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The diversity of plants that exist in the forest wildlife of Lambusango, Southeast Sulawesi

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ABSTRACT

Lambusango forest is one of the protected areas in Buton Regency. Lambusango forest is located in Buton district (Kapontori, Lasalimu and Pasarwajo sub-districts). Based on the status can be divided into 2, namely; 1) Lambusango wildlife reserve (SM) (± 28,510 ha); 2) Kakunauwe Nature Reserve (± 810 ha). The purpose of this study was to collect data and information, especially about the types of plants that exist in the Lambusango Wildlife Reserve area on Buton Island. This research uses literature study method. From the research results, there are about 110 species of plants that have been collected, 104 species of which have known potential utilization by the local community. There were 10 plant species in bush vegetation, 10 plant species in secondary forest, and 21 plant species in primary forest. Furthermore, 21 species of seed plants (Spermatophyta), 21st species of ferns (Pteridophyta) and 16 species of mosses (Pteridophyta) were obtained.

1. Introduction

Forest is a terrestrial biome that is a place to live and develop living things, forests can change shape following the natural conditions that occur [1]. Indonesia is one of the countries that has forest areas, with protected forests, as well as unprotected forests. Lambusngo forest is one of the protected forests in Southeast Sulawesi, precisely in Buton Regency. Lambusango Forest is located in Buton Regency (Kapontori District, Lasalimu, South Lasalimu, Wolowa, Siontapina and Pasarwajo). Based on the status can be divided into three; (1) Lambusango Wildlife Reserve (SM) (± 28,510 ha); (2) Kakenauwe Nature Reserve (CA) (± 810 ha). Both are currently under the management of the Ministry of Forestry (Forest Resources Conservation Center, Southeast Sulawesi/BKSDA); (3) Protected and production forest areas around the conservation area (± 35,000 ha) managed by the local government of Buton Regency [2].

Lambusango Forest is a tropical rainforest on the island of Buton, located in Southeast Sulawesi. This forest covers an area of about 95,000 ha, with different parts of the forest having different levels of conservation protection. The climate is seasonal, with a three-month dry season and considerable variability from year to year due to El Ninoo and La Nia events [3]. Forests are also one of the natural resources that play a role in maintaining, maintaining and increasing the availability of water and soil fertility. The availability of water and soil fertility is the source of human life. The diversity of plants in the Lambuango forest is a form of wealth owned by the forests in Southeast Sulawesi. Diversity also has benefits for survival on earth. The diversity of plants in an ecosystem provides uniqueness to the ecosystem. In addition to physiological functions, several types of plants in the Lambusango forest have been identified as plant species that can be used as food, medicinal plants, and as alternative energy sources [4]. Based on the Decree of the Minister of Agriculture Number: 639/Kpts/9/Um/1982 dated September 1, 1982. The Lambisango Wildlife Forest is one of the protected forests in Southeast Sulawesi with an area of approximately 27,700 ha, which

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is geographically located between (05012 ' – 05024' South Latitude and 122047' – 122056' East Longitude) with an altitude between 15 m to 780 m above sea level.

2. Material and Method

2.1 Types of research

This research is a type of scientific research, which is a literature study, by obtaining references to theories and journals related to the themes that the authors adopt. The theoretical and journal references obtained from this literature study are used as the basis and main tool for analysis.

2.2 Population and Sample

The research population is the whole of the research subjects who have certain qualities and characteristics determined by the researcher. The population of this study is all journals that discuss plant diversity. The sample of this study is part of the number and characteristics possessed by the population. The sample of this research is devoted to taking several journals related to the diversity of plants in the Lambusango wildlife area.

2.3 Type of data used

The type of data used is secondary data, namely data obtained from journals, literature articles, and media publications. When sources in the form of e-books, e-journals, or other literature are formed electronically, the authors type keywords in the population source search section. Then the source is taken from a valid journal [5].

3. Results and Discussion

The results obtained in this study, there are several types of plants found, in the area of shrub vegetation, secondary forest vegetation, and primary forest vegetation. The results obtained in this study are listed in Table 1 [6].

