Bioedukasi
Jurnal Biologi dan Pembelajarannya
Vol. 21 No 2, June 2023, page 166-173
e-ISSN: 2580-0094; p-ISSN:1693-3931
DOI: 10.19184/bioedu.v21i2.38863
jurnal.unej.ac.id/index.php/BIOED

Ethnomedicine Study of Medicinal Plants in the Menoreh Salaman Village Community as a Biology Reference Book

Setiyo Prajoko[1], Shefa Dwijayanti Ramadani[2], Fiki Wafara Amali[3]
[1]Biology Education, University Tidar, Indonesia

Article Info
Article history:
Received April 12, 2023
Revised June 25, 2023
Accepted June 25, 2023

Keywords:
Ethnomedicine
Medicinal Plants
Menoreh Village
Reference Book

ABSTRACT
Utilization of biodiversity, especially plants as ingredients for traditional medicine is a tradition of rural communities in Indonesia. Villagers know traditional medicine from their ancestors which has been passed down from generation to generation. However, knowledge regarding the use of plants for traditional medicine has not been well documented and is only known by the elderly. Ethnomedicine study is one solution that can be done to overcome this problem. The diversity of plants used by the community for treatment has the potential as a biological reference source. This study aims to identify plants used for traditional medicine by the people of Menoreh Village and to develop and produce a product in the form of a reference book based on the results of the ethnomedicine study conducted. This study used a mixed method, namely an ethnographic study with a qualitative descriptive research approach and 4D model R&D development research. Ethnographic study data collection techniques were carried out through observation, interviews, documentation, and characterization techniques, while the 4-D research method was through a feasibility test of reference books. The collected data were then analyzed qualitatively and quantitatively. The results of the study found that: 1) there were 79 species of plants belonging to 27 orders; 2) The plants most often used are kencur and awar-awar; 3) The most widely used part of the plant is the leaves; 4) The method of processing that is often done is boiling; 5) The dominant method of use is drinking; and 6) The most common disease treated with medicinal plants is cough and cold. The results of the ethnographic study were then compiled into a reference book with a feasibility of 82.46% or in good criteria. Through the development of regional local knowledge-based learning resources, it is hoped that knowledge of traditional medicine will continue to be preserved from generation to generation.

Corresponding Author:
Dr. Setiyo Prajoko M.Pd.
Biology Education, Universitas Tidar
Jalan Kapten Suparman 39, Magelang, 56116, Indonesia
Email: setiyoprajoko@untidar.ac.id

1. INTRODUCTION

Indonesia is one of the archipelagic countries in the world which has high biodiversity. Indonesia's very strategic geographical position is one of the factors causing this high biodiversity. (Retnowati *et al*, 2019). Indonesia is a country that is rich in biodiversity, in which there are many kinds of biodiversity, so it is no stranger to being called a Megabiodiversity Country (Rohman, 2021). The richness of biodiversity and its use are related to the culture of the local community. One of them is through the use of various types of medicinal plants used in traditional medicine (Tapundu, *et al.*, 2015). Traditional medicine is a system of non-medical treatment based on hereditary knowledge from ancestors (Irmawati, 2016). Most of the people who still use medicinal plants for traditional medicines are rural communities. This is because people's belief in cultural elements that have been passed down by their ancestors is still strong (Silalahi, 2016).

Based on observations, the people in Menoreh Village, Salaman District, Magelang Regency still believe in the hereditary tradition of using medicinal plants for the traditional treatment of a disease. Currently there is no research or study on medicinal plants in Menoreh Village which are used for traditional medicine by the people of Menoreh Village. Information regarding knowledge about traditional medicine has not been well documented and it is feared that gradually this knowledge and tradition will begin to disappear. Therefore, it is necessary to document the results of a study on medicinal plants found in Menoreh Village so that the culture of using these medicinal plants is not lost and remains sustainable (Rahma, 2010).

