Plant Diversity In Ancol Coastal Area, Semidang Alas Maras District, Seluma Regency As A Teaching Material To Improve Learning Outcomes On The Classification Of Living Things For Grade IX Students At SMPN 14 Seluma

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ABSTRACT

The aim of this research is to determine 1) the diversity of plants in the Ancol beach area as teaching material to improve learning outcomes in the material on the classification of living creatures for class IX students at SMP Negeri 14 Seluma, 2) the influence of the results of identifying plant diversity in the Ancol beach area, Kec. Semidang Alas Maras District. Seluma as teaching material to improve learning outcomes in the material on the classification of living things for class IX students at SMP Negeri 14 Seluma. This type of research is quantitative correlational research with a quantitative descriptive approach. The research sample of class IX students at SMP Negeri 14 Seluma was 30 people using a total sampling technique. Data collection techniques are observation, tests and documentation. Data analysis used quantitative with the t test. The results of the research showed that the plants on the coast of Ancol, Semidang Alas Maras District, Seluma Regency consisted of 15 types of plants, namely Rhizopora apiculata (fire mangrove), Rhizopora mucronata (ringworm mangrove), Peking grass (Zoysia matrella (L.)Merr), cypress (Casuarina equisetifolia L), horsetail (Ipomea pes caprae), Terminalia catappa L (sea hyacinth), wedelia blifora (Sea chrysanthemum), sea fern (Acrostichum aureum), Cyperus Esculentus (yellow sesame grass), ketapang (Terminalia catappa L, bitter jukut (Axonopus compressus Swartz), davallia solida (rabbit's foot fern), needle grass (Andropogon aciculatus), coconut (Cocos nucifera), sea pandan (Poaceae and Arecaceae). There is an influence on the results of identifying plant diversity in the coastal area of Ancol District. Semidang Alas Maras District. Seluma as teaching material for improving learning outcomes in the material on the classification of living things for class IX students at SMP Negeri 14 Seluma tcount > ttable 2.03011 and p value 0.000 < 0.05. .

Keywords: Diversity, Plants, Teaching Materials, Learning Outcomes

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1.   INTRODUCTION

Diversity is the variation that exists among all living things at the gene, species and ecosystem levels. In the coastal areas of this community, many types of plant vegetation grow, ranging from trees, poles, bushes to lower level plant vegetation (herbaceous). Plant vegetation is a term used to describe a location that is dominated by several plant species in coastal areas [1] .

Seluma Regency is a district in Bengkulu Province which has quite large tourism potential. The Ancol beach area is one of the tourist attractions that is often enjoyed by local people and other foreign communities. Ancol Beach is located in Semidang Alas Maras District. Initial observation results in the Ancol coastline area have a diverse plant composition including Casuarina equisetifolia, Lantana camara, Pandanus odorifer, Acasia sp, and Terminalia catappa. The variety of plant types that grow in the area can be used to support biology learning, especially on the theme of plant diversity and various other types of plants.

Based on the results of a survey at SMP Negeri 14 Seluma, it was found that biology learning so far, especially on biodiversity material, has only been focused in the classroom and school environment, while the diversity of coastal forest ecosystems should be one of the discussions in biology subjects on diversity material, this has led to lack of knowledge and understanding obtained directly in biology learning about the diversity of coastal forest ecosystems. The lack of knowledge about the diversity of

coastal forest ecosystems in the Ancol coastal area makes this area worthy of research and worthy of being used as an additional reference in biology learning.

Identification of plant diversity in coastal areas can be used as a reference for teaching materials in Biology subjects. Diversity is one of the learning materials in the class IX (nine) Biology subject which contains material, understanding the benefits of biodiversity, which discusses various levels of Indonesia's biodiversity, with basic competency (KD.1.1) namely admiring the order and complexity of God's creation of diversity. biology, ecosystems and the environment with one of the main topics being biodiversity which includes plant diversity .

