CHARACTERISTICS OF FLORA IN NUI CHUA NATIONAL PARK, NINH THUAN PROVINCE: A COMPARATIVE STUDY BETWEEN MOIST AND ARID FORESTS

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SUMMARY

The complete and profound understanding of vegetation has practical significance for the sustainable development of biodiversity resources in Nui Chua National Park. Fourteen typical temporary plots (20 m x 20 m) were equally divided between the moist and arid forests. The study suggested that the species and stand structure of the two forest types were significantly different. The distinctiveness of the moist forest, where the typical tree species of Gymnospermae were *Dacrycarpus imbricatus, Podocarpus neriifolius, Nageia wallichiana*; while the arid forest with the emergence of low trees, many branches, small DBH; thick bark; stems many small tumours and spines; tiny and thick leaves, spines, and with serrated margins; crown trees were skewed; trees include 3-4 stems, etc. The forest vegetations in Nui Chua National Park are diverse in species composition and conservation value, with fifty-one woody plant species of 26 families belonging to Gymnospermae and Angiospermae; and 18 threatened plant species in Decree 84/2021/ND-CP, Vietnam Red Data Book (2007) and IUCN Red List (2021). Most of the recorded tree species have a regular distribution (over 78%). Ecologically significant trees such as *Syzygium zeylanicum, Vatica harmandiana, Ilex cochinchinensis* were represented in moist forests. While *Terminalia triptera, Diospyros mollis, Sindora siamensis, Albizia corniculata* and *Millettia brandisiana* were found in arid forests. The species richness had significant differences. In contrast, the Magarlef (d), Pielou (J'), and Shannon (H') index had no difference between these two forest types. Quantitative diversity components indicated low plant diversity (1.75-2.17). The study also indicated that the tree species composition, the association between species, and the plant community of the two forests were significantly different. Therefore, it is required to develop different management and conservation approaches for each object in practice.

Keywords: Arid forest, moist forest, Nui Chua, species composition, tree diversity.

1. INTRODUCTION

Forest ecosystems and vegetation cover play an essential role in the existence and sustainable development of human societies and creatures. It is home to species and has a role to play in the fight against climate change. In addition, forest vegetation protects the environment, maintains soil fertility, and corrects the adverse effects of extreme weather events (Hang & Ly, 2011).

The forest ecosystem of the Nui Chua National Park is diverse in plant species composition with 1504 species, in which 30 rare species are listed in the IUCN Red Book (Dinh, 2018), 99 endemic species (Nui Chua National Park, 2020), non-timber forest products (Vu and Luu, 2009; Nguyen *et al.,* 2010; Alex, 2010; Long *et al.,* 2013; Hop *et al.,* 2021). It contains a lot of potential for new plant species for science, some recently discovered and described species such as *Billolivia moelleri* (Middleton *et al.,* 2014), *Curcuma arida* (Škorničková *et al.,* 2015), *Aristolochia nuichuaensis* (Do *et al.,* 2019).

Nui Chua National Park is the only standard sample of the arid forests ecosystem with characteristics and uniqueness of Vietnam and the typical broadleaf-coniferous mixed evergreen forest of the humid subtropical climate. However, studies on these two ecosystems have not been thoroughly and systematically studied. Therefore, this study aims to elucidate the unique characteristics of

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the wet and arid forests as the basis for the management, conservation and sustainable development of the forest ecosystems of Nui Chua National Park.

2. RESEARCH METHODOLOGY

2.1. Study sites

The present study was conducted from March 2017 to June 2017 and October 2020 at Nui Chua National Park, Ninh Thuan province (from 11°35'25" to 11°48'38" N and 109°4'5" to 109°14'15" E) (Figure 1). The total identified area was about 29,865 ha. This place was characterized by a monsoonal coastal climate regime combined with bow-shaped topography that formed a low-mountain subtropical moist forest (moist forest) with an average annual rainfall of over 1000 mm and the arid forests with an average annual rainfall of 500-700mm. The annual average temperature was 26°C. The average annual humidity was about 80% in moist forests and below 70% in arid forests, especially in the dry season, down to 20-25% (Dinh, 2018).

