Inventory of Yard Plant Species in Mulyasri Village, East Luwu As a Source of Learning Biology

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Abstract

This research was conducted in Mulyasri Village, Tomoni District, East Luwu Regency. The purpose of this study was to determine the types of yard plants that were deliberately planted in the yards of residents of Mulyasri Village, Tomoni District, East Luwu Regency; and to find out the output of plant inventory results that are used as a source of learning biology. This research method is a descriptive method and an exploration method. The results showed that there were 77 species of yard plants that were found and identified to the species level and classified into the kingdom plantae. There are two groups of plants found, namely spike plants (Pteridophyta) and flowering plants (Magnoliphyta). Spike plants (Pteridophyta) are found in 2 families with 2 species. Flowering plants (Magnoliphyta) are found in 38 families with 75 species. The results of the identification of the yard plants were compiled into a learning resource in the form of Flora which contains plant images, classifications, descriptions, local names and benefits of yard plant species found to be recommended as learning resources that students can use to increase knowledge about biological materials.

Introduction

Indonesia is one of the archipelagic countries consisting of more than 17,000 large and small islands, most of which are in the form of oceans, and have a high diversity of flora (plants). Plant diversity is a variation in the shape, body structure, color, number, and other properties of plants that exist in an area (Afiani, 2021). This diversity can be caused by environmental factors, namely the strategic condition of Indonesia's geography, development, growth, adaptation, mutation, and genetics. Until 2017, the diversity of plants and fungi in Indonesia is known to be 31,750 types consisting of 2,273 types of fungi, 2,722 types of mosses, 512 types of crustal mosses, 1,611 types of pteridophytes, and 24,632 types of spermatophytes (Retnowati, 2019).

Diverse plant species can be known through identification and inventory activities. Identification is to reveal or establish the identity of a plant, in this case determining its correct name and its proper place in the classification system. Meanwhile, inventory is an effort to find out the condition and status of the population in more detail and the area of its distribution carried out inside and outside its habitat and in conservation institutions. Plant exploration activities aim at conservation, as well as conducting research and documentation of plant diversity in an area, where the main target in the global strategy for plant conservation is the known and documented plant diversity (Irawanto, 2017). In the field of education, the abundant diversity of plants and the presence of plants in the surrounding environment can be used as real objects that are used as a source of learning, especially Biology lessons.

Learning activities that utilize the environment allow students to develop knowledge about living beings and even hone their sensitivity to environmental issues that occur (Nizar, 2017). The yard

environment is one of the potentials that can be used to support the learning process that can be utilized as an object of science, especially biological sciences with an insight into local potential. The diversity of plant species in the yard environment has the opportunity to become a fun learning resource (Munajah, 2021).

Tomoni Subdistrict has an area of 230.09 km² with an altitude of 15.00 meters above sea level. The average air temperature per year is 27.5°C with air humidity of 80.5% per year. Rainfall per year is 260 mm³ (BPS, 2017). One of the villages located in Tomoni District is Mulyasri Village. The territory of this village consists of land, not coast. Residents in Mulyasri Village, especially in Kebumen Hamlet, plant various plants in their yard land. The results of preliminary observations show that the yards of residents' houses in Mulyasri Village grow various plant species, ranging from several types of moss and spikes, and are dominated by flowering plants, including from the families *Caricaceae, Solanaceae, Arecaceae, Zingiberaceae, Fabaceae, Rosaceae* and others. All of these yard plants are very suitable to be used as a source of learning biology for students.

Kingdom plantae is one of the X class materials studied in the even semester of high school/MA. The basic competence of plantae material is KD 3.8 Grouping plants into divisions based on general characteristics, and relating their role in life. The scope in the plantae material is quite wide. Based on basic competencies includes classifying plants, based on general characteristics such as body characteristics, way of life, habitat, reproduction methods and benefits. These basic competencies require students to master the basic classification of plantae material (Kurniawan, 2021).

Septiasari (2016) revealed that the variety of learning difficulties experienced by class X high school students in understanding biology material in the Plantae sub-material, namely students have difficulty in understanding scientific names and grouping plants based on observed characteristics. In addition, teaching materials in the form of textbooks are less in demand by students because their appearance contains a lot of writing and few pictures of native plants, as well as limited examples of plant species that are imprisoned in plantae material.

Efforts that can be made to overcome the above problems need to be carried out an inventory of yard plant species in Mulyasri Village, Tomoni District, East Luwu Regency. The results of this inventory are expected to be used as a learning resource that can support biology learning activities, which are packaged in the form of Flora.