Teaching materials are all things that can be used by students, both individually and in groups, that can support and facilitate the continuation of the learning process. The need for learning resources is currently very important, especially for students and teachers. Lack of use of media and learning resources can make students less active in learning and can affect student learning outcomes.

One effort to make it easier to recognize plant species in an area can be started by inventorying, identifying and classifying. Viewed from an ecosystem and education perspective, coastal forests play a very important role, namely that apart from being a habitat for several flora and fauna, coastal forests can also be an optimal medium for learning biology on biodiversity material. However, the existence of coastal forests to support learning is still very minimal, which can be seen from the lack of references discussing coastal forest issues.

In general, coastal forests have low species diversity, usually in coastal forests, conifers (needle leaves), lianas and flowering plants (trees) are found, accompanied by an abundance of Pandanus, sp and Barringtonia sp. The specific characteristics of coastal forest succession are usually dominated by vines, namely Ipomea pes-capre, called the Pescapre formation and subsequently found in the Barringtonia sp formation [2] .

Based on the results of research by Samin et al (2016), which was carried out in the Pasir Jambak beach tourist area, Padang city, it was concluded that this area has relatively low diversity of coastal vegetation. This statement is based on the data obtained, namely the composition at the tree level was found to be 5 families, 5 species and 36 individuals. At the sapling level, 4 families, 4 species and 36 individuals were found. Furthermore, at the seedling level, 12 families, 19 species and 712 individuals were found [3] .

Based on the research results of Onrizal and Cecep, K. et.al (2004) who examined the coastal forest in the Rambut Island Wildlife Reserve area, Jakarta Bay, it was found that the coastal forest area of the Rambut Island Wildlife Reserve was composed of 22 types of trees, 5 types of saplings were found and 3 types of seedlings were found. type. Alfaida et al, et.al (2013) in their research in Palawa Barun Village, Central Parigi District found 30 species of coastal plants, 8 species belonging to the herbaceous group and 11 species belonging to the shrub group and 11 species belonging to other groups.

Based on several studies above, it is known that previous research only examined the diversity of biological vegetation in coastal areas. This is the basis for the difference between this research and previous research, where this research examines the diversity of plants in the Smart area and uses it as teaching material on the classification of living things for class IX students in junior high school. The importance of this research is that it can provide benefits in science, especially for teachers and students, where the results of identifying plant diversity in the Ancol coastal area can add to teachers' teaching materials related to plant diversity in coastal areas in improving student learning outcomes [4] .

2. METHOD
Place and time of research
This research was carried out in the Ancol beach area, Semidang Alas Maras District, Seluma Regency from June to July 2023.
Types and Research Approaches
This type of research is quasi-experimental research (pre experiment). Quasi-experimental research was conducted to determine the effect of a treatment on the characteristics of the subjects studied, which included only one group that received the intervention [5] . In quasi-experimental research it is not possible to control all relevant variables. The experimental design used is one group before after or pre-test and post test group design. This design consists of one experimental group in each intervention which is treated in the form of applying the model.

$$O_1 \longrightarrow X_1 \longrightarrow O_2$$

Information :

O $_1$	=	Pre test (learning results before using teaching materials on coastal plant diversity
X $_1$	=	Treatment or treatment (use of teaching materials on coastal plant diversity)
O $_2$	=	Post test (learning results before using teaching materials on coastal plant diversity)

Data analysis technique

Descriptive Statistics

Descriptive statistics is data analysis by describing or illustrating the data that has been collected as it is without the intention of making general conclusions or generalizations. Descriptive statistics includes the presentation of data on mean, standard deviation, variance, maximum and minimum values.

Analysis Prerequisite Test

Normality test

The normality test aims to determine whether the data is normally distributed or not. Data management from the normality test using the SPSS Version 20.0 for Window program with the Kolmogorov Smirnov Test. The decision criteria in the normality test on SPSS according to Arifin (2017, 85) are:

1. If the significance value is > 0.05, the data is normally distributed.
2. If the significance value is <0.05 then the data is not normally distributed.

