

Ethnobotanical study of local wisdom on the Jembul Jepara tradition as a reference book

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Abstract: The diversity of cultures in Indonesia, one of which is the Jembul Tradition, can be implemented through ethnobotanical studies that can support community knowledge. The purpose of this study is to find out the ethnobotanical profile in the Jembul Tradition and analyze the feasibility of reference books based on experts. The research method uses mixed research, namely descriptive research including ethnographic research and R&D (Research and Development) development research with the 4D development method. Data collection was carried out by interviews, observations, and documentation. The feasibility of reference books is carried out by validation from material experts and the media and then tested for public readability. The results of the study were obtained from 35 types of plants which were grouped into 22 orders. The developed reference books have been validated by material and media experts with an average of 84% with a very feasible category. The percentage of readability by the public was obtained on average 93.8% with a high category. It can be concluded that the book developed is worthy of being used as a source of knowledge for the general public.

Keywords: ethnobotanical studies; Jembul tradition; local wisdom; reference books

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Introduction

Cultural values and biodiversity need to be preserved because Indonesia has many cultural heritages and diverse local wisdom. Cultural values can be further preserved through education. Culture-based education can directly preserve culture and will provide insight to the next generation so that they can provide meaning for life in the future (Siahaan, 2018). The implementation of culture-based education is currently still minimal, even though there are many values from culture that are useful as a support for the learning process that can increase public knowledge in environmental conservation and utilization (Setiawan & Qiptiyah, 2014). One application of local wisdom is through biology learning which can have a positive impact on community welfare (Alimah & Marianti, 2016).

Local wisdom applied in education has a very broad function, including being able to produce a competent and useful generation of the nation and being able to preserve the nation's culture. Based on research, the role of society in preserving local wisdom in daily activities is still very lacking, so due to the limitations of local wisdom studies associated with biology learning, local wisdom studies will be carried out so that they are useful as a source of knowledge and understanding for the community about the use of local wisdom (Ridianingsih & Aini, 2022).

Based on this, it is very important to be able to associate local wisdom with biology learning because it can make a positive contribution to the preservation of the environmental and cultural balance in Indonesia. Therefore, ethnobotanical studies can be used as one of the sources of biology learning that integrates local wisdom as an effort to conserve plants (Niman, 2019).

Ethnobotany studies are used as a tool to document existing knowledge in society, especially various types of plants that exist in everyday life (Setiawan, 2014). There are several previous studies by Angestyaniingrum (2018) and research by stating that ethnobotany studies can be used as a source of learning biology through popular scientific books with traditions, customs, animals, and plants that provide benefits to increase knowledge. Through this ethnobotany study, it is hoped that it will provide a new source of information for the community regarding the use and preservation of plants so that they can be used by the next generation.

Biology learning resources are learning resources that come from nature and the environment that can provide benefits as the preservation of natural resources that need to be maintained, recognized, understood, and preserved by all parties (Sasmita, 2020). Biology learning resources can be realized

with the cultural diversity that exists in Indonesia as local wisdom (Harmida & Sarno, 2011). Forms of local wisdom that can be used as biology learning materials include plants and animals that only exist in the area, social norms, customs, traditional architecture, traditional clothing, regional songs, typical foods, and various other things. One of the biology learning resources based on local potential for the community is the Jembul Ceremony Tradition Alimah (2019) in Tulakan Village, Donorojo District, Jepara Regency which uses abundant biodiversity to be used as a source of biology learning. In this tradition, there are various kinds of plants used that are obtained from produce.

There has been no study of ethnobotanical studies in the Jembul Tradition which requires the development of a reference book on ethnobotanical studies so that the purpose of this research is to find out the types of plants, the parts of plants used, their uses, and the meanings contained in the Jembul Ceremonial Tradition in Tulakan Village, and to analyze the feasibility of the book on the results of ethnobotanical studies as a Biological Reference book based on community response.

