benguet, Philippines. It was established in 1916 as Trinidad Farm School and has undergone several name changes until chartered as state university in 1986. At present, the university maintains a Graduate School, the Open University, eight (8) colleges and three (3) institutes offering seven (7) doctorate degrees, 32 masters programs, 19 undergraduate degrees, and a number of diploma/certificate special short courses.

The university is now a century old. From its humble beginnings, BSU now averages an enrolment of 10,000 students every semester. Its status as a CHED-SUC-LEVEL IV University has been mainly attributed to the majority of its programs, projects and activities having attained Level III based on the standard of the Accrediting Agency of Chartered Colleges and Universities of the Philippines, Inc. (AACCUP). The university consists of three campuses at present namely La Trinidad, Bokod and Buguias campuses. This study has been conducted in the La Trinidad main campus. The La Trinidad campus is sprawled on a 605.78 hectare-land at the heart of La Trinidad, the capital town of Benguet Province, about 255 kilometers north of Manila and 5 kilometers away from Baguio City (Fig. 1).

Figure no. 1 Map showing the study site, Benguet State University



Documentation, Identification and Description.

The inventory included photodocumentation, identification, classification and description of all vascular plants in Benguet State University Main Campus, La Trinidad, Benguet. Part of the photodocumentation is to take detailed photos of the plants showing habit, leaf, flower, fruit and seed characters such as leaf type, attachment, venation, phyllotaxy, lamina shape, shape of the base and apex, margin, division, flowers and seeds etc. Several taxonomy references were consulted for the identification of the vascular plants such as Vascular Plants of Mt. Makiling and Vicinity Volume 1-4 (Pancho 1983; Pancho and Gruezo 2006, 2009, 2012), Manual of Ricefield Weeds (Pancho and Obien 1995) and Flora of Taiwan (Boufford et al. 2003). On-line databases generated by Pelser et al. (2011 onwards) and that of tropicos.org (2013) were also consulted. Identification is considered a primary process for the researchers to have an easier way of describing, classifying and incorporating information related to a certain floral species. For more organized manner, classification was done for easier access, enabling us to know the heritage and details of a plant, to avoid duplication of names and to facilitate easier communication between people about a certain plant. Scientific names and classification were checked and verified in Kew website (www.theplantlist.org).

Results and discussion:

Species Richness

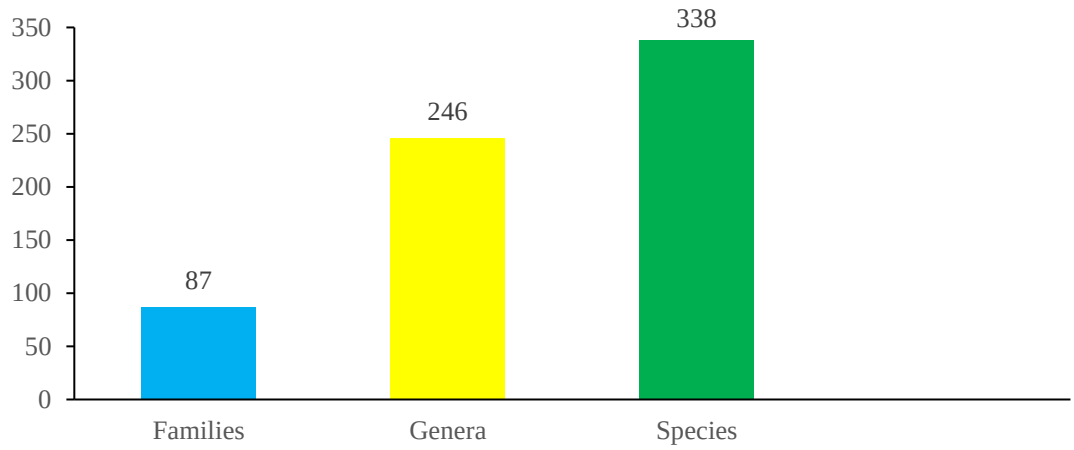
A total of 338 species of vascular plants belonging to 246 genera and 87 families were documented in BSU La Trinidad Main Campus (Fig. 2; Tab. 1, Annexes). This shows a high species richness in the campus which is much higher than those documented in nearby areas. Species richness in the campus is much higher than those documented in nearby Alno Communal Forest by Lumbres et al. (2014) at 78 species belonging to 43 families, Talinguroy Research Station by Guron et al. (2019) at 68 species belonging to 40 families and in Palina River, Kibungan by Batani et al. (on press) at 61 species under 25 families. The species richness in the campus is more comparable with the result of Salcedo (2001) in northern slope of Mt. Amuyao, Mountain Province with 280 vascular plant species belonging to 180 genera and 84 families. This proves interesting indeed since amidst the high rate of human disturbance in the campus, it still harbors a wealth of species richness of vascular plants. However, this high species richness in the campus is mainly human-induced with the creation of several land-uses (agricultural, agroforestry, forestry, silvi-pastoral, residential, urban) in the campus creating several microhabitats that favor different plants to grow. Additionally, the introduction of several ornamental plants for landscaping purposes greatly enhanced the campus' plant diversity (see later discussions). Nonetheless, these findings support the conclusion of Rajendran et al. (2014) that campuses pose a lot of potential for biodiversity conservation.

Comparing our result with other biodiversity studies in university campuses, our result is much higher than those documented by Kumar et al. (2016) in K.M. Government College campus Narwana, India at 83 species but it is comparable with Rajendran et al. (2014) result in Bharathiar University Campus, India of 335 vascular plant species belonging to 222 genera and 67 families.

In terms of species richness, families Asteraceae, Poaceae and Fabaceae were the most represented with 21, 21, 20 species, respectively, followed by Euphorbiaceae with 16, Asparagaceae with 14, Araceae with 11 and Solanaceae with 10 species (Fig. 3, Annexes). The species richness of families Asteraceae, Fabaceae and Poaceae in the campus is not unexpected since these are three of the largest plant families (Pancho and

Gruezo 2012). These three families harbor species of certain importance and feature wide distribution. Asteraceae family or sunflower family consists of 1,911 genera and 32,205 species worldwide (Royal Botanic Gardens Kew and Missouri Botanic Garden 2019), Fabaceae has 946 genera and about 24, 505 species and Poaceae has 759 genera and 11,554 species. Several of the species under these families serve as crops, ornamentals and weeds contributing to their wide distribution. The Asteraceae is the most represented family in BSU because the conditions that it requires to flourish are met in the area. According to Pacific Open Space, Inc. (2019), Asteraceae are found in all soil types and moisture condition, in open and sunny areas. It is also common in dry grasslands, meadows, desert, seabluffs, fresh erosion and disturbed soil. Also, the continuous human disturbance in the campus contributes to opening new areas that weedy Asteraceae can readily colonize. This family is equipped with fast dispersal of their cypsela and its fast growth rate (Napaldet and Buot 2019). The semi-temperate condition of the area also favours this plant family (Pancho and Gruezo 2012).

Figure no. 2 Number of plant families, genera and species inventoried at BSU La Trinidad Main Campus



On the other hand, the majority of the Fabaceae species in the campus are ornamentals, crops and weeds, while Poaceae species are predominantly weeds except for some food grains (*Oryza sativa*, *Zea mays*), medicinal ornamentals (*Cymbopogon citratus*) and plants as building materials (*Bambusa* spp.). This result is comparable with the findings of Rajendran et al. (2014) which has likewise found Fabaceae and Poaceae to be the most represented in Bharathiar University Campus, India.