Methods

This research was conducted in April-June 2022 in Mulyasri Village, Tomoni District, East Luwu Regency. The tools that used in this study include a digital camera for documentation and stationery to record the results of the study. The samples obtained from this study were matched with several reference sources and several plant identification applications available on the internet.

The population in this study was all houses in mulyasri village, Tomoni district, which amounted to 209 houses. Calculating the sample size of a predetermined population can use the Slovin formula (Umar, 2013) which is as follows:

$$n = \frac{N}{1+Ne^2}$$

where,
n   : sample
N   : population
e   : presentation of research leeway due to stilllerable sampling errors (e=0.1)

$$n = \frac{N}{1+Ne^2}$$

$$n = \frac{209}{1+209(0.1)^2}$$

$$n = \frac{209}{1+2.09}$$

$$n = \frac{209}{3.09}$$

n = 67.64 rounded to 68

Based on the calculation results above, the minimum number of samples studied was 68 yards in Mulyasri Village. Furthermore, to calculate the proportion of the number of samples, the Proportionate

Stratified Random Sampling technique was used, which according to Sugiyono (2014) this sampling technique was used for populations that had inhomogeneous members/elements and were proportionally. This technique is used because the objects studied are stratified/grouped, consisting of RT 01, RT 02 and RT. For calculating the proportion of samples, the following formula is used:

$$n = \frac{X}{N} \times ni$$

Description:
n   : number of desired samples from each region
X   : number of population of each region
N   : total population of all houses in Mulyasri village
Ni   : sample
        Based on the formula above, the distribution of samples for each Rukun Tetangga (RT) contained in Kebumen Hamlet can be seen in table 1 as follows.

Table 1. Distribution of samples for each Rukun Tetangga (RT) in Mulyasri Village

Mulyasri Village	Sample Calculation	Total Sample	Rounded Up Samples
RT 01	$\frac{56}{209} \times 68$	18,22	18
RT 02	$\frac{78}{209} \times 68$	25,37	25
RT 03	$\frac{75}{209} \times 68$	24,40	24
Total		67,99	68

(Source: Data Processing, 2022)

Results and Discussion

Types of Yard Plants That Are Deliberately Planted by Residents
        Based on the results of research in Mulyasri Village, 40 families and 77 species of plants were found that were deliberately planted by residents in their yards. Yard plants consist of the groups of Pteridophyta and Magnoliophyta. The families and species of pteridophyta plants found in Mulyasri Village can be seen in table 2. The family and species of Magnoliophyta plants found in Mulyasri Village can be seen in table 3.

Table 2. Types of Pteridophyta Plants

No	Familia	Scientific Name	Indonesian Name	Local Name
1	*Aspleniaceae*	*Asplenium nidus*	Kembang doa	Kembang doa
2	*Pteridaceae*	*Platycerium bifurcatum*	Paku tanduk rusa	Tanduk rusa

(Source: Research data, 2022)

Table 3. Types of Magnoliophyta Plants

No	Familia	Scientific Name	Indonesian Name	Local Name
1	*Agavaceae*	*Agave americana*	Nanas sebrang	Bunga pedang
2		*Sansevieria sp.*	Lidah mertua	Lidah mertua
3	*Anacardiaceae*	*Mangifera indica*	Mangga	Pao
4	*Annonaceae*	*Annona muricata*	Sirsak	Sarikaja
5		*Polyalthia longifolia*	Glodokan tiang	Pohon tiang
6		*Adenium obesum*	Kamboja	Kamboja
7	*Apocynaceae*	*Allamanda cathartica*	Alamanda	Alamanda
8		*Catharanthus roseus*	Tapak dara	Tapak dara
9		*Tabernaemontana divaricate*	Mondokaki	Mondokaki
10	*Araceae*	*Aglonema sp.*	Aglonema	Aglo
11		*Anthurium plowmanii*	Gelombang cinta	Gelombang cinta

