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Herb Inventory in the Forest Education of Forestry Faculty Mulawarman University

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ABSTRACT
An herbaceous plant is a plant group with a short, small plant and has a wet trunk because many contain water and have no wood. This research aims to inventory herbaceous plant species in three different locations and provide information uses of botanicals herbs. The results showed that the slopes area had been found 12 types of herbaceous, 340 individuals. The highest number of SDR of 29.26% is kind of *Nephrolepis bisserata* (SW.) Schott. In the area, ramps have found 11 types of herbaceous, 215 individuals. The highest number of SDR of 34.81% is *Phrynium pubinerve* Blume. In a bridge, the area has found 16 different herbs, 542 individuals. The highest number of SDR of 38.72% is *Phrynium pubinerve* Blume. The lowest number of SDR of 0.89% is *Adiatum* sp., *Asplenium nidus* L., *Davallia lorrainii* Hance, *Haplopteris malayensis* (Holttum) E. H. Crane, *Ottochloa nodosa* (Kunth) Dandy, and *Tacca chantrieri* Andre. Dominance index (C) in three locations research of 0.26, 0.23 and 0,31. Similarity index (ISs) in three locations have a high degree of similarity: IS > 50%-75%. Herbaceous plants that have usability there are 19 kinds of herbs in the family of 15.

Keywords: *Vegetation, Herbs, Dominance index, Similarity index*

1. INTRODUCTION

There are eight habitus plants in tropical rain forests, i.e., tree, terna (herbaceous), bushes, shrubs, fungi, epiphyte, and liana, a parasite. The herbaceous plant is a plant group with short stature, small, and has a wet trunk because many contain water and have no wood [1]. Herbaceous plants can spread easily in the form of a group with the same individual at different conditions of different habitats such as soil moist or watery, dry ground, rocks, and a shade fewer habitat meetings or open [2].

In herbaceous plants of the tropical rain forest is rare to find. While in the forest, an herbaceous plant found as scattered individuals far between each other, sometimes not find at all, even a social species group pun almost rare. The vegetation is abundant herbaceous can generally be found in the plateau's steep slopes and rain forests where the closure of less lush trees between each other. Most of the herbaceous species of plants commonly found in the open can also be found in small amounts in the shade, but can not be found in the Woods' darkest part. The main factors that affect the difference are light and other things caused by competition or competition roots. Species that are resistant to light often tend to behave socially and grow in clusters, whereas species that cannot bear the light of generally solitary in remote places [3].

Herbaceous plants are also used as medicines, ornamental plants, and crafts. This research to preserve in KPHP – HPFU with the aim of herbaceous plants and inventory provides information about the usefulness of the herbaceous plants have been identified.

2. METHOD AND DATA ANALYSIS

Sampling is done using a combination of methods with the placement of purposive sampling, the path along the 100 meters with a plot of 5 x 5 meters (hose side) in the area of the slopes, ramps, and bridge. Tools used meter 50 meters, a machete, a compass, writing tools, cameras, GPS, thermo-hygrometer, lightmeter, canopy cover application, tape survey, ribbons, laptop, and calculator. The materials used are location map research, tally sheet, and guidebook.

Table 1. Species of herbs and summed dominance ratio in the area of slopes

No	Species	N	F	INP	SDRn
1	*Nephrolepis bisserata* (Sw.) Schott	114	11	58.53	29.26
2	*Asystasia gangetica* (L.) T. Anderson	114	6	47.17	23.58
3	*Molineria latifolia* (Dryand ex W. T. Aiton) Herb ex Kurz	55	6	29.81	14.91
4	*Hornstedtia conica* Ridl.	19	6	19.22	9.61
5	*Calathea concinna* (W. Bull) K. Schum.	15	4	13.50	6.75
6	*Scleria bancana* L.	5	3	8.29	4.14
7	*Alocasia longiloba* Miq.	3	2	5.43	2.71
8	*Amischotolype griffithii* (C. B. Clarke) I. M. Turner	3	2	5.43	2.71
9	*Dicranopteris linearis* (Burm. f.) Underw.	4	1	3.45	1.72
10	*Stachyphrynium repens* (Korn.) Suksathan & Borchs	4	1	3.45	1.72
11	*Cheilcostus speciosus* (J. Koenig) C. D. Specht	2	1	2.86	1.43
12	*Phrynium pubinerve* Blume	2	1	2.86	1.43
	Total	340	44	200	100