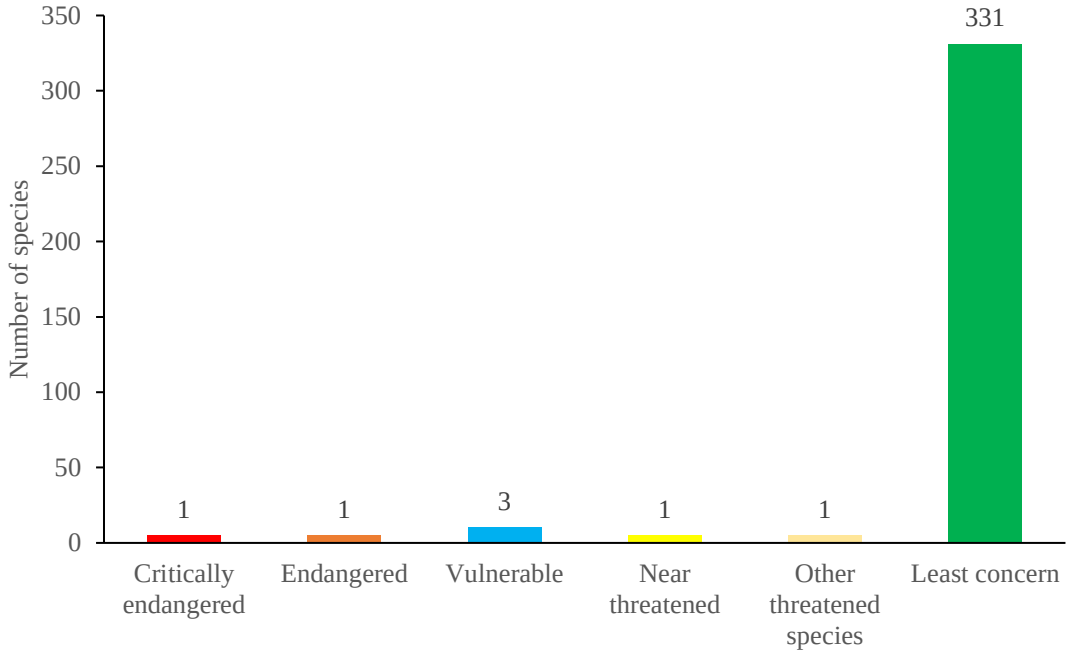
The diversity of Euphorbiaceae, Asparagaceae and Araceae in BSU Main Campus is predominantly due to the introduction of ornamental species belonging to these families. These include *Codiaeum variegatum, Euphorbia cotinifolia, E. milii, E. pulcherrima, E. tirucalli* and *E. tithymaloides* of family Euphorbiaceae; *Agave ovatifolia*, *Asparagus* spp., *Chlorophytum comosum*, and *Dracaena* spp. of family Asparagaceae; and *Alocasia micholitziana*, *Anthurium* spp., *Dieffenbachia amoena*, *Philodendron* spp., and *Zamioculcas zamiifolia* of family Araceae. However, most of these are exotic species or non-native to the area. On the other hand, Solanaceae diversity in the campus is mainly due to cultivation of food crop species

of this family such as *Solanum* spp. and *Capsicum frutescens*.

Conservation status and ecological distribution

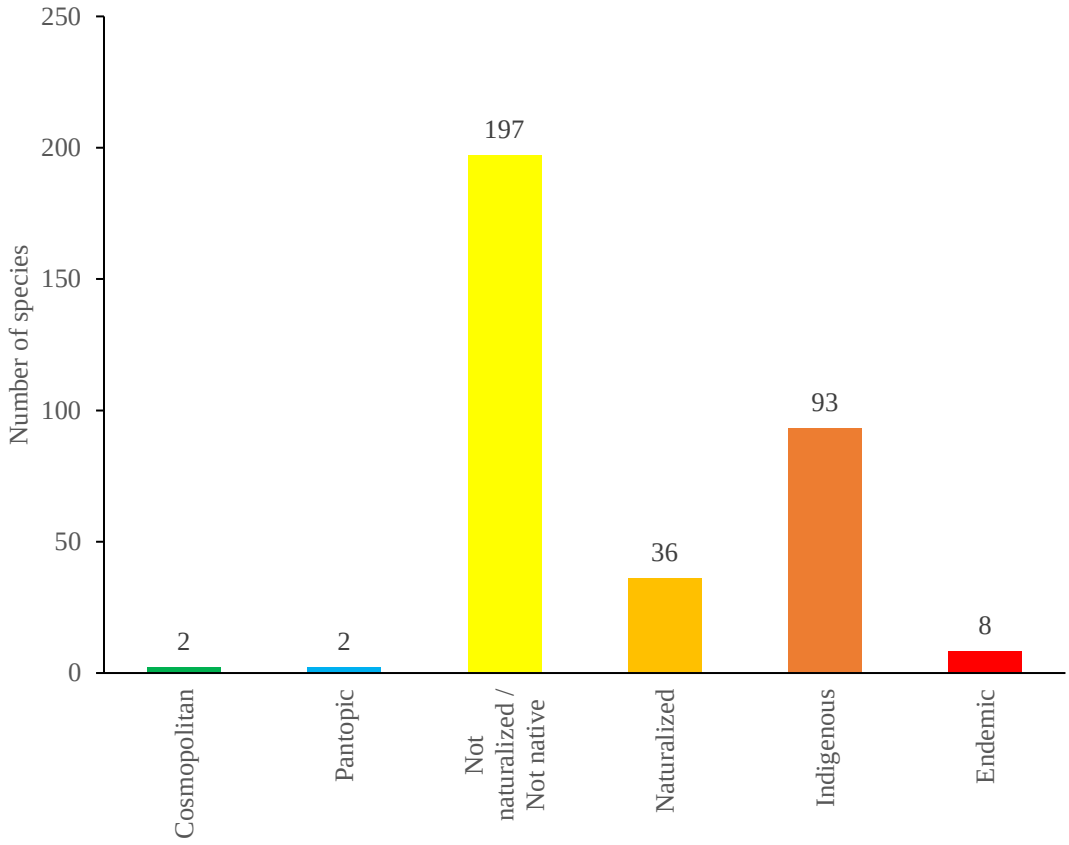
Amidst the high species richness of vascular plants, the campus contributes little in biodiversity conservation. This is revealed in Figure 4 showing that almost all vascular plants in the campus are the least concern with very few biodiversity-important species. These include species that are: critically endangered *Pterocarpus indicus*; endangered *Medinilla pendula*; vulnerable *Asplenium nidus*, *Cyathea contaminans* and *Alocasia micholitziana*; near threatened *Calamus manillensis*; and other threatened species such as *Rosa transmorrisonensis*.

Figure no. 4 Conservation status of vascular plants in Benguet State University La Trinidad Main Campus



Moreover, majority of vascular plants in the campus are not native (Fig. 5). This is primarily due to the introduction of ornamental plants for landscaping in the university without regard to the bad impacts of exotic species. According to Simberloff (2000), invasive introduced species rank second only to habitat destruction in terms of threats to biodiversity. In fact, the introduced species are a greater threat to native biodiversity than pollution, harvest, and disease combined. Out of the 338 species of vascular plants in the campus, 200 are introduced as exotic species. The large number of these exotic species is more alarming than the 64 exotic species out of 335 total species in Bharathiar University Campus, India by Rajendran et al. (2014). This shows the immediate need to alert the management of the university to improve its biodiversity conservation efforts. This become more prevalent with the high rate of biodiversity loss in different areas of Cordillera brought up by rampant forest conversion at the backdrop (Navarro and Saldo 2000).

