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Composiation and Association Undergrowth Vegetation at Industrial Plant Forest Area of State Agricultural Polytechnic of Samarinda

*Corresponding Author : Rudi Djatmiko
Department : Forest Management
Institution : State Agricultural Polytechnic of Samarinda
City Postal Code, Country : 75131, Indonesia

Second Author : Emi Malaysia
Department : Forest Management
Institution :State Agricultural Polytechnic of Samarinda
City Postal Code, Country : 75131, Indonesia

Third Author : Dwinita Aquastini
Department : Forest Management
Institution : State Agricultural Polytechnic of Samarinda
City Postal Code, Country : 75131, Indonesia

Fourth Author : M. Masrudy
Department : Forest Management
Institution : State Agricultural Polytechnic of Samarinda
City Postal Code, Country : 75131, Indonesia

Fifth Author : M. Fadjeri
Department : Forest Management
Institution : State Agricultural Polytechnic of Samarinda
City Postal Code, Country : 75131, Indonesia

Abtract:- This research is motivated by the tendency that undergrowth vegetation is still neglected and is still not being considered as a component of the forest ecosystem. In fact, when viewed from the function and role undergrowth vegetation, it is also very large in maintaining forest ecosystems such as in terms of maintaining soil structure, soil fertility, maintaining soil temperature in the process of water infiltration, holding back surface erosion (run off), a source of food for animals.

The purpose of this study was to determine the types of undergrowth vegetation and to determine the relationship between species (associations) between undergrowth species in the Industrial Plantation Forest area of Samarinda State Agricultural Polytechnic.

The method used in this research is a plot made with a single plot method where the plot is made purposively on the land to be studied with an area of 58 x 26 m2 in which there are 40 sub-plots measuring 2 x 2 meters with 40 sub plots with evenly distributed placement in the plot. (systematic).

From the results of research on the types of undergrowth vegetation in the HTI area of Samarinda State Agricultural Polytechnic: the presence of undergrowth vegetation species around HTI Politani Samarinda has a diversity of 26 species, 24 orders, 22 families and an abundance of 688 individuals. From the Dominantce of the species, it is known that 5 types are Dominantt with Di index> 5%, 3 types are sub Dominantt with Di index of 2 - 5% and the remaining 18 species are not Dominantt with Di index <2%. The three Dominantt palin types are Asystasia intrusa, Nephrolepis falcata (Cav) C. Chr, and Scleria purpurascens Benth. The highest distribution of species was dominated by Neprolepis falcata (Cav) C.Hr (23 frequencies, 180 indv), Asystasia intrusa (22 frequencies, 197 indv), Scleria purpurascens Benth. (17 frequencies, 77 indv), Bauhinia sp (16 frequencies, 50 indv), and Bauhinia lingua DCs (11 frequencies, 46 indv). Type association of the 26 types present obtained 323 combinations of relationships with the closeness test, obtained 57 very close relationships (17.65%), then 85 close relationships (26.32%), moderate relationships as many as 106 (32.82%), only weak relationships 2.48%) and there were 67 (20.74%) Very Weak relationships.

Keywords:- *Composition, Association, Undergrowth Vegetation and Industrial Plant Forest.*

I. INTRODUCTION

The diversity of living things or biodiversity has an important meaning to maintain the stability of the ecosystem. According to Anonymous (1994), biodiversity is the diversity among living things from all sources including land, oceans and other aquatic ecosystems as well as ecological complexes that are part of its diversity, including diversity within species, between species and ecosystems. Species diversity is a characteristic level in a community based on its biological organization, which can be used to express the structure of the community. A community is said to have high diversity if the community is composed of many species with the same and almost the same species abundance. Conversely, if a community is composed of few species and if only a few species are Dominantt, the species diversity is low (Umar, 2011). One of the ecosystem units that play an important role in maintaining the balance of the ecosystem is undergrowth vegetation. Plants that grow between the main trees will strengthen the soil structure of the forest. These undergrowth vegetation plants can function in absorption and help to resist falling water directly. The undergrowth vegetation can play a role in inhibiting or preventing rapid erosion. reducing surface runoff velocity, encouraging the development of soil biota which can improve soil physical and chemical properties and play a role in adding soil organic matter, thereby increasing soil resistance to erosion. According to Hilwan et al., (2013), the existence of undergrowth vegetation on the forest floor can function as an antidote to rainwater blows and surface runoff thereby minimizing the danger of erosion. The growth of undergrowth vegetation is also important in the forest ecosystem and determines the microclimate The description of the structure common to all tropical rainforests is manifested in the general description of the architecture, namely the stratification of tree stands (Richards, 1975). , canopy tiers). The top level is called the upper stratum (stratum A), below it is the stratum B, C, D or E. In the forest ecosystem there is tree stratification, one of which is undergrowth stratification. Lower plants in a stratified arrangement occupy layer D which has a height <4.5 m and a stem diameter of about 2 cm (Windusari et al, 2012). The types of undergrowth vegetation are annual, biennial, perennial and their distribution patterns are random, clustered and evenly distributed. The lower plants found are generally members of the Poaceae, Cyperaceae, Araceace, Asteraceae and Paku-pakuan tribes (Nirwani, 2010). The area of Industrial Plantation Forest located at Samarinda State Agricultural Polytechnic has an area of 0.6 ha, with a thickness of approximately 15o and there are Acacia, Gmelina, Karet, Sengon and Sungkai plants.

