

IDENTIFICATION OF MACROSCOPIC FUNGI TYPES IN THE BANTIMURUNG BULUSARAUNG NATIONAL PARK AREA, SAMANGKI VILLAGE, MAROS REGENCY AS READING MATERIAL FOR FUNGI MATERIAL

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ABSTRAK

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Penelitian ini bertujuan untuk mengetahui keanekaragaman jenis jamur makroskopis di Kawasan Taman Nasional Bantimurung Bulusaraung Desa Samangki Kabupaten Maros guna menyusun bahan bacaan berupa biomagazine. Hasil dari penelitian berupa foto spesies dan identifikasi tiap spesies yang selanjutnya disusun sebagai bahan bacaan yang berupa biomagazine. Biomagazine didesain menggunakan aplikasi Microsoft Office Word yang dikombinasikan dengan aplikasi desain grafis menggunakan Canva Design. Jenis penelitian ini adalah penelitian deskriptif yang bertujuan untuk mendeskripsikan tentang keanekaragaman jamur makroskopis khususnya Ascomycota dan Basidiomycota. Data dikumpulkan langsung dari lapangan menggunakan metode eksplorasi dengan menelusuri langsung lokasi penelitian. Proses identifikasi Jamur makroskiopis dilakukan dengan membandingkan gambar menggunakan aplikasi identifikasi (GBIF.org, MushroomExpert.com dan Google Lens), kajian pustaka, pendapat ahli, dan proses penyusunan biomagazine melewati tahap validasi oleh dosen ahli yang telah dinyatakan valid dengan rata-rata skor 4,70. Hasil penelitian merupakan identifikasi jenis jamur makroskopis yang kemudian disusun menjadi bahan bacaan berupa biomagazine yang praktis.

Kata Kunci : *Ascomycota, Basidiomycota, Bahan Bacaan, Biomagazine, Identifikasi, Makroskopis*

This study aims to determine the diversity of macroscopic fungi in the Bantimurung Bulusaraung National Park Area, Samangki Village, Maros Regency in order to compile reading materials in the form of biomagazines. The results of the study are in the form of photos of species and identification of each species which are then compiled into reading materials in the form of biomagazines. Biomagazines are designed using Microsoft Office Word applications combined with graphic design applications using Canva Design. This type of research is descriptive research that aims to describe the diversity of macroscopic fungi, especially Ascomycota and Basidiomycota. Data were collected directly from the field using an exploration method by directly exploring the research location. The process of identifying macroscopic fungi was carried out by comparing images using identification applications (GBIF.org, MushroomExpert.com and Google Lens), literature reviews, expert opinions, and the process of compiling biomagazines went through a validation stage by expert lecturers who have been declared valid with an average score of 4.70. The results of the study are the identification of macroscopic fungi which are then compiled into reading materials in the form of practical biomagazines.

Keywords : *Ascomycota, Basidiomycota, Reading Material, Biomagazine, Identification, Macroscopi*

Samangki Village is located in Simbang District, Maros Regency, South Sulawesi. Part of the area is within a National Park. The village is characterized by hilly landscapes, highlands or mountains, and lowlands. It is also located in an area associated with faults and karst landscapes with thin layers of



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alluvium. However, many parts of the valleys contain thicker and more fertile alluvium deposits. These fertile valleys have long been the settlements of the traditional Maros people (Safitri et.al, 2021).

The majority of Samangki Village is located within the Bantimurung Bulusaraung National Park. Parts of the national park inhabited and utilized by local communities are primarily located in Tallasa Hamlet and Pangia Village. Administratively, both areas are under the management of Bantimurung Bulusaraung National Park, specifically managed by the Pattunuang Karaenta Resort, which is part of the National Park Management Section Region II (Safitri et.al, 2021).

Indonesia has a humid tropical climate, which supports the growth of various types of plants and microorganisms. One such microorganism that thrives in Indonesia is fungi. Fungi are heterotrophic organisms, meaning they obtain their nutrition from organic compounds. Macroscopic fungi typically have a body structure consisting of a blade, cap, stalk, ring, and volva. However, not all macroscopic fungi have all these parts; some lack the ring (Linna Fitriani et.al, 2018).

Mushrooms are one of the things that make various types of living things even more interesting. The presence of mushrooms that can be seen with the naked eye is influenced by various environmental factors such as temperature, humidity, and light levels. Some types of mushrooms are edible, but there are also mushrooms that should not be consumed. Mushrooms that should not be eaten are usually very light in color, show no signs of being bitten by another creature, and emit an unpleasant odor. This odor is usually caused by compounds such as sulfides that produce a rotten egg odor (H₂S) or ammonia (NH₃). They can even contain toxic compounds such as cyanide (Agus Eko Wahyudi, et.al, 2012).

The knowledge gained from studying biology must be truly understood, not simply heard or read. This is because learning biology has distinct characteristics and requires a specific approach (Hanifah et al., 2020). Numerous local resources can be utilized in biology learning, thus impacting teachers' development of biology subjects as a tool for delivering material relevant to everyday life. One location with diverse fungal species is the Bantimurung Bulusaraung National Park, Samangki Village, Maros Regency.

