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The Plant Blindness Profile of Secondary School Students

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ABSTRAK

Kemampuan belajar siswa khususnya tentang tumbuhan harus lebih luas dan beragam. Minimnya pengetahuan tentang keberadaan tumbuhan di lingkungan sehingga mereka melupakan peran tumbuhan itu sendiri bagi kehidupan. Penelitian ini bertujuan untuk mengetahui persentase kebutaan tanaman pada siswa sekolah menengah di kecamatan Sandai. Metode yang digunakan dalam penelitian ini adalah deskriptif kualitatif. Pada penelitian ini, pengumpulan data menggunakan kuesioner dan wawancara, analisis data digunakan untuk mengidentifikasi buta tanaman pada siswa dalam mengenali sayuran lokal dengan menggunakan metode statistik. Hasil penelitian menunjukkan bahwa siswa SMP memiliki tingkat buta tumbuhan yang lebih tinggi dibandingkan dengan siswa SMA. Dengan rentang skor ≥70%, siswa SMP mendapatkan 37,77% dan siswa SMA mendapatkan 76,20%. Siswa SMP dengan rentang nilai ≤70 sebanyak 62,23% dan siswa SMA sebanyak 23,8%, terdapat perbedaan nilai yang cukup besar antara kedua kategori nilai tersebut. Kedepannya diharapkan siswa lebih tertarik untuk mengenal tanaman khususnya sayuran lokal sehingga dapat mencegah buta tanaman dan dapat melestarikan sayuran lokal, selain itu guru dapat menjadikan sayuran lokal sebagai sumber belajar baru bagi siswa.

ABSTRACT

Students' learning abilities, especially about plants, must be broader and more diverse. The lack of knowledge about the existence of plants in the environment so that they forget the role of the plants themselves for life. This study aims to analyze the percentage of plant blindness in secondary school students. The method used in the research is descriptive qualitative. In this study, data collection used questionnaires and interviews, data analysis was used to identify plant blindness in students in recognizing local vegetables by using statistical methods. The results showed that junior high school students had a higher rate of plant blindness than senior high school students. With a score range of ≥70%, junior high school students received 37.77% and senior high school students received 76.20%. Junior high school students with a score range of ≤70 were 62.23% and senior high school students were 23.8%, there is a considerable difference in value between the two value categories. In the future, students are expected to be more interested in knowing plants, especially local vegetables so that they can prevent plant blindness and can conserve local vegetables, besides that, teachers can make local vegetables a new learning resource for students.

1. INTRODUCTION

One way to contribute understanding to conservation is through teaching children about plants. At the moment, low interest in learning makes it difficult for students to identify plants in their immediate environment (Akkus et al., 2007; Fatimah & Santiana, 2017). The phenomenon of plant blindness, which was first described, is the inability of an individual to pay attention to and recognize plants. The hypothesis that there is an imbalance of knowledge at the primary, intermediate, and tertiary levels toward science teachings about animals or Zoozhauvinism, which receives greater attention, is what gives rise to the phenomena of plant blindness. This has a significant impact on the attention given to science lessons about plants (Pany, 2014; Phoon et al., 2020). Plants have an important role for human survival, where biodiversity as natural wealth that has not been exploited must be maintained and preserved according to their respective functions, be it as a source of food, a source of treatment and others (Kacprzyk et al., 2023; Pany, 2014). Previous study reported the results that there is a difference in learning time for animal material that is longer than plant material which causes students to be moreable to recognize animals than plants based on the example images given during the study, so this imbalance is the focus of observation and must be corrected in order to overcome students' learning perceptions of animals and plants (Balas & Momsen, 2014). In addition, other study stated that more than 65% of

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students get many opportunities to learn plant material after entering college, where previously at school there was very little material about plants (Batke et al., 2020).

