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ASSESSING AND EXPLORING OF THE STRUCTURE AND COMPOSITION OF FOREST STAND TYPES IN SITU LENGKONG PANJALU, CIAMIS DISTRICT, WEST JAVA

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Abstract

Situ LengkongPanjalu, located in Ciamis Regency, West Java Province, is a tourist area that has a unique forest structure pattern in the form of an island surrounded by a lake. The aim of this research is to determine the structural pattern and composition of tree species in the Situ LengkongPanjalu area. The method used is a grid line which is placed using Purposive Sampling based on the highest encounters. The research results found 10 tree species belonging to 8 families with a total of 149 individuals. The species that are important trees with the highest Important Index (INP) values are Dysoxilumdensiflorum (103.06%), Gordoniaexcelsa (83.45%), and Dysoxylumparasiticum (27.88%) as well as the species diversity index (H') in This area is included in the medium category (1.47).

Key Words: Forest, Composition, Pattern, Structure, Diversity, Important Index

1. Introduction

In a forest ecosystem, the vegetation that grows and its environmental conditions will be closely related to each other. The differences in the number and shape of the structures of each type of plant show this relationship. The formation of diversity patterns and forest stand structure is always changing and is influenced by biotic and abiotic environmental conditions (Istomo and Wahyu, 2019).

Forest stand structure is generally characterized by tree density, cover or area of the stand base, distribution of diameter classes and distribution of species in space (Krisnawati, 2015). In science, typology or classification of forest groups is useful for various purposes, such as forest mapping, assessing habitat quality, analyzing forest dynamics, or determining sustainable management strategies. One type, namely quantitative typology, intended for forestry applications, usually focuses on horizontal and vertical forest structure as the main classification criteria (Caceres et al, 2019).

One area that has high species diversity with a quite unique forest formation pattern is the Situ LengkongPanjalu natural tourist area (Pardian, 2023). This area is unique in the form of island-shaped forest stands surrounded by lakes (Rachman and Hani, 2017). Based on research by Adnan (2023), Situ LengkongPanjalu has plant species with a high importance value index (INP), including Dysoxylumdensiflorum at the seedling and tree level and Litseacassiaefolia at the pole level.

Natural succession/regeneration is one of the factors that can change the stand structure in the Situ LengkongPanjalu Forest from time to time. Based on natural regeneration, the types of trees that grow, the number of trees, the location and composition of the tree species formed will change over time so it is necessary to know the shape/pattern of diameter and height distribution as one of the basic considerations in managing the Situ LengkongPanjalu Forest in the future. The absence of recent research conducted regarding the vertical and horizontal structure of stands and species composition in the Situ LengkongPanjalu Forest is the reason that this research is needed. This area has its own uniqueness, so all the potential within it must be explored so that it can be taken into consideration in planning and development. Region.

2. Research Method

The research was carried out in the Situ LengkongPanjalu area, Ciamis Regency, West Java. The tools and materials used in this research are GPS (Global Positioning System), Binoculars, Meter, Stationery, Tally Sheet, and digital camera. Tree data collection was carried out using a grid line method measuring 20 x 20 meters (Figure 1).

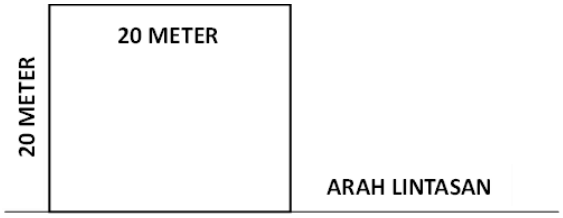

Figure 1. Plotted Line Method

Sample plots were placed using purposive sampling based on tree growth level. Tree data collection is classified based on horizontal structure and vertical structure, namely tree diameter and height (Ismail et al, 2019) (Table 1). Data analysis carried out included the Important Value Index (INP), Species Diversity Index (H') at tree level

Table 1. Classification of Tree Diameter and Height Classes (Ismail et al, 2019)

No	Class	Diameter (cm)	High (m)
1	A	10-20	>30
2	B	21-30	20-30
3	C	30-40	4-20
4	D	41-50	1-4
5	E	>50	<1

3. Result and Discussion

Type Composition

Based on observations at Situ LengkongPanjalu, 10 tree species from 8 families were found with a total of 149 individuals (Table 2). The species with the highest number of individuals is Dysoxilumdensiflorum with 65 individuals, then Aporosaarborea with 35 individuals, and Glianthuspopulacus with 12 individuals.