The purpose of this study is to determine the type, classification, description, and level of validity of reading materials made in the form of Biomagazine regarding the types of macroscopic fungi found in the Bantimurung Bulusaraung National Park area, Samangki Village, Maros Regency. Biology learning, especially fungi material, can utilize local potential in the surrounding environment. The results of this study can later be developed into reading materials in accordance with the facts obtained in accordance with the results of research, especially on the Phase E fungi material for class X SMA/MA.

METHODS

This research is descriptive. This study also uses an exploratory method, which is a research activity by exploring the Bantimurung Bulusaraung National Park area where various types of mushrooms can be found. The mushrooms found were then documented using a camera in their habitat. The documentation process also used a ruler for visual scale comparison. The documented mushrooms were then placed in a ziplock plastic and given alcohol to preserve the mushrooms. Macroscopic mushroom observations began with observing the habitat or substrate where the mushrooms grow, then continued with the process of identifying mushrooms using the Picture Mushroom application and the Global Biodiversity Information Facility website and Google Lens. Then, matching the names of the species found with previous research articles.

The data obtained are then explained descriptively in the form of classification, morphology, habitat, and roles or benefits. The results of this study will be used as reading material in the form of a biomagazine. The biomagazine consists of a cover title and core material divided into several chapters. The chapters are divided based on the division of fungi that have been classified. The classifications contained in the biomagazine are Kingdom, Division, Classis, Ordo, Familia, Genus, and Species. Meanwhile, descriptions of the collected fungi will be discussed regarding the characteristics, morphology of fungi, habitat, and benefits of these fungi based on relevant sources. The biomagazine was created using Microsoft Word combined with a graphic design application, namely Canva Design.

Then, the biomagazine that has been created is then tested for validation carried out by media experts. The measurement scale used in the questionnaire is a rating scale that contains challenges from the compiled biomagazine. The rating scale used has a range of values 1 to 5 with the highest value being 5.

Table 1. Rating Scale Categories in the Expert Validity Questionnaire

No.	Score	Description
1	5	Very Good/Strongly Agree
2	4	Good/Agree
3	3	Fair/Fairly Agree
4	2	Poor/Disagree
5	1	Poor/Disagree

(Sumber: Arikunto, 2010)

According to Fitri and Haryanti (2020), the average value per indicator is calculated using the following formula:

$$\bar{x} = \frac{\sum i}{n}$$

Description:

- \bar{x} : average per item
- $\sum i$: total number of validator responses
- n : number of validators

After calculating the score for each statement, the percentage of validators' overall responses is calculated using the formula:

$$\bar{x} = \frac{\sum x}{\sum xi}$$

Description:

- \bar{x} : average total score
- $\sum x$: total validation score
- $\sum xi$: number of assessment aspects

The validation categories or levels of achievement used to determine the validity of the compiled biomagazine are explained in Table 3.2:

Table 2: Biomagazine Validity Level Categories

No.	Validity	Level Interval
1	4,21 – 5,00	Very Valid
2	3,41 – 4,20	Valid
3	2,61 – 3,40	Fairly Valid
4	1,81 – 2,60	Invalid
5	1,00 – 1,80	Very Invalid

(Sumber: Fitri & Haryanti, 2020)






RESULT AND DISCUSSION







Research Results

1. Types and Classification of Macroscopic Fungi in the Banttimurung Bulusaung National Park Area, Samangki Village, Maros Regency.

Based on research conducted in the Banttimurung Bulusarang National Park area, Samangki Village, Maros Regency, 15 species of macroscopic fungi were found and identified based on their names and morphology. The types of macroscopic fungi are shown in the following table.

Table 3. Types, Classification, and Description of Macroscopic Fungi Found in the Bantimurung Bulusaraung National Park Area, Samangki Village, Maros Regency

No	Image	Classification
1		Kingdom : Fungi Divisio : Ascomycota Class : Pezizomyctes Order : Pezizales Family : Sarcoscyphaceae Genus : Cookeina Species : Cookeina sulcipes (Berk.) Kuntze Sumber : GBIF_Global Biodiversity Information Facility
2		Kingdom : Fungi Divisio : Ascomycota Class : Pezizomyctes Order : Pezizales Family : Sarcoscyphaceae Genus : Cookeina Species : Cookeina tricholoma (mont.) Kuntze Sumber : GBIF_Global Biodiversity Information Facility
3		Kingdom : Fungi Divisio : Ascomycota Class : Sardariomycetes Order : Xylariales Family : Xylariaceae Genus : Xylaria Species : Xylaria polimorpha (pers.) Grav. Sumber : GBIF_Global Biodiversity Information Facility
4		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Hymenochaetales Family : Hymenochaetaceae Genus : Coltricia Gray Species : Coltricia cinnamomea (jacq.) Murrill. Sumber : GBIF_Global Biodiversity Information Facility
5		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Polyporales Family : Polyporaceae Genus : Trametes Species : Microporus vernicipes (Berk.) Kuntze. Sumber : GBIF_Global Biodiversity Information Facilit