Table 2. Species of herbs and summed dominance ratio in ramps area

No	Species	N	F	INP	SDRn
1	*Phrynium pubinerve* Blume	84	11	69.63	34.81
2	*Scleria bancana* L.	41	7	38.51	19.26
3	*Calathea concinna* (W. Bull) K. Schum.	30	3	22.29	11.14
4	*Molineria latifolia* (Dryand ex W. T. Aiton) Herb ex Kurz	29	1	16.27	8.13
5	*Stachyphrynium repens* (Korn.) Suksathan & Borchs	11	4	16.23	8.11
6	*Hornstedtia conica* Ridl.	6	4	13.90	6.95
7	*Ottochloa nodosa* (Kunth.) Dandy	10	1	7.43	3.71
8	*Alocasia longiloba* Miq.	1	2	6.02	3.01
9	*Blechnum occidentale* L.	1	1	3.24	1.62
10	*Haplopteris malayensis* (Holttum) E. H. Crane	1	1	3.24	1.62
11	*Homalomena occulta* (Lour.) Schott	1	1	3.24	1.62
	Total	215	36	100	100

2.1. Summed Dominance Ratio (SDRn)

Summed Dominance Ratio is a comparison of the important value index of vegetation with the parameters used. The SDR calculation uses two parameters; among others, the relative abundance and frequency parameters are relative. More details can be seen in the following formula [4].

$$SDRn\ (\%) = INP/n \quad (1)$$

Description:
SDRn = Summed Dominance Ratio
INP = Important Value Index
n = Observation variable

2.2. Dominance Index (C)

According to Simpson (1949), the Odum [5] dominance index can be calculated with the following formula.

$$C = \Sigma(ni/N)^2 \quad (2)$$

Description:
C = Dominance Index
ni = Number of individuals for type-i
N = Number of individuals of all

2.3. Similarity Index

According to Simpson (1949), the Odum [5] similarity index can be calculated with the following formula.

Table 3. Species of herbs and summed dominance ratio in the bridge area

No	Species	N	F	INP	SDRn
1	*Phrynium pubinerve* Blume	237	16	77.43	38.72
2	*Hornstesia conica* Ridl.	47	12	29.15	14.57
3	*Molineria latifolia* (Dryand ex W. T. Aiton) Herb ex Kurz	40	12	27.60	13.80
4	*Calathea concinna* (W. Bull) K. Schum.	71	4	21.96	10.98
5	*Leptaspis urceolata* (Roxb.) R. Br.	18	5	11.79	5.90
6	*Amichotolype griffithii* (C. B. Clarke) I. M. Turner	21	2	7.77	3.89
7	*Cheilocostus speciosus* (J. Koenig) C. D. Specht	5	2	4.23	2.12
8	*Alocasia longiloba* Miq.	3	2	3.79	1.89
9	*Scleria bancana* L.	2	2	3.57	1.78
10	*Solanum* sp.	2	1	2.00	1.00
11	*Adiatum* sp.	1	1	1.78	0.89
12	*Asplenium nidus* L.	1	1	1.78	0.89
13	*Davalia lorrainii* Hance	1	1	1.78	0.89
14	*Haplopteris malayensis* (Holttum) E. H. Crane	1	1	1.78	0.89
15	*Ottochloa nodosa* (Kunth.) Dandy	1	1	1.78	0.89
16	*Tacca chantrieri* Andre	1	1	1.78	0.89
	Total	452	64	200	100

$$SI\ (\%) = \frac{2C}{A+B}\ x\ 100 \qquad (3)$$

SI = Similarity Index
A = Number of types on location A
B = Number of types on location B
C = The same number of type on both locations

3. DISCUSSION

3.1. The Existence of the Type of Herbs on the Slopes

There have been found 12 types of herbs consisting of 340 individuals in slopes (Table 1). *Nephrolepis bisserata* had the highest summed dominance ratio value (29.26). The species with the lowest summed dominance ratio value (1.43) were *Cheilocostus speciosus* and *Phrynium pubinerve* Blume.