Method

This study applied survey analysis which aimed to obtain the description and analysis results regarding Basically, this section describes the way the research was done. The main materials must be This research is mixed method research that has two stages, namely qualitative descriptive research and quantitative descriptive research. In the first stage, qualitative descriptive research by conducting ethnographic research methods, namely conducting interviews, observations, and documentation. Then in the second stage of quantitative descriptive research, namely by conducting R&D (Research and Development), namely a continuation by developing the results of interviews, observations, and documentation into reference books that use a 4D development model that is modified into 3D or up to the third stage, namely developing or 3D (*define, design, and develop*) because this research aims only to determine the ethnobotany profile and the feasibility of ethnobotany book results so that it is sufficient to do it up to the 3D stage only. This research was conducted in Tulakan Village, Donorojo District, Jepara Regency, Central Java, as seen in Figure 1. The tools and materials used include stationery, interview instruments, observation sheets, voice recorders, and cameras.



Figure 1. Map of the Research Location

The residents in this study who were interviewed were the people of Tulakan Village. The sample in this study is 10 respondents with different backgrounds, including 5 people from Tulakan Village and 5 biology education students. The selection of respondents was carried out through the purposive sampling technique because the reference book developed was aimed at the people of Tulakan Village and for biology education students because the discussion of the book was developed in accordance with the field of biology with the criteria of people who are considered to have knowledge of ethnobotanical profiles.

The instruments used in ethnographic research are observation sheets, interview sheets, field notes, voice recorders, and cameras. In development research, the use of reference books requires analysis sheet instruments, validation instruments (material experts and media experts) to assess the reference books that have been made. The last instrument is a community response test to see the community response to the reference book that has been developed.

The ethnographic research stage uses three types of data collection, including interviews, observations, and documentation. Sampling of the study was carried out by purposive sampling technique. Data was collected through interview, documentation, and identification techniques. The interview was conducted to explore information related to the ethnobotanical profile of the Jembul Tradition used by the people of Tulakan Village. After that, an assessment was carried out based on the results of the research carried out.

A modified 4D development model to 3D (define, design, dan develop). The Define The stage involves analysis including the needs analysis stage and the material analysis. At Design stage including the initial design of the reference book product. At Development stage including the development of the initial draft of the reference book, validation by material experts and media experts, phase 1 revision, community response tests, and final products in the form of reference books.

Ethnographic data analysis techniques are carried out through the reduction and presentation of interview data in the form of ethnobotanical characterization tables and images. Data analysis techniques in the development of reference books are carried out based on the analysis of validation instruments of material experts and media experts, as well as response test instruments given to the community and students. The determination of reference book validation uses the following formula. Product validation criteria are defined and revised using [Formula 1 \(Arikunto, 2013\)](#).

$$P = \frac{x}{x_1} \times 100\% \quad (1)$$

The [Formula 2](#) used for overall data processing is:

$$P = \frac{\sum x}{\sum x_1} \times 100\% \quad (2)$$

Information:

P : percentage

x : the number of respondents' answer scores per item
x₁: the number of ideal scores in a single item

∑x : the total number of respondents' answer scores

∑x₁: the total number of ideal scores

The scores that have been obtained are then averaged and converted into category values as shown in [Table 1](#).

Table 1. Product Revision Decision Making

Achievement level	Category	Results
81-100	Very worthy	No need to revise
61-80	Proper	No need to revise
41-60	Quite Decent	Partially Revised
21-40	Less Worthy	Revised
0-20	Not Eligible	Revised

(Source: [Arikunto, 2013](#))

The [Formula 3](#) for processing the score of the readability test results is as follows.

$$\text{Percentage of each student's score} = P = \frac{x}{x_1} \times 100\% \quad (3)$$

Information:

X : the number of respondents' answer scores

X₁ : Maximum number of scores

After the data is collected, then calculate the average score with the [Formula 4](#).

$$\text{Average} = \frac{\sum x}{N} \quad (4)$$

Information:

∑X : the number of respondents' answer scores

N : number of respondents

The category of achievement of readability of reference books based on the *Rumpang* test is listed in [Table 2](#).

