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From Indigenous Knowledge to Biology Education: Ethnobotany of Ritual Plants in the Lampung Saibatin Community

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Abstract:
Background. Ethnobotany is a crucial field of study because many traditional plant uses remain undocumented, and a lack of public awareness can lead to cultural degradation.
Aims. This study aims to determine how plants are utilized in the traditional rituals of the Lampung Saibatin tribe in Penggawa V Ulu Village.
Methods. These practices include traditional life-cycle rituals (the seven-month pregnancy ceremony, weddings, and funerals) and sacred rituals (ngebabali, ngumbai, and butegak). This research employed a descriptive qualitative approach. Researchers selected samples using purposive and snowball sampling techniques and conducted in-depth interviews with 25 informants, including traditional leaders and ritual practitioners.
Result. The findings show that coconut and banana are the most commonly used plants, followed by betel leaf, turmeric, and various flowers, each with specific symbolic functions and spiritual value in the rituals. The team then integrated all gathered ethnobotanical data into an educational biology encyclopedia designed to enhance students' botanical literacy and preserve local culture. Material experts validated the product, declaring it ready for field testing after minor revisions regarding taxonomic misconceptions.
Conclusion. Meanwhile, design experts rated its feasibility at 86.5% (highly feasible). In a field trial involving 40 respondents, the encyclopedia achieved a feasibility rating of 88.55% (3.54 out of 4.00). Based on these results, the developed media is declared valid and highly suitable for use as student learning material.

Keywords: biology encyclopedia, ethnobotany, Lampung saibati

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INTRODUCTION

Because Indonesia is the world's largest center of biodiversity and culture, preserving ethnobotanical knowledge is increasingly important. Indonesia has more than 1,300 ethnic groups and about 30,000 species of flowering plants, providing significant potential for science and education, according to Akhmad (2020). Nevertheless, traditional customs in local communities have declined significantly because modernization has not been accompanied by cultural preservation awareness. The disappearance of knowledge about using indigenous plants is accelerated by shifts in urban lifestyles and the lack of value transmission through oral traditions. Because of modern lifestyles and reduced intergenerational value transmission, most of the population in West Lampung has begun to leave (Leeksikowati et al., 2020).

This phenomenon of cultural shift is evident in Penggawa V Ulu Village, one of the important customary areas in the Saibatin community in West Coast Regency. Based on initial interviews with traditional leaders on December 11, 2025, it is known that many plants sacred, which used to have a high symbolic value, are now only considered an ordinary plants with no special meaning according to Winandari et al. (2020). Saputri (2023), in his research, stated that betel leaves, which were once used as a symbol of respect and brotherhood in welcoming guests, are now more often used as an aesthetic complement. This shift in meaning reflects a cultural change that reshapes people's perspectives on nature and tradition. In addition, this change is also influenced by the community's increasing economic and consumptive orientation, which places efficiency above cultural values (Safitri et al., 2023). Furthermore, Zen (2024) emphasized that studying ethnobotany associated with the traditional ceremonies of Lampung Pepadun has the potential to be an effective source of biology learning because it integrates scientific, social, and spiritual values in an integrated manner.

Research by Komalasari (2018) and Avi (2021) also shows that indigenous plants in Lampung rituals play an important role in education, character building, and environmental conservation. According to Aziz et al. (2019), through ethnobotany-based learning, students not only learn to know biodiversity but also understand the value of ecological responsibility and the harmonious relationship between humans and nature. Thus, integrating ethnobotany into biology education can serve as a transformative learning medium that instills the value of nature and cultural preservation (Komalasari, 2018). According to Baharuddin & Maturahmah (2025), an encyclopedia is not just a collection of data; it is a useful educational

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tool that makes Kingdom Plantae material more contextual by connecting medicinal plants and rituals to the environment around us. In biology learning, an encyclopedia can improve students' critical thinking skills and science literacy, according to Fajrin et al. (2025). This is because it presents systematic information on plant classification and their sociocultural uses (Sari et al., 2024).

According to Hidayati et al. (2024), preparing the encyclopedia is an effort to digitize and systematize the "living library," which has so far been stored only in the memories of indigenous leaders. Encyclopedias of ethnomedicine and ethnobotany are very suitable as sources of independent learning because they show the harmonious relationship between humans and nature (Adawiyah et al., 2023). Biology education supports the transfer of scientific knowledge, cultural conservation, and ecosystem preservation by presenting an encyclopedia rooted in Saibatin's local wisdom (Pangesti, 2023).

