

The situation of florae diversity on the Nong Lam University campus, Ho Chi Minh City

Thuy T. Vuong*, Tien T. M. Duong, Huyen T. Nguyen, & The T. M. Ngo

Faculty of Environment and Natural Resources, Nong Lam University, Ho Chi Minh City, Vietnam

ARTICLE INFO	ABSTRACT
Research Paper Received: October 17, 2024 Revised: January 25, 2025 Accepted: March 17, 2025 Keywords Flora diversity Flora management Nong Lam University campus Species *Corresponding author Vuong Thi Thuy Email: vuongthuy@hcmuaf.edu.vn	College campuses usually have diverse floral habitats and plant communities. Nong Lam University is one of the largest universities in Vietnam with an area of 118 ha. This study determined the diversity of flora on the Nong Lam University campus. This research was carried out from June to September 2024 and collected systematic data to support the management of the university's flora. There were 243 recorded species, distributed in 70 families, including 12 rare species listed in the 2024 IUCN Red List (International Union for Conservation of Nature), and 9 species recorded in the Vietnam Red Data Book (2024). The study evaluated species diversity at many taxa such as phylum, class, order, genus, species, as well as plant growth forms, and origins. The current flora management practices were analyzed. Prior to this study, no flora database existed at the Nong Lam campus, including names, years of planting, ages, etc. Hence, the study recommended that the flora should be collected and managed using geographic information systems (GIS) and integrated into the university's website (webGIS). This will inform staff and students about the campus's plant biodiversity, promote awareness of the role of plants in ecology, and encourage the protection of existing flora.

Cited as: Vuong, T. T., Duong, T. T. M., Nguyen, H. T., & Ngo, T. T. M. (2026). The situation of florae diversity on the Nong Lam University campus, Ho Chi Minh City. *The Journal of Agriculture and Development* 25(3), 73-87.

1. Introduction

Florae on university campuses is critical for students' lives. Previous studies showed that the florae on campuses might improve the students' mental and physical health. Besides that, plants on campuses could reduce school violence (Alcock, 2014; Younan, 2016) by mitigating stress and

altering emotional states such as more happiness or less anxiety (Bowler et al., 2010; Lachowycz & Jones, 2013; Mcsweeney et al., 2015). In one research, Dymment & Bell (2008) concluded that in schools with plants, students behaved more civilly (72%), communicated more effectively (63%), were more cooperative (69%), and reinforced their interactions with teachers (69%). In addition,

there was a decline of 7% in health problems for children in classrooms with plants (Duijn et al., 2011). Besides that, students' scores significantly increased while studying in a green environment. Florae around the school buildings support raising test scores, grades, memory, work efficiency, and attention (Matsuoka, 2010). Lawns, gardens, and trees on campuses provide students with spaces for academic exchange, thus enhancing communication skills (Dymont & Bell, 2008). Moreover, flora communities support students' learning and living in a green environment and teach them a sense of responsibility for environmental sustainability (Doan, 2002).

Due to the importance of plant communities on campuses, many studies have been conducted to understand the situation and the diversity of florae on campuses. Jichun (2012) did research in three high schools in Suzhou City. The plant frequency and species richness were analyzed. The results found 144 plant species on campuses, belonging to 65 families, and 131 genera. There were 31 arbor species, 37 bush species, 73 herb species, and 3 liana species. Besides that, there were 92 cultivated species and 51 naturally growing weed species. Among them *Cynodon dactylon* and *Zoysia matrella* were the main weeds. Another study was conducted on the campus of five high schools in Chu-Shan town. There were 183 species found on these campuses. These species belonged to 138 genera and 57 families, including 2 Pteridophytes, 17 Gymnosperms, 140 Dicotyledons, and 24 Monocotyledons (Yang et al., 2011). Similarly, the Central University of Himachal Pradesh campus collected 125 plant samples, both cryptogams and phanerogams in 2019. The results showed there were 56 flora families and the dominance was *Poaceae* and *Asteraceae* (Dey et al., 2021). The diversity of woody plants on three university campuses, including Inner Mongolia University

(IMU), Inner Mongolia Agriculture University (IMAU), and Inner Mongolia Normal University (IMNU) was determined by Qing (2012). There were 85 species found in 29 families. Among them, they recorded 10 evergreen trees, 43 broadleaved trees, and 32 shrubs that belonged to 2, 20, and 13 families, respectively. IMU contained 63 plant species, which belonged to 24 families while IMAU and IMNU recorded 57, and 43 species, which belonged to 22, and 15 families correspondingly. Furthermore, due to the vital role of the flora ecosystem on campus, the plant management practice should be noticed. Barker concluded that an effective system in place to manage plants on campus was important. Suitable plant management could prevent risks, contribute to sustainable safety, and improve education (Barker, 2024). In summary, the previous studies showed that the florae on campuses were diverse and needed to be managed well. It is necessary to collect information on flora diversity on campuses and provide management planning for these communities.

Nong Lam University was established in 1955, with a campus area of nearly 120 ha, which is considered one of the largest universities in Ho Chi Minh City (Ngo, 2019). There have not been many studies on florae at the campus of Nong Lam University. It was recorded that only one research by Tran (2020) collected information on trees along main roads and lecture halls at Nong Lam University Campus. The 33 woody species were found belonging to 16 families. Thus, the study of flora diversity on the Nong Lam University Campus was still limited. The entire campus should be surveyed to determine the flora diversity. In addition, groups of habits, such as trees, shrubs, herbs, climbers, lilies, and bamboo, should be analyzed to build a comprehensive plant catalog for Nong Lam University. These results

may serve as the cornerstone for management and provide research and learning environment for lecturers and students. Therefore, the study on flora diversity on the Nong Lam University campus was conducted.