Homogeneity Test

If it is known that the data is normally distributed, the next step is to carry out a variance homogeneity test. This test is to find out whether the two samples have homogeneous variance or not. The testing criteria for the homogeneity test are as follows:

1) A significant value < 0.05 means the data is from a population that has unequal/non-homogeneous variance.
2) A significant value ≥ 0.05 means the data is from a population that has the same/homogeneous variance.

Hypothesis Test (t Test)

In this research, hypothesis testing to analyze knowledge of plant diversity and student learning outcomes in class IX biology subjects at SMP Negeri 14 Seluma used the t test. The t statistical test basically shows how much influence an independent variable individually has in explaining the dependent variable (Ghozali, 2016). In the t statistical t test, the calculated t value will be compared with the t table. If t count > t table or probability < significance level (Sig <0.05) then the independent variable has an effect on the dependent variable.

This test was carried out with a t test at a confidence level of 95% or an error rate of 0.05 using the SPSS 20 for Windows application. The results of the SPSS 20 for Windows test calculations can be concluded using the following criteria:

a. If the value of tcount ≤ ttable, it means that there is no relationship with the identification of plant diversity in the coastal area of Ancol District. Semidang Alas Maras District. Seluma as teaching material with learning outcomes on the classification of living things for class IX students at SMP Negeri 14 Seluma

b. Ho is rejected if the value of tcount ≥ or ttable, meaning that there is a relationship with the identification of plant diversity in the coastal area of Ancol District. Semidang Alas Maras District. Seluma as teaching material with learning outcomes on the classification of living things for class IX students at SMP Negeri 14 Seluma

3.   RESULTS AND DISCUSSION

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The activities carried out in this research were plant diversity in the Ancol coastal area, Semidang Alas Maras District, Seluma District as teaching material to improve learning outcomes in the material on the classification of living creatures for class IX students at SMPN 14 Seluma. With research on diversity studies, it is possible to find out which plants that make up the coast grow, such as shrubs, herbs, trees, bushes, vines.

In this research, data was collected by making observations by coming directly to the research location to collect data. The data collection technique in this research uses the belt transect method which is used to describe the population condition of a type of coral that has various relative sizes or has a certain maximum size.

Researchers carried out plant inventories using square plots measuring (80 cm x 80 cm) to see the bias in species richness in different shapes of observation plots. In this research, researchers used 7 plots measuring 80 cm x 80 cm, the distance between one plot and another was around 4 m. Data collection was carried out on each plot by recording the number and each type in the table provided. Then documentation is carried out by taking pictures of each type found.

Overall, the potential for plant ecosystems on the Ancol coast of Seluma Regency is only a small part because the plants on the coast are damaged where the Ancol coast has been installed with breakwaters. Research on this diversity study produced 15 types of plants that make up the coast, plant types were found from 7 plots. From station 1 to station 7, various types of plants were found. This study only consisted of 7 plots due to the limited reach of researchers to enter coastal areas.

The results of an inventory of high-level plant species richness obtained based on observations using square plots cannot be concluded as the optimal plot form for plant inventory. To obtain the optimal plot shape and size that can be used to inventory the richness of high-level plant species, it is necessary to carry out further tests on the results of the species richness inventory obtained. The size and shape of the observation plot is the most fundamental thing in carrying out a biodiversity inventory. Different plot shapes with the same size have different perimeters, which is called the edge effect. Observation results show that there are variations in species richness obtained using longitude plots cage.

Based on the research data obtained from the study of the diversity of coastal vegetation, it can be seen that the biodiversity index is by identifying and calculating the data on each plot. The diversity index can be determined from the various plant diversity found from each station and the plant dominance index found in each plot.