Figure no. 5 Ecological distribution / status of vascular plants in Benguet State University La Trinidad Main Campus



Major classification and plant habit

Dicot plants are predominant in BSU La Trinidad Main Campus followed by monocot, pteridophytes and gymnosperm (Fig. 6). This is expected since dicot species is the largest plant group worldwide with about 175,000 compared to 60,000 species of monocot, 1,000 gymnosperm and 13,000 pteridophytes (Britannica.com and Plant list.com). In terms of plant habit, herbs predominate in the campus with 196 species followed by 55 trees and 50 shrub species (Fig. 7). The highest diversity of herbs in the campus has arisen from the introduction of many ornamental herbs coupled with human disturbance on many areas of the campus resulting to the proliferation of many weedy herbs or grass. This is consistent with the result of Kumar et al. (2016) in K.M. Government College campus Narwana, India, who also found herb to be most diverse. These findings support the claim of Langenberger (2004) that herbs and shrubs should also be focused on in biodiversity studies since these account for the bulk of species richness of many ecosystems.

Economic / ecological importance of vascular plants in BSU

Figure 8 shows that the majority of the vascular plants in BSU are ornamentals (186 species) followed by weeds (74), crops as food (58) and crops as wood (12). Majority of these ornamentals are introduced species with very few (4) endemic, some (27) indigenous and few (7) naturalized ones (refer to

Annexes, Tab. 1, to see complete list). This limited number of endemic / indigenous ornamentals in the campus is inexcusable due to high diversity of unique plants in the area that can be propagated as ornamentals. In fact, the diversity of flora in Baguio and Benguet had puzzled the first Americans who visited the area. In 1904, Merrill noted that the Benguet-Bontoc region, located at the southern part of CCR has a unique type of vegetation, and the plant species found in this area is not found in other parts of the Philippines (Balangcod et al. 2011).

Figure no. 6 Major classification of vascular plants in Benguet State University La Trinidad Main Campus

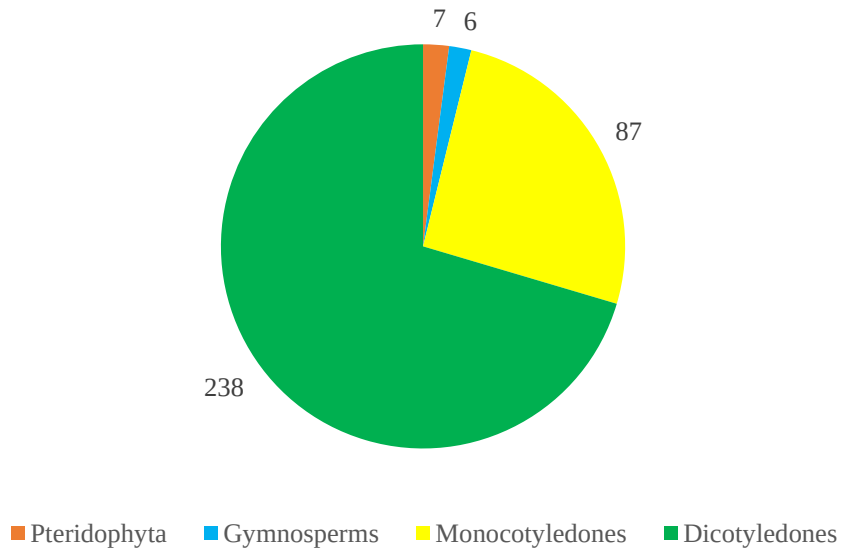


Figure no. 7 Plant habit of vascular plants in Benguet State University La Trinidad Main Campus

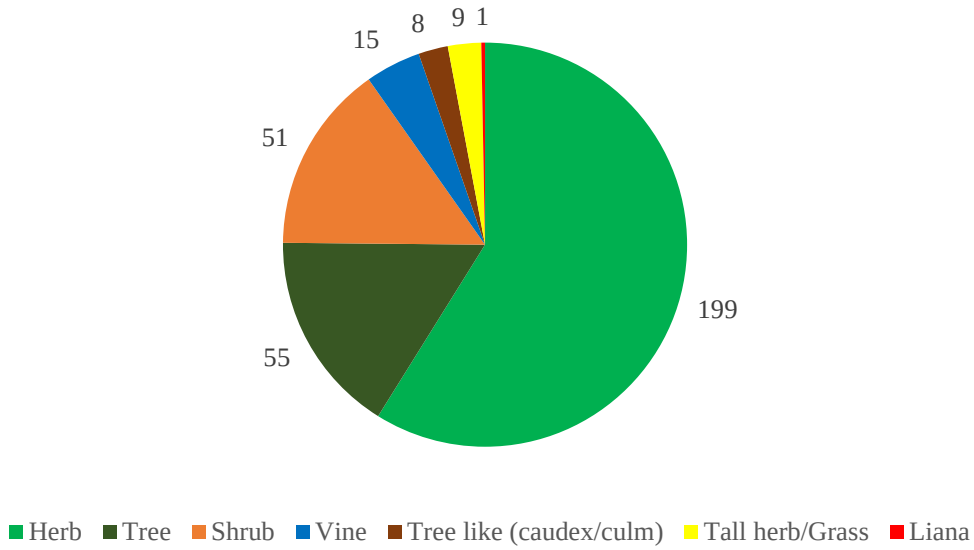
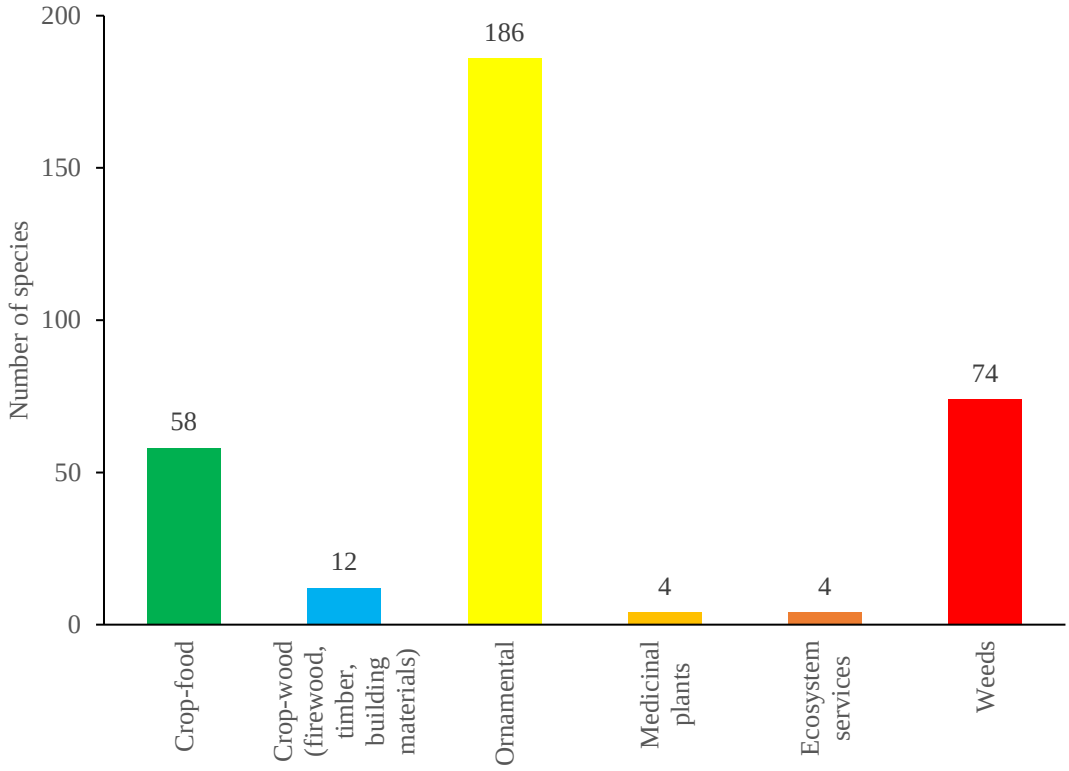


Figure no. 8 Economic / ecological importance of vascular plants in Benguet State University La Trinidad Main Campus



Additionally, there are some indigenous trees introduced in the campus as ornamentals that are not suitable in the area, namely *Casuarina equisetifolia*. This may be an indigenous species in the country but it is suited only in the lowland. In the campus, it was planted along campus roads but was observed to easily topple down during heavy rains / typhoon endangering both life and properties. If the university has really been keen on having trees with needle-like leaves, then it could have planted a highland suited *Gymnostoma* sp., a related species of *Casuarina equisetifolia*. Another alarming result of the study is the proliferation of exotic *Spathodea campanulata*. According to Global Invasive Species Database (2020), this tree - invades agricultural areas, forest plantations and natural ecosystems, smothering other trees and crops as it grows becoming the prevailing tree in these areas and thus it should not be encouraged to be propagated not just here in the campus but also in the whole country in general.