Thus, this research aims to document, interpret, and actualize the Saibatin community's knowledge of plant use in the traditional ceremonies of Penggawa V Ulu Village. This study will use an in-depth qualitative approach (Adhia & Asih, 2022). The main objective of this study is to understand the symbolic meaning of plants in the context of local culture and how plants can be used as a source of biological knowledge based on local wisdom (Muhfahroyin & Oka, 2021). This research aims to develop a biology learning model that integrates cultural, ecological, and spiritual elements into a sustainable education system, building on Jacinda & Surtikanti (2023). This study not only helps the development of science and cultural preservation, but is also an important step in supporting community-based ecological conservation and the formation of ecological character in the younger generation (Umrotin, 2022)

METHODS

This research was conducted for one month in February 2026 in Penggawa V Ulu Village, Karya Penggawa District, West Coast Regency. The tools and materials used were a list of questions, stationery, and mobile phones used for documentation. In this study, the sampling technique combined two complementary qualitative approaches: Snowball Sampling and Purposive Sampling, as in the research of Musmuliadi et al. (2022). Meanwhile, according to Astuti (2023), snowball sampling is used because it allows researchers to identify informants gradually through social networks and referrals from previous informants. Meanwhile, *the Purposive Sampling technique is applied to identify*

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additional informants based on criteria aligned with the research objectives (Nainggolan et al., 2025). This type of research is descriptive, using a combination of qualitative research methods and quantitative methods. All data, both qualitative and quantitative, are analyzed descriptively and comprehensively related to the aspects being studied (Herunanda et al., 2023).



Figure 1: Research Location

RESULTS

This research was carried out in Penggawa V Ulu Village, Karya Penggawa District, West Coast Regency. This research focuses on the traditional plants of the Lampung Saibatin tribe, used in 7 monthly events: baby shaving, wedding rituals, buantak, nurun ajang, sesuduk, siraman kebayan, death events, ngebebali, ngumbai, butegak, tomb ngejalang, sacred vows, and ngejalang pekon. The plants were compiled into an encyclopedia as a biology learning material on biodiversity, with the main informants being Mr. Zaburahman of the traditional shop, with the title of dalom nirmala and Noble with the title of suntan simbangan dalom, Mr. Hasanudin with the implementation of sacral rituals, Mr. Izhar Badri with the implementation of traditional and sacred rituals, and Mr. Izhar AM with the implementation of traditional rituals.

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Table 1. Table of species of indigenous plants found in Penggawa V Ulu Village

Plant Names				
Yes	Local Name	Latin Names	Plant Family	Family
1	Aren	Arenga *pinnata*	Rubber	Arecaceae
2	Yellow Bamboo	*Bambusa vulgaris var. striata*	Rod	Poaceae
3	Bamboo Rope	*Bambusa vulgaris*	Rod	Poaceae
4	Boroco	*Celosia argentea L*	Flowers	Amaranthaceae
5	Paper flowers	Bougainvillea glabra	Flowers	Nyctaginaceae
6	Calethea Makoyana	*Goeppertia makoyana*	Leaves	Marantaceae
7	Cempaka	*Magnolia champaca L*	Flowers	Magnoliaceae
8	Sandalwood	Santalumalbum L	Rod	Santalaceae
9	Cocor Duck	*Kalanchoe daigremontiana*	Leaves & Stems	Stuart O'Neill
10	Gambir	*Uncaria Gambir (W.Hunter) Roxb*	Rubber	Rubiaceae
11	Double Double Coat	*Hedychium coronarium*	Flowers	Zingiberaceae
12	Squirt	*Leeaindica*	Rod	Stuart O'Neill
13	Lime	*Citrus aurantiif olia*	Fruit	Rutacea
14	Orange Nagami	*Citrus japonica*	Fruit	Rutacea
15	Kaffir lime	*Citrus Hystrix*	Fruit	Rutacea
16	Coconut	*Cocos nucifera L*	*Flowers, leaves And flowers*	Arecaceae
17	Authenticity	*Styrax benzoin Dryand*	Rubber	Styracaceae
18	Kenanga	*Cananga odorata*	Flowers	Annonaceae
19	Sticky Rice	*Oriza sativa L. var Glutinosa*	Seeds	Poaceae
20	Turmeric	*Curcuma longa L*	Rhizome	Zingiberaceae
21	Pumpkin	*Lagenaria siceraria*	Fruit	Cucurbitaceae
22	White Jasmine	*Jasminum sambac L*	Flowers	Oleaceae
23	Priest	*Oriza sativa L.*	Seeds	Poaceae
24	Pinang	*Areca catechu L*	Rod	Poaceae
25	Bananas	*Musa paradisiaca L*	*Leaves, fruits, stems*	Musaceae
26	Bananas Again	*Musa Acumina Takes You Out*	Fruit	Musaceae
27	Purification	*Codiaeum variegatum (L.)*	*Leaves & stems*	Euphorbiaceae
28	Earth Details	*Quamoclit*	Flowers	Convolvulaceae
29	São Paulo	*Proiphysamboinensis*	*Leaves & stems*	Amaryllidaceae
30	Cassava	*Manihotesculenta*	*Leaves & stems*	Euphorbiaceae
31	Betel	*Piper betle L*	Leaves	Piperaceae
32	Black Taro	*Xanthosoma sagittive olium*	Rod	Araceae
33	Black Sugarcane	*Saccharum officinarum L*	Rod	Poaceae
34	Tobacco	*Nicotiana tabacum L*	Leaves	Solanaceae