Table 2. Category of Achievement of readability of reference books

Score	Category
> 60%	High
40% – 60%	Medium
<40%	Low

(Source: Rankin & Culhane, 1969)

Results and Discussion

This research procedure using the R&D method which only reaches the 3D stage is for the first stage Define is done by determining and defining the needs used for product development and collecting information related to book products. The data needed includes the type, part, benefits of use and meaning of the use of plants in the Jembul Tradition. The second stage is Design, which designs reference book products by selecting book designs, book formats, and initial designs, then for the last stage Develop, the development of learning resources in the form of reference books is carried out based on the designs that have been made through several stages including prototype I, expert validation, revision I, Prototype II, validation test, revision II and the final result in the form of a final reference book. Based on the results of research that has been conducted with several respondents, there are 34 types of plants used in the Jembul Tradition in Tulakan Village which are grouped into 22 different orders, namely Poales, Fabales, Zingiberales, Solanales, Rubiales, Magnoliales, Musales, Sapindales, Rosanales, Pandanales, Rosales, Papavorales, Apiales, Morales, Caryophyllales, Rhoedales, Arecales, Liliales, Asparagales, Myrtales, Vitales, and Lamiales. The most abundant plants in the order Poales are 4 types of plants. The order Fabales and Zingiberales amounted to 3 types of plants each. The orders Solanales, Rubiales, Magnoliales, Musales, Sapindales, and Rosanales amount to 2 types of plants each. Then the least number of plants are those that fall into the order Pandanales, Rosales, Papavorales, Apiales, Morales, Caryophyllales, Rhoedales, Arecales, Liliales, Asparagales, Myrtales, Vitales, and Lamiales with 1 type of plant each.

Based on the use of plants used in the Jembul Tradition, it can be seen in [Table 3](#). There are several procession activities that take place in the Jembul Ceremony Tradition: (1) *Buka Luwur* is the opening of the Jembul Tradition. The procession carried out is to replace the mori cloth at the hermitage of Ratu Kalinyamat. The old *Luwur* will be auctioned off by people with a fairly high price range. It is believed that *Luwur* brings blessings because it is accompanied by the recitation of tahlil ([Tsani, 2023](#)); (2) *Manganan* is a medium of gratitude to Allah for the abundance of agricultural products and as a prayer to be kept away from disaster is done by praying together ([Khabib & Zafi, 2020](#)); (3) National parade (*Kirab Kebangsaan*) and *Budaya Kabumi* is a series of Jembul Tradition processions which are carried out with prayers and ngaji together with the hope that Tulakan Village will be kept away from danger, its people can live in peace and prosperity; (4) *Istigosah* and *Kenduri* are praying together as a form of gratitude of the Tulakan Village community for the blessings given, which is hoped that in the Jembul Tradition event can run smoothly, the community can live in harmony, peace, prosperity and well-being ([Asyari et al., 2021](#)); (5) The Buffalo Slaughtering Procession is the process of slaughtering a buffalo which has a meaning as a symbol of prosperity ([Tulung, 2022](#)); (6) The *Wayang Kulit* Performance is a performance whose function is only to entertain residents, tracing the performances held by ancestors in the past ([Asyari et al., 2021](#)); (7) The peak of the event is the Ritual Tradition Ceremony is a tradition that has been preserved since ancient times as an expression of gratitude from the community for the abundant produce and as a symbol of respect and loyalty of the head of Tulakan Village which is marked by the submission of bekti hair in the form of produce by the our elders (*kamituwa*) ([Indrahti et al., 2019](#)). The diversity of plants used in the Jembul Tradition is obtained from the agricultural products of the Tulakan Village community, because the plants used are often found so they are easy to get and use. Activities in the Jembul Tradition use and utilize a variety of plant diversity, some of which are processed first and some are used directly. Understanding the use of plants used in this Tradition has long been preserved by the Tulakan Village community. According to [Wardani et al., \(2021\)](#), the existence of the Jembul Tulakan Tradition explains that Queen Kalinyamat had a grudge against Arya Penangsang who had killed Queen Kalinyamat's brother and husband. He swore not to end the asceticism he had done before he could bathe in Arya Penangsang's blood and mat with hair or what is called Jambul.