2. Materials and Methods

The main campus of Nong Lam University is located on an area of 118 ha that belongs to Linh Trung Ward, Thu Duc City, and Di An City, Binh Duong Province ($10^{\circ}52'16.6''\text{N}$ $106^{\circ}47'29.8''\text{E}$), belongs to the Southeast region so it has all the terrain, climate, and soil characteristics of the region. This region has a tropical monsoon climate (Köppen, 1948), high temperatures all year round, with a deep differentiation between the rainy and

dry seasons, and a predominance of rainfall from May to November. The terrain is mainly semi-plains, midlands, and low mountains below 1000 m above sea level. The main soil in the research area is primarily ancient alluvial gray soil and basalt (Nguyen et al., 2024). The Nong Lam University campus contains 13 sub-zones (Figure 1). The survey was carried out in the flowerbed, roads, gardens, interior, and between the open areas of the buildings, and nurseries of the entire campus from June 2024 to September 2024 (Figures 1 and 3). The data collection method included observation, information records, photography, and sample collection. These methods were conducted based on the documents of Klein & Klein (1970) for unidentified species. Figure 2 illustrates some of the collected samples.

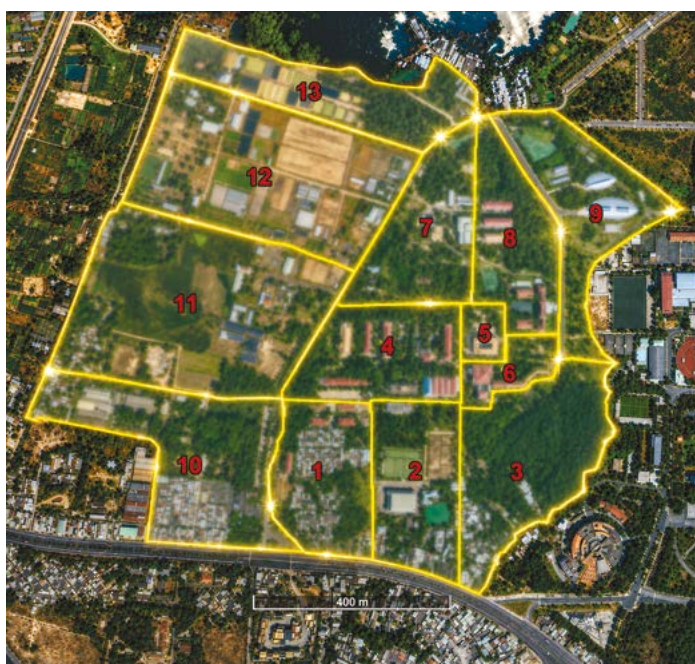


Figure 1. Map of the study areas. (1. Tam Giang area and Guest house, 2. Co May dormitory and stadium, 3. Area behind Rang Dong lecture hall, 4. Dormitory A, B, C, D, E, 5. Administrative building, 6. Rang Dong lecture hall, 7. Water pavilion area, Cam Tu building and Faculty of Mechanics, 8. Phuong Vy, Cat Tuong, Tuong Vy, Huong Duong building, 9. Faculty of Forestry, Faculty of Biology, 10. Kiosk and sawmill area, 11. Faculty of Environment & Natural Resources and Nguyen Thai Binh park, 12. Faculty of Agronomy nursery, 13. Aquatic experimental farm and Landscaping and environmental horticulture nursery).

The collected samples, photos, and descriptions of floras were compared morphologically with species in books, including “An Illustrated Flora of Vietnam” (Pham, 2000), “500 Useful Plants in Landscape Design” (Dinh, 2021), and “1001 Garden plants in Singapore” (Boo et al., 2006) to identify the species' botanical names. The updated scientific names of collected floras were updated according to the website (<http://www.worldfloraonline.org/>, 2024). The rarity of the species was verified in the

IUCN (International Union for Conservation of Nature) Red List categories (IUCN, 2024) and Vietnam Red Data Book - Part II Plants (MOST, 2024). The collected data were synthesized in Microsoft Excel 2015. In addition, an in-depth interview was conducted to understand the management situation of flora at the Nong Lam campus. The purposive sampling method was chosen. The participant was an officer who worked at the Facility Management office.

