DIVERSITY OF TREE TYPES IN THE FOREST AREA OF LAMPAGEUUJONzxG PANCU VILLAGE, ACEH BESAR REGENCY

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ABSTRACT

Research efforts on "Tree Species Diversity in the Forest Area of Lampageu Ujong Pancu Village, Aceh Besar Regency" were carried out in June 2023. The aim of conducting research on Tree Species Diversity in the Forest Area of Lampageu Ujong Pancu Village, Aceh Besar Regency is to identify the types and diversity of trees found in that region. The research steps taken were to identify tree species in the research area and calculate the tree diversity index in the Lampageu Ujong Pancu Village Forest Area, Aceh Besar Regency. The method used in this research is an exploratory survey method by making direct observations at the location and object of observation. The data collection technique uses the transect method (line transect). Research data was analyzed using the diversity index formula with the Shannon Wiener formula. The results of the research show that there are 37 species which are members of 27 families and consist of 68 individuals who live in the research location. Flacourtia jangomas and Terminalia oblong as many as 6 individuals. The family that has a relatively large number of species is Anacardiaceae, 5 species.
Keywords**:** Diversity of tree species, Lampageu Ujong Pancu

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Research efforts on "Diversity of Tree Types in The Forest Area of Lampageu Ujong Pancu Village, Aceh Besar Regency" were carried out in June 2023. The aim of conducting research on Tree Species Diversity in the Lampageu Ujong Pancu Village Forest Area, Aceh Besar Regency is to determine the types and diversity of trees found in the area. The research steps taken were to identify the types of trees in the research area and calculate the tree diversity index in the Lampageu Ujong Pancu Village Forest Area, Aceh Besar Regency. The method used in this research is an exploratory survey method by making direct observations at the location and object of observation. The data collection technique used the transect method (line transect). Research data was analyzed using the diversity index formula with the

Shannon Wiener formula. The research results showed that there were 37 species which were members of 27 families and consisting of 68 individuals who lived in the research location, namely the Flacourtia jangomas and Terminalia oblong plants as many as 6 individuals. The families that have a relatively large number of species are Anacardiaceae 5 species.

Keywords**:** Diversity of tree species, Lampageu Ujong Pancu

A. INTRODUCTION

Lampageu Ujung Pancu is one of the areas in Peukan Bada District, Aceh Besar Regency, precisely at the westernmost tip of Banda Aceh city which is directly adjacent to Ulee Lheu with a distance of around 5 kilometers from the center of Banda Aceh city. Lam Pageu is a fishing village located on a beautiful beach. Apart from presenting the charm of a beach that is still very beautiful, on the way to this place there are also very cool mountains and beautiful natural views. This area is still very natural because most of it is surrounded by forests and it can be said that there has been no forest destruction or forest management by humans, so there are still many species of flora and fauna in the area, including tree species.

The Lampageu area, Ujung Pancu, Aceh Besar is an area that has good forest potential and has a diversity of species that is still classified as well maintained. In this area there are various types of plants ranging from food source plants (fruit), to plants that are used for wood and non-wood. Apart from being planted, many plants also grow naturally from the natural regeneration process.

Geographically, Indonesia is included in two geographic groups, namely Indo Melaya and Australasia and between the two there is the Wallacea transition zone. This geographic condition causes Indonesia to have high biodiversity. Species diversity is a measure that expresses the variety of plant types in a community which is influenced by the number of species and the relative abundance of each species.

A tree is a plant that has a trunk diameter greater than 10 cm. With this limitation, climbing plants, woody plants, bananas, tree ferns, palmae, and bamboo that have a perimeter and diameter as stipulated above are categorized into the tree group.

Trees are the dominant component in a forest, which act as producer organisms and habitat for various types of birds and other animals. Trees use solar radiation energy in the photosynthesis process, so they are able to assimilate CO2 and H2O produces chemical energy stored in carbohydrates and releases oxygen which is then utilized by all living things in the respiratory process. Tree diversity can be used as a community level indicator (indicator) based on its biological organization.

Trees are included in the category of higher plants with trunks and branches made of wood and can live for several years. The four main parts of a tree are roots, trunk, branches and leaves. Tree roots are in the ground. A single tree has many roots. Roots carry water and food from the soil through the stem and branches to the leaves. The trunk is the main part of the tree. Branches are tied to the trunk. The trunk is covered with bark that protects the trunk and damage, branches develop from the roots of the tree.