Description of Each Order







Identify the types of plants used by paying attention to the classification, morphology that includes the types of plants, plant parts, uses, and meanings contained in the Jembul Ceremony Tradition, along with an explanation of the characteristics and some plants grouped in the order which can be seen in [Table 3](#). Based on the 22 orders obtained which are listed. Each has its own role in each activity in the tradition, the uses of which are as offerings, scattering flowers in the hermitage, staple foods, food ingredients, kitchen ingredients, as treats, as a Jembul and *ancak* frame, and as a Jembul filling. The plants consist




of several types of plants, namely grains, spices, vegetables, fruit plants, and flowering plants, and finally the group of building material plants. The parts of the plants used also vary from fruit, flowers, tubers, stems, leaves, and rhizomes. Most of the plants in the Jembul Tradition are used directly and some are processed into food in the past such as rice, glutinous rice, bananas, besides that the plants used are easy to find around the house and the community. This is in accordance with the statement of [Hulyati et al., \(2014\)](#) that generally people have long known the plants used as a tradition and tend to take those that are in the environment. In the Jembul Tradition Ceremony, the plants used have symbolic meanings in each plant which provide their own meaning and learning for the community, such as the characteristic of this tradition is using bamboo which has the meaning of depicting the hair or crest of Arya Penangsang. As told by [Wardani et al., \(2021\)](#) that the *ancak* found in the Jembul Tradition which is made of bamboo symbolizes the crest/hair of Arya Penangsang. Then using sticky rice which has a characteristic as a filling for jembul which is processed into food, namely *tape*, *gemblong*, and *apem* has the meaning that humans must stick together and live in harmony, which is expected that all residents of Tulakan Village can establish good brotherhood. According to [Achroni \(2017\)](#), sticky rice has the meaning of *ngraketake paseduluran* which means to strengthen brotherhood.





Table 3. Order Classification of Plant Types Used in the Jembul Tradition





No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
1.	Poales	<i>Manganan</i> (staplefood), buffalo cutting (basket filling), Puncak Tradition Jembul (Jembul filling) Symbol: Attitude of surrender to Allah SWT	 <i>Oryza sativa</i>	The leaves have parallel or curved leaf bones, not prickly with frond-rooted. True flowers with stamens and pistils, the flowers are grains found in the armpits of the chaff. The tip of the husk is needed, the husk is not arranged in a spiral. The stem is round and slightly flattened. The mother of the flower stalk is mostly booked.
		<i>Buka luwur</i> (offering), buffalo cutting procession (basket filling), puppet show (treat), peak of the Jembul Tradition (Jembul filling) Symbols: Humans must glue each other together	 <i>Oryza sativa var glutinosa</i>	
		<i>Manganan</i> (kitchen materials), buffalo cutting procession (basket filling), the peak of the Jembul Tradition (kitchen materials) Symbol: Spreader of goodness	 <i>Cymbopogon citratus</i>	
		Peak of Jembul Tradition (Jembul and <i>Ancak</i> skeleton) Symbol: Depicts the crest of Arya	 <i>Bambusa vulgaris</i>	

No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
2.	Fabales	<p>Penangsang</p> <p>The peak of the Tradition of Jembul (Jembul filling)</p> <p>Symbol: Longevity</p>	 <p><i>Vigna sinensis</i></p>	<p>The habitus of the tree, the leaves are compound and pinnate. Perfect flowers, pod-shaped fruits, and generally have fibrous roots</p>
		<p>Manganan (foodstuffs), the peak of the Jembul Tradition (stuffing of jembul)</p> <p>Symbol: Togetherness and harmony</p>	 <p><i>Glycine max</i></p>	
		<p>Manganese (foodstuffs)</p> <p>Symbol: There is love in it</p>	 <p><i>Phaseolus vulgaris</i></p>	
3.	Zingiberales	<p>Manganan (kitchen material), buffalo cutting (basket filling), the peak of the Jembul Tradition (kitchen material)</p> <p>Symbol: Ancestral emblem</p>	 <p><i>Alpinia galanga</i></p>	<p>Herbaceous habitus/perennial terna, rhizomes in the soil. The leaves are wide and can be divided into three parts: leaves, stalks, and upils. The leaf symmetrical, bony pinnate. The flowers are sissy, zygomorphy. The fruit will sink into the seed. The fruit is fleshy. The seeds are slightly endosperm, but have large perisperm</p>
			 <p><i>Curcuma longa</i></p>	
		<p>Istighosah and feast (treat), the peak of the Jembul Tradition (Jembul filling)</p> <p>Symbol: Strong protection and devotion</p>	 <p><i>Musa paradisiaca</i></p>	



