



Keanekaragaman Jamur Makroskopis di Danau Perintis Provinsi Gorontalo Sebagai Sumber Belajar Biologi

Diversity of Macroscopic Fungi in Perintis Lake Gorontalo Province as a Source for Studying Biology

Herinda Mardin¹, Ilyas H. Husain^{2*}

^{1,2}Prodi Pendidikan Biologi, Jurusan Biologi,
Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Gorontalo

Abstract

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Learning biology by learning directly with direct objects makes students' learning experience more real. This study aimed to create valid and appropriate fungi learning resources based on the results of research on macroscopic fungi diversity in Perintis Lake, Gorontalo province. This research is a qualitative descriptive study, by making student worksheets (LKPD) based on PBL (Problem-Based Learning) based on the results of research on the diversity of macroscopic fungi found in Perintis Lake. The flow of this research is to make learning resources in the form of worksheets based on the results of research on the types of macroscopic fungi in Lake Perintis, then validate the learning resources with 4 (four) validators. Furthermore, data validation results from 4 (four) validators are calculated by analysis of the Content Validity Ratio (CVR) and CVI (Content Validity Index). The results of this study based on data analysis and calculation of the validation results from the four validators on learning resources in the form of LKPD which have been carried out show that each criterion obtains a CVR value of 1.00 with a valid statement, while the average value of each criterion is obtained through CVI calculations show that LKPD with validation results is valid with a CVI value of 1.00. The conclusion of this study is that biology learning resources in the form of student worksheets (LKPD) based on observations of macroscopic fungi found in the Perintis lake of Gorontalo Province are declared valid with a CVI value of 1.00 and is suitable for use as a source of learning biology on fungi class X SMA.

Keywords: Macroscopic Fungi, Perintis Lake, Biology Learning Resources

(*) Corresponding Author: ilyas_husain@ung.ac.id

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INTRODUCTION

This nature was created with all the abundant biological and non-biological diversity. We can use this biodiversity and non-biological diversity in nature as a source of learning. Learning in nature is not just studying natural phenomena, events or phenomena, but we can also use nature for learning resources, supporting tools in the learning process (Kumaladita, 2014). Learning resources can be of various types (Prastowo, 2018), for example biology learning resources can be in the form of the surrounding environment (environment-based), textbooks, not necessarily in class, but can also be learned from libraries, media centers,



playgrounds, direct visits to the field, museums, halls and houses (Arsal, 2017). There have been many studies conducted by related researchers making nature a source of learning, especially for the field of biology. For example, the kinship of plant species belonging to the *Caesalpinioideae* sub-family based on pollen morphological studies in the Special Region of Yogyakarta is a source of learning in biology lessons for class X high school students on species diversity learning material (Kumaladita, 2014). Also research on the isolation and identification of microscopic fungi in sago dregs as a source for high school biology learning (Mardin, 2022).

Learning that uses nature as a learning resource is science, including biology (Kristyowati, 2019). In learning biology, students have difficulties in the learning process, this can be seen from several topics that have a high level of difficulty such as heredity, genetic substance, coordination system, circulation system and cell division. Whereas for biology topics with a moderate level of difficulty are biodiversity and mushroom material (Mardin, 2017). In fungi material, learning resources are needed which are the results of research so that they are more real and relevant to students. The need to create learning experiences for students so that their learning becomes meaningful. In the learning process must involve the role of teachers and students, interact with each other and share experiences. Learning that is fun and meaningful as well as learning directly with real objects, makes students understand more quickly and store memories that last longer (Alvitasari, 2016, Masfadilah, 2018).

Learning biology by learning directly with real objects in the field makes the learning experience more real. Students understand and understand more about the material they are studying without memorizing or imagining what the form and process will look like. In learning biology, it is important to give students an understanding of science concepts and skills. To be able to provide these two things, namely understanding science concepts and skills, learning resources are needed which are the results of research. In this study, research was conducted on the diversity of macroscopic fungi found in Perintis Lake, Gorontalo province, and was made into a biology learning resource on mushroom material in senior high schools. The learning resources created in this study were in the form of PBL (Problem Based Learning) based student worksheets. Perintis Lake is the only lake located in the eastern part of Bone Bolango district, Gorontalo province. Perintis Lake is a green open space used as a natural and educational tourism area (Ibrahim, 2020).

Based on the foregoing, the purpose of this study was to create a valid and appropriate fungi material learning resource based on the results of research on macroscopic fungi diversity in Perintis Lake. It is important to make student worksheets (LKPD) based on PBL as a biology learning resource based on research results on the diversity of macroscopic fungi found in Perintis Lake, Gorontalo province. This is done so that the learning carried out can encourage the formation of a more meaningful understanding which makes students able to understand the meaning of learning (learning how to learn). In addition, it can also foster sensitivity and a sense of caring for the environment in students. They will care and love the environment and raise awareness to protect the environment.