2.2. Methodology

2.2.1. Field survey

Based on the preliminary survey results and the current forest status map in 2020 of the forest owner, the location of the samples was set up using the method of typical samples, which represent two forest states (moist forest and arid forests). Then based on the terrain, sample plots were arranged in the field and adapted to the investigation site. GPS and hand-held terrain were used to determine each sample plot's coordinates, elevation, and slope. A total of 14 typical temporary samples plots were established in two forest states (moist forest: from sample plot 1 - 7 and arid forests: from sample plot 8 - 14). Each sample plot had an area of 400 m^2 (20 x 20 m) (Mishra, 1968; Sharma, 2003; Huy, 2005). Sample plots of arid forests were arranged in two altitude belts, from 40 m to 97 m and from 241 m to 261 m above sea level. At the same time, the moist closed evergreen forest was located in the elevation from 781 m to 789 m and from 806 m to 820 m above sea level (Figure 1). In each sample plot, data on the species name, the number of individual trees, diameter at breast height (DBH) (DBH ≥ 5 cm), total height (Hvn), bole height, crown width, of all trees with DBH more significant than 5 cm were collected. DBH was measured with a contour frame ruler with an error of 0.5 cm. Crown width (Dt) was measured with a tape in the East-West and South-North directions and then averaged. Total height (Hvn) and bole height were identified by the Blum-Less ruler, combined with a 5 m high ruler with an error of 0.3 m. Morphology of tree species (Crown tree, branch, bark, leaves) was described through actual observation and photography.

2.2.2. Data analysis

Determination of the forest status: The vegetation name (forest type) was identified and described according to Trung (1999).

Plant species identification: The collecting and processing of plant samples were carried out according to the document "Handbook of Biodiversity Research" (Thin, 1997). Comparative morphological and expert methods were used to treat and identify plant samples. The specimens were searched and stored at the Vietnam National University of Forestry - Dong Nai Campus. We used technical documents to determine species names that do not have standard samples for comparison. The documents used include An Illustrated Flora of Vietnam, volumes 1-3 (Ho, 1999-2003); Vietnam Timber Resources (Hop, 2002). The scientific name of the plants was determined and updated by Plants of the World Online (2021), World flora online (2021). The plant species list was arranged according to the taxonomy of Brummitt (1992) combined with the Melbourne International Nomenclature Law (Melbourne Code, 2012).