One way to maintain local community knowledge about medicinal plants is through ethnographic studies on ethnomedicine. Ethnomedicine is a branch of ethnobotany which can be defined as a knowledge regarding the development of medicine based on local culture with integration strategies between local community beliefs and medicinal practices that are not influenced by modern medicinal frameworks (Sumawardani, Widayatin, & Wardhani, 2016). The results of ethnomedicine studies have the potential to be developed and integrated into the fields of education, arts, culture, health, food, and so on, so that they can indirectly contribute to the development of science and technology while preserving local cultural wisdom in society (Surata, Gata, & Sudiana, 2015).

Plants used as medicine in the Menoreh Village community will be analyzed for their potential as alternative sources of learning in the form of interesting biology reference books because not all understand the use of plants used as traditional medicine. Through the development of regional local knowledge-based learning resources, it is hoped that knowledge of traditional medicine will continue to be preserved from generation to generation. In addition, the community can also further improve conservation behavior by protecting and caring for the surrounding plants to prevent the extinction of these plants (Ilhami, et al., 2021). This research is important because until now there has never been a study on the use of medicinal plants explored in Menoreh Village. Therefore, ethnomedicine studies need to be carried out as an effort to optimize the utilization and preservation of regional potential. It is hoped that all groups, including lecturers, teachers, students, researchers, and the public in general, will know the culture that has existed in the people of Menoreh Village which has been passed down for generations and will be able to add insight about medicinal plants in Menoreh Salaman Village. This study aims to determine the types of plants that are used as medicine for the people of Menoreh Village and are poured into a biology reference book.

2. RESEARCH METHOD

This study used a mixed method, namely an ethnographic study with a qualitative descriptive research approach and 4D model R&D development research. Ethnographic research was carried out to identify the types of plants used by the people of Menoreh Village to treat various diseases, while Research and Development (R&D) research with 4D models that was carried out up to the develop stage was carried out for the development of reference books.

The ethnographic study procedure consists of 6 stages. The ethnographic study procedures include (1) Selecting an ethnographic project, (2) Submitting ethnographic questions to informants or resource persons in Menoreh Salaman Village including herbal concocters, traders of medicinal plants, especially traders who trade traditional medicinal plants, masseurs, community leaders and ordinary people who use various types of plants for traditional medicine, both men and women. (3) Collecting ethnographic data is done through observation, interviews, documentation and characterization techniques. (4) Making ethnographic recordings, using tools in the form of field notes, voice recorders, and cameras. (5) Analyze ethnographic data by means of data reduction and data presentation. Data reduction is a process of summarizing, choosing the main things, regarding plants used as a treatment for certain diseases of the people of Menoreh Salaman Village. Presentation of data in the form of tables and pictures resulting from the characterization of plants, both in terms of morphology, how to use them, the parts of the plants used, and the uses of each type of plant used as a treatment for certain diseases of the people of Menoreh Salaman Village. (6) Writing ethnography (Creswell, 2012).

The results of the ethnographic study are then used as material for the development of a reference book. The development research method is based on the 4-D model (define, design, develop, and disseminate) developed by Thiagarajan (1974), which is modified as shown in Figure 1.

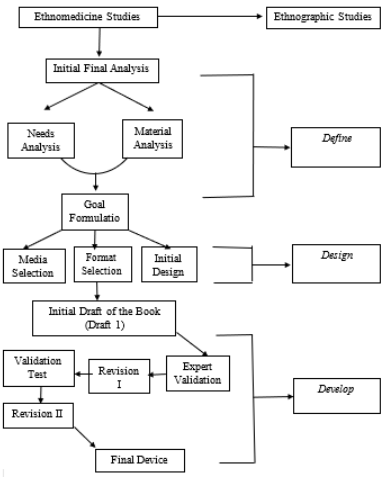

Figure 1. 3-D Development Scheme
(Putri,2021)

The next stage is 4-D data analysis (Reference Book Feasibility Test) to determine the quality of reference books and then converted into quantitative data using a Likert Scale. The steps for analyzing interactive learning media data are carried out, namely changing the letter assessment into a score using a Likert scale with the following conditions (Anikan, 2014).