Weeds are also diverse in the campus. Notable ones are *Ageratum conyzoides*, *Amaranthus spinosus*, *Axonopus compressus*, *Bidens pilosa*, *Chromolaena odorata*, *Commelina diffusa*, *Cynodon dactylon*, *Digitaria sanguinalis*, *Eleusine indica*, *Galinsoga parviflora*, *Lantana camara*, *Mikania cordata*, *Mimosa pudica*, *Paspalum conjugatum*, *Plantago major*, *Pennisetum purpureum*, *Portulaca oleracea*, *Oxalis corniculata*, *Rumex obtusifolius*, *Solanum americanum*, *Sonchus oleraceus* and *Spergula arvensis* which were counted among the world's worst weeds (Holm et al. 1977). These plants are usually found in farrowing / abandoned farms in the campus but some of them are used as ground cover in parks (*A. compressus*, *C. dactylon*, *P. conjugatum*),

fodder (*E. indica*, *P. purpureum*) and as food (*S. americanum*). Nonetheless, these weeds are usually removed upon resumption of farm cultivation.

Conclusions:

The study documented a total of 338 species of vascular plants in Benguet State University La Trinidad main campus belonging to 246 genera and 87 families. Asteraceae, Poaceae and Fabaceae were the most represented families with 21, 21, 20 species, respectively, followed by Euphorbiaceae with 16, Asparagaceae with 14, Araceae with 11 and Solanaceae with 10 species. Herb species dominate in the campus with 199 species. However, amidst the high species richness, the campus contributes little to biodiversity conservation since the majority of its vascular plants are the least concern (331) and not native (197) introduced rampantly as ornamentals with obvious neglect of its negative impact.

Nonetheless, these findings show that university campuses pose a lot of potential for biodiversity conservation with sufficient mainstreaming of biodiversity considerations in economic sectors, and in cross-sectoral policies such as development plans and budgets. This inventory is an important baseline information that should be incorporated in drafting land use and other developmental plans for the university. The several exotic species in the university should be replaced with indigenous or endemic species incorporating these in the landscaping of the university.

Rezumat:

DIVERSITATEA PLANTELOR VASCULARE DIN CAMPUSUL PRINCIPAL AL UNIVERSITĂȚII LA TRINIDAD DIN STATUL BENGUET, FILIPINE: UN RAPORT DE SITUAȚIE ȘI O BAZĂ DE DATE PENTRU SUSȚINEREA REALIZĂRII DEZVOLTĂRII DURABILE

Se susține că biodiversitatea se află în centrul dezvoltării durabile, dar o bază de date insuficientă împiedică realizarea acesteia, astfel încât se impune necesitatea mai multor studii privind biodiversitatea. Acest studiu și-a propus să contribuie în această direcție prin realizarea unui studiu privind plantele vasculare din campusul principal de la Universitatea La Trinidad din Statul Benguet, Filipine. A fost semnalat un mare număr de specii în cadrul Universității, respectiv 338 de specii, aparținând la 246 de genuri și 87 de familii. Cele mai reprezentate familii sunt Asteraceae, Poaceae și Fabaceae, cu 21, 21, și 20 de specii, urmate de Euphorbiaceae cu 16, Asparagaceae cu 14, Araceae cu 11 și Solanaceae cu 10 specii. Plantele ierboase domină în campus cu 199 de specii. Cu toată această bogăție ridicată a speciilor, campusul contribuie puțin la conservarea biodiversității, deoarece majoritatea plantelor sale vasculare sunt stabile (331), iar cele exotice (200), introduse agresiv ca plante ornamentale, cu neglijarea evidentă a impactului lor negativ. Totuși, această constatare arată că campusurile universitare prezintă mult potențial pentru conservarea biodiversității, prin integrarea considerațiilor privind biodiversitatea în sectoarele economice, precum și în politicile intersectoriale, cum ar fi planurile de dezvoltare și bugetele.

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Istros – Museum of Braila "Carol I"

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Annexes:

Table no. 1 List of families and species of vascular plants in Benguet State University

Family	Species	CS	ES	EI	MC	Ha
Acanthaceae	*Blechum pyramidatum* (Lam.) Urb.	LC	NNv	W	D	He
	Justicia brandegeeana Wassh. & L.B.Sm	LC	NNv	O	D	Sh
	Justicia carnea Lindl	LC	NNv	O	D	He
	Odontonema tubaeforme (Bertol.) Kuntze	LC	NNv	O	D	Sh
	Pachystachys lutea Nees	LC	NNv	O	D	Sh
	Sanchezia nobilis Hook.f	LC	NNv	O	D	Sh
	Thunbergia erecta (Benth.) T. Anderson	LC	NNCu	O	D	Sh
Alstroemeriaceae	*Alstroemeria aurea* Graham	LC	NNCu	O	M	He
Amaranthaceae	*Alternanthera brasiliana* (L.) Kuntze	LC	NNv	O	D	He
	Alternanthera ficoidea (L.) Sm	LC	NNv	O	D	He
	Alternanthera sessilis (L.) R.Br. ex DC	LC	NNv	W	D	He
	Amaranthus spinosus L.	LC	IP	W	D	He
	Amaranthus viridis L.	LC	I	WCV	D	He
	Dysphania ambrosioides (L.) Mosyakin & Clemants	LC	NNv	W	D	He
Amaryllidaceae	*Allium ampeloprasum* L.	LC	ICu	CV	M	He
	Allium ramosum L.	LC	ICu	CV	M	He
	Crinum moorei Hook.f	LC	NNvCu	O	M	He
	Crinum sp.	LC	I	O	M	He
	Hippearastrum reticulatum (L 'H'er.) He	LC	NNvCu	O	M	He
	Zephyranthes atamasco (L.) He	LC	NNv	O	M	He
Anacardiaceae	*Mangifera indica* L.	LC	I	CFT	D	Tr
Annonaceae	*Annona muricata* L.	LC	NNv	CFT	D	Tr
Apiaceae	*Apium graveolens* L.	LC	NN	CV	D	He
	Centella asiatica (L.) Urb	LC	IP	W	D	He
Apocynaceae	*Allamanda cathartica* L.	LC	NNv	O	D	Sh
	Allamanda schottii Pohl.	LC	NNv	O	D	Sh
	Catharanthus roseus (L.) G.Don	LC	NNv	O	D	He
	Hoya benguetensis Schltr.	LC	E	O	D	Vi
	Hoya cumingiana Decne	LC	E	O	D	He
	Pachycymbium sp.	LC	NNvCu	O	D	He
Araceae	*Alocasia micholitziana* Sander	VU	E	O	M	He
	Anthurium andraeanum Linden ex André	LC	NNvCu	O	M	He
	Anthurium montanum Hemsl.	LC	NNvCu	O	M	He
	Colocasia esculenta (L.) Schott.	LC	I	CV	M	He
	Dieffenbachia amoena Bull.	LC	NNvCu	O	M	He
	Philodendron acreanum K.Krause	LC	NNvCu	O	M	He
	Philodendron 'Anderson Red Plant'	LC	NNvCu	O	M	Vi
	Philodendron sp.	LC	NNvCu	O	M	He
	Syngonium podophyllum Schott	LC	N	W	M	HeVi
	Xanthosoma sagittifolium (L.) Schott	LC	IP	WCV	M	He
	Zamioculcas zamiifolia (Lodd.) Engl	LC	NNvCu	O	M	He
Araliaceae	*Hydrocotyle* sp.	LC	IP	W	D	He
	Hydrocotyle verticillata Thunb	LC	IP	W	D	He

