
	Gema WIRALODRA
	Editor-in-Chief: Yudhi Mahmud
	 Publisher: Universitas Wiralodra

Exploring The Potential of Biodiversity: An Ethnobotany Approach As A Learning Resource At SMA Negeri 1 Tempilang

Suhartati^a, Marlina Ummas Genisa^b,
Wulandari Saputri^c

^aMahasiswa Pendidikan Biologi Program Magister Universitas Muhammadiyah Paembang/SMA Negeri 1 Tempilang, Bangka Belitung Province, Indonesia

suhartati1010@gmail.com

^bPendidikan Biologi Program Magister Universitas Muhammadiyah Palembang, South Sumatra Province, Indonesia

marlina_ummas@um-palembang.ac.id

^cPendidikan Biologi Program Magister Universitas Muhammadiyah Palembang, South Sumatra Province, Indonesia

wulandari_saputri@um-palembang.ac.id

To cite this article:

Suhartati, S., Genisa, M. U., Saputri, W. (2024). Exploring The Potential of Biodiversity: An Ethnobotany Approach As A Learning Resource At SMA Negeri 1 Tempilang. *Gema Wiralodra*, 15(3), 970 – 977.

To link to this article:

<https://gemawiralodra.unwir.ac.id/index.php/gemawiralodra/issue/view/27>

Published by:

Universitas Wiralodra

Jln. Ir. H. Juanda Km 3 Indramayu, West Java, Indonesia

Exploring the Potential of Biodiversity: An Ethnobotany Approach as a Learning Resource at SMA Negeri 1 Tempilang

Suhartati^{a*}, Marlina Ummas Genisa^b, Wulandari Saputri^c

^{a*}Mahasiswa Pendidikan Biologi Program Magister Universitas Muhammadiyah Paembang/SMA Negeri 1 Tempilang, Bangka Belitung Province, Indonesia, Email: suhartati1010@gmail.com

^b Pendidikan Biologi Program Magister Universitas Muhammadiyah Palembang, South Sumatra Province, Indonesia, E-Mail: marlina_ummas@um-palembang.ac.id

^c Pendidikan Biologi Program Magister Universitas Muhammadiyah Palembang, South Sumatra Province, Indonesia, E-Mail: wulandari_saputri@um-palembang.ac.id

*Correspondence: suhartati1010@gmail.com

Abstract

This study aims to analyze the ethnobotany biodiversity approach as a learning resource in the environment of SMA Negeri 1 Tempilang. Using biodiversity integrated with the community's traditional knowledge of plants (ethnobotany) in learning is crucial to increase students' understanding and awareness of the environment. The method used was a survey with a questionnaire instrument distributed to 35 SMA Negeri 1 Tempilang students to measure the level of knowledge, techniques, and obstacles to using ethnobotanical biodiversity in learning. Based on the results of the descriptive analysis, most students are at a high level of knowledge about ethnobotany, with 76 students or about 43.43% of the total population. Most of the other students were at a moderate level, with 50 students or about 28.57%. Deficient levels of knowledge have a relatively small number of students, with ten (5.71%) and 17 (9.71%), respectively. There is also a small number of students with a very high level of knowledge, namely 22 students or around 12.57%. Overall, the understanding and knowledge of ethnobotany among students is relatively good. The study results show that students understand ethnobotanical biodiversity well, but its use as a learning resource still needs improvement. The main obstacles include the limitation of learning materials and the need to utilize local potential. This study concludes the importance of integrating ethnobotany biodiversity materials in the school curriculum to increase environmental awareness and appreciation of local cultural richness. The results of this study can be a reference for the development of curriculum and learning strategies that are more relevant to local conditions.

Keywords: Biodiversity, Ethnobotany, Learning Resources, SMA Negeri 1 Tempilang.

1. Introduction

Biodiversity is one of the crucial aspects that need to be understood by the younger generation, especially students at the high school level. Understanding biodiversity involves knowledge of plant and animal species and human relationships with their natural environment, often manifested in traditional practices and the use of plants in daily life (Susanto et al., 2022). One approach that can be used to integrate this knowledge into learning is through an ethnobotany approach. Arum et al. (2012) explained that ethnobotany is a science that studies the relationship between humans and plants in a cultural context. This approach provides insight into how local communities use plants for various purposes, such as medicine (Dahuri, 2003), food (Haris & Toding, 2019), rituals (Leksono, 2010), and building materials (Purwanto, 2021). The ethnobotany approach can be a rich and relevant educational resource, especially in biodiversity-related learning (Yulianti, 2014).