Based on the results of research on the diversity of plant species in the Ancol coastal area of Seluma Regency, 15 types of plants were found, namely Rhizopora apiculata (fire mangrove), Rhizopora mucronata (ringworm mangrove), Peking grass (Zoysia matrella (L.)Merr), cypress (Casuarina equisetifolia L) , horsetail (Ipomea pes caprae), Terminalia catappa L (sea waru), wedelia blifora (Sea chrysanthemum), sea fern (Acrostichum aureum), Cyperus Esculentus (yellow nutgrass), ketapang (Terminalia catappa L), bitter jukut (Axonopus compressus Swartz), davallia solida (rabbit's foot fern), needle grass (Andropogon aciculatus), coconut (Cocos nucifera), sea pandan (Poaceae and Arecaceae).

As mentioned above, the Ancol beach in Seluma Regency has two main formations that make up the ecosystem, namely the Pes-capre formation which consists of horseshoes (Ipomea pes caprae) from the Convulvulaceae family which is associated with pine stands (Casuarina equisetifolia L), which is then followed by with the barringtonia formation towards the land with the constituent family dominated by the ketapang plant (Terminalia catappa L), which is found in the white to brownish sand zone towards the land with a denser formation.

In this study, the plants most commonly found were grasses such as Peking grass (Zoysia matrella (L.)Merr), Cyperus Esculentus (yellow nut grass), bitter jukut (Axonopus compressus Swartz), needle grass (Andropogon aciculatus) because in this genus this type of plant can adapt to heat, it can be seen from the morphology of the plant which has the characteristic of being a strong clump, living anywhere because it has strong roots.

Of all the plants found in the Ancol coastal area, Seluma Regency have quite varied morphological characteristics. This can be seen from the shape of the roots, stems and leaves. Judging from the roots, this plant has two characteristics, namely tap roots and fibrous roots. Taproot plants are Rhizopora apiculata (fire mangrove), Rhizopora mucronata (ringworm mangrove), cypress (Casuarina equisetifolia L), ketapang (Terminalia catappa L), coconut (Cocos nucifera), sea pandan (Poaceae and Arecaceae), horse's tap (Ipomea pes caprae), and plants with fibrous roots are Peking grass (Zoysia matrella (L.)Merr), Terminalia catappa L (sea hyacinth), Wedelia blifora (Sea chrysanthemum), sea fern (Acrostichum aureum), Cyperus Esculentus (yellow sesame grass), bitter jukut (Axonopus compressus Swartz), davallia solida (rabbit's foot fern), needle grass (Andropogon aciculatus).

The level of vegetation diversity in coastal areas is influenced by the level of soil fertility in the area. Environmental factors that influence growth are climatic factors, soil factors (edaphic), physiography and biotic factors. Of these three factors, soil (edaphic) factors are the most dominant factors that cause changes in vegetation in the same area. One of the abiotic factors that plays a significant role in plant survival is temperature. Plants are unable to maintain cells and tissues at a constant optimum temperature. However, roots, leaves and stems usually tend to approach the surrounding temperature,

namely the temperature of the surrounding air and soil. Therefore, plant growth and metabolism are greatly influenced by environmental temperature. This causes plants on the coast to spread within certain limits according to the climatic conditions in the area. The temperature study in the study area was 30.7oC and this shows that the conditions on the beach are quite hot and this affects the types of plants that are able to adapt to grow in this area.

This condition shows that each species has a certain habitat range. Each environmental range has certain environmental parameters, both edaphic factors and climatic factors. Every time there is a change in the environmental range, there will also be changes in the edaphic and climatic conditions. Each species has a range of environments that suit its living needs. Therefore, the number of plant species that exist in each particular habitat is highly correlated with environmental conditions.

Based on the research results, it is known that there are not many types of plants that live in the Ancol coastal area, Seluma Regency, this is because the soil structure in the area is dominated by sand so that not all types of plants can thrive in this area. The species that exist along the coast in general are species that have economic value such as coconut, shade value such as waru, camplung, kuanji, and ketapang, cemcem; and several wild plants such as kerinyu, galah grass, katang-katang. Some of these plants are planted deliberately, grow naturally, and some grow by chance.

Another factor that influences the level of species diversity in the area is the existence of agricultural land for residents. The plant species found along the coast are mostly found on land owned by coastal residents. Edaphic factors and light factors are factors related to the physiology of vegetation. These factors are important in the survival of vegetation.