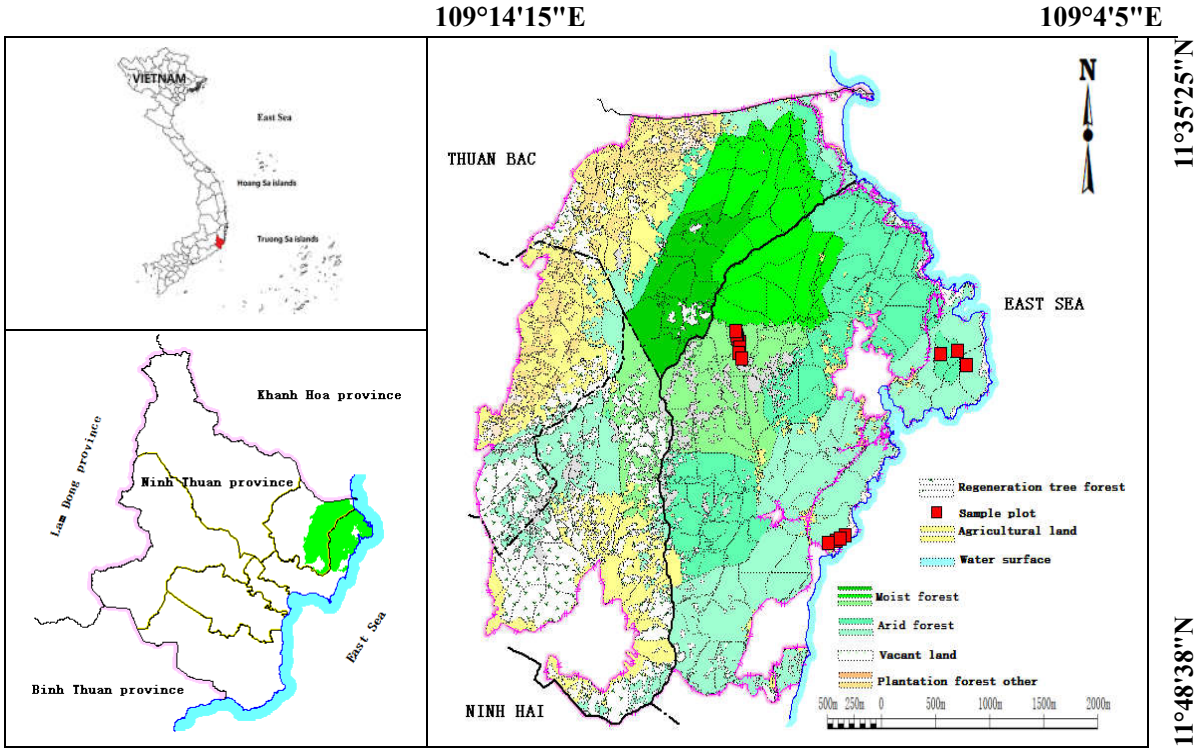

Figure 1. Location of the investigation plots

Determination of threatened species: Threatened species were identified according to Decree 84/2021 of the Government of Vietnam, Vietnam Red Data Book (2007), and IUCN Red List (2021) (updated September 2021).

$$IVI = RD + RF + RBA \text{ (Mishra, 1968)} \quad (1)$$

$$D = \frac{\text{Total of trees of the species in all plots}}{\text{Total of plots}} \quad (2)$$

$$RD(\%) = \frac{\text{Relative density of each species}}{\text{Total of relative density of all species}} \times 100 \quad (3)$$

$$F(\%) = \frac{\text{Number of plots with species occurring}}{\text{Total of plots}} \times 100 \quad (4)$$

$$RF(\%) = \frac{\text{F\% of each species}}{\text{Total of F\% of all species}} \times 100 \quad (5)$$

$$\text{Basal area (BA)} = \pi \times (DBH/2)^2 \quad (6)$$

$$RBA(\%) = \frac{\text{BA of each species}}{\text{Total of BA of all species}} \times 100 \quad (7)$$

$$A(\%) = \frac{\text{Total of trees in all plots}}{\text{Number of plots with species occurring}} \times 100 \quad (8)$$

$$\left(\frac{A}{F}\right) \text{Spatial pattern} = \frac{A(\%)}{F(\%)} \quad (9)$$

Determination of the plant diversity:

Important value index (IVI) (Mishra, 1968): The IVI index of each species was calculated by the formula (1). Density (N); Relative density (RD%); Frequency (F%); Relative frequency (RF%); Basal area (BA); and Relative basal area (RBA%) (Sharma, 2003) were determined by the formula (2), (3),

(4), (5), (6), (7), respectively. The abundance (A) and spatial distribution (A/F) of each species (Curtis & Mclntosh, 1950) in each forest type were determined according to equations (8) and (9).

Determination of the plant diversity indices: Margalef (d), Shannon – Weiner (H'), Simpson (Cd) (1949), Pielou (J') indices were calculated using PRIMER 6.1.6 software. Species diversity (H') was assessed according to the classification scale of Fernando (1998): Low (H' = 1 - 2.49), Moderate (H' = 2.5 - 2.99), High (H' = 3 - 4).

Analysis of relationships between species, plant communities:

A cluster diagram was used to analyze relationships between species and plant communities. Statistical standard T-test in the SPSS 23 software was used to check the difference between stand structure components (Hvn, Hdc, D1.3, Dt, N) and plant diversity (S, d, H', J') between moist and arid forests.

3. RESULTS

3.1. Characteristics of moist and arid forests

Investigating and analyzing data showed that there were significant differences between moist and arid forests (P-value < 0.05) in terms of distribution elevation, slope, soil characteristics, morphology tree species, and stand structure characteristics (DBH, total height, bole height, crown width, density (N)) (Table 1).