II. METHOD

The materials used in this study were various types of undergrowth vegetation in the area of Industrial Plantation Forest State Agricultural Polytechnic of Samarinda. The tools used are stationery, machetes, meters, calculators, compasses, cameras, raffia ropes, labels, scissors, plastic bags. The method used in this research is a plot made with a single plot method where the plot is made purposively on the land to be studied with an area of 58 x 26 m2 in which there are 40 sub-plots measuring 2 x 2 meters with 40 sub plots with evenly distributed placement in the plot. (systematic). Samples of undergrowth vegetation were taken which were recorded in a book and then counted and documented. The identification of undergrowth vegetation was carried out by matching the herbarium collection of understorey species and with the plant species identification identification book (Ngatiman and Murtopo Budiono, 2010). Then analysis and calculation of species composition data, family and number of individual undergrowth vegetation using the species Dominantce index (Di), the distribution of species (frequency) and knowing the closeness relationship between undergrowth vegetation species using the association index.

III. RESULTS AND DISCUSSION

The results showed that the determination, distribution, Dominantce and abundance of undergrowth vegetation species in the HTI Politani area is shown in Table 1. The Chi-square value of undergrowth vegetation tennis in the HTI Politani area is shown in Table 2.

IV. CONCLUSION

1. The presence of undergrowth vegetation species around HTI Politani Samarinda has a diversity of 26 species, 24 orders, 22 families and an abundance of 688 individuals.
2. From the Dominantce of the species, it is known that 5 types are Dominantt with Di index> 5%, 3 types are sub Dominantt with Di index of 2 - 5% and the remaining 18 species are not Dominantt with Di index <2%. The three Dominantt palin types are Asystasia intrusa, Nephrolepis falcata (Cav) C. Chr, and Scleria purpurascens Benth.
3. The highest distribution of species was dominated by Neprolepis falcata (Cav) C.Hr (23 frequencies, 180 indv), Asystasia intrusa (22 frequencies, 197 indv), Scleria purpurascens Benth. (17 frequencies, 77 indv), Bauhinia sp (16 frequencies, 50 indv), and Bauhinia lingua DCs (11 frequencies, 46 indv).
4. Type association of the 26 types present obtained 323 combinations of relationships with the closeness test, obtained 57 very close relationships (17.65%), then 85 close relationships (26.32%), moderate relationships as many as 106 (32.82%), only weak relationships 2.48%) and there were 67 (20.74%) Very Weak relationships.

V. ADVICE

1. Given the complexity of the information obtained, it is necessary to carry out similar studies with different locations and methods in order to obtain better results.
2. Continue to explore the types and benefits after knowing the diversity of species in an effort to explore the potential, especially undergrowth vegetation.