METHODS

This research is a qualitative descriptive study, by making student worksheets (LKPD) based on PBL (Problem Based Learning) based on the results of research on the diversity of macroscopic fungi found in Perintis Lake, Gorontalo province. The next stage is to validate the learning resources with 4 (four) validators. Learning resources are validated with 5 (five) criteria including 1) suitability of the material with indicators and learning objectives; 2) suitability of the concept with the concept developed by experts; 3) the depth of the material according to the characteristics of students; 4) use simple sentences, clear and easy to understand; 5) activities in LKPD can help students understand the material. Furthermore, data validation results from 4 (four) validators are calculated using the Content Validity Ratio (CVR) analysis according to Lawshe (1975) with the following formula:

$$\text{CVR} = \frac{ne - \frac{1}{2} N}{\frac{N}{2}}$$

Information:

CVR : *Content Validity Ratio*

Ne : Number of validators agreeing to the validity of the media (considered agreeing if the criterion value is 3 or 4, if < 3 then it is considered not agreeing to the validity of the media)

N : Total number of validator

After obtaining the CVR value for each criterion, the CVI (Content Validity Index) value or the overall average CVR value is calculated using the formula:

$$\text{CVI} = \frac{\text{CVR}}{\text{jumlah kriteria}}$$

The validity or suitability criteria of the CVR and CVI indices are as follows:

0 ≤ 0,33 : invalid
 0,34 ≤ 0,67 : quite valid
 0,68 ≤ 0,99 : valid
 (Lawshe in Kamil, 2014).

The following is an overview of the flow of this research explained in Figure 1.

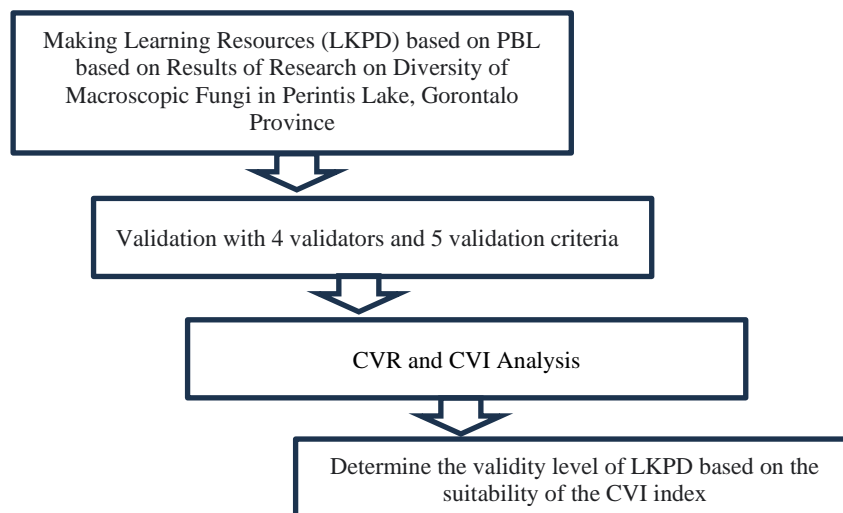


Figure 1. Research Flow

RESULTS & DISCUSSION

Results

Based on research results from observations that have been made regarding the diversity of macroscopic fungi species in the Perintis lake, Gorontalo province, 21 macroscopic fungi species were found in the Perintis lake. All species can be seen in the following table:

Table 1. Types of Macroscopic Fungi in Perintis Lake, Gorontalo Province

Division	Class	Ordo	Family	Genus	Species		
Basidiomycota	Agaricomycetes	Polyporales	<i>Polyporaceae</i>	<i>Trametes</i>	<i>Trametes versicolor</i>		
				<i>Tyromyces</i>	<i>Tyromyces chioneus</i>		
				<i>Pycnoporus</i>	<i>Pycnoporus sanguineus</i>		
					<i>Pycnoporus cinnabarinus</i>		
				<i>Neofavolus</i>	<i>Neofavolus alveolaris</i>		
				<i>Trametes</i>	<i>Trametes hirsute</i>		
					<i>Trametes pubescens</i>		
				<i>Pycnoporus</i>	<i>Cinnabar-red polypore</i>		
				<i>Earliella</i>	<i>Earliella scabrosa</i>		
		<i>Fomitopsidaceae</i>	<i>Daedaleopsis</i>	<i>Daedaleopsis confragosa</i>			
		<i>Ganodermataceae</i>	<i>Ganoderma</i>	<i>Ganoderma applanatum</i>			
				<i>Ganoderma sesille</i>			
		Agaricales	<i>Psathyrellaceae</i>	<i>Chandolleomyces</i>	<i>Chandolleomyces</i>	<i>Chandolleomyces candoleanus</i>	
					<i>Parasola</i>	<i>Parasolaplicatilis</i>	
					<i>Psathyrella</i>	<i>Psathyrella condolleana</i>	
					<i>Pleurotaceae</i>	<i>Pleurotus</i>	<i>Pleurotus ostreatus</i>
					<i>Schizophyllaceae</i>	<i>Schizophyllum</i>	<i>S. commune</i>
					<i>Mycenaceae</i>	<i>Panellus</i>	<i>Panellus stipticus</i>
	Auriculariales	<i>Auriculariaceae</i>	<i>Auriculariaceae</i>	<i>Auriculariaceae</i>	<i>Auricula-judae</i>		
				<i>Russulales</i>	<i>Bondarzewiaceae</i>	<i>Bondarzewia</i>	<i>Bondarzewia berkeley</i>
				<i>Basidiomycetes</i>	<i>Aphylophorales</i>	<i>Schizophyllum</i>	<i>Schizophyllum</i>