No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
4.	Solanales	<p>Manganan (kitchen material), buffalo cutting (basket filling), the peak of the Jembul Tradition (kitchen material) Symbol: whoever does bad will get the consequences</p> <p>Manganan (kitchen material), buffalo cutting (basket filling), the peak of the Jembul Tradition (kitchen material) Symbol: small but brave</p>	 <i>Capsium annum</i>  <i>Capsicum frutescens</i>	<p>Habitus in the form of bushes, shrubs and rarely woody. The leaves are single without concentrating leaves, the flowers are sessile and mostly multiple 5. The stamens are located close to the crown of the flower which contains 1 prospective seed. The fruit will be partially submerged or half-submerged</p>
5.	Rubiales	<p>Buka luwur (offering) Symbol: flawless</p> <p>Manganan (sowing in petilasan), the peak of the Jembul Tradition (procession of <i>resikan</i>) Symbol: Happynes</p>	 <i>Coffea arabica</i>  <i>Ixora coccinea</i>	<p>Herbaceous habitus, shrub or tree. The leaves are single, scattered or crossed opposite, with condensing leaves in the armpits or between the armpits. The flowers are compound in the type of simosa, bisexual, actinomorphic. The fruit will be inferior, berry space, each space has 1 seed, the pistil stalk is 1. The seeds mostly have endosperms, straight and bony boards</p>
6.	Magnoliales	<p>Buka luwur (offering), manganan (sowing in petilasan), buffalo cutting (basket filling), and the peak of the tradition (procession of <i>resikan</i>) Symbol: glue the wish to be</p>	  <i>Kananga Odorata</i>	<p>Habitus shrubs to trees. The leaves are single with sitting leaves scattered, flowers that have many areas (bisexual actinomorphs) and the fruit is double</p>

No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
		<p>granted immediately</p> <p><i>Buka luwur</i> (offering) Symbol: an image of a human being who can be this and so</p>	 <p><i>Michelia alba</i></p>	
7.	Musales	<p>The peak of the Jembul Tradition al (Jembul filling) Symbol: teaches to repent of sin Buffalo cutting (basket filling), the peak of the Jembul Tradition (Jembul filling) Symbol: greatness and good wishes</p>	 <p><i>Musa paradisiaca (Banana Kepok)</i></p> <p><i>Musa paradisiaca (Plantain)</i></p>	<p>The large terna habitus with a pseudo-stem consists of layered leaf ridges, and the leaves are wide and elongated, the leaf mother is thick, grooved on the upper side, clearly different from the pinnate branch bones. Sissy flower or has a single genitals, zigomorf, Tubular petals, elongated, Thread-shaped stamens, stamens up a line, bear 2. The fruit will sink, the stamens are thread-shaped, the stamens are notched. Fleshy, non-open fruit is a buni fruit or kendaga fruit</p>
8.	Sapindales	<p>National and cultural carnival (treat) Symbol: contains many benefits</p> <p>National and cultural carnival (treat) Symbol: good luck, abundant wealth and prosperity</p>	 <p><i>Citrus x sinensis</i></p> <p><i>Dimocarpus longan</i></p>	<p>The habitus of a shrubor tree, the head is compound or single and rarely has a condensing leaf. Sissy flowers, often single-sexed, crown and petals multiple 5, generally zigomorf, 2-3 fruit, each chamber contains 1-2 apotrophic or epitropic seed</p>