Tree leaves are usually green, but can also have other colors, shapes and sizes. Leaves take in sunlight and use water and food from the roots to make the tree grow and reproduce. (Marentek, 2006).

Tree diversity can be used to express community structure. Tree diversity can also be used to measure community stability, namely the ability of a community to maintain itself stable despite disturbances to its components (Soegianto, 1994 quoted by Indriyanto, 2006).

A forest is an area densely covered with trees and other plants. Areas like this are found in large areas of the world and function as carbon dioxide reservoirs (carbon dioxide sink), habitats, animals, modulators of hydrologic flows, and conservation of soil, and is one of the most important aspects of the Earth's biosphere. (Fahrudin, 2004).

In forest ecosystem communities, as a result of competition, certain species are more powerful (dominant) than others. Tall trees from the top stratum (layer) defeat or dominate lower trees, these are the types of trees that characterize the forest community in question. (Soerianegara, 2010).

One method for analyzing plant vegetation is by using line transects. To study a forest group whose condition is not previously known, it is best to use transects. (Campbell, 2004).

The aim of this research is to determine the diversity of tree species found in the Forest Area of Lam Pageu Ujong Pancu Village, Aceh Besar Regency and to provide benefits in the form of basic scientific information about the diversity of vegetation types in the Forest Area of Lam Pageu Ujong Pancu Village, Aceh Besar Regency so that it can be used as a database in management. and utilization by the community and local government.

B. RESEARCH METHOD

1. Time & Place of Research

This research was conducted in the Lampageu Ujong Pancu Village Forest Area, Aceh Besar Regency, Aceh Province. This research was conducted in June 2023 and continued to process data at the Biology Education Laboratory at UIN Ar-Raniry Banda Aceh.

2. Tools & Materials

The tools and materials used in this research consisted of equipment for observing tree diversity as well as documentary equipment for activities during the research. The tools and materials used can be seen in Table 1 below.

Table 1. Tools and Materials Used in Research on Tree Species Diversity in the Forest Area of Lampageu Ujong Pancu Village, Aceh Besar Regency, Aceh Province.

No	Type of Tool/Material	Function
1	Tali Rafia	To determine the plot area
2	Popular	To mark the boundaries of each sample plot
3	Stationery	To record research data
4	Observation Table	To record research results

5	Digital camera	To provide image saver and other media
6	Plant Scissors	To take samples
7	Plastic Bags	For gather results recruitmentsamples from the field
8	Identification Book	To identify the type of sample obtained from the field

3. Data Collection Techniques

The research steps taken were to identify tree species in the research area and calculate the tree diversity index in the Lampageu Ujong Pancu Village Forest Area, Aceh Besar Regency. The method used in this research is an exploratory survey method by making direct observations at the location and object of observation. Data collection uses the transect method (line transect), namely collecting data along a straight line, but in some conditions, for example ravines, valleys, rivers, etc., this provision does not apply rigidly and data collection canbe swerved to avoid these obstacles. To complement environmental factors such as humidity, temperature, air, height and light intensity are also measured, and a complete report is made according to the images and field results obtained (Eddy, 2008).

4. Data analysis

Data analysis includes tree diversity (Diversity Index). Calculation of diversity (Diversity index) is carried out using the Shannon-Wiener Diversity Index ($\hat{H}$) as follows (Indriyanto, 2018):

$$\hat{H} = -\sum Pi.Ln.Pi$$

Keterangan:
H'=Species diversity index
pi = ni/N or pi = important value
ni = Number of individuals of species i
N = Number of individuals in all species

H' Value Range: 1-3
H’<1 = Very low diversity H'>1-2 = Low diversity
H’>2-3 = Medium diversity
H'>3-4 = High diversity
H’>4 = Very high diversity

C. RESULT AND DISCUSSION

Species diversity is a parameter of the interdependence between species richness and species distribution. Species diversity is a measure of population heterogeneity in a community. Safe'i and Tsani (2016) stated that one of the biological components in a forestis a collection of plants or trees. Forest biodiversity is all living creatures in the forest, sotree diversity is all types of trees in the forest.

Because plants have different phenological periods or different habitus sizes or different ecotypes, species diversity calculations are carried out at each stratum in the community rather than being calculated for the entire community (Babar, 1987 and Kent, 1992).