Previous study explains that students' learning abilities, especially about plants, should be broader and more diverse, especially literacy skills about plants which are now difficult to improve, this has an impact on the lack of knowledge about the existence of plants in the environment so that they forget the role of plants themselves for life (Rizkamariana et al., 2019). The reality that occurs is the opposite of what is expected, low interest in learning results in individual indifference to plants also occurs, even though plants are important for the ecosystem, namely as a producer of energy that is needed for survival, plants perform photosynthesis to produce the first level of the food chain needed by all living things (Çil & Yanmaz, 2017; Pany et al., 2022). School is a very appropriate place for students to foster a sense of care for the environment, where this effort can be made so that student awareness in maintaining environmental aspects is getting higher for the sustainability of future life (Lesmi & Triyani, 2022; Sutarni et al., 2021). Nate Benuah is one of the areas used by the community for agriculture and farming. The area is located in the Sandai sub-district of Ketapang Regency, local vegetables are widely grown on the land to meet daily needs and as a livelihood. Local vegetables are defined as vegetables that are adapted to an area and can grow well in their habitat. Utilization of local vegetables in addition to being a source of food, local vegetables are also a source of medicine, for example bitter melon can be used as diabetes, stomach pain, and other diseases (Hyman et al., 2020; Wasonowati, 2021). This research is considered necessary in order to provide an overview of plant blindness that occurs in secondary school students. The aim of this study is to analyze the percentage of plant blindness in secondary school students in the Sandai sub-district. Then the results of this study are expected to be the focus of teachers in overcoming student problems and can be a reference for biology teachers in utilizing the potential of local plants / vegetables as a source of learning biology. In addition, it can also be used as a forum to introduce local types of vegetables not only as a source of knowledge and insight, but also as a way to maintain the conservation of these vegetables. The purpose of this study is to determine the percentage of plant blindness that occurs in high school students.

2. METHODS

The research used descriptive qualitative method. Stages of research conducted (1) Exploration and identification of local vegetables, (2) Identification of plant blindness in students, (3) Questionnaires and interviews (Nair, 2018; Seixas et al., 2018). Exploration of local vegetables was conducted in the Nate Benuah area by recording and documenting local vegetables encountered in community gardens. Identification of local vegetables is done by looking at and recording the morphological characters of vegetables such as: leaves, stems, flowers and fruits. Identification of plant blindness is done by assessing student answers with score criteria ≥70 and ≤70. The questionnaire given to students is open-ended, that is, the answers are not provided or are decomposed, interviews were conducted freely with the community to find out the types of vegetables encountered, and interviews with students to find out the reasons for recognizing and not recognizing local vegetables. In this study, the population was all secondary school students in the sandai sub-district, and the samples were students of SMPN 1 Sandai and SMAN 1 Sandai. In this study, data collection used questionnaires and interviews. Data analysis was used to identify plant blindness in students in recognizing local vegetables by using statistical methods (Abrori et al., 2021; Kaasinen, 2019), the description of the results of data analysis is carried out with reference to the percentage criteria presented in Table 1. Then data in the study will be presented with statistical methods presented in Table 2.

Table 1. Criteria for Percentage of Students' Plant Blindness

Criteria	Interval Value
Easy to recognize	≥70
Difficult to recognize	≤70

Table 2. Statistical Methods

Research Question	Statistical Methods
How well students recognize local vegetables?	Average (means)
Which Local Vegetable is the Most Recognizable?	Frequency

3. RESULT AND DISCUSSION

Results

The result of this study is the percentage of local vegetables recognized by secondary school students. The results obtained by junior high school students are higher in plant blindness than high school students, this can indirectly illustrate that the delivery of material about plants is still lacking.

Data on Plant Blindness Profile of Junior and Senior High School Students in Sandai Sub-district

In the research that has been carried out, the results of each student's answers after being corrected for the correctness of the answers, then grouped based on the correct question number, the questionnaire contains 30 items containing 30 types of local vegetables in the Sandai sub-district, while the questions are given to find out how well students know local vegetables. Plant blindness profile of Junior and Senior High School students in Sandai Sub-District is show in Table 3.

Table 3. Plant Blindness Profile of Junior and Senior High School Students in Sandai Sub-District