SK (Very Less) = 1 B (Good) = 4
K (Poor) = 2 SB (Very Good) = 5
C (Enough) = 3

After the data is collected, then calculate the average score using the formula (Anikan, 2014).

$$\mathbf{P} = \frac{\Sigma \boldsymbol{Xi}}{\Sigma \boldsymbol{X}} \boldsymbol{X}\ \mathbf{100\%}$$

Information:
P = Percentage of assessment
ΣXi = Number of answers from the validator
ΣX = Highest number of answers

The ideal assessment criteria for the development of a reference book for Ethnomedicine Studies of Medicinal Plants in the Salaman Community (Anikan, 2014).

Table 1. Reference Book Assessment Criteria

No.	Score Range (Valuation Presentation)	Category
1.	P > 90	Very Good
2.	80 ≤ P < 89	Good
3.	70 ≤ P < 79	Enough
4.	50 ≤ P < 69	Poor
5.	P ≤ 49	Very Less

The way to find out the quality of the Reference Book product being developed is by collecting data in the form of a validation sheet. The distribution of scores in this reference book uses a Likert scale, and which is divided into five scales, namely SK (Very Poor) 1, K (Poor) 2, C (Enough) 3, B (Good) 4, SB (Very Good) 5. The basis for determining the quality scale of the developed reference book is that the reference book is considered feasible if the final average score is at least 70. However, if the final average score is less than 70, the reference book is declared inadequate (Anikan, 2014).

3. RESULT AND DISCUSSION

The results of the study found that there were 79 types of medicinal plant species used by the community for treatment. The plants used are grouped into 27 different orders. Data obtained from research in Menoreh Salaman Village included local names of plants which were then identified with the help of the Picture This application, reference books and relevant journals to identify scientific names and classifications and descriptions of each plant species. The data is presented in Figure 2.

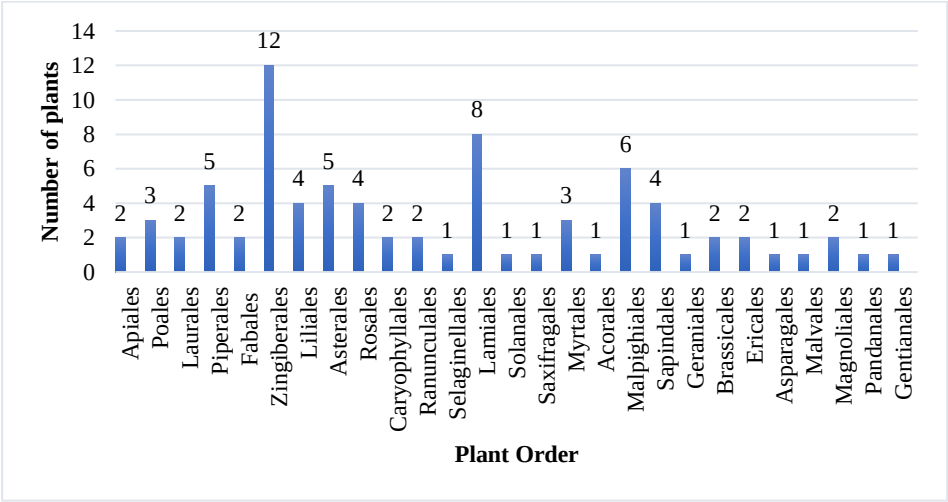

Figure 2. Order of Plants Used for Medicine

Figure 2 shows the 27 orders of plant species used for medicine, while the details of the medicinal plant species found from the 27 orders can be seen in table 2 below.