	Schefflera actinophylla (Endl.) Harms	LC	NNvCu	O	D	He
Araucariaceae	*Araucaria heterophylla* (Salisb.) Franco	LC	NNvCu	O	G	Tr
Arecaceae	*Calamus manillensis* (Mart.) H.Wendl	NT	E	CFT	M	Li
	Caryota rumphiana Mart.	LC	I	O	M	TrCa
	Cocos nucifera L.	LC	IP	CFT	M	TrCa
	Dypsis lutescens (H.Wendl.) Beentje & J.Dransf.	LC	NNvCu	O	M	TrCa
	Ptychosperma macarthurii (H.Wendl. ex H.J.Veitch) H.Wendl. ex Hook.f	LC	NNvCu	O	M	TrCa
	Rhapis excelsa (Thunb.) Henry	LC	NNvCu	O	M	Sh
	Roystonea regia (Kunth) O.F.Cook	LC	NNvCu	O	M	TrCa
Asparagaceae	*Agave ovatifolia* G.D.Starr & Villarreal	LC	NNCu	O	M	He
	Asparagus aethiopicus L.	LC	NNCu	O	M	He
	Asparagus africanus Lam	LC	NN	W	M	He
	Asparagus densiflorus (Kunth) Jessop	LC	NNCu	O	M	He
	Chlorophytum comosum (Thunb.) Jacques	LC	NNCu	O	M	He
	Cordyline fruticosa (L.) A.Chev	LC	NNCu	O	M	Sh
	Dracaena acaulis Baker	LC	NNCu	O	M	Sh
	Dracaena angustifolia (Medik.) Roxb.	LC	IP	O	M	Sh
	Dracaena fragrans (L.) Ker Gawl	LC	NNCu	O	M	Sh
	Dracaena reflexa Lam	LC	NNCu	O	M	Sh
	Dracaena surculosa Lindl	LC	NNCu	O	M	Sh
	Ophiopogon japonicus (Thunb.) Ker Gawl.	LC	I	O	M	He
	Sansevieria canaliculata Carrière	LC	NNCu	O	M	He
	Sansevieria trifasciata Prain	LC	NNCu	O	M	He
Aspleniaceae	*Asplenium nidus* L.	VU	I	O	P	He
Asteraceae/ Compositae	*Ageratina riparia* (Regel) R.M.King & H.Rob	LC	NNv	W	D	He
	Ageratum conyzoides (L.) L.	LC	NNv	W	D	He
	Bidens pilosa L.	LC	IP	W	D	He
	Chromolaena odorata (L.) R.M.King & H.Rob	LC	NNvIv	W	D	He
	Chrysanthemum indicum L.	LC	NNv	O	D	He
	Coreopsis drummondii (D.Don) Torr. & A.Gray	LC	NNCu	O	D	He
	Crassocephalum crepidioides (Benth.) S.Moore	LC	NNv	W	D	He
	Erigeron sumatrensis Retz	LC	NP	W	D	He
	Elephantopus tomentosus	LC	N	W	D	He
	Euryops chrysanthemoides (DC.) B.Nord	LC	NNCu	O	D	He
	Galinsoga parviflora Cav.	LC	NNvIv	W	D	He
	Lactuca sativa L.	LC	NNvCu	CV	D	He
	Lactuca sativa subsp. *longifolia* (Lam.) Alef	LC	NNvCu	CV	D	He
	Mikania cordata (Burm.f.) B.L.Rob	LC	NNv	W	D	He

	Pseudoelephantopus tomentosus	LC	NNv	W	D	He
	Sonchus oleraceus (L.) L.	LC	NNvIv	W	D	He
	Tagetes erecta L.	LC	NNvCu	O	D	He
	Taraxacum officinarum	LC	NNv	W	D	He
	Tithonia diversifolia (Hemsl.) A.Gray	LC	NIv	W	D	Sh
	Youngia japonica (L.) DC	LC	I	W	D	He
	Zinnia elegans L.	LC	NNCu	O	D	He
Balsaminaceae	*Impatiens balsamina* L.	LC	ICu	O	D	He
	Impatiens walleriana Hook.f	LC	N	O	D	He
Basellaceae	*Basella alba* L.	LC	NNvP	CV	D	He
	Basella rubra	LC	NNvP	CV	D	He
Begoniaceae	*Begonia robusta* Blume	LC	ICu	O	D	He
	Begonia sp. 1	LC	ICu	O	D	He
	Begonia sp. 2	LC	ICu	O	D	He
	Begonia sp. 3	LC	ICu	O	D	He
	Begonia sp. 4	LC	ICu	O	D	He
Betulaceae	*Alnus japonica* (Thunb.) Steud	LC	NN	CFW	D	Tr
Bignoniaceae	*Spathodea campanulata* P.Beauv	LC	NNv	O	D	Tr
Boraginaceae	*Ehretia microphylla* Lam	LC	ICu	O	D	Sh
Brassicaceae	*Brassica oleracea* var. italica	LC	NNvCu	CV	D	He
	Brassica oleracea var. sabellica L.	LC	NNvCu	CV	D	He
	Brassica rapa subsp. *pekinensis*	LC	NNvCu	CV	D	He
	Cardamine hirsuta L.	LC	N	W	D	He
	Rorippa indica (L.) Hiern	LC	IP	W	D	He
Bromeliaceae	*Neoregelia* 'rosy morn'	LC	NNCu	O	D	He
	Vriesea imperialis Carrière	LC	NNCu	O	D	He
Cactaceae	*Cereus repandus* (L.) Mill.	LC	NNCu	O	D	He
	Hylocereus undatus (Haw.) Britton & Rose	LC	NNCu	O	D	He
	Mammillaria elongata DC	LC	NNCu	O	D	He
	Mammillaria sp.	LC	NNCu	O	D	He
	Opuntia sp.	LC	NNCu	O	D	He
Campanulaceae	*Hippobroma longiflora* (L.) G.Don	LC	NNv	OW	D	He
Cannaceae	*Canna indica* L.	LC	N	OW	M	He
	Canna sp.	LC	NNv	OW	M	He
	Canna x generalis L.H. Bailey & E.Z. Bailey	LC	NNv	OW	M	He
Caricaceae	*Carica papaya* L.	LC	NNvCu	CFT	D	Tr
Caryophyllaceae	*Drymaria cordata* (L.) Willd. ex Schult	LC	NNv	W	D	He
	Spergula arvensis L.	LC	N	W	D	He
Casuarinaceae	*Casuarina equisetifolia* L.	LC	ILL	O	D	Tr
Chloranthaceae	*Sarcandra glabra* (Thunb.) Nakai	LC	I	OMP	D	He
Cleomaceae	*Cleome houtteana* Schltdl.	LC	NNvIv	W	D	He
Combretaceae	*Terminalia catappa*	LC	ILL	O	D	Tr
Commelinaceae	*Belosynapsis* sp.	LC	I	W	M	He
	Commelina diffusa Burm.f	LC	IP	W	M	He
	Tradescantia pallida (Rose) D.R.Hunt	LC	NN	W	M	He
	Tradescantia spathacea Sw.	LC	N	O	M	He
	Tradescantia zebrina var. *zebrine*	LC	NNvIv	OW	M	He