Ethnobotany biodiversity is the close relationship between biodiversity, predominantly plants, and human culture and life. Silalahi (2020) explained that ethnobotany is a science that studies how people use, manage, and understand plants in their social and cultural contexts. This includes how local communities use plants for various needs such as food, medicines, building materials, ritual ceremonies, etc.



Biodiversity in the ethnobotanical context includes the number and variety of plant species present in an area, as well as the traditional knowledge local communities possess about using and utilizing those plants. This knowledge is often passed down from generation to generation, reflecting local wisdom and the harmonious relationship between humans and nature (Siboro, 2019). In other words, ethnobotanical biodiversity involves not only biological and ecological aspects of plants (Syafitri et al., 2014) but also cultural (Purwanto et al., 2020), social (Harapan et al., 2024), and economic aspects related to the use of plants by humans (Vidyalakshmi et al., 2008; Walujo, 2011). The ethnobotany approach to biodiversity studies helps us understand how traditional knowledge can contribute to the conservation and sustainable use of natural resources.

SMA Negeri 1 Tempilang, an educational institution in an area rich in biodiversity, has excellent potential to develop ethnobotany-based learning. Through this learning, students will learn about biodiversity and develop an appreciation for local wisdom and environmental sustainability.

This study aims to analyze the effectiveness of the ethnobotanical approach as a learning resource in the environment of SMA Negeri 1 Tempilang. Using descriptive quantitative methods, it will measure how this approach can improve students' understanding of biodiversity and how it is integrated into existing educational curricula.

The research results are expected to contribute to developing learning strategies that are more contextual and relevant to the environment around students. In addition, this research is also expected to be the basis for policymakers in the field of education to develop learning programs that support biodiversity conservation through an ethnobotanical approach.

2. Method

This study uses a descriptive quantitative design to provide a systematic overview of the researched phenomenon, namely the potential of ethnobotanical approaches in biodiversity learning at SMA Negeri 1 Tempilang. This research was carried out from May to June 2024. The sample in this study is the entire population of class X students, totaling 175 students. The instrument used in this study is a questionnaire or questionnaire prepared based on indicators relevant to the concept of biodiversity and ethnobotany. This questionnaire measures students' understanding, attitudes, and perceptions of the material being taught.

The data analysis technique in this study uses descriptive statistics. The data processed with descriptive statistics is recapitulated data of students' answers to environmental literacy indicators. The research data that has been collected is then analyzed using descriptive statistics and adjusted to environmental literacy criteria. The criteria for environmental literacy are as follows:

Table 1.

Criteria for Students' Environmental Literacy Ability

Percentage (%)	Criterion
90– 100	Very High
80 – 89	High
70 – 79	Medium
60 – 69	Low
≤ 59	Very Low

Sumber: Adlika (2020)



3. Results and Discussion

Result

The study's results presented the students' ethnobotanical approach results as a score distribution. These results show how high the students' ethnobotanical approach results are. Environmental attitudes will be assessed based on their views on the importance of environmental conservation, while environmental behavior will be analyzed based on actual actions taken by students.

1) The level of knowledge of students about ethnobotany

Figure 1.