No	Familia	Scientific Name	Indonesian Name	Local Name
12		*Caladium bicolor*	Keladi merah	Keladi merah
13		*Dieffenbachia seguine*	Sri rejeki	Sri rejeki
14		*Monstera andansonii*	Janda bolong	Janda bolong
15		*Cocos nucifera*	Kelapa gading	Kaluku gading
16	*Arecaceae*	*Cyrtostachys renda*	Palem merah	Palem merah
17		*Salacca zalacca*	Salak	Sala'
18	*Asparagaceae*	*Cordyline fruticose*	Hanjuang	Hanjuang
19		*Cryptanthus bivittatus*	Kriptatus coklat	Kriptatus
20	*Asteraceae*	*Melampodium divaricatum*	Butter daisy	Bunga matahari kecil
21	*Bromeliaceae*	*Ananas comosus*	Nenas	Ponrang
22		*Bromelia sp.*	Bromelia	Bromelia
23	*Cactaceae*	*Hylocereus undatus*	Buah naga	Bua naga
24	*Caricaceae*	*Carica papaya*	Pepaya	Paniki
25	*Clusiaceae*	*Garcinia mangostana*	Manggis	Manggis
26	*Combretaceae*	*Terminalia mantaly*	Ketapang kencana	Ketapang cina
27	*Convolvulaceae*	*Ipomoea batatas*	Ubi jalar	Kandora
28		*Ipomoea reptana*	Kangkung darat	Lara'
29	*Cucurbitaceae*	*Luffa acutangula*	Gambas	Pare kalau
30		*Momordica charantia*	Pare	Paria
31	*Elaeocarpaceae*	*Muntingia calabura*	Kersen	Karseng
32		*Codiaeum variegatum*	Puring	Puring
33	*Euphorbiaceae*	*Jatropha curcas*	Jarak pagar	Pallang
34		*Manihot utilissima*	Ubi kayu	Battawe
35		*Pedilanthus pringlei*	Patah tulang	Patah tulang
36		*Pedilanthus tithymaloides*	Bunga zigzag	Bunga zigzag
37		*Sauropus androgynous*	Katuk	Katu'
38	*Fabaceae*	*Arachis hypogaea*	Kacang tanah	Kacang tanah
39	*Lamiaceae*	*Ocimun basilicum*	Kemangi	Kemangi
40	*Liliaceae*	*Hippeastrum striatum*	Lili orange	Lili
41	*Malvaceae*	*Hibiscus rosa-sinensis*	Kembang sepatu	Kembang sepatu
42		*Theobroma cacao*	Coklat	Cokela'
43	*Menispermaceae*	*Cyclea barbata*	Cincau rambat	Cawu
44	*Moraceae*	*Artocarpus altilis*	Sukun	Baka'
45		*Artocarpus heterophyllus*	Nangka	Panasa
46	*Moringaceae*	*Moringa oleifera*	Kelor	Kelor
47	*Musaceae*	*Musa paradisiaca*	Pisang	Loka
48		*Psidium guajava*	Jambu biji	Jambu serang
49	*Myrtaceae*	*Syzygium aqueum*	Jambu air	Jambu wai
50		*Syzygium oleana*	Pucuk merah	Pucuk merah
51		*Syzygium polyanthum*	Salam	Salam
52	*Nyctaginaceae*	*Bougainvillea glabra*	Kembang kertas	Kembang kertas
53	*Oleaceae*	*Jasminum sambac*	Melati	Melati
54		*Dendrobium phalaenopsis*	Anggrek larat	Angrek
55	*Orchidaceae*	*Spathoglottis plicata*	Anggrek tanah	Anggrek sakura
56		*Vanilla planifolia*	Vanili	Panili
57	*Oxalidaceae*	*Averrhoa bilimbi*	Belimbing wuluh	Jarru
58		*Averrhoa carambola*	Belimbing bintang	Belimbing manis
59	*Poaceae*	*Cymbopogon citratus*	Sereh	Sarre

No	Familia	Scientific Name	Indonesian Name	Local Name
60		*Saccharum officinarum*	Tebu	Ta'bu
61	*Rosaceae*	*Rosa hybrid*	Mawar	Mawar
62	*Rubiaceae*	*Ixora coccinea*	Asoka	Asoka
63		*Morinda citrifolia*	Mengkudu	Mengkudu
64	*Rutaceae*	*Citrus aurantifolia*	Jeruk nipis	Lemo nipi'
65		*Citrus hystrix*	Jeruk merica	Lemo
66		*Citrus limon*	Lemon	Lemon
67		*Citrus maxima*	Jeruk besar	Lemo bali
68	*Sapindaceae*	*Dimocarpus longan*	Langsat	Lasse
69		*Nephelium lappaceum*	Rambutan	Rambutan
70	*Solanaceae*	*Capsicum frutescens*	Cabe rawit	Passe
71		*Solanum melongena*	Terong	Katarrung
72	*Xanthorrhoeaceae*	*Aloe vera*	Lidah buaya	Lidah buaya
73		*Alpinia galanga*	Lengkuas	Likku'
74	*Zingiberaceae*	*Curcuma longa*	Kunyit	Kunyi'
75		*Zingiber officinale*	Jahe	Passe layya

(Source: Research data, 2022)

Based on the classification of yard plants found in Kebumen Hamlet, Mulyasri Village, Tomoni District, East Luwu Regency, there are 2 divisions, 3 classis, 30 orders, 40 families, 68 genus, and 77 species that have been found and identified in 68 yards that are sampling locations. Divisio Pteridophyta consists of 1 classis, 1 order, 2 genus, and 2 species. Divisio Magnoliophyta consists of 2 classiss, 29 orders, 66 genus, and 75 species.