Convolvulaceae	*Ipomoea aquatica* Forssk	LC	IP	CV	D	He
	Ipomoea batatas (L.) Lam	LC	IP	CV	D	He
	Ipomoea carnea Jacq.	LC	NNvCu	O	D	He
	Ipomoea cairica (L.) Sweet	LC	NNv	OW	D	He
Crassulaceae	*Crassula ovata* (Mill.) Druce	LC	NNvCu	O	D	He
	Crassula sp.	LC	NNvCu	O	D	He
	Echeveria secunda Booth ex Lindl	LC	NNvCu	O	D	He
	Kalanchoe integra (Medik.) Kuntze	LC	IP	O	D	He
	Sedum morganianum E.Walther	LC	NNvCu	O	D	He
	Sedum pachyphyllum Rose	LC	NNvCu	O	D	He
	Sedum rupestre L.	LC	NNvCu	O	D	He
	Sedum sp.	LC	NNvCu	O	D	He
Cucurbitaceae	*Cucurbita maxima* Duchesne	LC	NNvCu	CV	D	Vi
	Lagenaria siceraria (Molina) Standl	LC	NCu	O	D	Vi
	Melothria pendula L	LC	NNv	W	D	Vi
	Sechium edule (Jacq.) Sw	LC	NNvCu	CV	D	Vi
Cupressaceae	*Cupressus lusitanica* Mill	LC	NNvCu	O	G	Tr
	Cupressus nootkatensis D.Don	LC	NNvCu	O	G	Tr
	Platycladus orientalis (L.) Franco	LC	NNvCu	O	G	Tr
Cyatheaceae	*Cyathea contaminans* (Wall. ex Hook.) Copel	VU	I	O	P	TrCa
Cycadaceae	*Cycas revoluta* Thunb	LC	NNvCu	O	G	Tr
Cyperaceae	*Cyperus distans* L.f	LC	IP	W	M	He
	Cyperus involucratus Rottb	LC	IP	W	M	He
	Cyperus sp.	LC	IP	W	M	He
	Kyllinga brevifolia Rottb	LC	IP	W	M	He
Dennstaedtiaceae	*Pteridium aquilinum* (L.) Kuhn	LC	I	W	P	He
Dioscoreaceae	*Dioscorea alata* L.	LC	ICu	CR	D	Vi
Equisetaceae	*Equisetum ramosissimum* Desf.	LC	IP	OW	P	He
Ericaceae	*Rhododendron* sp.	LC	NNvCu	O	D	Sh
	Vaccinium ovatum Pursh	LC	NNvCu	O	D	Sh
Euphorbiaceae	*Codiaeum variegatum* (L.) Rumph. ex A.Juss	LC	NNvCu	O	D	Sh
	Euphorbia cotinifolia L.	LC	NNvCu	O	D	Sh
	Euphorbia hirta L.	LC	I	W	D	He
	Euphorbia milii Des Moul	LC	I	O	D	He
	Euphorbia nutans Lag	LC	NNv	W	D	He
	Euphorbia prostrata Aiton	LC	I	W	D	He
	Euphorbia pulcherrima Willd. ex Klotzsch	LC	ICu	O	D	Sh
	Euphorbia tirucalli L.	LC	NNv	O	D	He
	Euphorbia tithymaloides L.	LC	NNv	O	D	He
	Euphorbia tomentulosa S.Watson	LC	NNvI	O	D	He
	Hura crepitans	LC	NNv	O	D	Tr
	Jatropha curcas L.	LC	NNv	O	D	Tr
	Jatropha podagrica Hook	LC	NNv	O	D	He
	Mallotus molissisimus	LC	I	O	D	Tr
	Manihot esculenta Crantz	LC	NNv	CR	D	Sh
	Ricinus communis L.	LC	NNv	OW	D	Sh
Fabaceae/ Leguminosae	*Acacia confusa* Merr.	LC	ILL	O	D	Tr
	Acacia mangium Willd.	LC	N	O	D	Tr
	Albizia saman (Jacq.) Merr.	LC	N	O	D	Tr
	Arachis pintoi Krapov. & W.C.Greg	LC	NNv	CFo	D	He

	Bauhinia malabarica Roxb.	LC	NNv	O	D	Tr
	Cajanus cajan (L.) Millsp.	LC	ICu	CF	D	Sh
	Calliandra calothyrsus Meisn.	LC	N	CFW	D	Tr
	Desmodium procumbens (Mill.) Hitchc.	LC	NNvP	W	D	Vi
	Desmodium velutinum (Willd.) DC	LC	I	W	D	Sh
	Enterolobium cyclocarpum	LC	NNCu	CT	D	Tr
	Erythrina crista-galli L.	LC	NNvCu	O	D	Tr
	Erythrina variegata L.	LC	I	O	D	Tr
	Inga edulis Mart.	LC	NNv	CF	D	Tr
	Leucaena leucocephala (Lam.) de Wit	LC	N	CFW	D	Tr
	Mimosa pudica L.	LC	N	W	D	He
	Phaseolus vulgaris L.	LC	ICu	CF	D	Vi
	Pisum sativum L.	LC	NNCu	CF	D	Vi
	Pterocarpus indicus Willd	CEN	I	CT	D	Tr
	Senna spectabilis (DC.) H.S. Irwin & Barneby	LC	NNv	O	D	Tr
	Vigna unguiculata subsp. *sesquipedalis* (L.) Verdc	LC	ICu	CF	D	Vi
Heliconiaceae	*Heliconia acuminata* A. Rich	LC	NNv	O	M	THe
	Heliconia metallica Planch. & Linden ex Hook	LC	NNv	O	M	THe
	Heliconia psittacorum L.f	LC	NNv	ES	M	THe
Hydrangeaceae	*Deutzia pulchra* S. Vidal	LC	I	O	D	Tr
	Hydrangea macrophylla (Thunb.) Ser	LC	NNv	O	D	He
Iridaceae	*Gladiolus hortulanus* L.H. Bailey	LC	NNvCu	O	M	He
	Gladiolus sp.	LC	NNvCu	O	M	He
	Iridaceae sp.	LC	NNvCu	O	M	He
	Iris pseudacorus L.	LC	NNvCu	O	M	He
Lamiaceae	*Ajuga reptans* L.	LC	NNvCu	O	D	He
	Clerodendrum thomsoniae Balf.f	LC	NNvCu	O	D	Sh
	Gmelina arborea Roxb	LC	NNvCu	CT	D	Tr
	Mentha x piperita L.	LC	NNvCu	CF	D	He
	Origanum vulgare L.	LC	NNvCu	MP	D	He
	Plecranthus 'Mona Lavander'	LC	NNvCu	O	D	He
	Plectranthus acaulis Brummitt & Seyani	LC	NNvCu	O	D	He
	Rosmarinus officinalis L.	LC	NNvCu	CF	D	He
	Vitex negundo L.	LC	I	MP	D	Sh
Lauraceae	*Persea americana* Mill	LC	NNvCu	CF	D	Tr
	Cinnamomum camphora	LC	ILL	O	D	Tr
Lythraceae	*Cuphea hyssopifolia* Kunth	LC	NNvCu	O	D	He
	Cuphea viscosissima Jacq.	LC	NNvCu	W	D	He
	Lagerstroemia speciosa (L.) Pers.	LC	I	O	D	Tr
Malvaceae	*Abelmoschus esculentus* (L.) Moench	LC	ICu	CF	D	Sh
	Abutilon megapotamicum (A.Spreng.) A.St.-Hil. & Naudin	LC	NNvCu	W	D	Sh
	Hibiscus acetosella Welw. ex Hiern	LC	NNvCu	O	D	Sh