Table 1. Comparison of characteristics of the moist and arid forests

No.	Characteristics	Moist forest	Arid forests
1	Altitude	781-838 m	74-256 m
2	Slop	< 20^0	20^0 - 40^0
3	Soil	Grey-brown soil, topsoil depth > 60cm, rate of exposed rock 10-20%.	Red-yellow soil, depth of topsoil < 50cm, rate of exposed rock 50-60%.
4	Morphology of plants	Big trees, high total height, highly branched, trunk with many epiphytes, few tumours and spines, evergreen, thin, rough, tomentose leaves, raw leaves, well-proportioned crown tree, single tree.	Small trees, shrubs, low total height, lowly branched and many branches; thick bark, cracked, rough, the trunk has many small tumours, spines; Leaves are thick, smooth, thorny, margins are serrated, small leaf; the crown tree is deviated due to wind, clusters of 2-3 stems, branches transformed into thorns; Stem diameter develops unevenly.
5	Density (N)	Xtb ± Sd: 482.14 ± 71.76^a trees/ha, minimum: 375 trees/ha, maximum: 575 trees/ha.	Xtb ± Sd: 342.86 ± 42.61^b trees/ha, minimum: 275 trees/ha, maximum: 400 trees/ha.
6	Total hight (Hvn)	Xtb ± Sd: 11.57 ± 2.98^a m, minimum: 3.5 m, maximum: 18.0 m.	Xtb ± Sd: 5.38 ± 1.79^b m, minimum: 2.2 m, maximum: 10.0 m.
7	DBH ($D_{1.3}$)	Xtb ± Sd: 21.97 ± 15.12^a cm, minimum: 5.1 cm, maximum: 98.5 cm.	Xtb ± Sd: 14.00 ± 6.45^b cm, minimum: 5.0 cm, maximum: 31.1 cm.
8	Bole height (Hdc)	Xtb ± Sd: 5.88 ± 2.21^a m, minimum: 2.0 m, maximum: 12.5 m.	Xtb ± Sd: 2.10 ± 0.84^b m, minimum: 0.5 m, maximum: 5 m.
9	Crown width (Dt)	Xtb ± Sd: 3.45 ± 0.91^a m, minimum: 1.05 m, maximum: 6.5 m.	Xtb ± Sd: 2.21 ± 0.63^b m, minimum: 0.85 m, maximum: 3.75 m.

Note: The T-test used different letters a and b to represent statistically significant differences (P < 0.05).

3.2. Woody plant species composition

3.2.1. Species composition

We recorded 51 tree species of 44 genera, 26 families belonging to two phyta, including Gymnospermae and Angiospermae. Most species were discovered belonging to Angiospermae (over 93% in the taxonomy levels) with 48 species, 41 genera, and 25 families; Gymnospermae had three species, three genera belonging to Podocarpaceae have been found. The most species-rich family was represented by Fabaceae (five species); Anacardiaceae, Myrtaceae, and Rubiaceae (four species together); Ebenaceae, Moraceae, Podocarpaceae (the same three species); six families with two species and 13 single species families. *Diospyros* was the most diverse genus (three species), five genera (the same two species) and 37 single species genera. Of the 51 species, 32 species, 27 genera of 22 families belonging to Gymnospermae and Angiospermae were identified in moist forests. Meanwhile, 19 species and 17 genera of 11 families were discovered in arid forests (Table 2).

Table 2. The composition species was recorded in moist and arid forests

Forest type	No. species	No. genera	No. families	No. phyta	No. threatened species
Moist forest	32	27	22	2	16
Arid forests	19	17	11	1	2
Total	**51**	**44**	**26**	**2**	**18**

3.2.2. Threatened species composition

We also recorded 18 species of plants threatened at different levels. Sixteen species in moist forest and two species in the arid forests. Detail analysis suggests that two species belong to group IIA of Decree 84/2021 of the Government; four species in the Vietnam Red Data Book (2007); and 17 species in IUCN Red List (2021).