Table 2. Plant Species Used for Medicine

No.	Ordo	Plant Name	
		Species Name	**Local Name**
1.	Apiales	*Foeniculum vulgare*	Adas
		Cantella asiatica	Pegagan
2.	Poales	*Imperata cylindrrica*	Alang-alang
		Cymbopogon citratus	Serai dapur
		Cymbopogon nardus L.	Serai wangi
3.	Laurales	*Persea americana*	Alpukat
		Cinnamomum zeylanicum	Kayu manis
4.	Piperales	*Houttuynia cordata*	Amis-amisan
		Piper retrofractum Vahl	Cabe jamu
		Piper cuceba L.	Kemukus
		Piper nigrum	Lada hitam
		Piper betle L.	Sirih hijau
5.	Fabales	*Tamarindus Indica*	Asam jawa
		Erythrina lithosperma	Dadap serep
6.	Zingiberales	*Zingiber Cassumunar Roxb.*	Bangle
		Zingiber officinale var. amarum	Jahe emprit
		Zingiber officinale var. rubrum rhizoma	Jahe merah
		Amomum cardomomum	Kapulaga
		Kaempferia galanga L.	Kencur
		Kaemferia rotunda	Kunir gombyok
		Curcuma domestica val.	Kunyit
		Zingiber zerumbet	Lempuyang
		Alpinia galanga	Lengkuas
		Curcuma heyneana	Temu giring
		Curcuma aeruginosa	Temu ireng
		Curcuma xantoriza	Temulawak
7.	Liliales	*Allium cepa L.*	Bawang merah
		Eleutherine bulbosa Mill.	Bawang sabrang
		Pleomele angustifolia	Daun suji
		Sansevieria trifasciata	Lidah mertua
8.	Asterales	*Pluchea indica Less*	Beluntas
		Gynura divaricata	Daun dewa
		Gynura procumbens	Sambung nyowo
		Sonchus arvensis L.	Tempuyung
		Isotoma longiflora	Tolod
9.	Rosales	*Zizipus mauritiana*	Bidara
		Caesalpinia sappan L.	Kayu secang
		Ficus septica Burm F	Awar-awar
		Morus alba L.	Murbei
10.	Caryophyllales	*Anredera cordifolia*	Binahong
		Basella alba L.	Gendola
11.	Ranunculales	*Tinospora crispa L.*	Brotowali
		Cyclea Peltata Miq	Camcao batang
12.	Selaginellales	*Selaginella deoderleinii*	Cakar ayam
13.	Lamiales	*Reullia tuberosa L.*	Ceplikan
		Orthosiphon stamineus Beth.	Kumis kucing
		Vitex trifolia L	Legundi
		Jasminum sambac	Melati
		Andrographis paniculata	Sambiloto
		Strobilanthes crispus	Keji beling
		Justicia gendarussa	Gandarusa
		Coleus scutellariodes	Iler
14.	Solanales	*Physalis angulata L.*	Ciplukan
15.	Saxifragales	*Kalanchoe pinnata L.*	Cocor bebek

No.	Ordo	Plant Name	
		Species Name	Local Name
16.	Myrtales	*Psidium guajava*	Jambu biji
		Terminalia catappa	Ketapang
		Syzgium polyanthum	Salam
17.	Acorales	*Acorus calamus L.*	Dlingo
18.	Malpighiales	*Acalypha hispida Burm. F.*	Ekor kucing
		Jathropha curcas L.	Jarak
		Euphorbia tirucalli	Patah tulang
		Sauropus androgynus	Katuk
		Phyllanthus niruri L.	Meniran
		Excoecoria cochinensis	Sambang darah
19.	Sapindales	*Bouea macrophylla Griff*	Gandaria
		Citrus hystrix	Jeruk purut
		Citrus aurantifolia	Jeruk nipis
		Murraya paniculata	Kemuning
20.	Geraniales	*Geranium*	Geranium
21.	Brassicales	*Moringa oleifera L.*	Kelor
		Carica pepaya L.	Pepaya
22.	Ericales	*Diospyros kaki Thunb.*	Kesemek
		Manilkara kauki	Sawo kecik
23.	Asparagales	*Aloe vera L.*	Lidah buaya
24.	Malvales	*Phaleria macrocarpa*	Mahkota dewa
25.	Magnoliales	*Myristica fragrans*	Pala
		Annona muricata	Sirsak
26.	Pandanales	*Pandanus amaryllifolius*	Pandan
27.	Gentianales	*Alstonia scholaris*	Pule