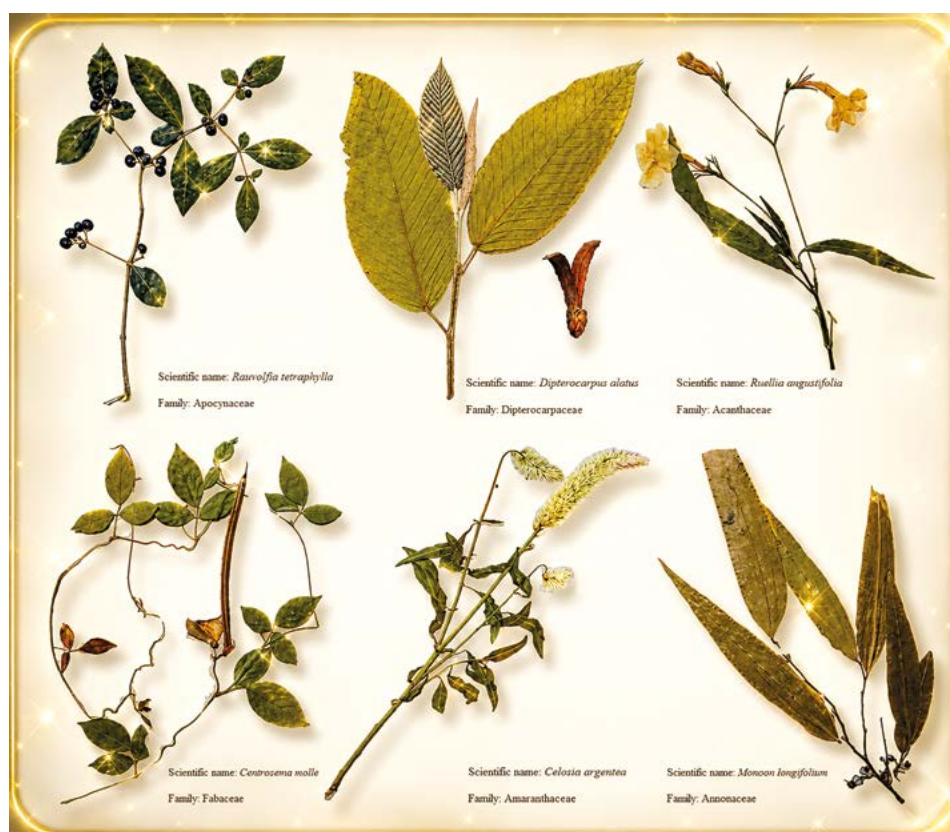


Figure 2. Specimens of some plant species at Nong Lam University.



Figure 3. Some survey areas in Nong Lam University campus. a) Zone 1 - Tam Giang area and Guest house b) Zone 4 - Dormitory c) Zone 6 - Rang Dong lecture hall d) Zone 7 - Water pavilion area, Cam Tu building and Faculty of Mechanics e) Zone 8 - Phuong Vy, Cat Tuong, Tuong Vy, Huong Duong building f) Zone 12 - Faculty of Agronomy nursery.

3. Results and Discussion

3.1. Inventory of floras at the Nong Lam University campus

Taxonomic diversity by phylum

The 243 flora species were recorded, belonging to 197 genera, 70 families, 30 orders, and 4 classes (Table 1).

Table 1. Taxon distribution by phylum and class

Phylum		Class		Order		Family		Genus		Species	
		Rate		Rate		Rate		Rate		Rate	
		Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Polypodiophyta	Polypodiopsida	1	25.0	1	3.3	1	1.4	1	0.5	1	0.4
Pinophyta	Pinopsida	1	25.0	1	3.3	2	2.9	2	1.0	2	0.9
Magnoliophyta	Magnoliopsida	2	50.0	22	73.3	53	75.7	151	76.2	192	98.7
	Liliopsida			6	20.0	14	20.0	43	22.3	48	
Total		4	100	30	100	70	100	197	100	243	100

Most taxa belonged to the phylum Magnoliophyta with 240 species (98.7%), 194 genera (98.4%), 67 families (95.7%), 28 orders (93.3%), and 2 classes (50%). Two phyla accounted for a very small proportion: Pinophyta with 2 species (0.9%), 2 genera (1.0%), 2 families (2.9%), 1 order (3.3%) and 1 class (25%); Polypodiophyta with 1 species (0.4%), 1 genus (0.5%), 1 family (1.4%), 1 order (3.3%), and 1 class (25%). These results were reasonable since the Nong Lam University campus is in Binh Duong Province and Thu Duc City, in the Southeast region (DFI, 2023) with a sub-equatorial climate and high temperatures year-round (EMP, 2017) is suitable for most species of the Magnoliophyta phylum.

Taxonomic diversity by class

There were differences in the distribution of taxa among three phyla, including

Magnoliophyta (Magnoliopsida class and Liliopsida class), Pinophyta (Pinopsida class), and Polypodiophyta (Polypodiopsida class) (Table 1). The Magnoliopsida class has 192 species, 151 genera, 53 families, and 22 orders. The Liliopsida class has 48 species, 43 genera, 14 families, and 6 orders. The Pinopsida class has the number of taxa at species, genus, family, and order levels 2, 2, 2, and 1, respectively. The Polypodiopsida class has the lowest number.

Taxonomic diversity by family

Among 70 flora families surveyed, the *Fabaceae* family had the highest number of species (35 species counted for 14.4%). The *Fabaceae* is a big plant family in Vietnam with about 600 species (Nguyen, 2003), making it the third largest flowering flora family following *Asteraceae* and *Orchidaceae* (Judd

et al., 2002). The *Fabaceae* family is suitable for campus cultivation. Additionally, other families were considered noteworthy such as *Arecaceae* (15 species), *Asteraceae* (12 species),

and *Apocynaceae* and *Poaceae* (11 species for each). Each remaining family accounted for 1 - 8 species. The number of species for each flora family was shown in Figure 4.