6		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Polyporales Family : Polyporaceae Genus : Microporus Species : <i>Microporus affinis</i> (Blume & T.Nees) Kuntze Sumber : GBIF_Global Biodiversity Information Facility
7		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Polyporales Family : Polyporaceae Genus : Favolus Species : <i>Favolus grammocephalus</i> (Berk.) Imazeki Sumber : GBIF_Global Biodiversity Information Facility
8		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Polyporales Family : Polyporaceae Genus : Earliella Species : <i>Earliella scabrosa</i> (Pers.) Gilb. & Ryvar den Sumber : GBIF_Global Biodiversity Information Facility
9		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Polyporales Family : Polyporaceae Genus : Fabisporus Species : <i>Pycnoporus sanguineus</i> (L.) Murrill Sumber : GBIF_Global Biodiversity Information Facility
10		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Polyporales Family : Phanerochaetaceae Genus : Hapalopilus Species : <i>Hapalopilus nidulans</i> (Fr.) P.Karst. Sumber : GBIF_Global Biodiversity Information Facility
11		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Agaricales Family : Marasmiaceae Genus : Clitocybula Species : <i>Clitocybula oculus</i> (Peck) Singer. Sumber : GBIF_Global Biodiversity Information Facility

12		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Agaricales Family : Marasmiaceae Genus : Pleurocybella Species : Pleurocybella porrigens (Pers.) Singer. Sumber : GBIF_Global Biodiversity Information Facility
13		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Agaricales Family : Mycenaceae Genus : Mycena Species : Mycena rosella (Fr.) P.Kumm. Sumber : GBIF_Global Biodiversity Information Facility
14		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Agaricales Family : Psathyrellaceae Genus : Coprinellus Species : Coprinellus disseminatus (Pers.) J.E.Lange. Sumber : GBIF_Global Biodiversity Information Facility
15		Kingdom : Fungi Divisio : Basidiomycota Class : Agaricomycetes Order : Agaricales Family : Bolbitiaceae Genus : Pholiotina Species : Pholiotina sulcata Arnolds & Hauskn. Sumber : GBIF_Global Biodiversity Information Facility

Based on the classification of the types of fungi found in the Bantimurung Bulusaraung National Park area, Samangki Village, Maros Regency, there are 2 Divisions, 3 Classes, 5 Orders, 9 Families, 14 Genuses, and 15 Species that were successfully found and identified. The Ascomycota Division consists of 2 Classes, 2 Orders, 2 Families, 2 Genuses, and 3 Species. The Basidiomycota Division consists of 1 Class, 3 Orders, 6 Families, 12 Genuses, and 12 Species.

The results of the identification carried out on the types of fungi in the Bantimurung Bulusaraung National Park area, Samangki Village, Maros Regency, showed that the Basidiomycota division was the most commonly found type of fungus.

2. Biomagazine: Macroscopic Fungal Diversity

The results of research on the identification of macroscopic fungi conducted in the Bantimurung Bulusaraung National Park area, Samangki Village, Maros Regency, are used as reading material. The following is a preview of the biomagazine titled "Macroscopic Fungi in the Bantimurung Bulusaraung National Park Area."