The Level of Knowledge of Students About Ethnobotany

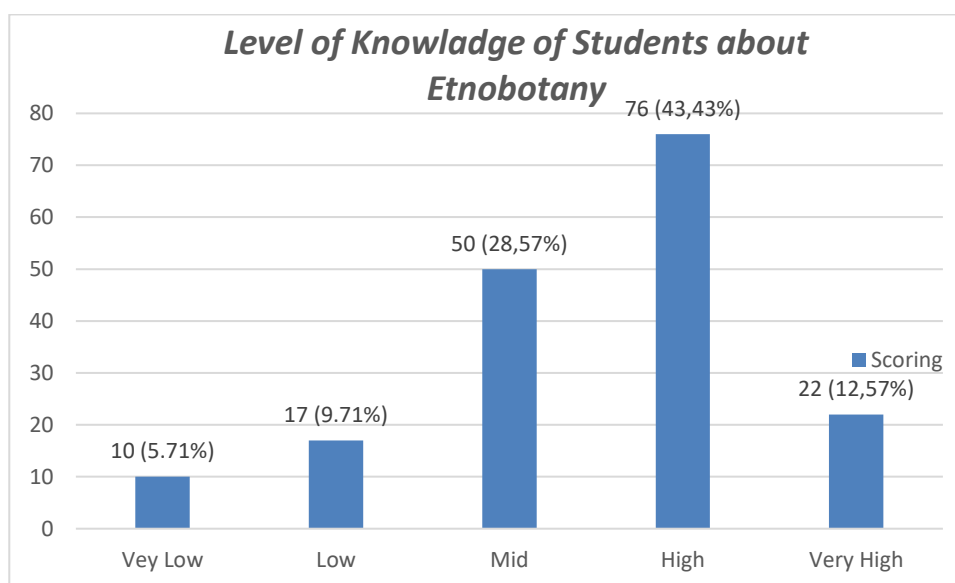


Figure 1 is a bar chart above showing the distribution of students' knowledge levels about ethnobotany. From this explanation, the level of knowledge could be higher: As many as ten students, equivalent to 5.71% of the total students, have a shallow level of knowledge about ethnobotany. Low Knowledge Level: There are 17 students, or about 9.71%, who need more knowledge about ethnobotany. Moderate Level of Knowledge: 50 students, or 28.57% of the total, have a moderate level of knowledge. High Level of Knowledge: The majority of students, namely 76 students or 43.43%, have a high level of knowledge regarding ethnobotany. Very High Level of Knowledge: Lastly, 22 students, or 12.57% of the total, have very high knowledge of ethnobotany.

These results concluded that most students had a high level of knowledge about ethnobotany, which showed a good understanding of this material. Nonetheless, many students must improve their knowledge, especially those at low levels. These results show variations in students' understanding of ethnobotany, which can be the basis for adjusting learning methods in the classroom to be more effective.

2) Students' Methods in Understanding Biological Ability Towards Ethnobotanical Approaches

Figure 2.

Ethnobotanical Biodiversity Frequency

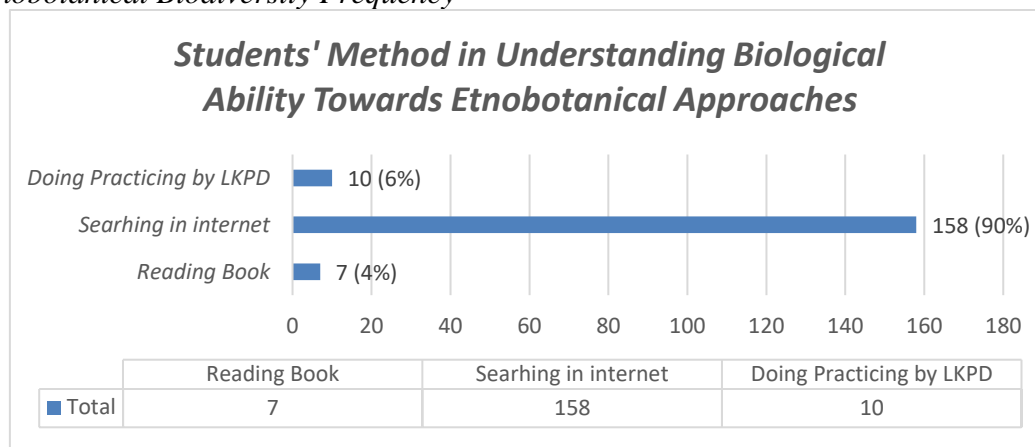


Figure 2 explains the bar diagram, which shows the survey results regarding students' methods of understanding the ethnobotanical approach's ability. This survey considers three methods: Practice Questions through LKPD (Student Worksheets), Searching on the Internet, and Reading Books.