Name of Vegetable			Student Recognize Local Vegetable (%)	
Number	**Local Name**	**Spesies**	**SMPN 1 SANDAI**	**SMAN 1 SANDAI**
1.	Sawi Lako	*Brassica juncea*	40	48
2.	Rebung	*Schizostachyum sp*	91	100
3.	Kacang Belimbing	*Psophocarpus tetragonolobus*	63	89
4.	Timun Lako	*Cucumis Melo*	89	96
5.	Terong Asam	*Solanum ferox*	78	93
6.	Terong Manggoy	*Solanum torvum*	70	99
7.	Terong Bulu	*Solanum lasiorcapum*	39	64
8.	Pucok Singkel	*Premna serratifolia*	22	58
9.	Gondo	*Luffa aegyptiaca*	14	50
10.	Lepang belut	*Trichosanthes cucumerina*	40	71
11.	Umbut Ruak	*Korthalsia scaphigera*	50	64
12.	Periak	*Momordica charantia*	82	99
13.	Saung	*Etlingera elatior*	19	50
14.	Kuce	*Allium schoenoprasum*	56	93
15.	Kacang Kampong	*Phaseolus vulgaris*	81	99
16.	Pakuk Lembiding	*Stenochlaena palustris*	64	95
17.	Kundor	*Benincasa hispida*	33	83
18.	Mengkudu	*Morinda citrifolia*	46	73
19.	Pucok Kesum	*Polygonum minus*	11	17
20.	Labuk Aik	*Lagenaria siceraria*	90	98
21.	Cangkok	*Sauropus androgynus*	60	72
22.	Belimbing Telunjok	*Averrhoa bilimbi*	54	82
23.	Pucok Kunyit	*Curcuma longa*	62	94
24.	Pakuk Ikan	*Diplazium esculentum*	88	100
25.	Keladi Betawi	*Xanthosoma sagittifolium*	23	50
26.	Pucok Betek	*Carica papaya*	88	99
27.	Pisang Mako	*Musa x paradisiaca*	90	100
28.	Sawi Malaysia	*Spinacia oleracea*	3	97
29.	Terong Kopet	*Solanum melongena*	91	16
30.	Pucok Ubi Getak	*Manihot glaziovii*	88	97

Base on Table 3 the results of the test of students' ability to answer questions in the questionnaire showed that students' knowledge in recognizing vegetables varied, there were 2 categories in the first assessment ≥70 and ≤70, from 30 types of local vegetables given in the student questionnaire, each obtained different scores, there were 11 types of vegetables that obtained the same score between junior and senior high school students scored ≥70, and 19 types of vegetables that obtained ≤70.

Data on pictures of local vegetables that are difficult to recognize by junior and senior high school students in Sandai sub-district

In the research that has been carried out based on the questionnaire test given there are 30 different types of local vegetables, the task of students is to answer the local name of the vegetable image on the questionnaire sheet provided, writing local names in each region is also different even though the type of vegetable is the same, after filling out the questionnaire the results show that there are several types of local vegetables that are most difficult for students to recognize, namely 12 types of local vegetables, while the 30 types of vegetables are typical local vegetables that are widely grown in the Nate Benuah area, Sandai District, Ketapang Regency. Figure 1 is show type of local vegetable hard to organize.