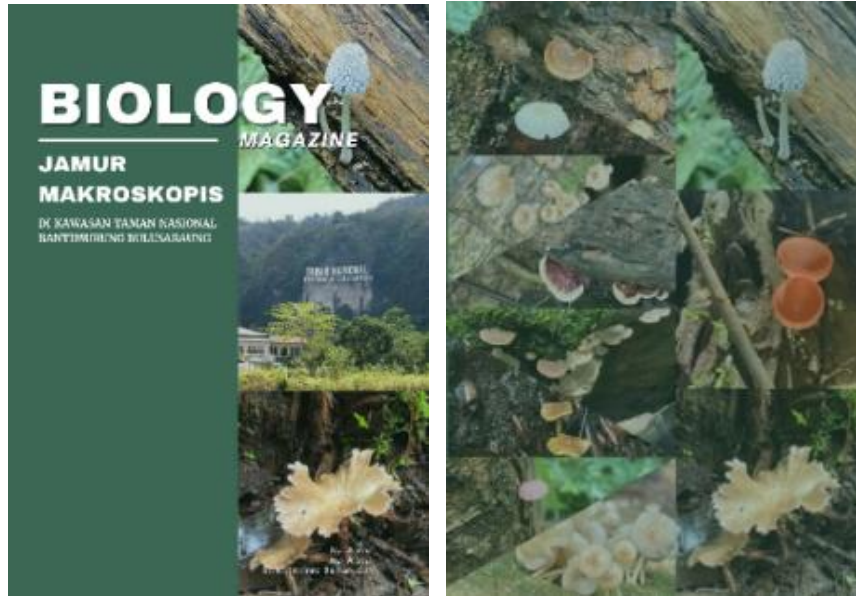


Figure 1. Front and Back Cover of Biomagazine

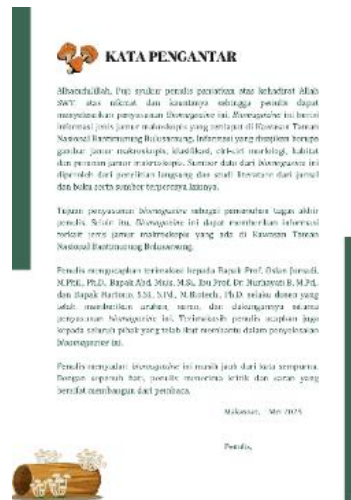


Figure 2. Foreword

DAFTAR ISI		DAFTAR GAMBAR		
Judul	Hal	Gambar	Judul	Hal
Sampul	1	1.1	Contoh Jamur Makroskopis	13
Kurikulum Materi jamur	12	1.2	Struktur Jamur Makroskopis	14
Mengenal jamur	13	1.3.1	Reproduksi Ascomycota	15
Peta Kawasan Taman Nasional Bantaronng Bukitbarung	20	1.3.2	Reproduksi Ascomycota	16
Lokasi Pengambilan Data Jamur Makroskopis	21	1.4.1	Jamur Cookeina Tumis Daun Kucal	19
Divisi Ascomycota	30	4.7	<i>Leptota cristata</i>	105
Divisi Basidiomycota	103	4.8	Ilustrasi tahapan keracunan jamur	105
Jamur Makroskopis Ancaman yang Kerap Terjadi	106	4.9	Ilustrasi pertumbuhan jamur musim hujan dan kemarau	106
Ketika Akan Terjadi: Minum dan Pertumbuhan Jamur	108	4.10	Faktor lingkungan pertumbuhan jamur	106
Mengenal Ahli Jamur: Pier Antonio Micheli	109	4.11	Bagian bagian jamur	107
Daftar Pustaka	112			

Figure 3. Table of Contents and List of Figures

KURIKULUM MATERI JAMUR

Capaian Umum
Pada akhir dari 1 semester siswa diharapkan mampu memahami konsep konsep dan pengetahuan, seperti dalam memahami, energi alternatif, klasifikasi biologi, keragaman hayati, struktur sel, molekul, basis biologi, bioteknologi, dan produksi. Siswa harus juga diharapkan mampu menggunakan pengetahuan ini untuk menyelesaikan masalah lokal dan global, serta berkeberhasilan pada persiapan Sustainable Development Goals (SDG).

Capaian Per Elemen
Penemuan IPA
Penerka didik diharapkan proses klasifikasi makhluk hidup, getas, virus, bakteri dan jamur dalam kelompok, memahami dan menerapkan pengetahuan serta keterampilan yang menggunakan dan menjelaskan biologi dengan bahasa yang sederhana.

Keterampilan Proses
Menyaji
Penerka didik diharapkan memahami hasil dan secara kreatif mengkomunikasikan dengan menggunakan bahasa dan gambar, dan dapat membuat karya menggunakan pengetahuan yang telah dipelajari.

MENGENAL JAMUR

Penemuan Siswa setelah belajar jamur diajarkan, diharapkan yang terdapat dan dapat menguraikan definisi jamur.

Siswa yang diberikan akan dapat menguraikan definisi jamur, menjelaskan peran jamur, dan menjelaskan peran jamur dalam kehidupan manusia. Siswa juga diharapkan dapat menjelaskan peran jamur dalam kehidupan manusia.

KARAKTERISTIK JAMUR MAKROSKOPIS

Siswa diharapkan memahami definisi jamur, peran jamur, dan menjelaskan peran jamur dalam kehidupan manusia. Siswa juga diharapkan dapat menjelaskan peran jamur dalam kehidupan manusia.

FAKTOR YANG MEMPENGARUHI PERTUMBUHAN JAMUR

- Kelembapan**
Kelembapan yang baik akan membuat jamur tumbuh dengan baik. Kelembapan yang rendah akan membuat jamur sulit tumbuh. (Darmasari, et al., 2021). Kelembapan yang optimal untuk jamur adalah 80-90%.
- Suhu**
Suhu pertumbuhan jamur bervariasi. Jamur yang tumbuh pada suhu 20-30°C akan tumbuh dengan baik. (Darmasari, et al., 2021). Suhu optimal untuk jamur adalah 20-30°C.
- Derajat Keasaman (pH)**
Jamur yang tumbuh pada pH 5-7 akan tumbuh dengan baik. (Darmasari, et al., 2021). Suhu optimal untuk jamur adalah 20-30°C dan pH optimal adalah 5-7.
- Intensitas cahaya**
Intensitas cahaya yang rendah akan membuat jamur tumbuh dengan baik. (Darmasari, et al., 2021). Intensitas cahaya yang optimal untuk jamur adalah 10-20%.
- Substrat**
Substrat yang baik akan membuat jamur tumbuh dengan baik. (Darmasari, et al., 2021). Substrat yang optimal untuk jamur adalah bahan organik yang kaya nutrisi.

PERANAN JAMUR MAKROSKOPIS

Siswa diharapkan memahami definisi jamur, peran jamur, dan menjelaskan peran jamur dalam kehidupan manusia. Siswa juga diharapkan dapat menjelaskan peran jamur dalam kehidupan manusia.

REPRODUKSI DIVISI ASCOMYCOTA

Figure 4. Introduction

PETA KAWASAN TAMAN NASIONAL BANTIMURUNG BULUSARAUNG

Daerah Persebaran Data Koleksi (DM) adalah lokasi dimana spesies jamur yang dikumpulkan di Bantimurung National Park, Sulawesi Selatan. Bantimurung National Park adalah salah satu taman nasional yang memiliki keindahan alam yang luar biasa. Bantimurung National Park memiliki berbagai macam ekosistem yang mendukung kehidupan berbagai jenis jamur.

Daerah Persebaran Data Koleksi (DM) adalah lokasi dimana spesies jamur yang dikumpulkan di Bantimurung National Park, Sulawesi Selatan. Bantimurung National Park adalah salah satu taman nasional yang memiliki keindahan alam yang luar biasa. Bantimurung National Park memiliki berbagai macam ekosistem yang mendukung kehidupan berbagai jenis jamur.