Based on NVivo analysis of interviews with traditional and community shops in Penggawa V Ulu Village, the most dominant plants were bananas, coconuts, frankincense, bamboo, and sandalwood.

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Figure 2**.** Analysis Results of the Word Cloud of Saibatin Traditional Plants Based on interviews with traditional shops and the community

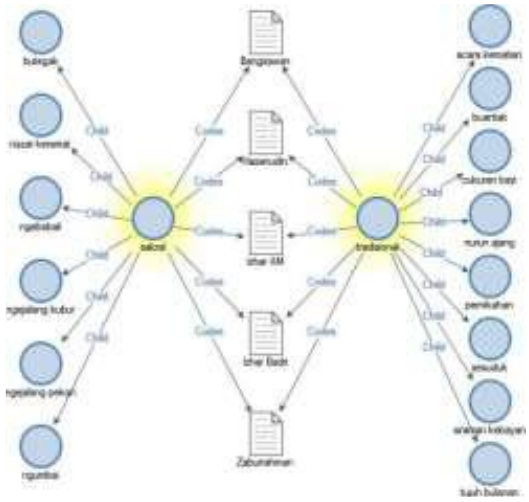


Figure 3**.** NVivo *Comparison* Analysis of Interviews with Traditional Stakeholders in Penggawa V Ulu Village

The validation results show that this encyclopedia is suitable for use after revision. Dr. Umar Abdul Labib, M.Pd., validated the material and stated that the product is worthy of trial because it is comprehensive, includes 34 indigenous plants listed alphabetically, and is supported by relevant images. However, the researcher made a total of edits to correct the text and taxonomic errors that were exchanged on pages 13, 35, and 39 to be scientifically valid. Meanwhile, Ade Gunawan, M.Pd., validated the design and obtained a feasibility percentage of 86.5%, categorized as "very feasible" based on Sa'dun Akbar's theory. This score is supported by typography (90%–95%), layout (85%), and proportional spacing (90%), which the researcher refined by ensuring all Latin scientific names are consistently italicized (Baharuddin & Maturahmah, 2025).

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DISCUSSION

An ethnobotanical study of the Saibatin Lampung community in Penggawa V Ulu Village identified 34 plant species from 21 families used in various traditional ceremonies. These rituals cover the entire human life cycle, from pregnancy (which lasts seven months) and birth (referred to as baby shaving) to death (Hernawan et al., 2023). They also include sacred acts such as ngebebali and ngumbai. According to Ajeng (2022), the diversity of species found shows that nature not only provides physical resources but is also an important part of community beliefs. According to some research, each ethnic group has a certain dependence on local biodiversity to
maintain their traditions and cultural identity (Komalasari, 2018).

According to the Index of Cultural Significance (ICS) Analysis, there is a clear path for cultural importance. Foods such as coconut, banana, and sticky rice received the maximum score of 250 and were included in the very high category in Nurdiana et al. (2024). Harsono et al. (2025) said that this value is very high because it can be used in various traditional rituals of Lampung Saibatin and cannot be replaced. Amid rapid modernization, understanding the cultural value of plants is a strategic step to maintain and strengthen ethnic identity. Therefore, documenting the importance of plant culture is essential for preservation so this knowledge is not affected by change (Akhmad, 2020).

By assigning coconuts and bananas the same value (1.00), indicating the same level of utilization across communities, the Data Use Value (UV) corroborates the findings. People in Penggawa V Ulu Village are very familiar with plants such as turmeric and sticky rice, showing that ethnobotanical knowledge is still well transmitted, according to Fazriah et al. (2025). How plants are used in ceremonies

This custom shows that local people use plants functionally and that each plant used has symbolic meaning (Avi, 2021). According to Musliha et al. (2023), the level of community loyalty to a particular plant is measured by the level of loyalty (LF). LF values reach 100% for coconuts and bananas in almost all conventional procedures. The results confirm that both are the main plants that play an important role in the cultural identity of Lampung Saibatin. In contrast, the more specific LF values in sacred plants such as frankincense indicate that different plants guard different sacred rituals. This strong attachment to plant use reflects the community's commitment to customs passed down from generation to generation (Fazriah et al., 2025).