Table 1. Diversity of plant species in the bush vegetation area, secondary forest vegetation and primary forest vegetation in the Lambusango forest area

Vegetation Type	**Plant Type**	
	Local name	**Scientific name**
Bush vegetation	Alang-alang	*Imperata cylindrica*
	Tembelekan	*Lantana camara*
	Komba-komba	*Chromolaena odorata*
	Daun gergaji	*Stachytarpeta jamaicensis*
	Katuk	*Breynia virgata*
	Bunga bisul	*Sida rhombifolia*
	Rore	*Pipturus argenteus*
	Keladi tikus	*Ipoemea angulata*
Secondary forest vegetation	Lapi kabu	*Mallotus risinoides*
	Tawala	*Macaranga mappa*
	kapasono ganda	*Glochidion* sp.
	une	*Callicarpa arborea*
	Moniaga	*Anthocephalus macrophyllus*
	Kafofo	*Kleinhovia hospita*
	Bangkai	*Nauclea orientalis*
	-	*Neonauclea calycina.*
	Bamban	*Donax cannaeformis*
	Ondok	*Dioscorea hispida*
Primary forest vegetation	Kase	*Pometia pinnata*
	Dongi	*Dillenia serrata*
	Betau	*Calophyllum soulatri*

Logasi	*Pangium edule*
Pacombo	*Leea spp*
Berdoa	*Asplenium nidus*
Daun burung	*Drynaria sparsisora*
Tumbuhan lipan	*Freycinetia angustifolia.*
Siri hutan	*Piper sp.*
	Elatostema sp
Bamban	*Donax canaeformis*
Deka biru	*Selaginella wildenowii*
Deka hijau	*Selaginella plna*
Lumut	*Mitthyridium undulatum*
Lumut	*Calymperes sp*
Lumut	*Garovaglia plicata*
Lumut	*Neckeropsis lepineana*
Lumut	*Barbella enervis*

3.1 Bush vegetation

Vegetation is very important in soil stabilization and erosion control, especially in mountainous and hilly areas. They also protect and conserve water supplies and prevent flooding. Small tree clusters and even single trees have a similar role locally in preventing landslides and in restraining riverbanks. In addition, it contributes significantly to nutrient recycling, carbon dioxide sequestration, and oxygen generation, including bush vegetation [7]. Bush vegetation has a vegetation structure that is usually quite open, to a closed canopy with irregular horizontal canopy spacing and varying height, but usually <5 m. Plants that live in this type of vegetation are found in open areas on the outskirts of Nature Reserves and Wildlife Sanctuaries, especially those bordering the highway. This type of vegetation is dominated by grasses, namely alang-alang (*Imperata cylindrica*). In addition, it is also overgrown by shrubs and other herbs. In the Lambusango forest area, 8 species of plants that grow on shrubs are found, namely: *Imperata cylindrica, Lantana camara, Chromolaena odorata, Stachytarpeta jamaicensis*, *Breynia virgata*, *Sida rhombifolia*, *Pipturus argenteus*, dan *Ipoemea angulata.*

3.2 Secondary forest vegetation

Secondary forest is a forest that grows and develops naturally after damage/change has occurred in the first forest. In general, it is a forest area with a slightly open tree canopy because it has experienced physical disturbances. With the opening of the area, many types of secondary trees are overgrown, the types that make up secondary forests are generally tree species that grow fast but do not last long. Perusakan hutan primer di seluruh dunia di masa lalu dan terus berlanjut maka terbentuk hutan sekunder [8]. The Food and Agriculture Organization (FAO) defines secondary forest as "forest that regenerates, largely through natural processes, after significant disturbance of native forest and exhibits substantial differences in forest structure and/or species composition compared to native primary forest [9]. The secondary forest vegetation in the lambusango forest area found 10 plant species, namely: *Ipoemea angulata, Mallotus risinoides*, *Macaranga mappa, Glochidion* sp., *Callicarpa arborea, Anthocephalus macrophyllus, Kleinhovia hospita, Nauclea orientalis, Neonauclea calycina, Donax cannaeformis*, and *Dioscorea hispida.*