3.2. The Existence of the Type of Herbs on the Ramps Area

There have been 11 types of herbs consisting of 215 individuals in the area of ramps (Table 2). *Phrynium pubinerve* Blume had the highest summed dominance ratio values (34.81). The lowest summed dominance ratio value (1.62) was *Blechnum occidentale*, *Haplopteris malayensis*, and *Homalomena occulta*.

3.3. The Existence of the Type of Herbs in Bridge Area

There have been 16 different herbs consisting of 452 individuals in the bridge area (Table 3). *Phrynium pubinerve* Blume had the highest summed dominance ratio values (38.72). The species with the lowest summed dominance ratio value (0.89) were *Adiatum* sp., *Asplenium nidus* L., *Davalia lorrainii* Hance, *Haplopteris malayensis* (Holttum) E. H. Crane, *Ottochloa nodosa* (Kunth.) Dandy, and *Tacca chantrieri* Andre.

3.4. Dominance Index

The dominance index in the slope area can be seen in Figure 1.

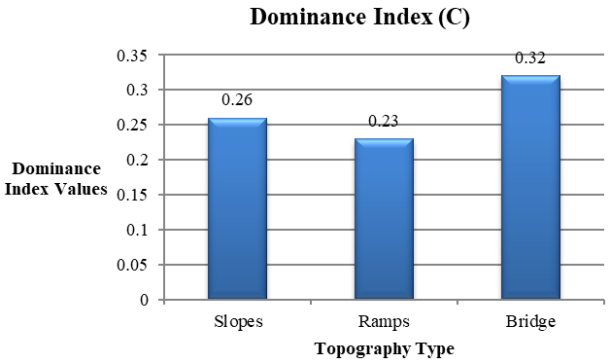

Figure 1 Dominance index in three research sites.

Based on Figure 1, the highest dominance index value was in the highest bridge area (0.32), categorized as a medium dominance index. The dominance index in the slopes and the ramps were 0.25 and 0.23, respectively, categorized as a low dominance index.

3.5. Similarity Index

The similarity index values in the three research locations can be seen in Figure 2.

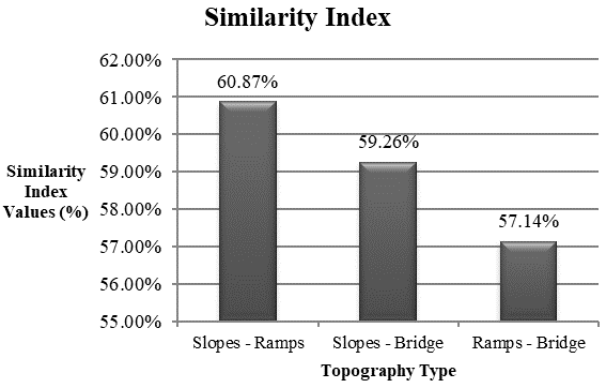

Figure 2 Dominance index in three research sites.

Based on Figure 2, it is known that the similarity index of herbs between slopes and ramps was 60.78%, 59.26% for slopes and bridge area, 57.14% for ramps and bridge area. The level of similarity is high because the species of herbs found in the three areas more or less the same.

3.6. Species of Herbs in the Research Location

The individual number of herb species found in the three locations can be seen in Table 4. There were 22 herb species with 1.007 individuals from 17 families in the three locations. The most abundant species were *Phrynium pubinerve* (323 individuals), followed by *Molineria latifolia* (Dryand ex W. T. Aiton) ex Kurz (124 individuals), and *Calathe concinn*a (W. Bull) K. Schum (116 individuals). *Adiatum* sp., *Asplenium nidus* L., *Blechnum occindentale* L., *Davallia lorrainii* Hance, *Homalomena occulta* (Lour.) Schott, *Solanum* sp., and *Tacca chantrieri* were among the scarcest species in the three locations.