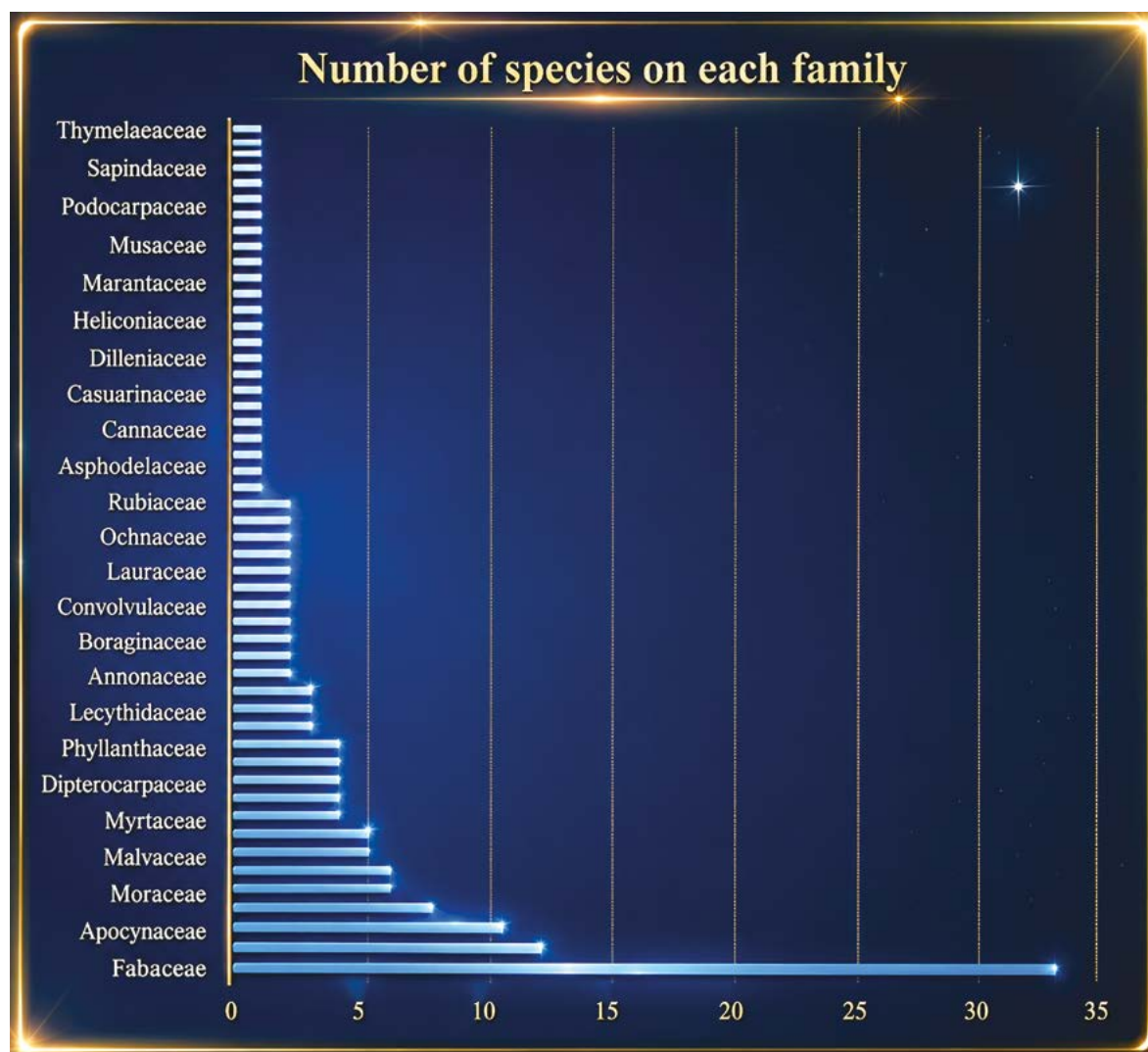


Figure 4. Number of species by families.

Taxonomic diversity of genus

A total of 197 genera were recorded at the Nong Lam University campus, of which 9 genera

(with 3 - 6 species per genus), accounted for 4.7%. The remaining genera were 1 - 2 species per genus (Figure 5).

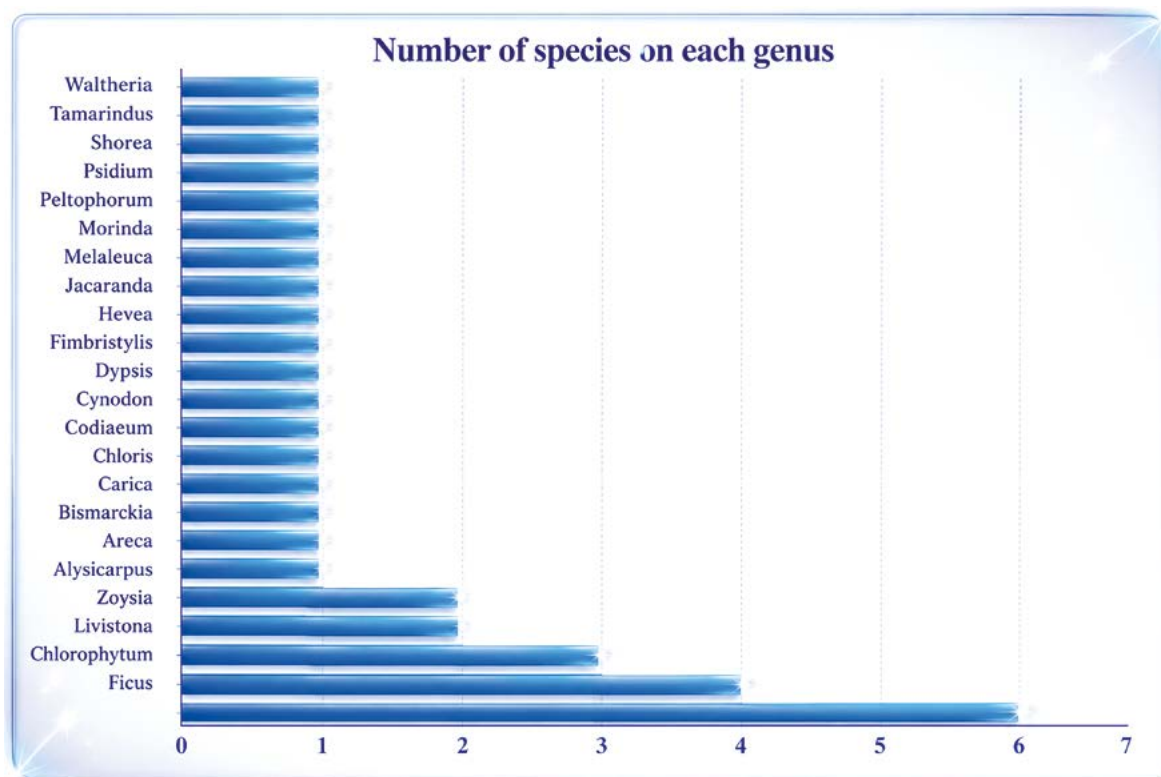


Figure 5. Number of species by genus.