3.3. Some indicators of plant biodiversity

3.3.1. Spatial distribution (A/F)

The number of species regular distribution changes from 78.95 (arid forests) to 87.5% (moist forest); the rest were randomly distributed. This result showed that the study site has fierce competition between species and was affected by unstable habitat conditions.

3.3.2. Important Value Index (IVI)

The ecologically significant species (IVI>5%), including *Syzygium zeylanicum, Vatica harmandiana, Ilex cochinchinensis, Mangifera duperreana, Parinari annamensis,* were recorded in moist forests. While *Terminalia triptera, Strychnos nux-vomica, Morinda tomentosa, Peltophorum dasyrhachis, Buchanania reticulata, Diospyros mollis, Sindora siamensis, Terminalia chebula, Albizia corniculata,* and *Millettia brandisiana* were identified in arid forests.

3.3.3. Some other biodiversity indicators

Species richness (S), Magarlef (d), Pielou (J'), and Shannon index (H') in moist forests were determined to have higher values than arid forests. The results of the T-test analysis between the two forest types have shown that there were significant differences in species richness (S) (P-value < 0.05); while, Magarlef (d), Pielou (J'), and Shannon index (H') had no significant difference (P-value > 0.05) (Table 3).

Table 3. Diversity indices were compared using the T-test standard between humid and arid forests

Forest types	Species richness (S)	Magarlef (d)	Pielou (J')	Shannon (H')
	Xtb ± Sd			
Moist forest	10.86 ± 2.91^a	3.31 ± 0.85^a	0.92 ± 0.04^a	2.17 ± 0.32^a
Arid forest	7.14 ± 2.73^b	2.34 ± 0.98^a	0.91 ± 0.10^a	1.75 ± 0.50^a
T-test	**P-value < 0.05**	**P-value > 0.05**	**P-value > 0.05**	**P-value > 0.05**

Note: The T-test used different letters a and b to represent statistically significant differences (P < 0.05).

3.4. Relationships between species, plant communities

3.4.1. Relationship between woody plant species

At 3% similarity, species were divided into two groups. Group 1 included 19 species distributed in arid forests, and group 2 had 32 species distributed in moist forests. At the 10%, 20%, 40%, 60%, 80%, and 90% similarity levels, species were divided into 4, 8, 14, 24, 41, and 44 species groups (Figure 2). *Dacrycarpus imbricatus, Nageia wallichiana, Cinnamomum cambodianum* were independent species and occurred in the lowest frequency. Besides, Based on the threat level specified in the Vietnam Red Data Book (2007), Decree 84/2021, and IUCN (2021). Therefore, we recommend that it is necessary to prioritize the conservation of these species in Nui Chua National Park.

3.4.2. The relationship between plant communities

The Cluster diagram indicated the relationship between the plant communities at different levels of similarity. At 20% similarity, it was divided into two groups; group 1 includes seven communities (1 to 7) belonging to moist forest, group 2 includes seven communities (8 to 14) belonging to arid forests. At 40% similarity, 60% and 70% were divided into 6, 13, and 14 community groups, respectively (Figure 3). Thus, based on this analysis, we can choose suitable solutions for each forest type to improve efficiency in managing and conserving forest resources.

The average Caswell V(N.D) index of the moist forest was 0.19 ± 0.99^a, and arid forests 0.44 ± 1.04^b showed that the level of impact on forest types was significantly different ($P < 0.05$). Hostile forests were less affected by humans than arid forests. It is easier to access arid forests' vegetation communities than moist forests because arid forests are at low altitudes, along coastal waters, and close to residential areas.