Table 4. Types of herbs find in the location of research

No	Species	Famili	Number of individual			Total
			1	2	3	
1	*Phrynium pubinerve*	Marantaceae	2	84	237	323
2	*Molineria latifolia*	Hypoxidaceae	55	29	40	124
3	*Calathea concinna*	Marantaceae	15	30	71	116
4	*Asystasia gangetica*	Acanthaceae	114	-	-	114
5	*Nephrolepis bisserata*	Araceae	114	-	-	114
6	*Hornstedtia conica*	Zingiberaceae	19	6	47	72
7	*Scleria oblata*	Cyperaceae	5	41	2	48
8	*Amischotolype griffithii*	Commelinaceae	3	-	21	24
9	*Leptaspis urceolata*	Poaceae	-	-	18	18
10	*Stachyphrynium repens*	Marantaceae	4	11	-	15
11	*Ottochloa nodosa*	Poaceae	-	10	1	11
12	*Alocasia longiloba*	Araceae	3	1	3	7
13	*Cheilocostus speciosus*	Costaceae	2	-	5	7
14	*Dicranopteris linearis*	Gleicheniaceae	4	-	-	4
15	*Haplopteris malayensis*	Vittariaceae	-	1	1	2
16	*Solanum* sp.	Solanaceae	-	-	2	2
17	*Adiatum* sp.	Pteridaceae	-	-	1	1
18	*Asplenium nidus*	Apleniaceae	-	-	1	1
19	*Blechum occidentale*	Blechnaceae	-	1	-	1
20	*Davallia lorrainii*	Davalliaceae	-	-	1	1
21	*Homalomena occulta*	Araceae	-	1	-	1
22	*Tacca chantrieri*	Dioscoreaceae	-	-	1	1
Total			340	215	451	1.007

3.7. The Use of Herb Species

The herb species in all locations can be categorized based on their use. More details can be seen in Figure 3.

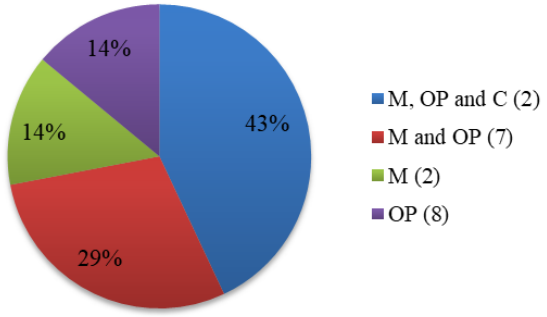

Figure 3 Percentage of The Type of Herbs Based on Usability.

Description:
M: Medicine, OP: Ornamental Plants, C: Crafts

In the research location, there were 19 useful species of herbs from 15 families. About 43% of herbaceous plants can be used as efficacious drugs, ornamental plants, and crafts, i.e., *Dicranopteris linearis* (Burm. f.) Underw. and *Molineria latifolia* (Dryand ex W. T. Aiton) Herb. ex Kurz. About 29% of herbaceous plants can be used as efficacious drugs and ornamental plants, i.e., *Asplenium nidus* L., *Asystasia gangetica* (L.) T. Anderson, *Cheilocostus speciosus* (J. Koenig) C. D. Specht, *Homalomena occulta* (Lour.) Schott, *Hornstedtia connica* Ridl., *Stachyphrynium repens* (Korn.) Suksathan & Borchs., and *Tacca chantrieri* Andre. About 14% of herbaceous plants can be used as efficacious medications, i.e., *Phrynium pubinerve* Blume and *Scleria oblata* S. T. Blake ex J. Kern. About 14% of herbaceous plants can be used as ornamental plants, i.e., *Adiatum* sp., *Alocasia longiloba* Miq., *Amischotolype griffithii* (C. B. Clarke) I. M. Turner, *Blechnum occidentale* L., *Calathea concinna* (W. Bull) K. Schum, *Davallia lorrainii* Hance, *Nephrolepis bisserata* (SW.) Schott, and *Solanum* sp.

4. CONCLUSION

The dominance index of the three locations is categorized as low to medium. There are 19 useful herb species for medicines, ornamental plants, and handicrafts.

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