Application of Teaching Materials in Improving Learning Outcomes for Class IX Students at SMP Negeri 14 Seluma

One of the functions of forests is as a very interesting object of study and research because they have diverse ecosystems, these ecosystems include various types of forest vegetation consisting of tropical forests, orchids, mushrooms and medicinal plants. Likewise, coastal forests have diversity that can be used as an educational object [6] .

This research is useful both theoretically and practically, the theoretical benefit is that it can be used in learning at school in the teaching and learning process at junior high school level, class IX, second semester with the main topic of biodiversity which is KD 4.1, as well as at senior high school level, class IX semester. first with the main material of understanding the concept of gene diversity, species and ecosystems, as well as becoming an additional reference for future researchers and certain parties who need information about this.

Apart from the benefits described above, this research is also useful for knowledge about the diversity of coastal forest ecosystems in the Ancol coastal area, Seluma Regency, both for the local community and other parties who need information regarding this matter.

The diversity found can be used as an environment-based learning resource, especially in science subjects at Junior High School (SMP) level and the use of the environment as teaching material can be developed, among other things, in the form of Student Worksheets (LKPD). The presence of learning media sourced from the surrounding environment is expected to be able to make the learning process more interesting so that students are more active in the learning process and interaction occurs in the learning process between teachers and students.

Learning by using objects that come from the surrounding environment can increase students' learning activities because students will find these objects directly in the environment so that their curiosity will arise and will arouse their curiosity by asking the teacher or their peers, then this will happen. a very interesting interaction process between students, teachers and colleagues.

This research was conducted at SMP Negeri 14 Seluma in class IX. Before the learning process begins, a pre-test is given in the form of a test which is carried out to measure the extent of students' basic abilities regarding the concept of biodiversity. Then, research was carried out by providing material on plant diversity in the Ancol coastal area, Seluma Regency as additional teaching material on the classification of living things. After conducting the research, a post-test was carried out in the form of another test to find out the extent of the students' abilities after going through the learning process.

The next step was for the researchers to hold a meeting with class After the researcher provided the material, the researcher then conducted another test to find out the extent of the improvement in student learning outcomes after receiving the teaching material.

Description of pretest and posttest data on learning outcomes using teaching materials from plant diversity in coastal areas Ancol District. Semidang Alas Maras District. For now, it can be seen in the following table:

Table 1 .Descriptive of Student Learning Outcomes in Control and Experiment Classes

	N	Range	Minimum	Maximum	Mean	Standard Deviation
				Descriptive Statistics		
Pre test Experiment	30	10	5	15	9.23	2,144
Post test Experiment	30	10	14	24	18.67	2,006
Pre test Control	30	8	7	15	10.97	1,921
Post test Control	30	11	7	18	12.67	2,578
Valid	30					

Based on Table 1 above, it can be seen that the experimental class pre-test results have an average score of 9.23 with a minimum score of 5 and a maximum score of 15 and a standard deviation of 2.144. For the experimental class post test results, it is also known that the average score is 18.67 with a minimum score of 14 and a maximum score of 24 and a standard deviation of 2.006. The average score in the pre-test control class obtained an average score of 10.97 with a minimum score of 7 and a maximum score of 15 and a standard deviation value of 1.921. Meanwhile, the control class post test obtained an average score of 12.67 with a minimum score of 7 and a maximum score of 18 and a standard deviation of 2.578.

Based on Table 1 above, it is known that in the experimental class there was a significant increase in student learning outcomes before and after providing plant diversity teaching materials from the results of identifying plant diversity on the Ancol coast, Seluma Regency. Meanwhile, in the control class there was no significant increase because in the control class students did not receive teaching materials regarding the classification of coastal plants in Ancol, Seluma Regency.