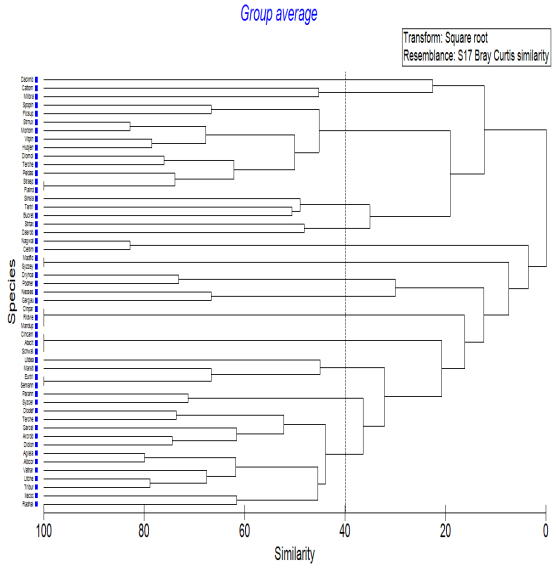

Figure 2. The relationship between tree species was analyzed by Cluster diagram at different levels of similarity

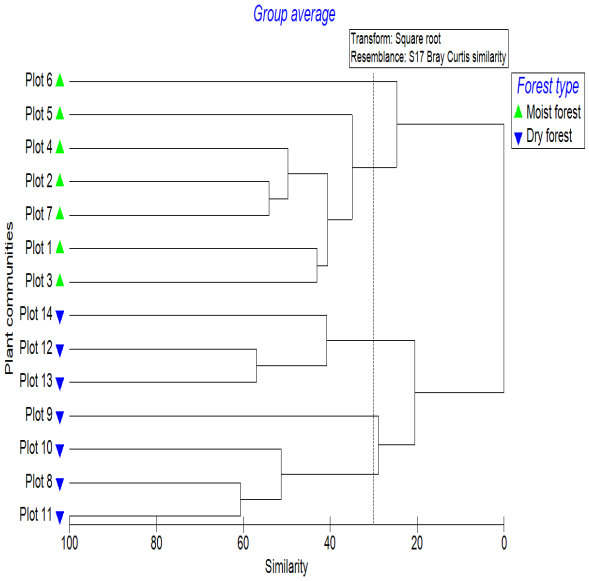

Figure 3. The relationship between the communities was analyzed by the Cluster diagram at different levels of similarity

4. DISCUSSION

Characteristics of moist and arid forests

The notes on the characteristics of arid forests in this study are similar to those reported by Lan (2006), who recorded the specific species composition and plant species morphologies of the arid forests in Ninh Hai district Ninh Thuan province. Moreover, Lan (2006) suggests that tree species composition in arid forests had exceptional biological characteristics, adapting to a particularly arid environment and diverse morphology. These features have formed a forest habitat similar to a "bonsai forest" and were also called tropical dry thorny thorns (Trung, 1999). This ecosystem is distributed in lowland areas compared to sea level, low rainfall uneven distribution. Moreover, shallow topsoil is an unfavourable factor for forming high diverse vegetation (Trung, 1999).

These unique and characteristic pieces of arid forests vegetation could be formed by the arid climate of the coastal area, where the average annual rainfall was less than 700 mm, the number of dry months was 10/12 months in the year. In addition, the bow-shaped topography had created a relatively separate arid zone compared to the rest of the flora of the National Park (Dinh, 2018). The plant communities here were significantly affected by elevation changes, from lowland arid forests transitioning through the semi-humid forest to lowland moist evergreen forest (Dinh, 2018). This place, which fully converges climate, soil, and topographic conditions, had formed a typical arid forests ecosystem in Vietnam and Southeast Asia (Chan, 2012).

The arid forest's landscape includes a few unique remaining puzzle pieces of arid forests communities of coastal plains to the east of Truong Son (Truong, 2012). The original plant carpet could be an arid forest with the dominant component of the Dipterocarp families, then turned into the type of shrub carpet that has the current spikes under human impact. This observation was supported by Truong (2012), who suggested that the vegetation of the drought area could be formed from the deciduous forests of the Dipterocarp families and shrublands characteristics. They were found in lowland areas where evaporation was about 600-800 mm per year.