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Table 1. etermination, Distribution and Domination of Lower Plants in the industrial forest State Agricultural Polytechnic of Samarinda Area

No	Family	Genus	species	Abudance		Frequency	Dominasi
				Indv	ni (%)		
1	Acanthaceae	Asystasia	*Asystasia intrusa*	197	28.634	22	Dominantt
2	Dryopteridaceae	Nephrolepis	*Nephrolepis falcata* (Cav) C.Chr	180	26.163	23	Dominant
3	Cyperaceae	Scleria	*Scleria Purpurascens* Benth	77	11.192	17	Dominant
4	Caesalpiniaceae	Bauhinia	*Bauhinia* sp	50	7.267	16	Dominant
5	Caesalpiniaceae	Bauhinia	*Bauhinia lingua* DC	46	6.686	11	Dominant
6	Flagellariaceae	Flelaria	*Flelaria* sp	29	4.215	9	Sub Dominant
7	Melastomataceae	Clidemia	*Clidemia hirta* (L) D.Don	17	2.471	1	Sub Dominant
8	Poaceae	Echinochloa	*Echinochloa colonum* (L) Link	14	2.035	2	Sub Dominant
9	Moraceae	Merremia	*Merremia* sp	10	1.453	3	Not Dominant
10	Blecnaceae	Blechnum	*Blechnum Orientale* L	9	1.308	8	Not Dominant
11	Fabaceae	Spatholobus	*Spatholobus ferrugineus* Benth	9	1.308	2	Not Dominant
12	Schizaceae	Lygodium	*Lygodium microphyllum* (Cav) R.Br	7	1.017	4	Not Dominant
13	Smilacaceae	Smilax	*Smilax modesta* DC	7	1.017	2	Not Dominant

14	Leeaceae	Leea	*Leea indica* (Burm.f) Merr	6	0.872	5	Not Dominant
15	Lamiaceae	Clerodendrum	*Clerodendrum* sp	5	0.727	2	Not Dominant
16	Poaceae	Centotheca	*Centotheca lappacea* (L) Desv	5	0.727	1	Not Dominant
17	Schizaceae	Lygodium	*Lygodium Circinatum* (Burm.f) Sw	4	0.581	3	Not Dominant
18	Pandanaceae	Freycinetia	*Freycinetia* sp	4	0.581	1	Not Dominant
19	Araceae	Alocasia	*Alocasia longiloba*	3	0.436	1	Not Dominant
20	Asteraceae	Eupatorium	*Eupatorium inulifolium*	2	0.291	1	Not Dominant
21	Thelypteridaceae	Pronephrium	*Pronephrium nitidum* Holtt	2	0.291	1	Not Dominant
22	Sapindaceae	Lipisanthes	*Lipisanthes* sp	1	0.145	1	Not Dominant
23	Verbenaceae	Lantana	*Lantana camara*	1	0.145	1	Not Dominant
24	Melastomataceae	Melastoma	*Melastoma malabathricum L*	1	0.145	1	Not Dominant
25	Costaceae	Costus	*Costus speciosus*	1	0.145	1	Not Dominant
26	Icacynaceae	Phytocrene	*Phytocrene* sp	1	0.145	1	Not Dominant
Amount	22	24	26	688	100	140	

Based on the range of Dominantce index values, it can be seen that the Dominantt undergrowth vegetation species (Di> 5%) in the study area were Asystasia intrusa, followed by Nephrolepis falcata (Cav) C. Chr, Scleria purpurascens Benth, Bauhinia sp and Bauhinia lingua. DC. There are three sub-Dominantt types (at 2 - 5%), namely Flelaria sp, Clidemia hirta (L) D. Don and Echinochloa colonum (L) Link. While the remaining 18 species are classified as non-Dominantt (Di <2%).

From the results of the distribution of understorey species, it is known that there are 5 most Dominantt species spreading in each research sub-plot, namely Neprolepis falcata (Cav) C.Hr (23 frequencies, 180 indv), Asystasia intrusa (22 frequencies, 197 indv), Scleria purpurascens Benth. (17 frequencies, 77 indv), Bauhinia sp (16 frequencies, 50 indv), and Bauhinia lingua DCs (11 frequencies, 46 indv).

Table 2. i-square value of understorey species in industrial forest plantations, Samarinda State Agricultural Polytechnic

No	**Species of plant**	**Kode**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
1	*Scleria Purpurascens Benth*	A											
2	*Blechnum Orientale L*	B	0.264										
3	*Asystasia intrusa*	C	1.216	0.340									
4	*Bauhinia lingua DC*	D	1.709	2.382	0.153								
5	*Bauhinia sp*	E	0.720	3.706	2.226	1.886							
6	*Lygodium Circinatum (Burm.f) Sw*	F	0.886	0.929	1.052	0.191	3.462						
7	*Lygodium microphyllum (Cav) R.Br*	G	3.925	3.989	0.766	2.910	3.706	3.205					
8	*Flelaria sp*	H	1.030	2.724	1.218	2.805	0.484	0.063	0.008				
9	*Clerodendrum sp*	I	3.591	6.532	0.010	3.090	3.462	4.889	6.532	3.092			
10	*Leea indica (Burm.f) Merr*	J	0.36	2.70	0.01	4.03	0.23	2.52	2.70	3.46	1.319		