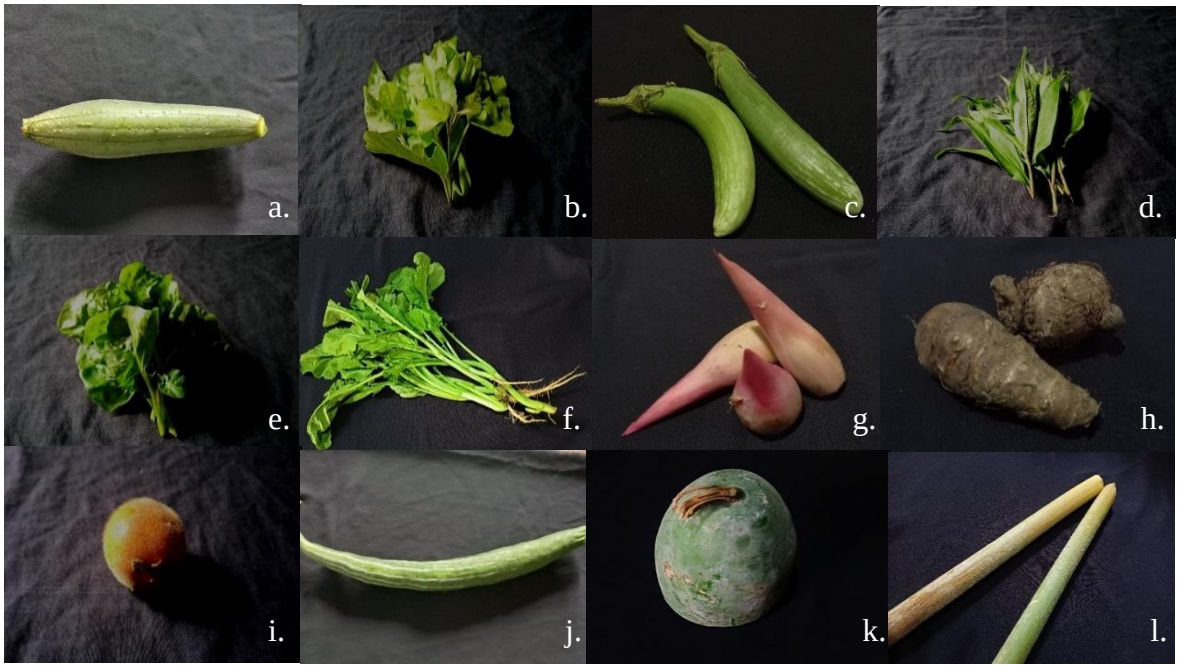

Figure 1. Local Vegetables That Are Hard to Recognize

Base on Figure 1 local vegetables that are difficult for students to recognize, namely a. Gondo *(Luffa aegyptiaca)* item number 9, b. Pucok Singkel *(Premna serratifolia)* item number 8, c. Terong Kopet *(Solanum melongena)* item number 29, d. Pucok Kesum *(Polygonum minus)* item number 19, e. Sawi Malaysia *(Spinacia oleracea)* item number 28, f. Sawi Lako *(Brassica juncea)* item number 1, g. Saung *(Etlingera elatior)* item number 13, h. Keladi Betawi *(Xanthosoma sagittifolium)* item number 25, i. Terung Bulu *(Solanum lasiorcapum)* item number 7, j. Lepang belut (Trichosanthes cucumerina) item number 10, k. Kundor *(Benincasa hispida)* item number 17, l. Umbut Ruak *(Korthalsia scaphigera)* item number 11.

Percentage Data on How Well Junior and Senior High School Students in Sandai Sub-District Know Vegetables

The results of the research conducted by conducting questionnaire tests to students were then corrected and obtained scores, then grouped into 2 groups based on the acquisition of scores of more than 70 and less than 70 to find out what percentage was obtained by junior high school students and high school students. Table 4 show ability of students in recognize vegetables.

Table 4. How Well Junior and Senior High School Student in Sandai Sub-District Recognize vegetables

School	Percentage	
	Students with a score ≥70	**Students with a score ≤70**
SMPN 1 Sandai	37.77%	62.23%
SMAN 1 Sandai	76.20%	23.8%

Base on Table 4 the research data shows that out of 90 junior high school students, only 37.77% scored above 70, while students who scored below 70 were 62.23% of the total students. As for the results obtained by 105 high school students, of the total number of students who got scores above 70 as many as 76.20% of students, the remaining 23.8% of students got scores below 70.

Data on the most recognizable local vegetables based on the overall percentage of total answers of 195 students

In the research that has been done, the results show that there are local vegetables that are difficult to recognize and the most recognizable local vegetables, the types of vegetables that are most recognized by junior high school students and high school students are different, not all types of vegetables are recognized the same. Data of most recognize vegetable is show in Table 5.

Table 5. Most recognized local vegetables by percentage of each answer (195 students)

The most recognized vegetable (90 students) SMPN 1 Sandai	The most recognized vegetable (105 students) SMAN 1 Sandai
Schizostachyum sp	*Schizostachyum sp*
Cucumis Melo	*Psophocarpus tetragonolobus*
Solanum ferox	*Cucumis Melo*
Solanum torvum	*Solanum ferox*
Momordica charantia	*Solanum torvum*
Phaseolus vulgaris	*Trichosanthes cucumerina*
Lagenaria siceraria	*Momordica charantia*
Diplazium esculentum	*Phaseolus vulgaris*
Carica papaya	*Allium schoenoprasum*
Musa x paradisiac	*Stenochlaena palustris*
Solanum melongena	*Benincasa hispida*
Manihot glaziovii	*Morinda citrifolia*
	Lagenaria siceraria
	Sauropus androgynus
	Averrhoa bilimbi
	Curcuma longa
	Diplazium esculentum
	Carica papaya
	Musa x paradisiac
	Spinacia oleracea
	Manihot glaziovii

Table 5 show the research data based on the criteria of vegetables that are most recognized are 12 types of vegetables that are most recognized by SMPN 1 Sandai students and 21 types of vegetables that are most recognized by SMAN 1 Sandai students.