The families with the most types are Lauraceae and Meliaceae with 2 types of each type found. Lauraceae is a family with abundant and economically valuable species (Wang et al, 2020). Several studies explain that the Lauraceae family has benefits as medicine (Ismail et al, 2019), wood for building materials, a source of fruit, and as an ornamental plant (Tamin et al, 2018). Then Meliaceae is a family that has around 600 species spread across tropical, subtropical and temperate areas (Christenhusz et al, 2016). This family has pharmacological activities such as antiplasmodial, antimicrobial, antiproliferative (Kemayou et al, 2021).

Table 2. Composition of Tree Species in Situ LengkongPanjalu

Species name	Family	∑ Individuals
Magnolia champaca	Magnoliaceae	4
Sterculia coccinea	Sterculiaceae	8
*Actinodphanes*p	Lauraceae	7
Rhodamnia c Jack	Myrtaceaeyang	5
Podocarpusblumei	Podocarpaceae	3

Dysoxilumdensiflorum	Meliaceae	65
Gordoniaexcelsa	Theaceae	35
Endiandrarubescens	Lauraceae	8
Dysoxylumparasiticum	Meliaceae	12
ArtocarpusElasticus	Moraceae	2
Total		149

Forest Stand Structure

The recorded tree species have a distribution based on horizontal structure, namely a diameter of between 10 cm – >50 cm (Figure 2). The tree with the largest diameter class is in diameter class E, namely >50 cm. This indicates that the vegetation succession at Situ LengkongPanjalu is damaged. The fewer number of trees with large diameters and vice versa indicates that the condition of vegetation succession in the area is not damaged (Nursanti et al, 2018). This is caused by the presence of Pteropusvampyrus which carries out activities at the top of the tree, causing the tree to suffer damage and even die (Rachman and Hani, 2017).