Based on Table 1 above, it shows the diversity of macroscopic fungi found in Lake Perintis at the family level, showing that there are 10 families of macroscopic fungi found in Lake Perintis. In the figure it can be seen that the most dominating family is the Polyporaceae with a total of 9 species, followed by the Pasthyrellaceae

family with a total of 3 species, the Ganodermataceae with a total of 2 species and the other families only have a total of 1 species. Most of the fungi found live on soil/wet litter, weathered wood and live trees (Hasan, 2022). Based on the results of the research conducted, 21 species of macroscopic fungi were obtained, all of which belong to the Basidiomycota Division and consist of 2 classes, namely Agaricomycetes and Basidiomycetes, 5 orders namely Poliporales, Agaricales, Auriculariales, Russulales and Aphyllophorales, 10 families namely *Polyporaceae*, *Fomitopsidaceae*, *Ganodermataceae*, *Psathyrellaceae*, *Pleurotaceae*, *Schizophyllaceae*, *Mycenaceae*, *Auriculariaceae*, *Bondarzewiaceae*, *Schizophyllum*.

The results of macroscopic fungi observations found in Perintis Lake, Gorontalo province, from this study were used as a source of learning biology in senior high schools on fungi. The learning resource is in the form of Class X Student Worksheets (LKPD) on KD fungi material. 3.7 in high school. The results of data analysis and calculation of validation results from the four validators on learning resources in the form of LKPD which have been carried out show that each criterion obtains a CVR value of 1.00 with a valid statement, while the average value of each criterion obtained through CVI calculations shows that the LKPD with the validation results is valid with a CVI value of 1.00 which can be seen in table 2 which means that the high school biology learning resource in the form of LKPD on fungi is suitable for use. The results of data analysis validation of learning resources in the form of LKPD can be seen in table 2 below.

Table 2. Analysis of Learning Resources Validation Data

Criteria	Validator				CVR	Information
	1	2	3	4		
Suitability of the material with the indicators and learning objectives	3	4	4	3	1,00	Valid
Conformity of the concept with the concept developed by experts	4	4	3	3	1,00	Valid
The depth of the material is in accordance with the characteristics of students	4	3	3	4	1,00	Valid
Use simple sentences, clear and easy to understand	4	3	4	3	1,00	Valid
Activities in LKPD can help students understand the material	4	4	4	3	1,00	Valid
CVI					1,00	Valid

Discussion

The results of research on macroscopic mushroom diversity in Perintis Lake were used as a source for high school biology learning in the form of LKPD on mushrooms. The validation results of 4 (four) validators on LKPD obtained a CVI value of 1.00 with valid criteria. Criterion 1 regarding the suitability of the material with the indicators and learning objectives includes aspects of content quality with a CVR value of 1.00 with valid criteria which means that the LKPD provided includes all learning indicators. Criterion 2 regarding the suitability of the concept with the concept developed by experts includes the aspect of correctness of the

concept obtained by a CVR value of 1.00 with valid criteria indicating that the concept contained in the LKPD is the correct concept based on the student's handbook and the latest learning resources. It is called the newest because the LKPD made is research-based and is the result of the latest research. This of course helps students in understanding the types of macroscopic fungi and saprophytic mushroom life in the Perintis lake area.

Criterion 3 regarding the depth of the material according to the characteristics of students includes the aspect of concept depth obtaining a CVR value of 1.00 with valid criteria indicating that the depth of concept contained in the LKPD covers all the indicators listed in the LKPD. Criterion 4 regarding using simple, clear and easily understood sentences includes aspects of language feasibility. Language feasibility is to use language that is easy to understand, easy to understand and in accordance with the standards for using standard and scientific language. The importance of using standard and scientific language standards because it will make it easier for students to understand the contents of the LKPD and does not lead to different interpretations of the messages conveyed in the LKPD (Lavenia, E. J., 2017). Criterion 5 is that the activities in the LKPD can help students understand the material including aspects of the quality of the completeness/supporting materials in the LKPD. A good LKPD is one that includes all the completeness/support materials needed in the learning process with those in the LKPD.

CONCLUSION

Based on the description described above, it can be concluded that biology learning resources in the form of student worksheets (LKPD) based on observations of macroscopic fungi found in Perintis Lake, Gorontalo Province, are declared valid with a CVI value of 1.00 and are suitable for use as a biology learning resource in fungi class X high school material.

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