3.3 Primary forest vegetation

Primary forest is a forest that has reached an advanced age and certain structural characteristics that are in accordance with its maturity, and thus have unique ecological characteristics [10]. Primary forests are found in all climates—tropical, boreal, and temperate where there is sufficient rainfall to support the tree canopy. Primary forests are declining globally. The Food and Agriculture Organization (FAO) notes that primary forests are being degraded or cleared at a rate of at least four million hectares per year [11]. Types of plants that are often found in this lambusango wildlife area, among others, types of plants that are often found in this lambusango wildlife area, among others. This study found 21 plant species in the lambusango forest area in primary forest vegetation, namely: *Pometia pinnata, Dillenia serrata*, *Calophyllum soulatri*, *Pangium edule, Leea* spp., *Asplenium nidus, Drynaria sparsisora, Freycinetia angustifolia*, *Piper* sp., *Elatostema* sp.,

Donax canaeformis, Selaginella wildenowii, Selaginella plna, Mitthyridium undulatum, Calymperes sp., *Garovaglia plicata, Neckeropsis lepineana,* and *Barbella enervis.*

3.4 Seed plants (Spermatophyta)

The results of the literature study found 110 species of seed plants (*Spermatophyta*), 104 species of which have known potential utilization by the local community. The results of these studies are listed in Table 2.

Table 2. Data on seed plants (*Spermatophyta*) in the Lambusango forest area

No.	Grouping of plants based on their use	Total
1.	Plants classified as potential wood producers	32 Species
2.	Plants collected as ornamental plants	20 Species
3.	Plants collected as medicine	17 Species
4.	Fruit producer	13 Species
5.	Poisonous plant	5 Species
6.	Essential oil producer	1 Species
7.	Collected ferns	12 Species
8.	Not yet known how to use	6 Species
9.	As an ornamental plant	4 Species
10.	As a craft material	1 Species

Based on population information, no less than 32 types of wood trees are useful for various purposes, including for building houses, making furniture, boards, poles and rafters as well as making boats. There are 16 species of medicinal plants used by local residents. Three of them are rare medicinal plant species, namely oeo or *tali kuning* (*Arcangelisia flava*), *komba-kamba* (*Oroxylum indicum*) and gompanga (*Alstonia scholaris*). There are not many types of trees that produce edible fruits in this area. One of them is dongi (*Dillenia serrata*) which is an endemic plant whose fruit can be eaten and used by local residents as a substitute for tamarind. There are also several species of ferns and orchids that can be used as ornamental plants.

3.5 Ferns (Pteridophyta)

The results of the literature study found several types of ferns in the forest area of the Lambusango forest. The results of the study are listed in Table 3.

Table 3. Diversity of fern species in the forest area of Lambusango forest [12]

No	Species	Marga
1	*Adiantum cuneatum* Langsd & Fisch	*Adiantum*
2	*Angiopteris avecta* Hoofm.	*Angiopteris*
3	*Tectaria angulata* Willd. Copel	*Tectaria*
4	*Tectaria* sp.	*Tectaria*
5	*Davallia denticulata* (Burm) Mett.	*Davallia*
6	*Lindsaea ensifolia* Sw.	*Lindsaea*
7	*Selaginella willdenowii* Backer.	*Selaginella*
8	*Selaginella plana* Hieron.	*Selaginella*
9	*Antrophyum semicostatum* Desv.	*Antrophyum*
10	*Asplenium polyodon* G. Forster	*Asplenium*
11	*Microsorium pteropus* (Bl.) Ching	*Microsorium*
12	*Microsorium* sp.	*Microsorium*
13	*Nephrolepis hirsutula* (Forst.) Pr	*Nephrolepis*
14	*Pteris ensiformis* Burm.	*Pteris*
15	*Lygodium circinatum* Sw.	*Lygodium*
16	*Christella dentata* Forst.	*Christella*
17	*Christella parasitica* (L.) H. Lev.	*Christella*
18	*Coryphopteris tahanensis* Holtt.	*Coryphopteris*