LOKASI PENGUMPULAN DATA JAMUR MAKROSKOPIS

Adapun lokasi untuk pengambilan data jamur makroskopis di Bantimurung National Park, Sulawesi Selatan, adalah sebagai berikut:

1. Desa Sumpang (Bantimurung sub-watershed 1 & 2)
2. Desa Lingsa (Bantimurung sub-watershed 3 & 4)

Empat lokasi tersebut merupakan lokasi pengumpulan data jamur makroskopis.

Figure 5. TN Babul Herd Map and Data Collection Locations



Figure 6. Division Page Title



Figure 7. Image Display, Classification, and Description of Fungi





Figure 8. Additional components of reading materials



Figure 9. List of References

The Biomagazine includes information in the form of images, classifications, morphological characteristics, and benefits of mushroom species identified and compiled from various relevant sources. The Biomagazine was created using Microsoft Word and combined with Canva Design, a graphic design application.

1. Biomagazine Validity Test

The prepared biomagazine was then validated by an expert validator lecturer using a questionnaire. The validity test was conducted to determine whether the prepared biomagazine was suitable for use. The results of the biomagazine validity test are shown in the following table.

Table 4. Biomagazine Validity Test Results

No.	Aspects Assessed	Average score of Validator s 1 and 2	Average
I. Content Suitability			
1.	The material in the reading material is relevant to the topic of Fungi	5	
2.	The reading material is well integrated within the biological context	5	

3.	The reading material presents information in the form of accurate text	5	
4.	The reading material presents information in the form of accurate images	5	4,8
5.	The reading material presents up-to-date information	4,5	
6.	The coverage of the material in the reading material is comprehensive	5	
7.	The sources of information and references used are credible and verified	4,5	
II. Presentation Suitability			
1.	The layout and structure of the reading material facilitate reader comprehension	4	
2.	The color scheme and visual design of the reading material attract attention	5	
3.	The choice of font type, size, and spacing facilitate reading	4	
4.	The quality of the images presented in the reading material	5	4,5
5.	The material is presented in a systematic order	4,5	
6.	The reading material is equipped with a table of contents and page numbers for ease of reading	5	
7.	Clear references are cited to ensure the accuracy of the information	4,5	
III. Language Suitability			
1.	The language used complies with the Enhanced Indonesian Spelling (EYD)	5	
2.	The language used is clear and easy for readers to understand	4,5	
3.	Sentences in the reading material are structured clearly and do not give rise to other interpretations	5	4,6
4.	There are no distracting spelling or grammatical errors	4	
5.	Scientific names are written in accordance with the rules of Binomial Nomenclature	5	
6.	The writing style of the reading material complies with scientific writing rules	4,5	
IV. Graphic Design			
1.	The cover design of the reading material is attractive and relevant to the content	4,5	
2.	The design of the material in the reading material is attractive and easy to understand	4,5	
3.	Illustrations are used appropriately to clarify information	5	
4.	The use of color in the reading material supports the communication objective	4,5	4,7
5.	Consistency of design style is applied across all elements of the reading material	5	
6.	The reading material has an attractive visual impression and is not monotonous	5	

Based on Table 5, it can be seen that the average score for each aspect obtained is in the very valid category and the final average is in the interval of 4.21-5.00. This indicates that the macroscopic mushroom biomagazine in the Bantimurung Bulusarang National Park area is suitable for use as reading material

Discussion

- Types of Macroscopic Fungi Found in the Bantimurung Bulusaraung National Park, Samangki Village, Maros Regency

Based on research conducted in the Bantimurung Bulusaraung National Park, Samangki Village,

Maros Regency, 15 species of macroscopic fungi were found, consisting of two divisions: Ascomycota and Basidiomycota.

Only three types of Ascomycota fungi were found at the research site, namely the Sarcoscyphaceae and Xylariaceae families. Twelve types of Basidiomycota fungi were found at the research site, with six families: Hymenochaetaceae, Polyporaceae, Marasmiaceae, Mycenaceae, Pleurotaceae, and Psathyrellaceae.

The research results show that the macroscopic fungal species found in the Bantimurung Bulusaraung National Park in Samangki Village are dominated by the Basidiomycota division. Based on their location, most of the dominant macroscopic fungi were found in habitats such as rotting and decaying wood or tree trunks.

2. The following is a description and type of macroscopic fungi found in the Bantimurug Bulusaraung National Park area, Samangki Village, Maros Regency.

a) Division Ascomycota

1. *Cookeina sulcipes*



(photo: Nur Aisyah, 2025)

Figure 10. *Cookeina sulcipes*

Cookeina sulcipes is a fungus belonging to the Sarcoscyphaceae family and a member of the Pezizales order. Members of this order are known to live as saprophytes on dead wood, soil, or litter. Some members of this family form distinct, brightly colored, cup-shaped ascocarps on wood from early spring to late autumn.

In the Bantimurung Bulusaraung National Park in Samangki Village, a species of mushroom, *Cookeina sulcipes*, has been found growing in clusters on dead wood. This mushroom has a funnel-shaped, pink pileus.