The survey results show that as many as 158 students, or 90%, prefer to search on the Internet as the primary method of understanding material about ethnobotany. This method may have been chosen because of the broader and faster access to online information and the flexibility in finding relevant and in-depth sources. In contrast, only ten students, or 6%, chose the Practice Questions method through LKPD to improve their understanding. This method may be considered less exciting or less adequate compared to more dynamic sources of information such as the Internet. Finally, Reading Books is the least chosen method by students, only seven or 4%. This may be due to changing preferences in how students learn in the digital age, where they are more likely to rely on digital sources than physical reading materials.

This data concluded that students preferred modern and interactive methods, such as the Internet, to traditional methods, such as reading books or practicing questions through LKPD. Teaching approaches integrating technology and online resources may be more effective in improving students' understanding of ethnobotany. It also highlights the importance of adapting learning methods to students' preferences and needs in this digital era.

3) Analysis of Learning Constraints on Biodiversity with Ethnobotany Relevance

Figure 3.

Frequency of Ethnobotany Biodiversity Learning Constraints

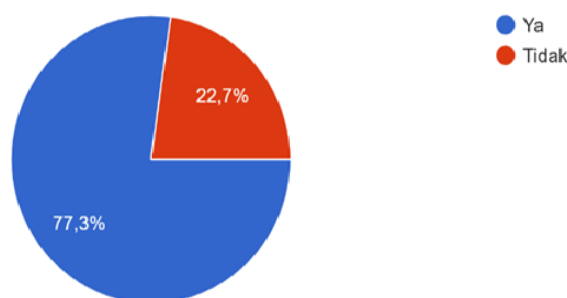


Figure 3 shows the results of the analysis of obstacles in biodiversity learning related to ethnobotany, reviewed from the student's point of view. The diagram above illustrates in detail that as many as 77.3% of students stated "Yes" and did not experience any problems learning biodiversity related to ethnobotany. This shows that most students feel comfortable and can follow the learning well. Supporting factors such as the availability of adequate learning resources, effective teaching methods, or a high interest in the topic contribute to this. As many as 22.7% of students stated "No" or experienced obstacles in learning. Although the number is less than that of those who do not experience problems, this is still an important point that needs to be considered. The obstacles experienced may be related to various factors, such as lack of access to learning resources, difficulty understanding the material, or limited time to delve into the topic.

The above results are as follows: Most students feel that there are no obstacles to studying ethnobotany-related biodiversity, which shows that the current learning environment is quite conducive. Although most did not experience difficulties, about a quarter of students felt obstacles. This indicates that special attention is needed to them by providing additional support such as guidance, additional learning resources, or adjustments to teaching methods. To increase the effectiveness of learning, it is recommended that teachers or related parties further identify the obstacles experienced by these 22.7% of students. Thus, appropriate intervention measures can be taken to help them overcome difficulties and ensure all students can learn effectively. This analysis can be the basis for improving the learning process of biodiversity related to ethnobotany so that it is more inclusive and supports all students.

Discussion

This study uses a descriptive quantitative method to evaluate the effectiveness of the ethnobotanical approach as a source of biodiversity learning at SMA Negeri 1 Tempilang. This approach measures the extent to which students understand and apply the concept of local knowledge-based biodiversity (ethnobotany) in the learning process.

From the research results, the level of student understanding was obtained; most students showed a good understanding of biodiversity through an ethnobotanical approach. The questionnaire results showed that students had a high level of knowledge about ethnobotany, with 76 students or about 43.43% of the total population. Most of the other students were at a moderate level, with 50 students or about 28.57%. Deficient levels of knowledge have a relatively small number of students, with 10 (5.71%) and 17 (9.71%), respectively. There is also a small number of students with a very high level of knowledge, namely 22 students or around 12.57%.

The results of this study show that the ethnobotany approach as a learning resource has succeeded in increasing students' understanding of biodiversity. Students gain theoretical knowledge and understand the cultural values and local wisdom related to the plants around them. The Positive Factor in the relevance of the material explained that this approach provides a clear and relevant context to students' daily lives, making learning more meaningful and memorable. Then, strengthening local wisdom about ethnobotanical materials helps preserve local knowledge, increasing students' sense of pride and responsibility towards the environment. Overall, the ethnobotany approach as a learning resource at SMA Negeri 1 Tempilang effectively increases students' understanding of biodiversity. However, to achieve more equitable results, it is necessary to improve the provision of resources and develop more inclusive learning methods. The descriptive quantitative approach used in this study provides a clear picture of the effectiveness of the method, as well as identifying areas that need improvement. Recommendations that can be drawn from this study include further development of ethnobotanical materials suitable to the local context and teacher training to

improve the application of these methods in daily learning activities (Purwanto et al., 2024; Taufiqi & Purwanto, 2024).