Based on the research conducted in Menoreh Village, the most common plants found were plants belonging to the Zingiberales order, namely 12 plants. This is influenced by the location of Menoreh Village which is located in the lowlands with red soil types, humid conditions, and shaded by tall trees (Sakti, 2021). This is in accordance with research conducted by Meliki, Linda, & Lovadi (2013) which said that red soil is a type of soil that is good enough for the growth of Zingiberaceae. The plant species most often used by the community is kencur (Kaempferia galanga L.). The kencur plant is easy to get and easy to process to treat diseases that people often suffer from, namely coughs and colds. The plant species most often used by the community besides kencur is also the awar-awar plant (Ficus septica Burm F). Awar-awar plants are easy to get and easy to process to treat diseases that people often suffer from. Awar-awar leaves are used to treat skin diseases, appendicitis, boils, venomous snake bites and shortness of breath (Fadini, 2023).

Parts of the plant, how to process it, how to use it most often and the diseases that can be treated can be seen in Figures 3, 4, 5 and 6.

.

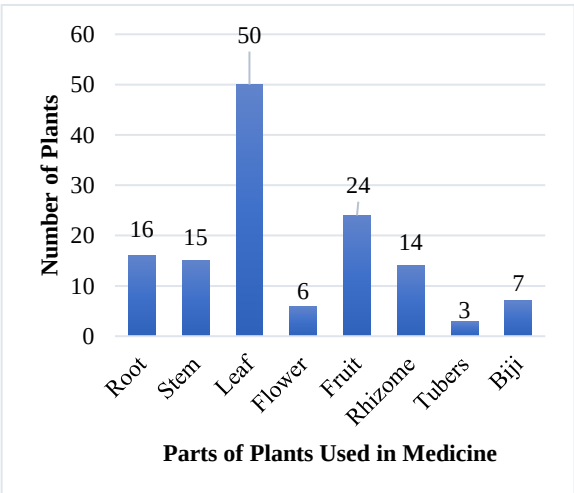

Figure 3. Plant Parts Used for Medicine

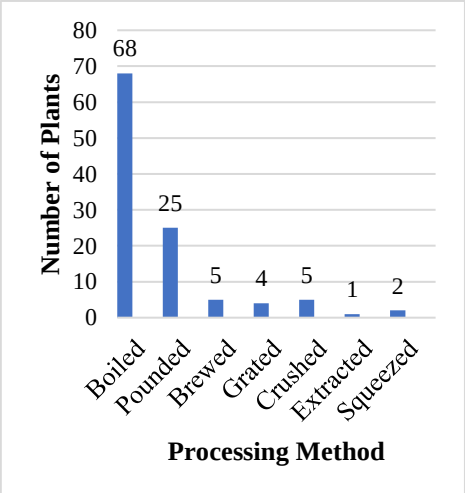

Figure 4. Processing of Medicinal Plants

The part of the plant that is most widely used for traditional medicine by the people of Menoreh Village is the leaf, which is as many as 50 plant species (Figure 3). This is because taking a few leaves from a plant does not really affect the survival of the plant and damage it because the leaves grow back easily. The method of processing leaves is also easier than other parts and has better properties (Kasrina and Veriana, 2014).

The method of processing plants that is most widely used is boiling, namely as many as 68 plants because the village community believes that making medicine by boiling has more effective properties compared to other methods (Figure 4). This is in accordance with research conducted by Ani (2018) which states that processing medicinal plants by boiling can extract the active substances contained in plants using water media because water is a polar solvent.