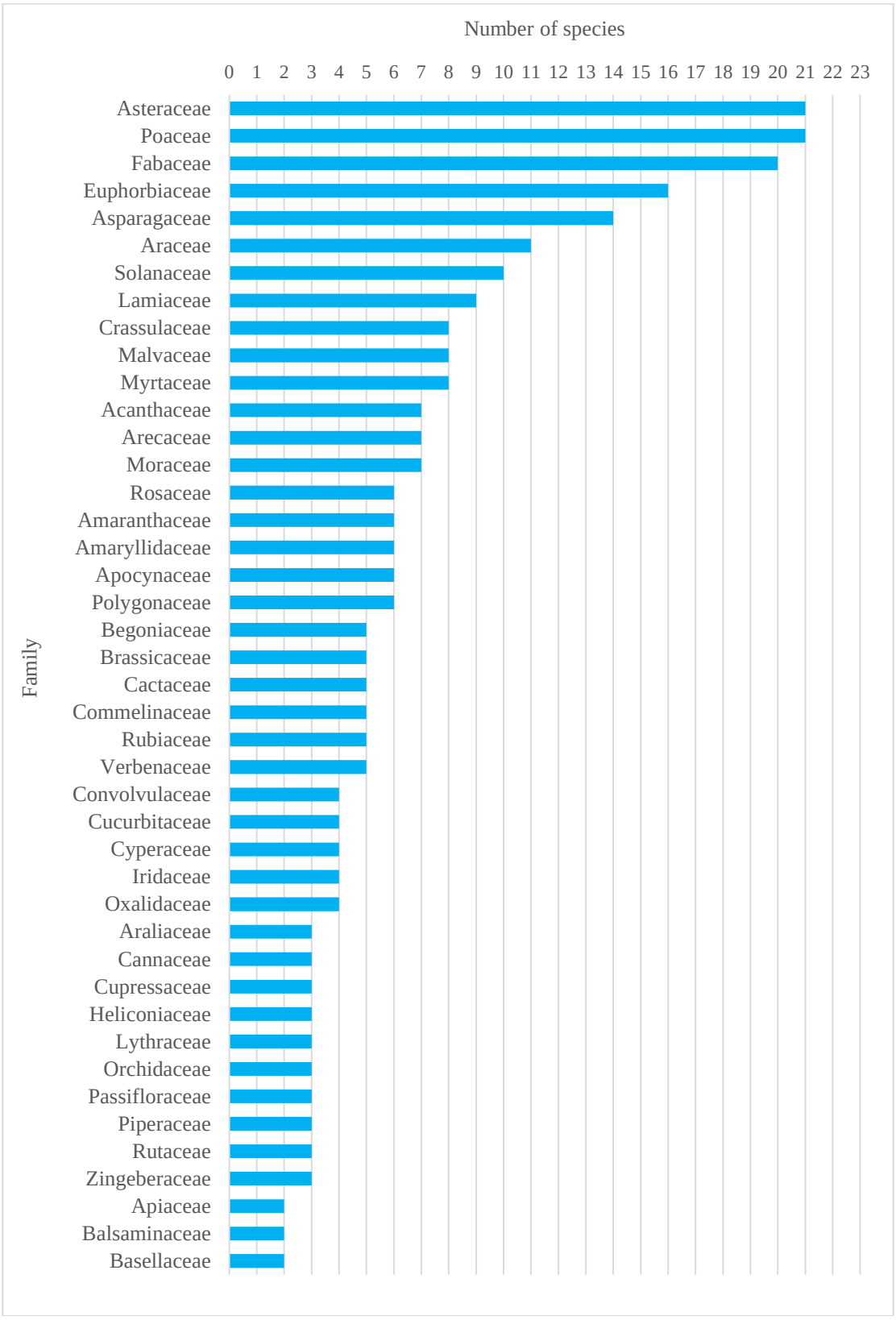
	Hibiscus rosasinensis L.	LC	NNvCu	O	D	Sh
	Hibiscus sabdariffa L.	LC	N	O	D	Sh
	Hibiscus sp. 2	LC	NNvCu	O	D	Sh
	Pachira aquatica Aubl	LC	NNvCu	O	D	Tr
	Sida acuta Burm.f	LC	N	W	D	He
Melastomataceae	*Medinilla pendula* Merr	EN	E	O	D	Sh
Meliaceae	*Melia azedarach* L.	LC	I	CT	D	Tr
	Swietenia macrophylla King	LC	NNvCu	CT	D	Tr
Menispermaceae	*Tinospora glabra* (Burm.f.) Merr	LC	I	NP	D	Vi
Moraceae	*Artocarpus heterophyllus* Lam	LC	N	CF	D	Tr
	Ficus benguetensis Merr	LC	E	ES	D	Tr
	Ficus benjamina L.	LC	I	O	D	Tr
	Ficus elastica Roxb. ex Hornem	LC	I	O	D	Tr
	Ficus septica Burm.f	LC	I	ES	D	Tr
	Ficus sp.	LC	NNvCu	O	D	Tr
	Morus alba L.	LC	N	CFT	D	Tr
Musaceae	*Musa x padesiaca*	LC	I	CF	M	THe
Myrtaceae	*Callistemon citrinus* (Curtis) Skeels	LC	NNvCu	O	D	Tr
	Eucalyptus camaldulensis Dehnh.	LC	NNvCu	O	D	Tr
	Eucalyptus deglupta Blume	LC	I	OMP	D	Tr
	Eucalyptus robusta Sm.	LC	NNv	O	D	Tr
	Psidium guajava L.	LC	N	CF	D	Tr
	Syzygium abbreviatum Merr.	LC	E	ES	D	Tr
	Syzygium myrtifolium Walp.	LC	NNvCu	O	D	Sh
	Syzygium subcaudatum (Merr.) Merr.	LC	E	CF	D	Tr
Nyctaginaceae	*Bougainvillea spectabilis* Willd	LC	NNvCu	O	D	ShLi
	Mirabilis jalapa L	LC	NNvCu	O	D	He
Nymphaeceae	*Nymphaea nouchali* Burm.f	LC	I	O	D	He
Orchidaceae	*Arundina graminifolia* (D. Don) Hochr.	LC	I	O	M	He
	Dendrobium sp.	LC	I	O	M	He
	Bulbophyllum sp.	LC	I	O	M	He
Oxiladiceae	*Oxalis abercornensis* R. Knuth	LC	NNv	O	D	He
	Oxalis corniculata L.	LC	I	OW	D	He
	Oxalis triangularis A. St.-Hil	LC	NNv	OW	D	He
	Oxalis violacea L.	LC	NNv	OW	D	He
Pandanaceae	*Pandanus amaryllifolius* Roxb.	LC	NNvCu	O	M	He
Passifloraceae	*Passiflora edulis* Sims	LC	N	CF	D	Vi
	Passiflora ligularis Juss.	LC	NNvIv	CF	D	Vi
	Turnera diffusa Willd. ex Schult	LC	NNv	O	D	Sh
Phyllanthaceae	*Phyllanthus urinaria* L.	LC	IP	W	D	He
	Sauropus androgynus (L.) Merr.	LC	NNvCu	CF	D	Sh
Phytolaccaceae	*Rivina humilis* L.	LC	NIv	O	D	Sh
Pinaceae	*Pinus kesiya* Royle ex Gordon	LC	I	CTES	G	Tr
Piperaceae	*Peperomia caperata* Yunck	LC	NNvCu	O	D	He
	Peperomia obtusifolia (L.) A. Dietr	LC	NNvCu	O	D	He
	Peperomia sp. 1	LC	NNvCu	O	D	He
Plantaginaceae	*Plantago major* L	LC	N	W	D	He
Poaceae	*Axonopus compressus* (Sw.) P. Beauv	LC	NNvP	W	M	He
	Bambusa guangxiensis L.C.Chia & H.L.Fung	LC	NNvCu	O	M	Sh