Taxonomic diversity of species and their situation

The study recorded 243 plant species on the Nong Lam University campus. Among them, 12 species (5.1%) were listed in the IUCN Red List (IUCN, 2024), and 9 species (3.7%) were included in the Vietnam Red Data Book (MOST, 2024) (Table 2). *Aquilaria crassna*, *Diospyros mun*, and *Dalbergia oliveri* were classified as critically endangered (CR) in the IUCN Red List (IUCN, 2024); meanwhile, *Aquilaria crassna* and *Dalbergia oliveri* were endangered (EN), and *Diospyros mun* was vulnerable (VU) in the Vietnam Red Data Book (MOST, 2024). The numbers of individuals recorded were 14, 2, and 4, respectively. Most of these individuals were cultivated on the campus.

Pterocarpus indicus, *Pterocarpus macrocarpus*, *Anisoptera costata*, and *Swietenia macrophylla* were listed as EN species in the IUCN Red List (IUCN, 2024), with 17, 3, 9, and 1 individuals, respectively. All had been planted as ornamentals. Additionally, *Pterocarpus macrocarpus* and *Anisoptera costata* were also listed as EN species in the Vietnam Red Data Book (MOST, 2024).

Dipterocarpus alatus, *Hopea odorata*, *Madhuca pasquieri*, *Dalbergia tonkinensis*, and *Khaya senegalensis* were classified as vulnerable (VU) in the IUCN Red List (IUCN, 2024), with 533, 84, 1, 2, and 565 individuals, respectively. These species had also been cultivated for ornamental purposes. Moreover, *Madhuca pasquieri* and *Dalbergia tonkinensis* were categorized as EN species in the Vietnam Red Data Book (MOST, 2024).

Similarly, *Sindora siamensis* (2 individuals) and *Chukrasia tabularis* (7 individuals) were listed as EN and VU species, respectively, in the Vietnam Red Data Book (MOST, 2024). These results indicate that rare and valuable species comprised only a small proportion of the total recorded flora. Representative plant photographs are presented in Figure 6.

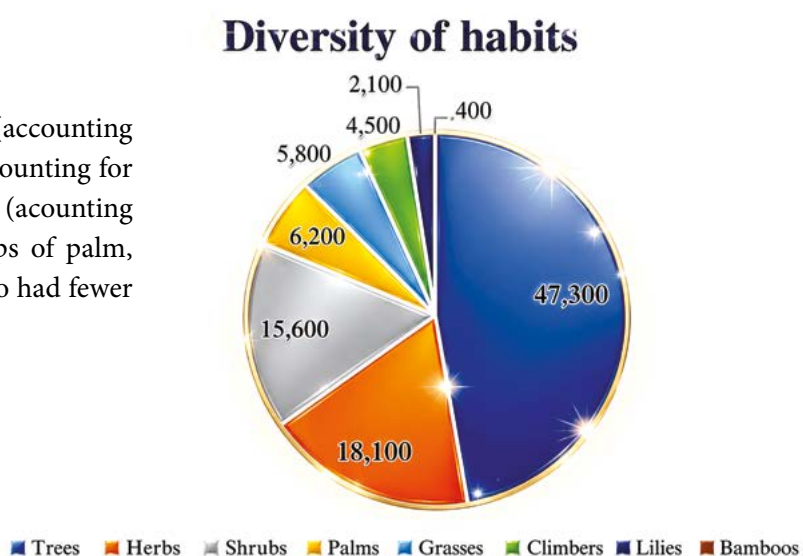
Table 2. List of species belonging to the IUCN Red List categories (2024) and the Vietnam Red Data Book (2024)

No.	Name	Family	Origin	Quantity	IUCN Red List (2024)	Vietnam Red Data Book (2024)
1	<i>Aquilaria crassna</i>	Thymelaeaceae	Cultivated	14	CR	EN
2	<i>Diospyros mun</i>	Ebenaceae	Cultivated	2	CR	VU
3	<i>Dalbergia oliveri</i>	Fabaceae	Cultivated	4	CR	EN
4	<i>Pterocarpus indicus</i>	Fabaceae	Cultivated	17	EN	
5	<i>Pterocarpus macrocarpus</i>	Fabaceae	Cultivated	3	EN	EN
6	<i>Anisoptera costata</i>	Dipterocarpaceae	Cultivated	9	EN	EN
7	<i>Swietenia macrophylla</i>	Meliaceae	Cultivated	1	EN	
8	<i>Dipterocarpus alatus</i>	Dipterocarpaceae	Cultivated	533	VU	
9	<i>Hopea odorata</i>	Dipterocarpaceae	Cultivated	84	VU	
10	<i>Madhuca pasquieri</i>	Sapotaceae	Cultivated	1	VU	EN
11	<i>Dalbergia tonkinensis</i>	Fabaceae	Cultivated	2	VU	EN
12	<i>Khaya senegalensis</i>	Meliaceae	Cultivated	565	VU	
13	<i>Sindora siamensis</i>	Fabaceae	Cultivated	2	LC	EN
14	<i>Chukrasia tabularis</i>	Meliaceae	Cultivated	7	LC	VU
Total				1,244		

*Memecylon caeruleum* Jack*Loropetalum chinense* (R. Br.)
Oliv.*Eurycoma longifolia* Jack*Lagerstroemia indica* L.*Tridax procumbens* L.*Waltheria indica* L.**Figure 6.** Photographs of selected plant species at Nong Lam University.