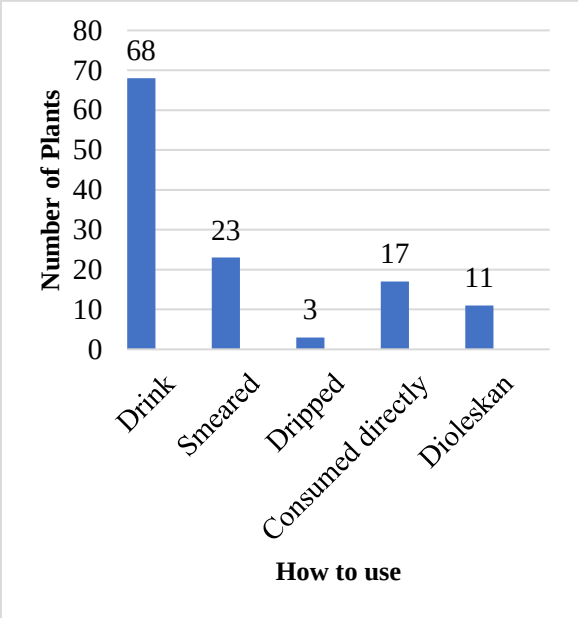

Figure 5. How to use medicinal plants

The use of medicinal plants most widely used by the community is by drinking (Figure 5). This is in line with research conducted by Efremila, Wardeenar, and Sisilia (2015) which said that people use plants more for medicine by drinking. This statement is based on the belief of the community that this method has a quick reaction and the disease that is felt will heal quickly compared to other methods.

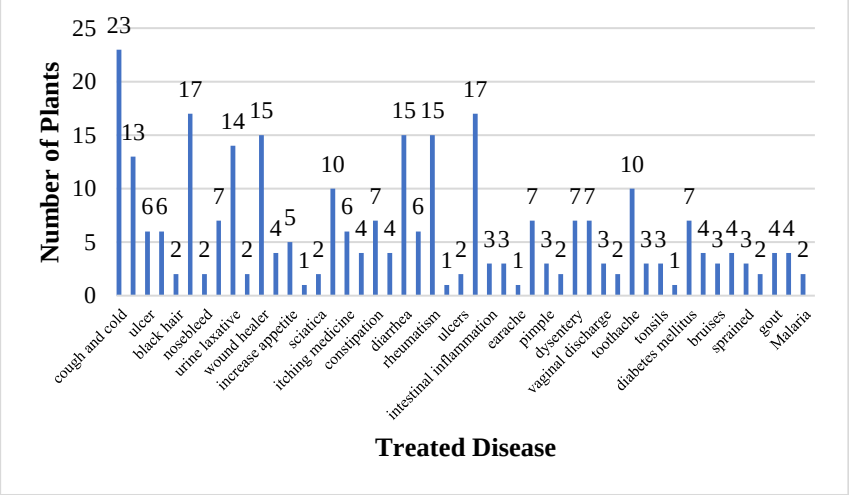

Figure 6. Treated Diseases

Traditional medicine using plants carried out by the people of Menoreh Village is able to treat various diseases. These medicinal plants have been used for generations by the people of Menoreh Village to treat at least 49 types of various diseases, ranging from common ailments experienced by the community such as cold coughs, fever, diarrhea and rheumatism to serious medical illnesses such as kidney failure, high blood pressure, stroke, and diabetes (Figure 6).

Ethnographic research is important to carry out to preserve medicinal plants in Menoreh Village, namely through documenting medicinal plants with ethnographic studies. After obtaining the results of the ethnographic research, the next step is to develop them into a reference book that can be used as a source of learning biology. Then the product is assessed by experts in the form of material experts and media experts. The product of the biology reference book resulting from the ethnographic study can be seen in the following figure.