	Bambusa vulgaris	LC	I	CT	M	TrCu
	Coix lacryma-jobi L.	LC	N	W	M	TGr
	Cymbopogon citratus (DC.) Stapf.	LC	ICu	MP	M	He
	Cynodon dactylon (L.) Pers.	LC	IC	W	M	He
	Dendrocalamus giganteus Wall. ex Munro.	LC	NNCu	CT	M	TrCu
	Digitaria sanguinalis (L.) Scop.	LC	IC	W	M	He
	Eleusine indica (L.) Gaertn.	LC	I	W	M	He
	Eragrostis japonica (Thunb.) Trin.	LC	I	W	M	He
	Miscanthus floridulus (Labill.) Warb.	LC	I	W	M	TGr
	Oplismenus compositus (L.) P. Beauv.	LC	IP	W	M	He
	Oryza sativa L.	LC	NCu	CF	M	He
	Paspalum conjugatum P.J.Bergius	LC	NP	W	M	He
	Paspalum scrobiculatum L.	LC	CIv	W	M	He
	Pennisetum purpureum Schumach.	LC	NNvIv	W	M	TGr
	Pennisetum setaceum (Forssk.) Chiov.	LC	NNvIv	W	M	TGr
	Saccharum officinarum L.	LC	NCu	W	M	He
	Setaria palmifolia (J. Koenig) Stapf.	LC	IP	W	M	He
	Zea mays L.	LC	NCu	CF	M	He
	Zoysia matrella (L.) Merr.	LC	ICu	O	M	He
Polygonaceae	*Homalocladium platycladum* (F. Muell.) L.H. Bailey	LC	NNvCu	O	D	He
	Persicaria glabra (Willd.) M. Gómez	LC	I	W	D	He
	Polygonum abbreviatum Kom	LC	NNv	W	D	He
	Polygonum perfoliatum L.	LC	I	W	D	Vi
	Rumex obtusifolius L.	LC	NNv	W	D	He
	Triplaris cumingiana Fisch. & C.A. Mey.	LC	NNv	O	D	Tr
Polypodiaceae	*Drynaria quercifolia* (L.) J. Sm.	LC	I	O	P	He
Portulacaceae	*Portulaca oleracea* L.	LC	IP	OW	D	He
Primulaceae	*Ardisia crenata* Sims.	LC	NNvCu	O	D	He
Pteridaceae	*Adiantum* sp.	LC	I	O	P	He
	Pteris vittata L.	LC	I	W	P	He
Rosaceae	*Eriobotrya japonica* (Thunb.) Lindl	LC	NNCu	CF	D	Tr
	Fragaria × *ananassa* (Duchesne ex Weston) Duchesne ex Rozier	LC	NNvCu	CF	D	He
	Rosa transmorrisonensis Hayata	OTS	I	O	D	Sh
	Rosa sp.	LC	NNvCu	O	D	He
	Rosa sp. 2	LC	NNvCu	O	D	He
	Rubus fraxinifolius Poir	LC	I	CF	D	He
Rubiaceae	*Coffea arabica* L.	LC	NCu	CF	D	Sh
	Gardenia jasminoides J. Ellis	LC	NNvCu	O	D	Sh
	Ixora chinensis Lam	LC	NNvCu	O	D	Sh
	Oldenlandia accedens (Miq.) Kuntze	LC	NNv	W	D	He
	Serissa japonica (Thunb.) Thunb	LC	NNvCu	O	D	Sh
Rutaceae	*Citrus japonica* Thunb	LC	NNvCu	CF	D	Sh
	Citrus × *limon* (L.) Osbeck or Burm. F	LC	NNvCu	CF	D	Sh
	Citrus maxima (Burm.) Merr.	LC	NCu	CF	D	Tr

Salicaceae	*Flacourtia jangomas* (Lour.) Raeusch	LC	NCu	CF	D	Tr
Solanaceae	*Brugmansia versicolor* Lagerh	LC	NNv	O	D	Tr
	Capsicum annuum L.	LC	NCu	CF	D	HeSh
	Nicotiana tabacum L.	LC	NNvCu	CTa	D	He
	Physalis peruviana L.	LC	NNvIv	W	D	He
	Solanum americanum Mill.	LC	NP	OW	D	He
	Solanum betaceum Cav.	LC	NNvCu	CF	D	Sh
	Solanum lycopersicum L.	LC	CCu	CF	D	He
	Solanum melongena L.	LC	PCu	CF	D	HeSh
	Solanum triflorum Nutt.	LC	NNv	CF	D	He
	Solanum tuberosum L.	LC	NNvCu	CF	D	He
Talinaceae	*Talinum fruticosum* (L.) Juss.	LC	N	CFW	D	He
Tropaeolaceae	*Tropaeolum majus* L.	LC	NNvCu	O	D	He
Urticaceae	*Pilea microphylla* (L.) Liebm.	LC	NPT	W	D	He
	Gonostegia hirta	LC	I	W	D	He
Verbenaceae	*Duranta erecta* L.	LC	NNvCu	O	D	Sh
	Lantana camara L.	LC	NNvIv	O	D	Sh
	Lantana 'Trailing snow white'	LC	NNvCu	O	D	Sh
	Phyla nodiflora (L.) Greene	LC	P	O	D	He
	Verbena bonariensis L.	LC	NNv	W	D	He
Xanthorrhoeaceae	*Aloe perfoliata* L.	LC	NNvCu	O	D	He
	Aloe vera (L.) Burm.f	LC	NCu	O	D	He
Zingeberaceae	*Curcuma zedoaria* (Christm.) Roscoe	LC	NNv	O	M	He
	Hedychium coronarium J. Koenig	LC	NNvIv	O	M	THe
	Zingiber officinale Roscoe	LC	ICu	CF	M	He

Note: CS: Conservation Status (LC - Least Concern; NT - Near Threatened; VU - Vulnerable; EN - Endangered; CEN - Critically endangered; OTS - Other Threatened Species); ES: Ecological Status (CC-Cosmopolitan/Cultivated; CIv - Cosmopolitan/Invasive; E - Endemic; I - Indigenous; IC - Indigenous/Cosmopolitan; ICu - Indigenous/Cultivated; ILL - Indigenous/Lowland; IP - Indigenous/Pantropical; N - Naturalized; NCu - Naturalized/Cultivated; NIv - Naturalized/Invasive; NP - Naturalized/Pantropical; NN - Not Naturalized; NNCu - Not Naturalized/Cultivated; NNv - Not Native; NNvCu-Not Native/Cultivated; NNvIv-Not Native/Invasive; NNvP-Not Native/Pantropical; P-Pantropical; PCu - Pantropical/Cultivated); EI: Economic Importance (CF - Crop Food; CFW - Crop Firewood, N Fertilizer Source; CFo - Crop Fodder, N Fertilizer Source; CFT - Crop Fruit Trs; CR - Crop Rootcrop; CTa - Crop Tabacco; CT - Crop Timber; CTES - Crop Timber, Ecosystem Services; CFW - Crop Food to Weed; CFT - Crop Food Timber; CV - Crop Vegetable; ES - Ecosystm Services; MP - Medicinal Plant; O - Ornamental; OW - Ornamental Weed; OMP - Ornamental Medicinal Plant; W - Weed; WCV - Weed Crop Vegetable); MC: Major Classification (D - Dyledonates; M - Myledonates; G - Gymnospermes; P - Pteridophytes); Ha: Habit (He - Herb; Sh - Shrub; Tr - Tree; Vi - Vine; The - Tall Herb; HeSh - Herb/Shrub; HeVi - Herb/Vine; TGr - Tall Grass; TrCu - Tree Like Culm; Li - Liana; ShLi - Shrub/Liana; TrCa - Tree Like Caudex). (Conservation status is based on Threatened plants of the Philippines: a preliminary assessment by Fernando et al.; Ecological status is based on Co's Digital Flora).

Figure no. 3 Distribution of species in plant families inventoried at BSU La Trinidad Main Campus



(continue Fig. 3 from the previous page)