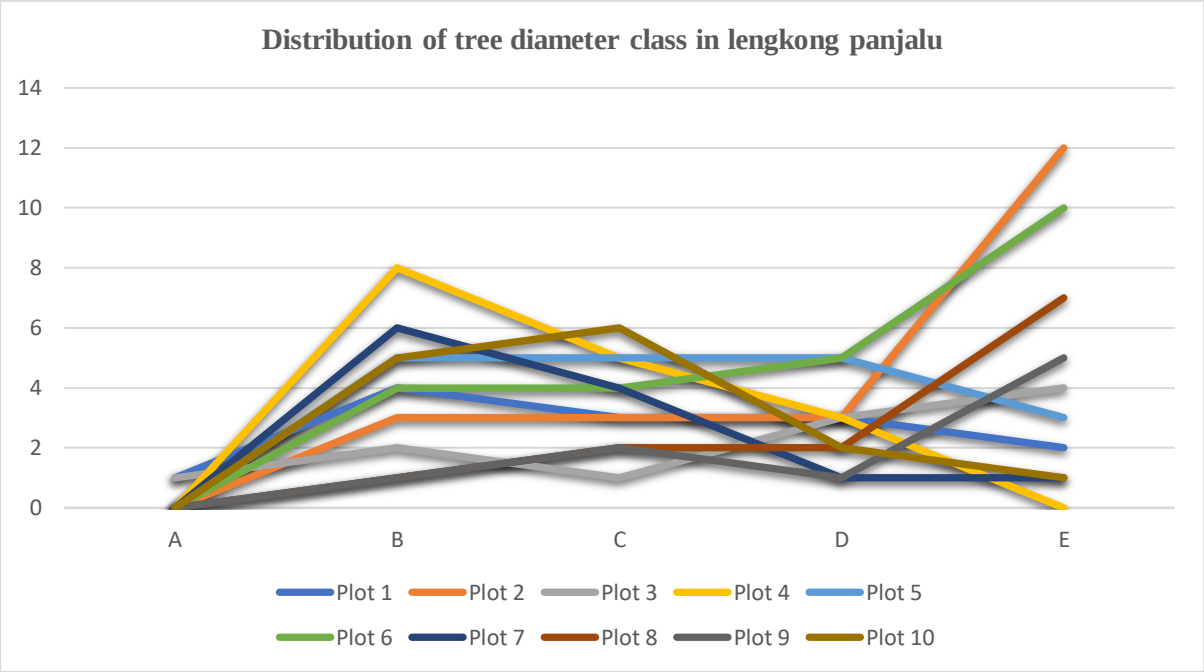

Figure 2. Distribution of tree diameter classes in LengkongPanjalu

Then the vertical structure of trees found was only in height class C, namely having a height ranging from 4 – 20 meters (Figure 3). Based on research by Istomo et al (2021), this indicates that the vegetation succession has experienced a climax, this situation is caused by the abundant population of Pteropusvampyrus in the area, thereby damaging other high class trees (Rachman and Hani, 2017)

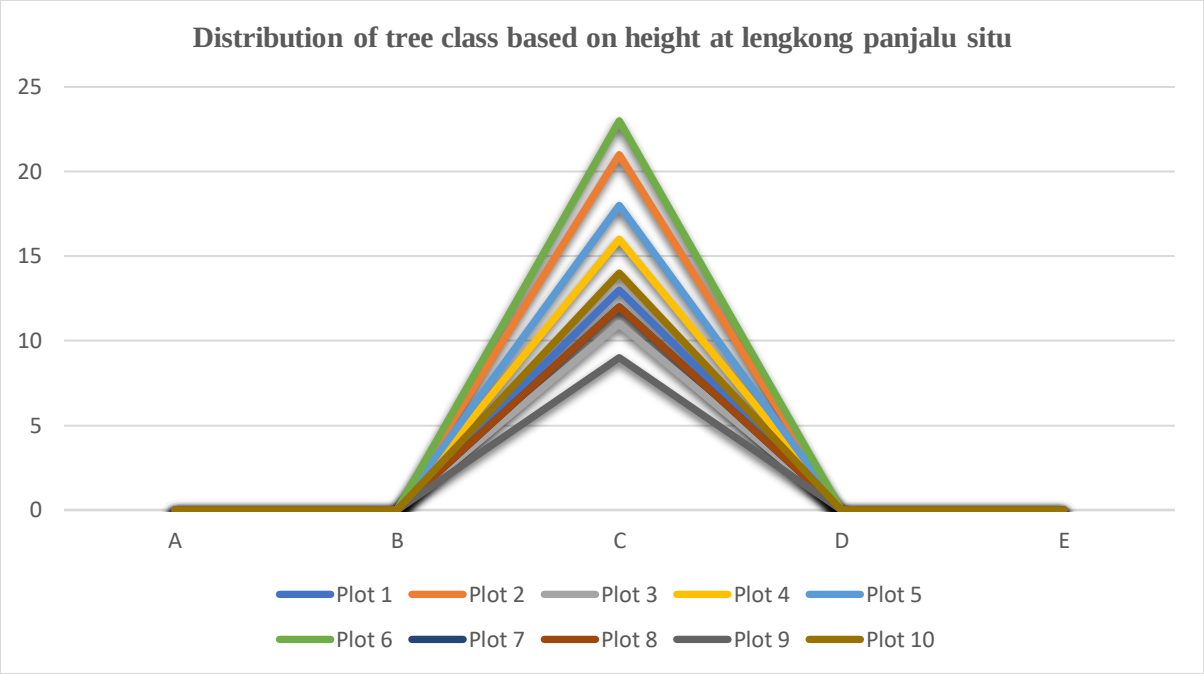

Figure 3. Distribution of tree height classes in LengkongPanjalu

Important Value Index (INP) and Species Diversity Index (H')

The types of important trees in Situ LengkongPanjalu with the highest Important Index (INP) values are Dysoxilumdensiflorum (INP = 103.06%), Gordoniaexcelsa (INP = 83.45%), and Dysoxylumparasiticum (INP = 27.88%) (Figure 4). The Importance Value Index is in line with the density of a tree, in this study the types of Dysoxilumdensiflorum, Gordoniaexcelsa, and Dysoxylumparasiticum had the highest density compared to other types.