			5	7	0	1	8	3	7	1			
11	*Spatholobus ferrugineus Benth*	K	2.308	2.665	2.279	2.265	1.882	2.725	0.033	0.081	0.577	0.357	
12	*Nephrolepis falcata (Cav) C.Chr*	L	0.681	5.864	0.009	0.016	0.038	6.708	0.910	0.267	4.850	1.768	0.006
13	*Merremia sp*	M	4.646	3.205	6.730	0.191	0.135	2.730	3.205	1.486	4.888	0.052	1.824
14	*Lipisanthes sp*	N	3.591	6.532	0.010	3.090	3.462	4.889	6.532	3.092	11.598	3.663	0.577
15	*Lantana camara*	O	3.591	6.532	0.010	3.090	3.462	4.889	6.532	3.092	11.598	3.663	3.141
16	*Centotheca lappacea (L) Desv*	P	0.264	3.989	0.340	2.910	3.706	3.205	3.989	2.724	6.532	2.707	0.033
17	*Echinochloa colonum (L) Link*	Q	3.925	3.989	0.766	2.910	3.706	3.205	3.989	2.724	6.532	0.301	0.033
18	*Clidemia hirta (L) D.Don*	R	3.591	6.532	0.010	3.090	3.462	4.889	6.532	3.092	11.598	3.663	3.141
19	*Melastoma malabathricum L*	S	0.024	6.532	4.569	0.260	3.462	4.889	6.532	3.092	11.598	3.663	3.141
20	*Freycinetia sp*	T	3.591	6.532	0.010	3.090	3.462	4.889	6.532	3.092	11.598	3.663	3.141
21	*Costus speciosus*	U	3.591	6.532	0.010	3.090	3.462	4.889	6.532	3.092	11.598	3.663	3.141
22	*Phytocrene sp*	V	3.591	6.532	4.569	3.090	3.462	4.889	4.373	0.445	11.598	3.663	0.577
23	*Eupatorium inulifolium*	W	0.024	6.532	4.569	3.090	3.462	4.889	6.532	3.092	11.598	3.663	3.141
24	*Smilax modesta DC*	X	5.502	2.866	3.244	3.567	0.938	5.766	2.866	0.255	4.103	2.540	2.934
25	*Alocasia longiloba*	Y	3.591	6.532	0.010	3.090	3.462	4.889	6.532	3.092	11.598	3.663	3.141
26	*Pronephrium nitidum Holtt*	Z	0.024	6.532	4.569	0.260	3.462	4.889	6.532	3.092	11.598	3.663	3.141

From the results of the 26 species present in the understorey that were present at the study site there were 323 relationships, which after the closeness test was carried out, it was found that there were 57 very close relationships (17.65%), then 85 close relationships (26.32%), moderate relationships as many as 106 (32.82%), weak relationships were only 8 (2.48%) and very weak relationships were 67 (20.74%).

Then based on observations of the closeness test carried out and linked to the distribution of species data in each observation sub plot, information is obtained that the magnitude of the distribution frequency of the species is not necessarily an indication that the species is high or closely related to other species, so it is not an indication that the species is high or closely related to other species. absolute indication. However, the joint presence between species in an observation plot shows that these species are able to live together and side by side, as well as the absence of together in each plot is also an indicator of the close relationship between types (Susanto, 2001).

From the existing data, it shows that a large number of frequencies does not always result in a relationship with a moderate, close and very close category, and vice versa, at a small or small frequency, it does not necessarily result in a relationship with a weak and very weak category. It's just that when returned to the formula X ^ 2, the calculation shows that the greater the value of X ^ 2, the stronger the relationship between the species (Dumbois and Ellenberg, 1974). Conversely, the smaller the value of X ^ 2 is calculated, the weaker the relationship between types. Agree with this, Whittaker, (1992) in Susanto (2001) states that the association or kinship relationship between several plant species is not very clear and some plant species may not even have a relationship in the community.