Figure 7. Display of the Cover Page and back cover of reference book

In the design section, the contents of the reference book describe the diversity of plants in Indonesia, the meaning and history of ethnomedicine, discuss the profile of the Menoreh community which includes geographical conditions, the livelihoods of the people of Menoreh Village, the diversity of flora in Menoreh Village, and the medicinal traditions of the Menoreh Village community, discuss regarding the ethnomedicin profile of medicinal plants in Menoreh Village which includes the types of plants used for traditional medicine in Menoreh Village and the use of medicinal plants for traditional medicine by the people of Menoreh Village, the types of plants used in the treatment of Menoreh Salaman Village consisting of 79 plant species. Each of these plants is explained regarding the classification of the plant, the morphology of the plant, the parts of the plant used and their contents, the utilization and also the method of processing.

The results of the reference book development were then validated by material experts and media experts. Expert validation is carried out to determine the feasibility of the developed reference book, as well as to obtain suggestions and input from experts for product improvement. The results of the validation analysis are listed in table 3 below.

Table 3. Average Validation Results of Material Experts and Media Experts

Assessment Aspects	Percentage	Eligibility Criteria
Material Validation Results	90,33	Very good
Media Validation Results	74,6	Poor
Average	82,46	Good

Based on table 5, data analysis from the validation results of material experts and media experts obtained an average percentage of 82.46%. The average value obtained is included in the score range of $80 < X < 89$ which is included in the good category (Anikan, 2014). Based on the assessment of material experts and media experts, this reference book is suitable for use with revision.

Based on the data from the book validation results as a whole, it can be concluded that the reference book compiled based on the results of an ethnomedicine study of medicinal plants used by the people of Menoreh Salaman Village has met the assessment standards as a reference book with the criteria of being suitable for use. The feasibility of the reference books that have been prepared includes several aspects including the feasibility of the content, presentation techniques, easy-to-read book appearance and proportional layout. The compiled reference book is suitable for use because the manufacturing process is in accordance with the book development procedures and also the tools used are in accordance with the needs of book making. In the first book development process, namely the definition stage (Define), the researcher carried out the Front-end Analysis, needs analysis

and material analysis stages. Furthermore, the design stage is the selection of media, format and the initial design of the reference book. Then the last stage of book development is the development stage (Develop). At this stage the reference books that have been compiled then go through the validation test stage of material experts and media experts, after receiving validation from material and media experts, the book is revised based on the suggestions and input of experts.

4. CONCLUSION

Based on the research that has been done, it can be concluded that there are 79 types of medicinal plants in Menoreh Salaman Village which are used as traditional medicine by people belonging to 27 orders. The Zingiberales order is the order most commonly found. The use of plants for traditional medicine is processed by boiling, pounding, brewing, grating, grinding, extracting, and pressing. The most widely used processing method is boiling. How to use the most widely used by the public is drinking. The Ethnomedicinal Reference Book on Medicinal Plants in Menoreh Salaman Village which has been developed is suitable for use as a source for learning biology and as documentation to add insight to the general public, lecturers, teachers, students and other researchers. This is based on product feasibility assessments from material experts and media experts showing an average score of 82.46% or in the good category.

5. REFERENCES

Ani, N. (2018). Potensi Pemanfaatan Tumbuhan Obat oleh Masyarakat di Taman Wisata Alam Madapangga (Studi Kasus: DESA Ndano, Kecamatan Madapangga, Kabupaten Bima, Nusa Tenggara Barat). Doctoral Dissertation, Universitas Mataram.

Anikan, Danang. (2014). Pembuatan Media Pembelajaran Interaktif Berbasis Komputer Melalui Flip Book sebagai Media Pembelajaran Mandiri pada Mata Pelajaran Seni Tari untuk Siswa SMA/MA. Skripsi, Fakultas Bahasa dan Seni. Yogyakarta: Universitas Negeri Yogyakarta.

Creswell, John W. (2012). Research Design Pendekatan Kualitatif, Kuantitatif, dan Mixed. Yogyakarta: Pustaka Pelajar.