According to Uracha et al., one of the macrofungal species that has been previously reported as an edible mushroom but has no evidence of commercial cultivation is *Cookeina sulcipes*. *C. sulcipes* has a high protein and phosphorus content, and a low lipid content, and γ -D-glucan from *C. tricholoma* shows significant inhibition of neurogenic pain. However, research on edible macrofungi to determine their benefits, including cultivation and nutritional value, has not been conducted.

2. *Cookeina tricholoma*



(photo: Nur Aisyah, 2025)

Figure 11. *Cookeina tricholoma*

Cookeina tricholoma is pink with fine white hairs on the surface of its cap and has a size of about 1 cm. At first glance this mushroom looks the same as the *Cookeina sulcipes* species but these two mushrooms are two different species *Cookeina tricholoma* has a shape almost the same as *Cookeina sulcipes* which is like a cup but at the end or edge of *Cookeina tricholoma* it is slightly closed inward.

This mushroom species was found on damp trees due to rain in the Bantimurung Bulusarang National Park area, Samangki Village. This type of mushroom is most commonly found in the research area.

3. *Xylaria polimorpha*



(photo: Nur Aisyah, 2025)

Figure 12. *Xylaria polimorpha*

Based on the results of direct observations at the research location and the results of matching based on the journal *Xylaria polymorpha* has the characteristics of being finger-shaped, has a gray/brown color which then blackens with age, has a varying size of 1-4 cm, and has a small stalk that functions to attach to dead wood, this mushroom was found in the Banttimuung Bulusarang National Park area, Samangki Village.

Xylaria polymorpha, commonly known as dead man's fingers, is a plant pathogen. It is a common inhabitant of forests and woodlands, typically growing from the base of rotting or injured tree stumps and decaying wood.

b) **Divisio Basidiomycota**

1. *Coltricia cinnamomea*



(photo: Nur Aisyah, 2025)

Figure 13 *Coltricia cinnamomea*

Based on the results of direct observations at the research location, namely in the Bantimurung Bulusaraung National Park area, Samangki Village, the *Coltricia cinnamomea* species grows on tree roots or on solid soil surfaces, has a height of about 1-10 cm, has a round and hard cap with a width of about 5 cm, is brown in color and has slightly thin edges, has a long, hard, and brown stem.

According to research by Titanio et al. in 2024, *Coltricia cinnamomea* was found on dead tree trunks and also in wood with damp conditions. This species of fungus is the most commonly found with a fairly large distribution among other macroscopic fungal species, where in one distribution area 5-8 species can be found so it can be said that the lifestyle of this fungus is scattered (in groups but the distance between fruit bodies is far apart). *Coltricia cinnamomea* is also found living in the soil, but in one distribution only consists of 1-2 fungi. The morphology of *Coltricia cinnamomea* is bowl-shaped, the shape of the mushroom cap is Depressed/uplifted which has a color of white, cream, milky white, to light brown which forms a layer resembling an annual ring, while the bottom (hymenophor) is only white with a type of pore modification, namely pores with strong attachment. The characteristics of the stalk/stipe of this fungus are basal tomentum. The position of the stipe attachment to the pileus is in the middle.

2. *Microporus vernicipes*



(photo: Nur Aisyah, 2025)

Figure 14. *Microporus vernicipes*

Microporus vernicipes is a species of the Polyporaceae family commonly found in Indonesia's tropical forests. Found on rotting logs, it has a smooth surface texture and various colors, ranging from light brown to black with smooth edges to wavy white. It measures approximately 2 cm across and 2-3 cm deep.

Based on research conducted by Darwis et al. (2018), *Microporus vernicipes* was found growing on decaying wood. This type of habitat is common in tropical rainforests with high humidity and abundant organic litter. This fungus acts as a decomposer, utilizing dead wood as its substrate. Furthermore, research in Gunung Palung National Park, West Kalimantan, also recorded the presence of species from the genus *Microporus* in peat swamp habitats. This fungus grows on decaying wood twigs with an ambient temperature of around 27–28°C and air humidity reaching 99% (Tampubolon, 2018). These conditions indicate that *Microporus vernicipes* is tolerant to high humidity and can adapt to various tropical environmental conditions.

3. *Mycroporus affinis*



(photo: Nur Aisyah, 2025)

Figure 15. *Mycroporus affinis*

Microporus affinis, commonly known as the "dark-footed tiny pore," is a species of fungus in the Polyporaceae family. Found on decaying tree trunks, this fan-shaped fungus has a grooved texture and comes in a variety of colors, including dark brown, light brown, and yellow, with a flat white edge.

Microporus affinis typically grows on decaying wood in humid tropical forests. Research in Citalahab Village, Mount Halimun Salak National Park, recorded the presence of this fungus in river basins, forest paths, and community gardens, demonstrating its adaptation to various microhabitats with high humidity and the presence of dead wood substrates (Fikri et al. 2022).

4. *Favolus grammocephalus*



(photo: Nur Aisyah, 2025)

Figure 16. *Favolus grammocephalus*

Favolus grammocephalus is found on dead wood. This mushroom has a fan-shaped fruiting body measuring approximately 1-5 cm across and 1-4 cm deep. It is brownish to light brown in color, with a smooth or even surface texture that appears to have fibers towards the base. This mushroom is found in the Bantimurung Bulusaraung National Park area of Samangki Village.