Data on Reasons for SMA and SMP Students Recognizing Local Vegetables

After the students filled out the questionnaire and had been corrected, the results showed that there were 2 groups of scores, namely below 70 and above 70, from the two groups then conducted interviews to find out the reasons for students to recognize local vegetables contained in the questionnaire, there were 3 questions for the reasons for recognizing local vegetables, 1. Frequently see and consume, 2. growing your own vegetables 3. selling vegetables. Percentage of reasons students recognize local vegetables is show in Figure 2.

Base on Figure 2 the results showed that the reason why students of SMAN 1 Sandai recognize vegetables is because they often see and consume vegetables 90%, while the reason for recognizing is planting the vegetables themselves gets 50% and 30% of the reason students recognize vegetables because their parents sell the vegetables themselves. Meanwhile, 70% of the students of SMPN 1 Sandai recognize vegetables because they often see and consume the vegetables, 20% of the students recognize vegetables because they grow the vegetables themselves and 10% of the students recognize vegetables because their parents sell the vegetables themselves.

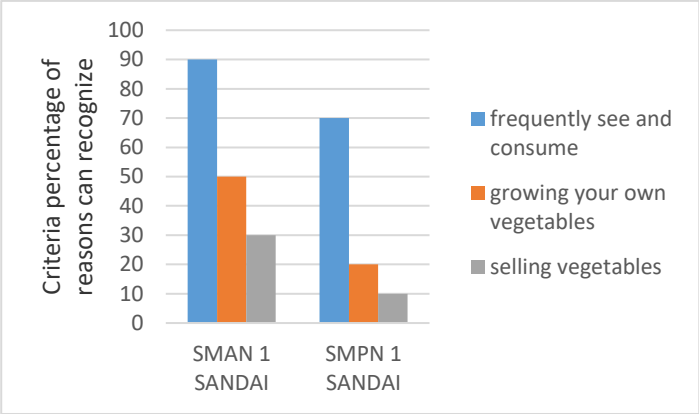

Figure 2. Percentage Diagram of Reasons Students Recognize Local Vegetables

Data on reasons why junior and senior high school students in Sandai sub-district do not recognize local vegetables

From the research that has been done, not all types of local vegetables are known or known to students for their names, to find out the reasons why students do not recognize local vegetables, interviews were conducted which included the following questions: 1. Never seen the vegetable, 2. Not consume these vegetable, 3. Not growing and selling vegetable. Percentage reasons students do not recognize local vegetables is show in Figure 3.

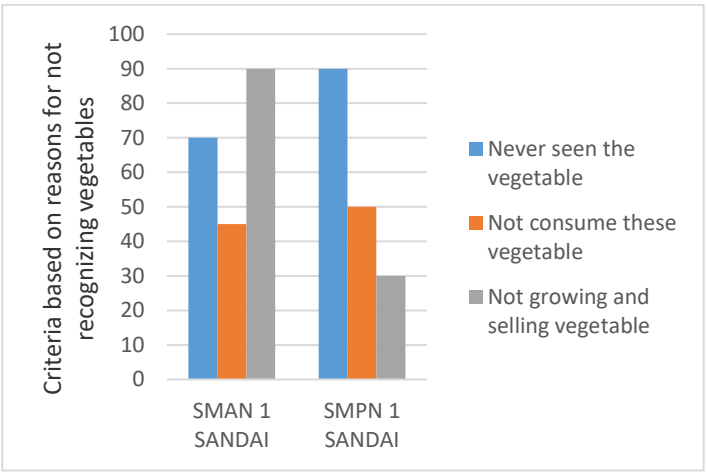

Figure 3. Percentage Diagram of Reasons Students Do Not Recognize Local Vegetables

Base on Figure 3 the results obtained based on the reasons for not recognizing vegetables, SMAN 1 Sandai students who gave reasons for not recognizing vegetables because they never saw as much as 70%, never consumed as much as 45%, and 90% of students did not recognize vegetables because they never grew or sold these vegetables. The reason why students of SMPN 1 Sandai did not recognize vegetables was 90% because they never saw them, 50% because they never consumed them, and 30% because they never grew or sold them.