The results of research conducted in the Lampageu Ujong Pancu Village Forest area, Aceh Besar Regency, Aceh Province, found 37 tree species which are members of 28 families. The presence of tree species and individuals were found at 6 stations and the most were found at station 6 with 28 species consisting of 55 individuals. The most common plantgroup found in the Lam Pageu Village Forest, Ujong Pancu is from the Anacardiaceae family.

The species diversity index (H) is intended to determine the species diversity of forest stands for each growth level. Forest health assessment is important to know when carrying out conservation forest management. It is important to assess

diversity indicators (biodiversity) with the aim of determining the level of complexity of a species in a conservation forest ecosystem by knowing the composition of the flora contained therein. The diversity that is assessed or calculated is diversity that meets the threshold according to previously determined provisions.

The tree species diversity index is an index that expresses community structure, so the better the species diversity index, the more stable an ecosystem will be. The condition oftree diversity in the Lampageu Ujong Pancu Village Forest area, Aceh Besar Regency, AcehProvince can be seen in Table 2 below:

Table 2. Species and Tree Diversity Index in the Forest Area of Lampageu Ujong Pancu *Village, Aceh Besar Regency, Aceh Province*

No	Family	Spesies	Nama Daerah	Jumlah	Pi	LnPi	PiLnPi	$\hat{H}$= -∑ Pi.Ln.Pi
1	Sterculiaceae	*Guazuma ulmifolia*	Jati Belanda	1	0.014705882	-4.219507705	-0.062051584	
2	Anacardiaceae	*Gluta travancorica*	Malayalam	1	0.014705882	-4.219507705	-0.062051584	
3		*Lannea coromandelica*	Pohon Kuda	1	0.014705882	-4.219507705	-0.062051584	
4		*Anacardium excelsum*	Mete Liar	3	0.044117647	-3.120895417	-0.137686562	
5		*Mangifera indica*	Mangga	2	0.029411765	-3.526360525	-0.103716486	
6		*Buchanania arborescens*	Goosbery kecil	1	0.014705882	-4.219507705	-0.062051584	
7	Fabaceae	*Tamarindus indica*	Asam Jawa	2	0.029411765	-3.526360525	-0.103716486	
8		*Dalbergia latifolia*	Sonokeling	3	0.044117647	-3.120895417	-0.137686562	
9		*Senna siamea*	Johar	3	0.044117647	-3.120895417	-0.137686562	
10	Thymelaeaceae	*Aquilaria malaccensis*	Gaharu	5	0.073529412	-2.610069793	-0.191916897	
11		*gonystylus bancanus*	Ramin	1	0.014705882	-4.219507705	-0.062051584	
12	Santalaceae	*Santalum album*	Cendana	1	0.014705882	-4.219507705	-0.062051584	
13	Moraceae	*Ficus insipida*	Bonsai	2	0.029411765	-3.526360525	-0.103716486	
14		*Ficus microcarpa*	Beringin Cina	2	0.029411765	-3.526360525	-0.103716486	
15		*Ficus tinctoria*	Ara batik	1	0.014705882	-4.219507705	-0.062051584	
16	Annonaceae	*Annona squamosa L*	Srikaya Hutan	1	0.014705882	-4.219507705	-0.062051584	
17	Salicaceae	*Flacourtia jangomas*	Kerukup	6	0.088235294	-2.427748236	-0.21421308	
18	Malpighiaceae	*Malphigia glabra L*	Sianci	1	0.014705882	-4.219507705	-0.062051584	
19		*Byrsonima densa*		1	0.014705882	-4.219507705	-0.062051584	3.407620942
20	Lauraceae	*Cinnamomum verum*	Kayu manis	3	0.044117647	-3.120895417	-0.137686562	
21	Rhamnaceae	*Paliurus spina*	Duri yeruslaem	2	0.029411765	-3.526360525	-0.103716486	
22	Bignoniaceae	*Mansoa alliccae*	Mansoa	1	0.014705882	-4.219507705	-0.062051584	
23	Combretaceae	*Terminalia oblonga*	Kayu naga	6	0.088235294	-2.427748236	-0.21421308	
24	Juglandaceae	*Pterocarya fraxinifolia*	Kenari kaukasia	1	0.014705882	-4.219507705	-0.062051584	
25	Ericaceae	*Orthilia secuda L*	Sidebells bergerigi	2	0.029411765	-3.526360525	-0.103716486	
26	Lythraceae	*Lafoensia glyetocarpa*	Lafoensia	1	0.014705882	-4.219507705	-0.062051584	
27	Rosaceae	*Prunus serotina*	Ceri hitam	2	0.029411765	-3.526360525	-0.103716486	
28	Celastraceae	*Elaeodendron buchanaii*	Anggur hutan	1	0.014705882	-4.219507705	-0.062051584	
29	Calophyllaceae	*Calophyllum calaba*	Metangur	1	0.014705882	-4.219507705	-0.062051584	
30	Meliaceae	*Swietania mahagoni*	Mahoni	2	0.029411765	-3.526360525	-0.103716486	
31	Arecaceae	*Cocus nucifera*	Kelapa	2	0.029411765	-3.526360525	-0.103716486	
32	Oleaceae	*Ligustrum japonicum*	Daun lilin	1	0.014705882	-4.219507705	-0.062051584	
33	Euphorbiaceae	*Havea brasiliensis*	Pohon karet	1	0.014705882	-4.219507705	-0.062051584	
34	Euphorbiaceae	*Mallotus philippensis*	Pohon kamala	1	0.014705882	-4.219507705	-0.062051584	
35	Apocynaceae	*Plimeria alba*	Pohon kamboja	1	0.014705882	-4.219507705	-0.062051584	
36	Styracaceae	*Styrax japonicus*	Lonceng salju jepang	1	0.014705882	-4.219507705	-0.062051584	
37	Cannabaceae	*Celtis simensis*	Celtis	1	0.014705882	-4.219507705	-0.062051584	
		Jumlah		68				