After knowing the pretest and posttest scores on student learning outcomes on the material on the classification of living creatures in class IX of SMP Negeri 14 Seluma Regency, then the researchers will then look at the influence of the results of identifying plant diversity in the coastal area of Ancol District. Semidang Alas Maras District. Seluma as teaching material for improving learning outcomes in the material on the classification of living things for class IX students at SMP Negeri 14 Seluma using the t test, namely *the paired t test* with a confidence level of 95%.

Table 2. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Results Study	Equal variances assumed	1,480	,229	-12,675	58	,000	-7,400	,584	-8,569	-6,231
	Equal variances not assumed			-12,675	55,480	,000	-7,400	,584	-8,570	-6,230

$_{calculated}$ t value > t $_{table\ is}$ 2.03011 and the p value is 0.000 $\leq$ 0.05 so that Ha is accepted, which means that there is an influence on the results of identifying plant diversity in the coastal area of Ancol District. Semidang Alas Maras District. Seluma as teaching material to improve learning outcomes in the material

on the classification of living things for class IX students at SMP Negeri 14 Seluma.

This is because learning about the diversity of plants on the Ancol coast of Seluma Regency which is linked to material on identifying living things and the environment for junior high school students is intended to introduce plant diversity in the environment of everyday life . Through the presence of learning materials, living creatures are directly experienced through learning activities, making participants students can build more meaning in memory, and can increase knowledge and experience for students. This means that the diversity of plants on the Ancol coast is very suitable for studying Biology Science with material on diversity or identification of living creatures .

The results of this research are in line with Yuni's opinion which states that learning by using the environment as a learning resource will make students active, because it is easier for students to interact with the environment. The existence of interaction in learning will make a positive contribution to the learning process. Students who are passive during learning will usually be more involved in learning when immersed in the environment . The aim is to utilize the surrounding environment so that learning is not boring and students understand more about the objects around the school environment. Because by bringing students directly to their place, students will better understand what is in the school environment and the benefits of the school environment. Students not only learn with theory but directly see objects around them [7] .

The results of this research are in line with research conducted by T. Syahril Alamsyah, entitled "Diversity of Coastal Forest Ecosystems in Flying Areas as an Additional Reference in Biodiversity Material at Sman 1 Pasie Raja, South Aceh Regency." This research aims to look at the coastal forest diversity index in the Terbangan area and its use as an additional reference in biology learning. The method in this research uses the Line Transect method and quadratic plots with plot placement using Purposive Sampling. Analysis of research results was carried out by calculating the Shannon-Wiener diversity index (H^1). The research results showed that there were 42 plant species consisting of 28 families with a diversity index of 1.087 in the medium category [8] .

The research results were also strengthened by Bill Mandaw's research with the title "Using the School Environment as a Science-Biology Learning Resource Material for the Classification of Living Creatures on Student Learning Outcomes at SMP Negeri 1 Sadaniang, Mempawah Regency" which shows that there is an influence of classes taught using the use of the school environment as a learning resource. on student learning outcomes

4. CONCLUSION

Based on the descriptions that the author has outlined in the discussion of this research, the conclusions of this research are:
1. The plants on the coast of Ancol, Semidang Alas Maras District, Seluma Regency consist of 15 types of plants, namely Rhizopora apiculata (fire mangrove), Rhizopora mucronata (ringworm mangrove), Peking grass (Zoysia matrella (L.)Merr), cypress (Casuarina equisetifolia L.), horseshoe (Ipomea pes caprae), Terminalia catappa L (sea waru), wedelia blifora (Sea chrysanthemum), sea fern (Acrostichum aureum), Cyperus Esculentus (yellow sesame grass), ketapang (Terminalia catappa L), bitter jukut (Axonopus compressus Swartz), davallia solida (rabbit's foot fern), needle grass (Andropogon aciculatus), coconut (Cocos nucifera), sea pandan (Poaceae and Arecaceae).
2. There is an influence on the results of identifying plant diversity in Ancol beach area, Kec. Semidang Alas Maras District. Seluma as teaching material for improving learning outcomes in the material on the classification of living things for class IX students at SMP Negeri 14 Seluma tcount > ttable 2.03011 and p value 0.000 < 0.05 .

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