Members of the divisionn Pteridophyta species found, *Asplenium nidus* and *Platycerium bifurcatum* have a herbaceous habitus and are generally used as ornamental plants because they have beautiful shapes and high aesthetic value (Adlini, 2021).

Members of the division Magnoliophyta are found to have habituses of herb, bush, shrub, and tree. Some are used as medicinal ingredients such as members of the *Zingiberaceae* family, *namely Alpinia galanga, Curcuma longa,* dan *Zingiber officinale.* As ornamental plants because of their high aesthetic value such as members of the *Araceae* family, *namely Aglonema sp., Anthurium plowmanii, Caladium bicolor, Dieffenbachia seguine,* and *Monstera andansonii*. As food ingredients such as members of Family *Caricaceae (Carica papaya),* Family *Convolvulaceae (Ipomoea batatas),* Family *Anacardiaceae (Mangifera indica)*, Family *Euphorbiaceae (Manihot uttilisima)* and many others.

Flora as a Source of Learning Biology

Flora is a source of learning free of local potential that is made to increase the knowledge of students. Learning resources created based on local potential can facilitate learning because students are often in direct contact with things that are close to them so that students are expected to have sufficient knowledge from the environment (Najmah, 2022). Flora Yard in addition to aiming to enrich the knowledge of students, can also motivate students in learning because it is equipped with attractive images and appearances.

Flora contains a list of plants supplemented by the classification, description and utilization of plants. Species names and plant classifications are adjusted by referring to Flora (Stenis, 2006) and also the Book of Medicinal Plants (Hidayat, 2015) as well as various literature that has relevance to the basic material / competencies taught and the biological material that students must master. The constituent elements of Flora generally consist of an opening section containing a preface and a table of contents; a section of content containing instructions for making a herbarium, a description of the terms used, instructions for determining, and a description of the types of plants; and a supporting section containing a bibliography and author profile (Steenis, 2006).

Flora created consists of three chapters. The first chapter discusses the process of making a herbarium, the second chapter discusses the description of the terms used and the third chapter discusses the description of plant types from the results of research consisting of 2 divisions of plants that are deliberately planted in residents' yards, namely spike plants (Pteridophyta) and flowering plants (Magnoliophyta). Flora is also equipped with an attractive design.

Flora is compiled based on the results of research and enriched with other relevant sources to describe every morpholgy, habitus, and benefit of each species encountered by referring to the current curriculum, namely the 2013 curriculum. The flora compiled is expected to help teachers and students in the learning process, especially the biology material of class X SMA / MA curriculum 2013, so that students' understanding of the species of each diverse division can increase, especially the plants contained in this Flora are often found in the surrounding environment.

The content of Flora is the result of direct identification from researchers so that it is expected to be able to support the implementation of a scientific approach in accordance with the 2013 curriculum. In addition, the presence of several complementary components such as classification, description, regional names, and the benefits of each species found which are then outlined in this book are expected to be able to support research-based learning and student knowledge about various types of plants that have been found.

The display of learning resources in the form of Flora is made based on the results of the identification of yard plants.
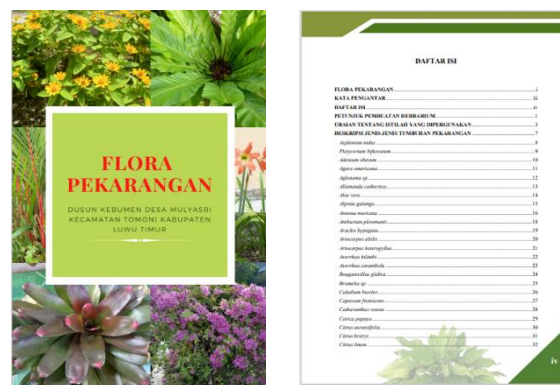
Figure 1. Flora Cover & Flora Table of Contents
(Source: Personal Documentation)

Figure 2. Contents of Flora
(Source: Personal Documentation)

Conclusions and Recommendations

Based on the results of research on the inventory of yard plant species in Mulyasri Village, Tomoni District, East Luwu Regency, it can be concluded: 1) There are 77 species of yard plants that are deliberately planted by residents in their yards 2) Flora from plant inventory can be used as a source of learning biology for students. The next suggestion for researchers is that further development of Flora has been made based on the study of yard plants to better adapt to the curriculum and also to improve the Flora that has previously been compiled by researchers.

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