The relevant study in this study was derived from Pei, S., Alan, H., & Wang, Y. (2020), who proposed that ethnobotany can contribute to biodiversity conservation by documenting and maintaining local and indigenous knowledge about plants and promoting sustainable development through innovative practices. The herbal market is vital in supplying medicinal plants and transmitting related knowledge. Samudra (2016) describes an investigation into the traditional use of medicinal plants traded in herbal markets in Kahramanmaraş, Turkey. They found 62 taxa of the crops traded, 26 of which were to some degree threatened globally. Commercialization often increases the demand for medicinal plants, consequently increasing the threat to these medicinal plant species and their improper utilization. Drug consumers. 46% of the 121 medicinal plants documented in the Buyi community were previously unknown to science. Then, research from Hanazaki, N., Nakamura, E., Lindner, B., & Boef, W. (2016) explains that ethnobotany is the study of the interconnectedness between human culture and plants, animals, and other organisms in its environment. It also creates awareness of the relationship between biodiversity and cultural diversity. Since the beginning of civilization, people have used plants for various purposes, such as food, shelter, medicine, etc. Ethnobotanists play a crucial role in exploring this information from indigenous peoples who create a gateway to formulate new medicines (Permatasari, 2013). The contents of this chapter discuss these aspects in an approachable way. From the explanation above, it is found that ethnobotany plays a vital role in biodiversity conservation by documenting and preserving traditional knowledge about plants (Mangunjaya, 2006). This knowledge helps in the sustainable management of natural resources and the development of new medicines and products (Leksono, 2010). Cultural and biological diversity are intertwined, and ethnobotanical studies can uncover unique practices that are important to preserve. Innovations in ethnobotanical research, such as using genomic technologies, further strengthen the discipline's contribution to conservation and sustainable development.

4. Conclusion

This study can conclude that the ethnobotany approach as a learning resource has been proven effective in increasing students' understanding of biodiversity. Students can relate academic knowledge to local wisdom and cultural practices relevant to the surrounding environment. Most students show a good to excellent understanding of the material being taught. However, a few students still need more understanding, indicating the need for more varied teaching strategies. Students' attitudes towards learning using an ethnobotanical approach are very positive. Most students found the material relevant and valuable, actively seeking additional information and engaging in learning activities. Some challenges include limited resources and references related to ethnobotany in the Tempilang area and the need to develop more inclusive teaching methods to achieve all levels of student understanding. Efforts are needed to increase access to more prosperous and ethnobotany-specific teaching materials and provide additional training to teachers to integrate these approaches into the curriculum more effectively. Overall, the ethnobotany biodiversity approach as a learning resource at SMA Negeri 1 Tempilang shows positive results but needs improvements to optimize student learning outcomes.



Acknowledgments

Thank you to the Principal of SMA Negeri 1 Tempilang for providing the opportunity to conduct research and data collection involving students. Thank you to the teachers and staff of SMA Negeri 1 Tempilang for providing support in completing this research. Thank you also to my thesis supervisor, who has provided valuable input so that this article can be well translated.