19	*Coryphopteris* sp.	*Coryphopteris*
20	*Pyrrosia numularifolia*	*Pyrrosia*
21	*Stenochlaena palustris*	*Stenochlaena*

Ferns (*Pteridophyta*) are one of the germplasms that play an important role in forest ecosystems and are beneficial for human life. The spread of ferns is very wide in the territory of Indonesia. Ferns have a variety of species and tremendous potential for use as feed ingredients, medicines and ornamental plants [13]. The results obtained 21 species of ferns (*Pteridophyta*), namely: *Adiantum cuneatum* Langsd & Fisch, *Angiopteris avecta* Hoofm., *Tectaria* sp., *Davallia denticulata* (Burm) Mett., *Lindsaea ensifolia* Sw., *Selaginella willdenowii* Backer., *Selaginella plana* Hieron., *Antrophyum semicostatum* Desv., *Asplenium polyodon* G. Forster, *Microsorium pteropus* (Bl.) Ching, *Microsorium* sp., *Nephrolepis hirsutula* (Forst.) Pr, *Pteris ensiformis* Burm., *Lygodium circinatum* Sw., *Christella dentata* Forst., *Christella parasitica* (L.) H. Lev., *Coryphopteris tahanensis* Holtt, *Coryphopteris* sp., *Pyrrosia numularifolia*, dan *Stenochlaena palustris.*

3.6 Moss plants (Briophyta)

The research results obtained 15 types of mosses and 10 genera. The results of this study are listed in Table 4.

Table 4. Species data (*Briophyta*) of mosses in the Lambusango forest area

No	Species	**Marga**
1	*Calymperes afzeli*	*Calympere*
2	*Calymperes serratum*	*Calympere*
3	*Mitthyridium undulatum*	*Mitthyridium*
4	*Syrrhopodon Schwaegr*	*Syrrhopodon*
5	*Syrrhopodon spiculosus*	*Syrrhopodon*
6	*Fissidens cristatus* Wils. ex Mitt	*Fissidens*
7	*Ctenidium lychnites* (Mitt.) Broth.	*Ctenidium*
8	*Ctenidium lychnites* (Mitt.) Broth.,	*Ctenidium*
9	*Barbella enervis* (Mitt.) Fleisch.	*Barbella*
10	*Homaliodendron Fleisch*	*Homaliodendron*
11	*Homaliodendron exiguum* (Doz. & Molk.) Fleisch.,	*Homaliodendron*
12	*Neckeropsis Reichd't.*, Novara Exped	*Neckeropsis*
13	*Neckeropsis lepineana* (Mont.) Fleisch.,	*Neckeropsis*
14	*Garovaglia plicata* (Nees) Endl	*Garovaglia*
15	*Thuidium plumulosum* (Doz.& Molk.) Bryo	*Thuidium*

Moss is a group of plants that belongs to the Bryophyta division and is also a group of small plants that grow attached to tree substrates, dead wood, weathered wood, litter, soil and rocks. Indonesia has a variety of moss plants. Around 1500-2000 species of true mosses and liverworts are found in the territory of Indonesia. Moss is generally found in moist habitats. [14]. Liverweed represents 20%-30% of all moss species [15]. In the Lambusango forest area, 16 species of mosses were found with 10 genera. Moss is a group of plants that has characteristics, small size, does not have true roots, stems and leaves. In addition, mosses have complicated metagenic properties [16].

4. Conclusion

Lambusngo forest is one of the protected forests in Southeast Sulawesi, precisely in Buton Regency. Lambusango forest is a wealth that is owned, which has enormous benefits for the local community, with various types of plants that live in it. Around 110 plant species have been collected, 104 of which have been identified for their potential use by the local community. These plants provide many benefits to the community, with several types of plants that live with different types of vegetation, including: there are those that live in areas of shrubby vegetation, secondary forest vegetation, and primary forest vegetation.

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