The question here is how they can survive in such harsh arid climates. Vegetative morphology of arid forests shows that they are well adapted to arid climates, where rainfall is low, temperature and light intensity is high. In addition, the species composition of this type of forest is a seasonal deciduous tree, which causes them to shed many leaves, reducing the ability of the tree to turn leaves. According to Canh (2006), arid forest tree species could adapt well to arid climate conditions because they could withstand burning and dehydration caused by high temperature, intense radiation, and accumulate water in the air body. Some species have good heat tolerance but poor tolerance to water loss or vice versa. However, some species of plants that can tolerate heat and water loss are drought tolerant. Mitloehner *et al.* (2000) showed that some species with very high osmotic pressure are well adapted to this arid region.

This type of arid vegetation plays a significant role in climate regulation for this hot and arid region. This observation was supported by Lan (2006), who suggests that arid forests play an essential role in creating vegetation cover to protect coastal sandy areas, prevent desertification, and as a place to conserve genetic resources of coastal tropical drought-tolerant plants. Besides, it also provides fuel (firewood) which is extremely important for the Raglai ethnic group (Long & Truong, 2009), and generates income through selling firewood (Long & Truong, 2009; Hop

et al., 2021) point out the role of this type of ecosystem through the resources of ornamental plants and medicinal plants exploited and used by local people.

Unlike the unique characteristics of arid forests, moist forests have a high species richness that determines the diversity of flora in Nui Chua National Park because of their complex species composition and standing structure. This type of forest is distributed from an altitude of 781 m - 838 m, represented by Myrtaceae, Rubiaceae, Lauraceae, Fagaceae, Podocarpaceae, Annonaceae. The unique feature of this forest type is the appearance of Gymnosperms such as *Dacrycarpus imbricatus, Podocarpus neriifolius, Nageia wallichiana,* where the coastal climate and continental climate intersect. Meanwhile, gymnosperms are widely distributed in subtropical climates, where the altitude is from 500 to 2100 m above sea level (Forest inventory and planning institute, 2009).

Species diversity, the relationship between species and plant communities

In this study, plant diverse index components showed low diversity. The results of this study are consistent with the research conducted by Sharafatmandrad *et al.* (2014), who recorded the H' index ranging from 1.39 to 1.68 in arid forests of Iran. However, this study is lower than that reported by Hop *et al.* (2021), which recognizes the diversity of medicinal plant species from low to medium at both moist and arid forests (H'=2.00 - 2.61) Nui Chua National Park.

By analyzing the cluster diagram, we determined that the species composition of these two vegetation types is significantly different. This was explained by differences in climate type, altitude, and soil characteristics that have formed tree species to adapt to a particular ecological environment. The most notable difference was the occurrence of Gymnosperms in moist forests. Meanwhile, the deciduous trees in the dry season are typical of arid forests. This was entirely consistent with their ecological characteristics to adapt to different habitat conditions. Therefore, it is necessary to apply different measures for these two types of forests to conserve plant biodiversity because of the different species composition, canopy structure, climate, and soil characteristics.

Luong & Nam (2010), Nam *et al.* (2012), Anh *et al.* (2018), Huong *et al.* (2021) determine the relationship between species and plant communities using Cluster diagrams as the basis for selecting species and communities to prioritize conservation. The Caswell index was used by Luong & Nam (2010) and Huong *et al.* (2021) to determine the degree of impact on the plant community according to natural and human factors. This study shows that natural and anthropogenic factors affect the plant communities in both forest types. The disturbance level of the habitat is quite large and threatens the existence of species in the habitat. This is caused by the human exploitation of orchids, medicinal herbs, and non-timber forest products (Long *et al.,* 2009; Long & Truong, 2009; Nguyen *et al.,* 2010; Alex, 2010; Long *et al.,* 2013; Hop *et al.,* 2021). The report of Hop *et al.* (2021) concluded that "The Raglai and Cham people know how to exploit some unique medicinal plants in two forest types." However, the effects of variation cannot be excluded from the climate.

5. CONCLUSION

Moist and arid forests in Nui Chua National Park have significant differences in species composition, threatened species, stand structure (DBH, density, total height, bole height, crown width), degree distribution height, slope, and soil characteristics and tree species morphology. The distinctiveness of the

moist forest, where the typical tree species of Gymnospermae; while the arid forest with the emergence of low trees, many branches, small DBH; thick bark; stems many small tumours and spines; tiny and thick leaves, spines, and with serrated margins; crown trees were skewed; trees include many stems, etc.