Discussion

The lack of student interest in getting to know and gain knowledge about plants at school causes students to not be able to recognize plants, especially local vegetables in the surrounding environment so that it can cause plant blindness (Jacob & Karn, 2003; Juanda et al., 2021; Mukti & Nurcahyo, 2017). Whereas knowledge alone is not enough to change students' attitudes and habits in interpreting the importance of plants (Aprianty & Nuraeni, 2018; von Kotzebue, 2022). Previous study explains that plant biodiversity is very important in efforts to maintain the ecosystem, but knowledge and awareness to maintain perception and care for plants is still very lacking (Breitschopf & Anne, 2023). There is very limited subject matter on plants taught in schools, which is one of the reasons for the emergence of the phenomenon of plant blindness. Especially in biology learning, direct interaction between students and

learning objects is an effort that can be made by students to observe and discover knowledge through direct learning experiences to become a focal point that must be considered (Amprazis & Papadopoulou, 2018; Susilo, 2018). Previous study mentioned that students actually have general knowledge about plants, but only know that plants are green without wanting to know the name of the species (Batke et al., 2020). In this case, it is said that plant blindness is that students are unable to name vegetable species seen from the level of correctness of answering the test on the grounds that they do not recognize and know how the vegetable processing process is even some have never seen it at all. Other study explained that the ability of biology students to recognize plants is limited, namely only being able to recognize several types, such as ferns *(Pteridophyta)* but more than 50% do not recognize seed plants *(Spematophyta)* (Abrori, 2020). Research has been conducted on students and teachers in Firland where the results of the study state that many students do not recognize plant species, species that are widely recognized by students there such as Raspberries and Balberries on the grounds that frequent fruit picking in the forest is the main reason why these species are the most recognized (Kaasinen, 2019).

Vegetables are parts of plants that can be eaten raw or cooked, the parts in question are other than fruits and mature grains, the definition of vegetables is mostly a culinary and cultural definition, so there are vegetables that are categorized based on botany, for example cucumbers are called vegetables culinary but are called fruits botanically (Hyman et al., 2020; Yurlisa et al., 2017). Local vegetables are native vegetables that have long been consumed by the community, local types of vegetables are often called indigenous vegetables. Previous study argues that local vegetables are organic vegetables where local vegetables are usually vegetables that are free from harmful chemicals and are certainly healthy and good for consumption, besides that it can be preserved as a high-value local vegetable cultivation (Minarni et al., 2017). Local vegetables if developed have great potential so that they can be used as a source of learning biology. The definition of learning resources is all sources such as messages, people, materials, tools, techniques, and settings that can be utilized by learners as one of the activities in improving the quality of learning (Mumpuni et al., 2013; Supriadi, 2015). Caring for the surrounding environment is an effort to maintain conservation that needs to be applied, the lack of awareness of plants is a serious obstacle, where plants are one of the important aspects of human life, for example as a food chain (Pany et al., 2022; Yurlisa et al., 2017). Presentation of material on plants and animals in equal amounts and using memorable examples of plant images to compensate for students' selective attention to animals, because plant blindness cannot be eliminated instantly, improvements in teaching are needed (Çil & Yanmaz, 2017; Kissi & Dreesmann, 2018). Because of that the role of teachers is important in an effort to overcome plant blindness in students. The importance of knowledge related to the diversity and cultivation techniques of local vegetables can be used as a basis for strategy and utilization in an effort to maintain the biodiversity of local vegetables in Indonesia (Lederman et al., 2002; Rochman et al., 2019).

This research can provide valuable insights into students' level of understanding and awareness of plants. The implication is the importance of including richer environmental education about ecosystems, biodiversity, and the importance of plants in the school curriculum. This research can provide valuable information for nature conservation efforts. By understanding the extent to which "plant illiteracy" affects students, interested parties can design programs to increase awareness and concern for plants and the environment in general. However, this study has limitations, one of which is that this study only involved students from the Sandai Sub-District, so the results may be difficult to generalize to student populations in other locations or with different cultural backgrounds. In addition, there are external factors that might influence the results of the research, such as the influence of the environment at home or events when the research was conducted.

4. CONCLUSION

Based on the results of research there is a difference in the percentage of plant blindness, junior high school students have a higher level of plant blindness, seen from the results of these calculations can be compared with the results of calculating the level of plant blindness in high school students who get lower results for blindness. This research certainly has many limitations, for example the types of local vegetables presented are still small, it is hoped that further research can add to the types of local vegetables in the neighborhood. While the results of this study are expected to be a reference for changes in the teaching patterns of subject teachers in the future so that there is no imbalance in knowledge about animals and plants. As for the obstacles during the research took place is the limited time that makes the interview session less effective.

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