Efremila, Wardeenar, E., & Sisilia, L. (2015). Studio Etnobotani Tumbuhan Obat Oleh Etnis Suku Dayak di Desa Kayu Tanam Kecamatan Mandor Kabupaten Landak. Jurnal Hutan Lestari, Vol. 3(2): 234-246.

Fadini, I., Pudjono, P., & Trisnawati, E. (2023). ANTIBACTERIAL ACTIVITY TEST OF AWAR-AWAR LEAF EXTRACT (Ficus septica Burm. F) WITH n-HEXANE AND WATER FILTERS AGAINST THE GROWTH OF Staphylococcus aureus BACTERIA. *Pharmacy Peradaban Journal*, *3*(1).

Ilhami, A., Diniya, D., Susilawati, S., Sugianto, R., & Ramadhan, C. F. (2021). Analisis Kearifan Lokal Manongkah Kerang di Kabupaten Indragiri Hilir, Riau sebagai Sumber Belajar IPA Berbasis Etnnosains. Sosil Budaya, 18(1). 20-27.

Irmawati. (2016). Etnobotani Tumbuhan Obat Tradisional Pada Masyarakat di Desa Baruga Kecamatan Malili Kabupaten Luwu Timur. *Skripsi*.

Kasrina, & Veriana, T. (2014). Studi Etnobotani Tumbuhan Obat yang Dimanfaatkan Oleh Masyarakat di Kecamatan Sindang Kelingi Kabupaten Rejang Lebong Bengkulu. Proceeding Biology Education Conference: Biology, Science, Environmental, and Learning, Vol. 11. No. 1:354-359.

Meliki, Linda, R., & Lovadi, I. (2013). Etnobotani Tumbuhan Obat Oleh Suku Dayak Iban Desa Tanjung Sari Kecamatan Ketungau Tengah Kabupaten Sintang. Jurnal Protobiont, Vol 2(3) : 129-135.

Rahma, I. (2010). Hubungan tingkat pendidikan formal orang tua dengan pola pengasuhan balita di desa Menoreh kecamatan Salaman kabupaten Magelang. Jurnal Penelitian Universitas Negeri Semarang.

Retnowati, A., Rugayah, J. S. R., & Arifiani, D. (2019). Status keanekaragaman hayati Indonesia: Kekayaan jenis tumbuhan dan jamur Indonesia.

Rohman, N. A., Qohar, I. A., Puspita, N. T., Harianto, S. P., Winarno, G. D., & Dewi, B. S. (2021). Analisis Keanekaragaman Fauna Study Kasus pada 24 (Dua Puluh Empat) Taman Nasional di Indonesia. Jurnal JOPFE, 9(2), 1-10.

Silalahi, M. (2016). Studi etnomedisin di Indonesia dan pendekatan penelitiannya. *Jurnal Dinamika Pendidikan, 9*(3), 117-124.

Sumawardani, F., Widayatin, S., & Wardhani, I.P. (2016). Rancangan Program Aplikasi Informasi Ramuan Etnomedisin Obat Tradisional Indonesia Berbasis Android. Jurnal Ilmiah KOMPUTASI, Vol. 15(1), 17-82.

Surata, I.K., Gata, I. W., & Sudiana, I. M. (2015). Studi Etnobotanik Tanaman Upacara Hindu Bali Sebagai Upaya Pelestarian Kearifan Lokal. Jurnal KajianBali, Vol. 5(2), 265-284.

Tapundu, A. S., Anam, S., & Pitopang, R. (2015). Studi Etnobotani Tumbuhan Obat Pada Suku Seko Di Desa Tanah Harapan, Kabupaten Sigi, Sulawesi Tengah. *Skripsi.*

Thiagarajan, Semmel S.S., & Semmel. (1974). *Instructional Development for Training Teacher of Exceptional Children a Sourcebook. Bloomington: Center for innovation on Teaching the Handicaped.*