Most recorded tree species have a regular distribution. Ecologically significant trees such as *Syzygium zeylanicum, Vatica harmandiana, Ilex cochinchinensis* were represented in moist forests. While *Terminalia triptera, Diospyros mollis, Sindora siamensis, Albizia corniculata and Millettia brandisiana* were found in arid forests. The species richness had significant differences. In contrast, the Magarlef (d), Pielou (J'), and Shannon (H') index had no difference between these two forest types. Quantitative diversity components indicated low plant diversity. The relationships between species and the plant communities of the two forests differed significantly.

This study serves as a basis for conserving and developing forest habitats and ecosystems. It provides data to select suitable native plant species for reforestation programs in the National Park and following site.

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ĐẶC ĐIỂM HỆ THỰC VẬT Ở VƯỜN QUỐC GIA NÚI CHÚA, TỈNH NINH THUẬN: MỘT NGHIÊN CỨU SO SÁNH GIỮA RỪNG HƠI ẨM VÀ RỪNG KHÔ HẠN

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TÓM TẮT

Những hiểu biết đầy đủ và sâu sắc về thảm thực vật có ý nghĩa thiết thực đối với sự phát triển bền vững tài nguyên đa dạng sinh học ở Vườn Quốc gia (VQG) Núi Chúa. 14 ô tiêu chuẩn điển hình tạm thời (20 m x 20 m) được chia đều cho kiểu rừng ẩm và rừng khô hạn. Nghiên cứu cho thấy những thành phần loài và cấu trúc lâm phần của hai kiểu rừng có sự khác biệt đáng kể. Đặc điểm nổi bật của rừng ẩm đó là sự xuất hiện các loài thực vật đặc trưng cho kiểu khí hậu á nhiệt đới như *Dacrycarpus imbricatus, Podocarpus neriifolius, Nageia wallichiana*; trong khi rừng khô hạn với được đặc trưng bởi những loài thực vật có chiều cao thấp, nhiều cành, đường kính ngang ngực nhỏ; vỏ dày; thân nhiều u nhỏ và gai; lá nhỏ và dày, có gai, mép có răng cưa; tán cây bị thường bị lệch; cây phân thành nhiều thân. Những thảm thực vật ở VQG khá đa dạng về thành phần loài và giá trị bảo tồn với 51 loài thực vật thân gỗ thuộc 26 họ của ngành Hạt trần và Hạt kín; 18 loài thực vật bị đe dọa trong Nghị định 84/2021/NĐ-CP, Sách Đỏ Việt Nam (2007) và Danh lục Đỏ IUCN (2021). Hầu hết các loài cây được ghi nhận có dạng phân bố liên tục (trên 78%). Những loài chiếm ưu thế và có ý nghĩa sinh thái như *Syzygium zeylanicum, Vatica harmandiana, Ilex cochinchinensis* được tìm thấy trong các khu rừng ẩm. Trong khi *Terminalia triptera, Diospyros mollis, Sindora siamensis, Albizia corniculata và Millettia brandisiana* trong các khu rừng khô hạn. Độ giàu loài có sự khác biệt đáng kể. Ngược lại, chỉ số Magarlef (d), Pielou (J') và Shannon (H') không có sự khác biệt rõ ràng giữa hai loại rừng này. Những hành phần đa dạng định lượng cho thấy mức độ đa dạng thực vật ở mức thấp (1,75-2,17). Nghiên cứu cũng chỉ ra rằng thành phần loài cây, mối liên hệ giữa các loài và giữa những quần xã thực vật của hai kiểu rừng có sự khác biệt đáng kể. Vì vậy, trong thực tế, đòi hỏi phải xây dựng các cách tiếp cận quản lý và bảo tồn khác nhau cho từng đối tượng.

Từ khóa: Đa dạng cây gỗ, Núi Chúa, rừng khô hạn, rừng ẩm, thành phần loài.

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