According to the Indonesian Institute of Sciences (LIPI), *Favolus grammocephalus* (*F. grammocephalus*) lives on dead wood. Its distribution is endemic to Asia and Australia, from Pakistan to China and Fiji. This fungus has a fanned or subulate fruiting body, attached laterally by a stalk that resembles a wrinkled base, and is yellowish-brown to brown or light brown in color. It lacks a true stalk. The surface pores are light brown.

5. *Pycnoporus sanguineus*



(photo: Nur Aisyah, 2025)

Figure 17. *Pycnoporus sanguineus*

This type of mushroom has a fan-shaped, almost round shape, is orange in color, has a grooved and hard texture, although the flesh of the fruit is slightly shiny, with a flat, yellowish-white edge. This species is found on tree trunks, measuring about 4 cm across and 3 cm deep.

Pycnoporus sanguineus is a white rot fungus that grows saprophytically on dead hardwood, particularly on degraded tree trunks. This fungus is typically found in tropical and subtropical regions, including Southeast Asia, Central America, and Africa. *P. sanguineus* can also grow on living wood, primarily as a pathogen on trees such as *Platanus* and *Mangifera indica*. The fungus's natural habitat includes a variety of humid environments, with relatively high temperatures and humidity, which support its growth. In nature, this fungus plays a role in the decomposition of organic matter, particularly lignin and cellulose in wood, which accelerates the carbon recycling process (Ferreira et al. 2023).

6. *Earliella scabrosa*



(photo: Nur Aisyah, 2025)

Figure 18. *Earliella scabrosa*

This species of mushroom is fan-shaped and attaches to wood. It is reddish-brown in color. It lacks a stem supporting its cap like most mushrooms. Young mushrooms have a white line following the contour of the mushroom's edge, while in mature mushrooms the white color on the edge becomes cloudier with a yellowish tinge and becomes darker. This mushroom is found on rotting logs and measures 2-5 cm.

Earliella scabrosa habitat is found on dead wood Distribution: common in tropical and subtropical areas, especially in open areas and degraded forests. *Earliella scabrosa* has a characteristic maroon fruit body, sometimes has a zone, first white to cream then covered by a maroon cuticle starting from the base of the cap, in old specimens the red color covers the entire surface of the cap, when dry the cuticle slightly shrinks. The surface of the pores is white, the pores are convoluted to semidaedaloid (LIPI, 2017).

7. *Hapalopilus nidulans*



(photo: Nur Aisyah, 2025)

Figure 19. *Hapalopilus nidulans*

This type of mushroom has an irregular semicircular or kidney-shaped shape, with a flat or smooth surface, a light orange to cinnamon brown or light brown color, and paler, yellowish to whitish edges. It measures about 3 cm across and 1-2 cm deep.

H. nidulans is a bracket or shelf fungus, meaning it grows directly from its substrate without a stalk. This means the fungus is generally semicircular to kidney-shaped, depending on the shape of the surface on which it grows. It grows up to 12 cm tall and 4 cm thick, making it a small to medium-sized fungus. On the top, its surface is orange to light brown or cinnamon-colored, initially covered with small hairs but smoothing over time. On the underside, *H. nidulans* produces small pores with flat edges ("angular pores") that are colored like a pileus (Thomas. 2016).

8. *Clitocybula oculus*



(photo: Nur Aisyah, 2025)

Figure 20. *Clitocybula oculus*

This species of mushroom is found in moist soil, they live in colonies, the cap of this mushroom is round with a size of 1 cm and has a dark brown to black pattern in the middle of the cap, on the underside of the cap it has gills, namely thin plates like sheets that radiate from the stem, this mushroom has a soft and fibrous white stipe/stem.

Clitocybula oculus is a saprotrophic fungus that grows on decaying hardwood. This species is often found on decaying tree trunks, both those with bark still attached and those that have peeled off. As a decay fungus, *C. oculus* plays a crucial role in the decomposition of organic matter, particularly lignin and cellulose in wood. Through this process, the fungus helps return nutrients to the ecosystem and supports the natural carbon cycle.

9. *Pleurocybella porrigens*



(photo: Nur Aisyah, 2025)

Figure 21. *Pleurocybella porrigens*

This species of mushroom is found on living tree trunks, this mushroom has a soft texture that is easily crushed, bright white in color with uneven or wavy edges, has a size of about 4 cm across and 2 cm deep.

Sugihiratake is the Japanese name for the mushroom *Pleurocybella porrigens*, a small mushroom

that grows abundantly during autumn, not only in the forests of northern Japan but also widely distributed throughout the Northern Hemisphere. This mushroom has an interesting flavor that was once favored by many Japanese people, usually consumed as a component of the very popular miso soup (fermented bean paste). To date, there have been no reports of significant adverse effects from consuming Sugihiratake. However, in the fall of 2004 in Japan, an outbreak of serious encephalopathy occurred in patients with chronic kidney disease after consuming this mushroom (Gejyo et al. 2005).

10. *Mycena rosella*



(photo: Nur Aisyah, 2025)

Figure 22. *Mycena rosella*

This type of mushroom is found on living tree trunks, has a convex cap shape with light-transparent lines, has a bright pink to brownish pink cap, the size of the cap is about 1 cm and the height from the base of the stipe to the cap is about 1.5 cm. This mushroom has a pale pink stipe.