Diversity of grow habits

There were 115 tree species (accounting for 47.3%), 44 herb species (accounting for 18.8%), and 38 shrub species (accounting for 15.6%). In addition, groups of palm, grass, climber, lily, and bamboo had fewer than 15 species (Figure 7).

**Figure 7.** Plant growth habits.

Origin of the species

Most of the surveyed species in this study had been planted (180 species, 74.1%). They were mainly distributed in area 4, 5, 6, 7 and 8; which concentrated the large impervious surfaces such as offices and lecture halls. The other 63 nature species (25.9%) were mainly found in area 2, 3, 9, 12 and 13 which had the less impervious surfaces (Figure 8). Besides that, the dominant portion of

flora in Nong Lam campus was native, occupying 57.2% while 42.8% was imported species. The proportion of imported species was quite high, which might negatively affect the population of native species such as changing the composition and function of the microbiome, affecting the nutrient cycle, and reducing native biodiversity (Scharfy et al., 2010).

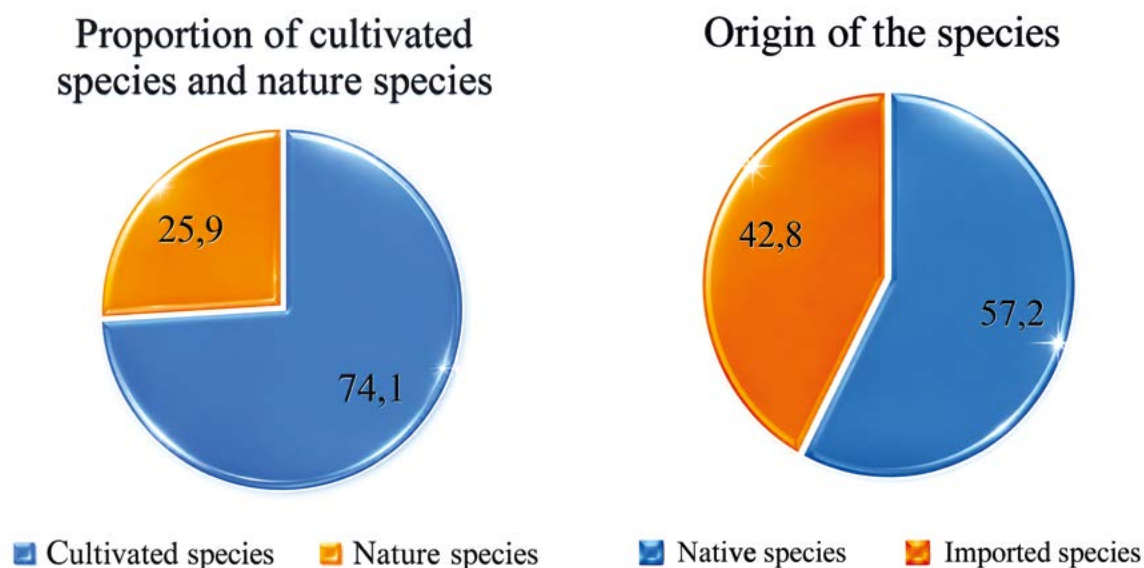


Figure 8. Origin of the species.

Management situation

Flora at the Nong Lam campus has not been assigned to any specialized functional office. The Facility Management office took charge of the flora system at the general level. Contractors conducted maintenance processes such as pruning, fertilizing, weeding, and watering. The big trees were pruned before the rainy season but there was no specific schedule for each year. The pruning, fertilizing, and weeding processes were applied for shrubs, flowers, and grass at some zones such as Nguyen Thai Binh park,

Phuong Vy area, Administration Building, and Huynh Anh Square. Only name tags showed scientific names and families of the big trees at the Administrative Building zone. In addition, no flora database at Nong Lam campus such as name, year of planting, age, etc. was managed by software.

3.2. Recommendations for flora management at the Nong Lam university campus

The results of the interview show that the flora in the Nong Lam campus need a sustainable

management system. To monitor and manage more effectively in the future, floras on the Nong Lam University campus should be collected and established a geodatabase. Hence, flora could be handled by space (planting location and growing space) and attribute characteristics (origin, growth, development characteristics, etc.). This could be accomplished by implementing a tree management system on specialized software such as Geographic Information Systems. Integrating the mentioned tree management software with the university's web page (webGIS) could provide information for students and staff about floras biodiversity on the campus, and foster the love of nature and environmental protection awareness. Particularly, it was crucial to have a geodatabase of 1,244 trees in the Vietnam Red Data Book (MOST, 2024) and IUCN Red List (IUCN, 2024) (Table 3). They were perennial trees and had historical and cultural values associated

with Nong Lam University. Hence, they should be marked as preserved groups. The preserved group should be photographed annually for monitoring. Trees should be pruned for vitality and safety. The management plan should control pests periodically every 6 months.

Vegetation on the Nong Lam University campus should be planned in separate planting areas with the plant labeled. The collection planting should focus on rare and native species to boost the richness of the local flora. The precious shading trees with beautiful canopies and flowers were suggested. In the dormitory and lecture hall areas, plants with large leaves that could prevent dust, and plants that repel insects should be chosen. The shrubs could be selected if they adapt to low-care conditions or can be pruned. Some species were suggested in Table 3.