Based on the table above, it shows that in the Lampageu Ujong Pancu Village Forest Area, Aceh Besar Regency, Aceh Province, there are 37 species with a total

of 68 individual trees that live in the research location. Flacourtia jangomas, and Terminalia oblong as many as 6 individuals, Aquilaria malaccensis as many as 5 individuals. A tall cashew, Dalbergia latifolia, Siamese Seine, True cinnamon as many as 3 individuals.

The family that has a relatively large number of species is Anacardiaceae with 5 species. Several families also have relatively many species, namely Fabaceae and Moraceae, with 3 species. However, there are also 24 families whose species are limited, namely only 1 and 2 species.

Tree diversity using the Shannon-Weiner index obtained a value of $\hat{H}$=3.407 (3.4). It can be concluded that the tree diversity in the Forest Area of Lampageu Ujong Pancu Village, Aceh Besar Regency, Aceh Province is classified as high. This is as stated by (Fachrul 2007), namely if H'= 0, then the diversity index is low, this is because the community only consists of one species, if H'= >1<3 then the diversity index is medium, where productivity is sufficient, ecosystem conditions are fairly balanced, and ecological pressure is moderate, and if H'>3, then the diversity index is high, because the community has more than one species where productivity is high and ecosystem conditions are good. The high or low diversity index of a plant community depends on the number of species and the number of individuals of each type (species richness). As explained by Indriyanto (2006), species diversity can be used to explain community structure. Species diversity can also be used to measure community stability, namely the ability of a community to maintain its stability despite disturbances to its components.

The plant diversity index in the Lampageu Village Forest area, Ujong Pancu, Aceh Besar has a value of 3.4. This value shows that the number of species among the total number of individuals is quite high. The high or low value of diversity of a species is influenced by the number of species and the number of individuals identified. According to Destaranti et al (2017), the more species found, the higher the diversity index value, the higher the diversity value, the more stable the community.

Connell (1978) stated that species diversity will be high in habitat conditions with intermediate levels of disturbance. Meanwhile, habitats that are influenced

by human activities and experience the most severe disturbance will influence the value of vegetation type diversity to be relatively low compared to other habitat types. Changes in environmental conditions, as well as increases in altitude and changes in soil quality, cause differences in the number of species studied in this study.

D. CONCLUSION

The results of the research that has been carried out show that the number of tree species found in the Lampageu Village Forest Area, Ujong Pancu, Aceh Besar is 37 species. The diversity of tree species in the Lampageu Village Forest Area, Ujong Pancu, Aceh Besar is classified as high with a Diversity Index of $\hat{H} = 3,407$. So it can be concluded that the Lampageu Village Forest Area, Ujong Pancu, Aceh Besar can be used as a laboratory for practical work, especially plant ecology practicum .

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