5. References

- Adlika, N. M. (2020). Analisis Sikap Peduli Lingkungan pada Siswa Kelas XI IPS SMA di Kota Pontianak. *Jurnal PIPSI (Jurnal Pendidikan IPS Indonesia)*, 5(2), 45–48.
- Arum, G. P. F., Retnoningsih, A., & Irsadi, A. (2012). Etnobotani tumbuhan obat masyarakat desa keseneng kecamatan Sumowono kabupaten Semarang Jawa Tengah. *Life Science*, 1(2).
- Dahuri, R. (2003). *Keanekaragaman hayati laut: aset pembangunan berkelanjutan Indonesia*. Gramedia Pustaka Utama.
- Harapan, E., Marisyah, F., Marsinah, M., Malini, S., & Purwanto, M. B. (2024). Assessing Work Habits and Discipline: High School Teachers in South Sumatra Province Post In-Service Teacher Professional Education Program (PPG-DALJAB). *Gema Wiralodra*, 15(2 SE-Articles), 726–737. <https://doi.org/10.31943/gw.v15i2.707>
- Haris, N. A., & Toding, A. (2019). Kajian Etnobotani Famili Rubiaceae Oleh Masyarakat Kota Tarakan Dan Potensinya Sebagai Sumber Belajar Biologi. *Biopedagogia*, 1(2), 87–93. <https://doi.org/10.35334/biopedagogia.v1i2.1703>
- Leksono, A. S. (2010). *Keanekaragaman hayati*. Universitas Brawijaya Press.
- Mangunjaya, F. M. (2006). *Hidup harmonis dengan alam: esai-esai pembangunan lingkungan, konservasi, dan keanekaragaman hayati Indonesia*. Yayasan Pustaka Obor Indonesia.
- Permatasari, I. (2013). *Etnobotani Tumbuhan Bahan Dasar Minyak Sumbawa di Kabupaten Sumbawa Besar Provinsi Nusa Tenggara Barat (NTB)*. Universitas Islam Negeri Maulana Malik Ibrahim.
- Purwanto, M. B. (2021). Peran Pendidik dalam Menciptakan Kelas Yang Berkarakter di Sekolah Dasar. *Jurnal PGSD Musi*, 4(2), 148–162. <https://doi.org/10.32524/jpgsdm.v6i1>
- Purwanto, M. B., Devi, D., & Nuryani, N. (2020). Pembelajaran Era Distrutip Menuju Masyarakat 5.0. *Prosiding Seminar Nasional Program Pascasarjana Universitas PGRI Palembang*.
- Purwanto, M. B., Yuliasri, I., Widhiyanto, W., & Rozi, F. (2024). Primary School English Education In The Age Of Industry 4.0: Tackling Challenges, Expanding Horizons. *Proceedings of Fine Arts, Literature, Language, and Education*, 859–873.
- Samudra, S. M. (2016). Ethnomedicinally essential plants of the family Rubiaceae from Pune District (MS). *Proceeding of National Conference on Environment and Development*, 86–88.
- Siboro, T. D. (2019). Manfaat keanekaragaman hayati terhadap lingkungan. *Jurnal Ilmiah Simantek*, 3(1).
- Silalahi, M. (2020). *Diktat etnobotani*.
- Susanto, Y., Effendi, M., & Purwanto, M. B. (2022). Sosialisasi Penggunaan Literasi Digital dalam Memasarkan Produk UKM di Desa Semangus Kecamatan Muara Lakitan Kabupaten Musirawas. *Abdimas Galuh*, 4(2), 1408–1415. <https://doi.org/10.25157/ag.v4i2.8612>
- Syafitri, F. R., Sitawati, S., & Setyobudi, L. (2014). *Kajian etnobotani masyarakat desa berdasarkan kebutuhan hidup*. Brawijaya University.
- Taufiqi, M. A., & Purwanto, M. B. (2024). Promoting Religious Moderation through English Language Teaching: Strategies and Challenges in Islamic Educational Settings. *ETERNAL*

- (English et al.), 15(2), 192–202. <https://doi.org/10.26877/eternal.v15i2.443>
- Vidyalakshmi, K. S., Vasanthi, H. R., & Rajamanickam, G. V. (2008). Ethnobotany, phytochemistry and pharmacology of *Mussaenda* species (Rubiaceae). *Ethnobotanical Leaflets*, 2008(1), 57.
- Walujo, E. B. (2011). Keanekaragaman hayati untuk pangan. *KIPNAS X. LIPI*, 1–9.
- Yulianti, D. (2014). Etnobotani Tumbuhan Pekarangan Sebagai Obat Tradisional Masyarakat Suku Serawai Kelurahan Dusun Baru Kabupaten Seluma Bengkulu Dalam Pengembangan Sumber Belajar Biologi SMA. *Skripsi. Universitas Bengkulu*.