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An IUCN status analysis shows that although most plants are in the Least Concern (LC) category, several species, such as gambier and sandalwood, are classified as Vulnerable (VU). Febrianto (2022) stated that the results show communities must make more active conservation efforts to maintain the availability of plants with indigenous value. Maintaining a balance between cultural use and sustainable ecosystem preservation efforts requires awareness of this conservation status (Zulfaningrum & PM, 2023). This study developed an electronic ethnobotanical encyclopedia that uses a contextual teaching and learning (CTL) approach. This medium supports students' science literacy by converting oral knowledge from indigenous figures into written data systematically compiled based on Hidayat et al. (2023). Local potential-based encyclopedias have been shown to improve learners' understanding of biology material because they provide a real, contextual, and close learning object to the learner's real world (Muhfahroyin & Oka, 2021).

Educationally, this encyclopedia not only serves as a source of information but also helps students think critically by analyzing scientific ethnobotanical data. Students are asked to understand the relationship between plant morphology, biological function, and their philosophical meaning in ancient rituals. This encyclopedia-based teaching material is an innovative way to improve biology learning while increasing pride in and concern for local cultural heritage (Adawiyah et al., 2023). Validation and media trials of the Lampung Saibatin Encyclopedia of Native Plants show a very high level of feasibility as a learning resource. In terms of material, Dr. Umar Abdul Labib, M.Pd., stated that the product is feasible because it comprehensively covers 34 indigenous plants, arranged alphabetically, and includes relevant images. Some taxonomic errors and descriptions on pages 13, 35, and 39 were corrected through thorough re-editing to maintain scientific validity and prevent misconceptions, according to Van den Akker's (1999) theory. The validity of the material was strengthened through design validation by Ade Gunawan, M.Pd., who obtained a score of 86.5% with the category of "very feasible" based on the criteria of Sa'dun Akbar (2013). The assessment was supported by the quality of the typography (90%- 95%), the layout (85%), proportional spacing (90%), and the consistent use of italicized Latin scientific names according to the rules of international biological nomenclature (Baharuddin & Maturahmah, 2025). In addition to expert validation, pedagogical and contextual reinforcement was also obtained through questionnaires from 40 respondents consisting of 30 students, 4 professional teachers, 2 students, 2 farmers, 1 self-employed person, and 1 respondent who had not yet worked. Quantitatively, the user questionnaire obtained a total actual score of

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2,692 out of a maximum of 3,040, with an average score of 3.54 on a 4.00 scale, or an eligibility percentage of 88.55%. Based on the theory of Suharsimi Arikunto (2016), the results are included in the category of "very feasible". This finding is also strengthened by positive feedback from readers who feel proud and gain new ethnobotanical insights through the medium of an encyclopedia that is
developed (Fajrin et al., 2025).

CONCLUSION

The results showed that the Lampung Saibatin community in Penggawa V Ulu Village continues to maintain local wisdom in using plants for traditional ceremonies. A total of 34 plant species from 21 families were found to be used in various rituals, including community and sacred rituals. According to quantitative analysis, the most important plants are coconut (Cocos nucifera) and bananas (Musa paradisiaca). Both have the highest Index of Cultural Significance (ICS), Value of Use (UV), and Fidelity Level (LF) values. This demonstrates their irreplaceable philosophical and functional role in the local community's cultural structure.

Ecologically, although most of the plants used are in the conservation status of Least Concern (LC), species in the Vulnerable (VU) category, such as sandalwood and gambier, require special attention in conservation efforts. This ethnobotanical documentation shows that preserving the traditional practices of Lampung Saibatin depends heavily on the sustainability of natural resources in the surrounding environment. Therefore, this study emphasizes the importance of integrating cultural protection and biodiversity conservation.

The research results were used to create an electronic ethnobotanical encyclopedia that supports contextual biology education. This encyclopedia transformed traditional knowledge into systematic teaching materials. It not only improved students' scientific knowledge and critical thinking skills, but also fostered pride in their local culture. This product serves as a strategic tool for digitizing local wisdom, ensuring that the knowledge heritage of Lampung Saibatin's ancestors remains relevant and accessible to the younger generation amid technological advances. The feasibility of this media is supported by subject-matter experts, who declared the product feasible after the taxonomy revision, as well as design experts, who rated it 86.5% (very feasible). In addition, field trials of 40 respondents resulted in a percentage of

Feasibility reached 88.55% (score of 3.54 out of 4.00), so this encyclopedia was tested valid and very feasible to be implemented in biology learning materials.

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