Mycena rosella has a small, parabolic cap shape, a wrinkled white cap surface with light brown tips, and a rough, grainy stem surface. *Mycena rosella* is found on decaying leaves, found at a temperature of 32 °C and a humidity of 65 (Klarisa et al. 2016).

11. *Coprinellus disseminatus*



(photo: Nur Aisyah, 2025)

Figure 23. *Coprinellus disseminatus*

This type of mushroom is found on rotten tree trunks. The cap of this mushroom is egg-shaped when young, measuring about 1 cm and 1.5 cm high. The cap is cream to white in color, with a white stem.

According to Robert & Evans, 2011 *Coprinellus disseminatus* produces fruit in large clusters. The hood is convex, the flesh is very thin and brittle, fluted or serrated, the surface is smooth or downy, initially pale whitish to brownish yellow, then becomes pale gray. The gill-shaped lamellae are whitish at first and then turn black. The stalk is the same color as the hood. This widespread species is gathered as food by native people in Ghana and other parts of Africa as well as in Southeast Asia.

12. *Pholiotina sulcata*



(photo: Nur Aisyah, 2025)

Figure 24. *Pholiotina sulcata*

This species of mushroom is found on rotting tree trunks and on the ground, this mushroom has a conical cap and will widen slightly with age, measuring 2 cm, the cap of this mushroom has a brownish color with a paler edge and the center of the cap has a darker color, the stem of this mushroom is thin and brittle with a length of 5 cm, yellowish brown or cream in color.

Pholiotina sulcata grows in meadows, parks, deciduous forests, humus soil, decaying wood, and compost (Hausknecht & Krisai-Greilhuber, 2007). Its habitat reflects its broad adaptability to various environmental conditions. Its role as a saprotrophic fungus aids in decomposition and nutrient recycling (Hausknecht, 2009).

3. Biomagazine Validity Test of Macroscopic Fungal Types in the Bantimurung Bulusaraung National Park Area, Samangki Village, Maros Regency

This A4-sized biomagazine contains classifications and descriptions, combined with various other sources to describe the morphological characteristics and benefits of mushroom species successfully discovered and identified in the Bantimurung Bulusaraung National Park area, Samangki Village, Maros Regency. This biomagazine is expected to assist readers in the teaching and learning process, especially on fungi material.

Before the compiled biomagazine was used in the learning process, the author first conducted a validity test. The validity test was conducted so that the biomagazine could be used by teachers, students, or readers according to their needs. The validity level test was the output produced from the study of identifying macroscopic fungi in the Bantimurung Bulusaraung National Park area, Samangki Village, Maros Regency, using the biomagazine validation instrument that had been filled out by an expert validator lecturer.

The biomagazine validation testing instrument consists of 4 aspects that are assessed, namely the feasibility of the content consisting of 7 statements, the feasibility of the presentation of 7 statements, the feasibility of the language of 6 statements, the graphic design of the book 6 statements with a total of 26 statements. The components assessed by the validator use a rating scale with a score of 1-5. The results of the calculation of the average score obtained are 3.70 with a very valid category with a general assessment of being suitable for use with minor revisions as a learning medium.

CONCLUSION AND RECOMMENDATION

Conclusion

Macroscopic fungi found in the Bantimurung Bulusaraung National Park area of Samangki Village, Maros Regency, which have been successfully identified to the species level, include 2 divisions, 3 classes, 5 orders, 9 families, 14 genera, and 15 species. The Ascomycota division consists of 2 classes, 2 orders, 2 families, 2 genera, and 3 species. The Basidiomycota division consists of 1 class, 3 orders, 7 families, 12 genera, and 12 species. Ascomycota and Basidiomycota are two main divisions of fungi distinguished by their sexual reproduction methods. Ascomycota form ascospores in asci and asexual spores in the form of conidia. These fungi can be unicellular or multicellular, with septate hyphae and chitinous cell walls. For example, *Cookeina tricholoma* and *Xylaria polymorpha*, which live in soil, decaying wood, or organic matter, act as decomposers, pathogens, or symbionts. Meanwhile, Basidiomycota produce basidiospores in basidia and have fruiting bodies (basidiocarps) that are generally macroscopic, such as toadstools, wood ear mushrooms, and shiitake mushrooms. Their hyphae are septate with a haploid nucleus, and most live as saprophytes, although some are parasitic, such as *Puccinia graminis*. Both are important in the ecosystem as decomposers and also have economic value in the food and pharmaceutical sectors. The validity test of the Biomagazine reading material on Macroscopic Fungus Types in the Bantimurung Bulusaraung National Park Area obtained an average total score of 4.70 with a very valid category for use as a learning source for Fungi material.

Recommendation

For the management: This research is expected to be an important reference regarding macroscopic fungi found in the Bantimurung Bulusaraung National Park area.

For the community: It is hoped that this research can increase general knowledge about macroscopic fungi and encourage community participation in efforts to preserve the natural habitat of these fungi.

For future researchers: It is recommended to conduct further research over a longer period of time and expand the data collection area to obtain more varied macroscopic fungal diversity data. Given that fungal growth is strongly influenced by seasonal factors and environmental conditions, these factors need to be taken into account. Furthermore, in the identification process, it is recommended not only to rely on morphological matching, but also to use molecular methods such as DNA barcoding analysis to produce more accurate and detailed species classifications.

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