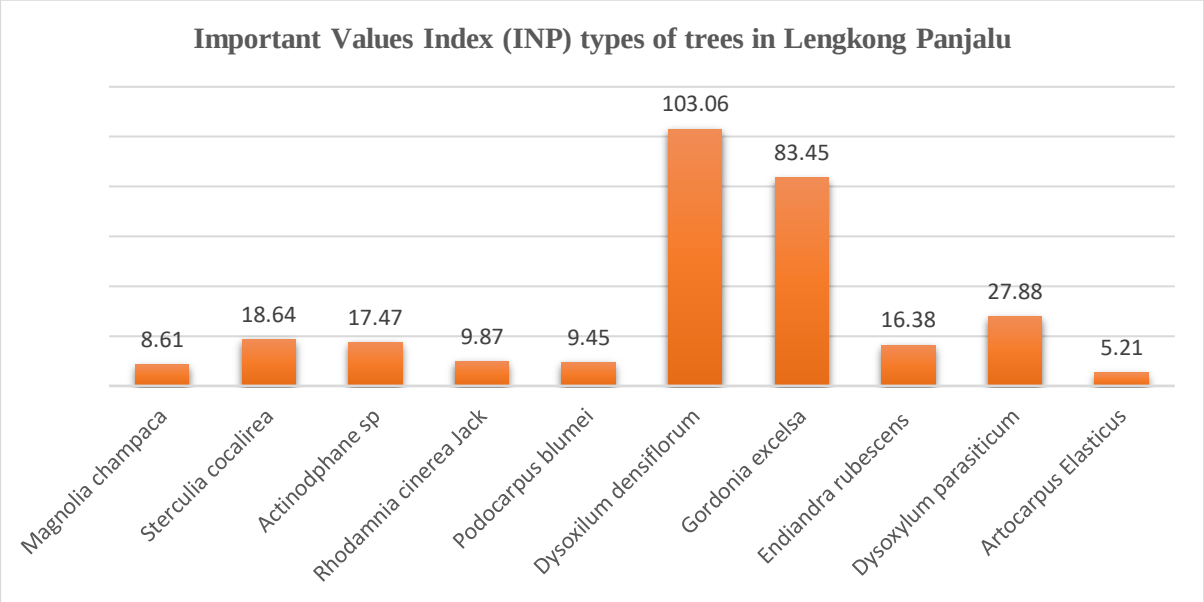

Figure 4. Important Value Index (INP) of Trees in LengkongPanjalu Situ

The Diversity Index for Tree Species with medicinal properties in the Pteropusvampyruhabitat, based on the results of the analysis, shows a value of 1.71, which is in the medium category. The large number of human activities in this area which constitute natural tourism are thought to influence the diversity of species in this area. In other locations, based on research by Ismail et al (2023), the plant species diversity index at various growth levels in the Mayana Hill Forest Area where there is quite high human activity shows the medium category. This is in line with research by Tudjuka et al (2014) that changes in forest conditions are influenced by external factors

4. Conclusion

The composition of tree species found in the Situ LengkongPanjalu area consists of 10 species belonging to 8 families with the largest INP values being Dysoxilumdensiflorum (103.06%), Gordoniaexcelsa (83.45%), and Dysoxylumparasiticum (27.88%). %). Then, for the tree stand structure, the horizontal structure indicates that the vegetation succession at Situ LengkongPanjalu is damaged and the vertical structure indicates that the vegetation succession has reached its peak.

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