Table 3. List of suggested tree species for future planting at Nong Lam University

No.	Scientific name	Family	Proposed planting area
1	<i>Gluta laccifera</i> (Pierre) Ding Hou	Anacardiaceae	Dormitory
2	<i>Pauldopia ghorta</i> (Buch.-Ham. ex G.Don) Steenis	Bignoniaceae	Lecture hall, Dormitory
3	<i>Terminalia calamansanai</i> (Blanco) Rolfe	Combretaceae	Dormitory
4	<i>Pentacme siamensis</i> (Miq.) Kurz	Dipterocarpaceae	Dormitory
5	<i>Parashorea stellata</i> Kurz	Dipterocarpaceae	Dormitory
6	<i>Shorea roxburghii</i> G. Don	Dipterocarpaceae	Dormitory
7	<i>Dellenia obovata</i> (Blume) Hoogland	Dilleniaceae	Lecture hall, Dormitory
8	<i>Diospyros mollis</i> Griff.	Ebenaceae	Dormitory
9	<i>Dalbergia cochinchinensis</i> Laness.	Fabaceae	Lecture hall
10	<i>Dalbergia tonkinensis</i> Prain	Fabaceae	Lecture hall
11	<i>Pterocarpus echinatus</i> Pers.	Fabaceae	Lecture hall
12	<i>Huchimingia ichthyochtona</i> (Drake) Z.Q.Song	Fabaceae	Lecture hall
13	<i>Millettia ichthyochtona</i> Drake	Fabaceae	Lecture hall

14	<i>Sindora siamensis</i> Teysm. ex Miq.	Fabaceae	Dormitory
15	<i>Saraca indica</i> L.	Fabaceae	Dormitory
16	<i>Saraca dives</i> Pierre	Fabaceae	Dormitory
17	<i>Schizolobium excelsum</i> Vogel	Fabaceae	Lecture hall
18	<i>Xylia xylocarpa</i> (Roxb.) W.Theob.	Fabaceae	Dormitory
19	<i>Peltophorum dasyrrhachis</i> (Miq.) Kurz	Fabaceae	Lecture hall
20	<i>Dalbergia cochinchinensis</i> Pierre	Fabaceae	Lecture hall
21	<i>Archidendron clypearia</i> (Jack) I. C.Nielsen	Fabaceae	Dormitory
22	<i>Brownea coccinea</i> Jacq.	Fabaceae	Lecture hall
23	<i>Dalbergia fusca</i> Pierre	Fabaceae	Lecture hall
24	<i>Fagraea fragrans</i> Roxb.	Gentianaceae	Dormitory
25	<i>Lagerstroemia loudonii</i> Teijsm. & Binn.	Lythraceae	Lecture hall
26	<i>Magnolia fordiana</i> (Oliv.) Hu	Magnoliaceae	Lecture hall
27	<i>Dysoxylum loureiri</i> Pierre	Meliaceae	Lecture hall, Dormitory
28	<i>Lagerstroemia floribunda</i> Jack	Lythraceae	Dormitory
29	<i>Lagerstroemia lecomtei</i> Gagnep.	Lythraceae	Lecture hall, Dormitory
30	<i>Lagerstroemia reginae</i> Roxb.	Lythraceae	Lecture hall
31	<i>Koelreuteria paniculata</i> Laxm.	Sapindaceae	Lecture hall
32	<i>Madhuca pasquieri</i> (Dubard) H. J. Lam	Sapotaceae	Lecture hall
33	<i>Vitex ajugiflora</i> Dop	Verbenaceae	Lecture hall

4. Conclusions

It can be concluded that flora diversity was notable on the Nong Lam University campus. The data collection showed that the phylum Polypodiophyta, Pinophyta, and Magnoliophyta were diverse in habits such as herbs, shrubs, trees, and climbers. The study recorded 243 species, belonging to 197 genera and 70 families. Among them, 12 rare species were recorded in the IUCN Red List categories (2024) and 9 species were listed in the Vietnam Red Data Book. Most of them are cultivated and imported plants. Hence, the future planting of flora at Nong Lam University should be planned with an emphasis on rare and native species. The results showed that plant management should be delegated to

a specialized unit. Spatial and attribute data of plants should be collected and managed using appropriate software. The maintenance plans should be based on the monitoring results. The oncoming research may develop professional software for flora management.

Conflict of interest

The authors declare that they have no conflict of interest.

Acknowledgements

This research was financially supported by the Nong Lam University Ho Chi Minh City research funding (the research code CS-CB24-MTTN-02).

References

- Alcock, I., White, M. P., Wheeler, P. W., Fleming, L. E., & Depledge, M. H. (2014). Longitudinal effects on mental health of moving to greener and less green urban areas. *Environmental Science and Technology* 48(2), 1247-1255. <https://doi.org/10.1021/es403688w>.
- Barker (The Barker Way). (2024). *Safety of trees on school premises and playing fields*. Retrieved October 11, 2024 from <https://www.barker-associates.co.uk/insights/safety-of-trees-on-school-premises-and-playing-fields/>.
- Boo, C. M., Karrtini, O. H., & Ou-Yang, C. L. (2006). *1001 garden plants in Singapore*. Singapore: National Parks Board.
- Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., & Pullin, A. S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health* 10, 456. <https://doi.org/10.1186/1471-2458-10-456>.
- Dey, D., Chauhan, S., Koundal, V., Devi, M., Awasthi, M., Shandil, R., Sharma, S., Chaudhary, S., Mehla, A., & Kaushal, S. (2021). Study of Plant Diversity in and around Central University of Himachal Pradesh TAB Campus, Shahpur and its Medicinal Uses. *Journal of Scientific Research* 65(1), 88-104. <https://doi.org/10.37398/JSR.2021.650113>.
- DFI (Department of External Information - Ministry of Information and Communications). (2023). *Binh Duong climate, geographical location, natural conditions of Binh Duong province*. Retrieved September 12, 2024, from <https://binhduong.vietnam.vn/khi-hau-binh-duong-vi-tri-dia-ly-dieu-kien-tu-nhien-cua-tinh-binh-duong/>.
- Dinh, D. Q. (2021). *500 useful plants in landscape design*. Ho Chi Minh City, Vietnam: Ho Chi Minh City Science and Technics Publishing House.
- Doan, L. D. (2002). *Research and build a model of an experimental garden to plant trees on school grounds and provide vocational and environmental education*. Son La, Vietnam: Son La Department of Science and Environmental Technology.
- Duijn, B. V., Bergen, S. V., Klein, H. J., Kuijt-Evers, L., Jansen, J., Spitters, H., & Kester, M. (2011). *Report project "Plant in the classroom"*. Delft, Netherlands: Netherlands Organisation for Applied Scientific Research. Retrieved September 19, 2024, from <https://repository.tno.nl/SingleDoc?find=UID%20ab629263-88da-4f6b-9111-889ad0130bd2>.
- Dymont, J. E., & Bell, A. C. (2008). Our garden is colourblind, inclusive and warm': Reflections on green schoolgrounds and social inclusion. *International Journal of Inclusive Education* 12, 169-183.
- EMP (Ethnic and Mountainous Photojournalism). (2017). *Geographical location and natural conditions of the Southeast region*. Retrieved September 12, 2024, from <https://dantocmiennui.vn/vi-tri-dia-ly-dieu-kien-tu-nhien-vung-dong-nam-bo-post130930.html>
- IUCN (International Union for Conservation of Nature). (2024). *IUCN red list categories*. Retrieved September 10, 2024, from <https://www.iucnredlist.org/>.
- JiChun, Y. (2012). Study on species diversity of the plants in high school campus of Suzhou City. *Journal of Jiangsu Forestry Science and Technology* 39, 35-37. <https://www.cabidigitallibrary.org/doi/full/10.5555/20123161134>.
- Judd, W. S., Campbell, C. S., Kellogg, E. A., Stevens, P. F., & Donoghue, M. J. (2002). *Plant systematics: A phylogenetic approach*. Massachusetts, USA: Sinauer Associates.
- Klein, R. M., & Klein, D. T. (1970). *Methods of plant research*. Ha Noi, Vietnam: Science and Technology Publishing House.

- Köppen, W. (1948). *Climatology: A study of the earth's climates*. Mexico: Fondo de Cultura Económica.
- Lachowycz, K., & Jones, A. P. (2013). Towards a better understanding of the relationship between greenspace and health: Development of a theoretical framework. *Landscape and Urban Planning* 118, 62-96.
- Matsuoka, R. H. (2010). Student performance and high school landscapes: Examining the links. *Landscape and Urban Planning* 97(4), 273-282. <https://doi.org/10.1016/j.landurbplan.2010.06.011>.
- Mcsweney, J., Rainham, D., Johnson, S. A., Sherry, S. B., & Singleton, J. (2015). Indoor nature exposure (INE): A health-promotion framework. *Health Promotion International* 30(1), 126-39. <https://doi.org/10.1093/heapro/dau081>.
- MOST (Ministry of Science and Technology). (2024). *Vietnam red data book - Part II plants*. Ha Noi, Vietnam: Natural Science and Technology Publisher.
- Ngo, H. C. (2019). *Visit Nong Lam with beautiful photos*. Retrieved September 28, 2024, from <https://www.tuoitrenonglam.com/2019/08/ghe-tham-nong-lam-voi-nhung-goc-anh-cuc.html>
- Nguyen, B. T. (2003). *Legumes (Fabaceae) in the list of plant species of Vietnam*. Ha Noi, Vietnam: Agricultural Publishing House.
- Nguyen, K. H., Phan, V. P., & Ha, V. T. (2024). *Geography* 12. Ha Noi, Vietnam: Vietnam Education Publishing House.
- Pham, H. H. (2000). *An illustrated flora of Vietnam*. Ho Chi Minh City, Vietnam: Youth Publishing House.
- Qing, C. (2012). A study of the species diversity of landscape trees on three university campuses from Inner Mongolia. *Acta Horticulturae* 937, 1141-1146. <https://doi.org/10.17660/ActaHortic.2012.937.142>.
- Scharfy, D., Güsewell, S., Gessner, M. O., & Venterink, H. O. (2010). Invasion of *Solidago gigantea* in contrasting experimental plant communities: effects on soil microbes, nutrients and plant-soil feedbacks. *Journal of Ecology* 98(6), 1379-1388. <https://doi.org/10.1111/j.1365-2745.2010.01722.x>.
- Tran, T. B. (2020). *Application of GNSS RTK and WebGIS technology in tree management at Nong Lam University campus in Ho Chi Minh City* (Unpublished bachelor's thesis). Nong Lam University, Ho Chi Minh City, Vietnam.
- Yang, C. K., Cheng, C. P., Yi, R. H., Chen, Y. F., & Wang, Y. N. (2011). Diversity investigation and analysis of woody plants in high school campuses of Chu-Shan Township, Nantou County. *Journal of The Experimental Forest of National Taiwan University* 23(2), 147-161. <https://www.cabidigitallibrary.org/doi/full/10.5555/20123010623>.
- Younan, D., Tuvblad, C., Li, L., Wu, J., Lurmann, F., Franklin, M., Berhane, K., McConnell, R., Wu, A. H., Baker, L. A., & Chen, J. C. (2016). Environmental determinants of aggression in adolescents: Role of urban neighborhood greenspace. *Journal of The American Academy of Child and Adolescent Psychiatry*, 55(7), 591-601. <https://doi.org/10.1016/j.jaac.2016.05.002>.