No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
9.	Rosanales	<i>Buka luwur</i> (offering), <i>manganan</i> (sowing in petilasan), the peak of the Jembul Tradition (procession of <i>resikan</i>) Symbol: people who live in the world are various colors of physicality, nature and desire	 <i>Rosa sp.</i>	It has fibrous roots that extend downwards. The stem forms rounded and irregular in length. The leaves are small round and have a size of 2-3 cm. The flowers are shaped like a round and consist of several layers of flowers totaling approximately 20-26 layers of flowers. The seeds are oval in shape and very small in size, and have a white and brownish color on the inside
10.	Pandanales	<i>Manganan</i> (sowing in the petilasan), buffalo cutting (basket filling) Symbol: harmony or harmony	 <i>Pandanus amaryllifolius</i>	Habitat shrubs or trees, the leaves are flat. The flowers are atypical and have flower bunches, usually arranged in a bouquet in the form of compound flowers. Male flowers have many stamens, female flowers have many potential fruits, each space contains potential seeds. The Institution's bladder contains more than 3 antipod cells.
11.	Rosales	The peak of Jembul traditional (Jembul filling) Symbol: fertility	 <i>Vigna radiata</i>	The flowers are small to medium in size with petals and the crown of the flowers have an assortment of colors
12.	Papavorals	Manganese (foodstuffs) Symbol: honoring his ancestors as if not abandoning the traditions that have been taught	 <i>Brassica oleracea</i>	A seasonal (annual) plant that is shrub-shaped. Flowering plants. The flowers are white that are more than one carpel. The roots are taproot and fibrous roots. The pollination of its flowers is carried out by cross-pollination or with the help of insects. The fruit is pod-shaped. The stem is usually small, soft and not very

No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
13.	Apiales	Manganese (foodstuffs) Symbol: can live anywhere	 <p><i>Daucus carota</i> L.</p>	obvious Root fibers and rides that experience. The stem is rounded with a diameter of 1-1.5 cm, textured and hard. The leaves are compound type with lanceolates. The flowers grow at the ends of the plant, most double-shaped with a reddish-white color. It has closed and two-piece seeds, the seeds are brownish with a length of 3 mm and a width of 1.5 mm.
14.	Morales	Manganese (foodstuffs) Symbol: prosperity and spirituality	 <p><i>Artocarpus heterophyllus</i></p>	Habitus trees. The leaves are thick, somewhat fleshy, the fruit is not a true fruit. The flowers are hidden inside the fruit and are pollinated by certain insects.
15.	Caryophyllales	Manganese (foodstuffs) Symbols: strength and health	 <p><i>Amaranthus Tricolor</i></p>	Habitusherbs/terna, shrubs, trees, or vines. The leaves are single and do not have concentrating leaves. The flowers are sissy, single or double-breasted with clear petals, and actinomorphic. The stamens are found in a single spiral. The fruit will hitchhike or sink, the average bearis one
16.	Rhoedales	Manganan (foodstuffs), The peak of Jembul traditional (stuffing of jembul) Symbols: luck and wealth	 <p><i>Brassica juncea</i></p>	Seasonal plants that have a short lifespan of about 30-45 days after planting. The leaves are oval, smooth, not creepy, grow upright, between 10-15 cm in height has anomocytic type stomata

No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
17.	Arecales	<p><i>Manganan</i> (kitchen material), buffalo cutting (basket filling) Symbol: beneficial to others</p> <p>Peak of the Jembul Tradition (skeleton bearerjembul) Symbol: A strong, sturdy, civilized and beneficial soul</p>	 <p><i>Cocos nucifera</i></p>  <p><i>Arenga pinnata</i></p>	<p>Habitus herbaceous/terna large, sometimes trees, the leaves are large, shared or compound with an arrangement of fingered or pinned bones. The flowers are small, single-sexed, including compound flowers, at the base there is a sheath that wraps or protects the compound flower. The fruit will hitchhike. The fruit is in the form of <i>buni</i> fruit or stone fruit</p>
18.	Liliales	<p><i>Manganan</i>, buffalo slaughter, the peak of the Jembul Tradition (kitchen ingredients) Symbol: A process in life that is bitter and sweet</p>	 <p><i>Allium ascalonium</i></p>	<p>Perennial herbaceous habitus. The leaves are elongated flattened and have a glossy dark green color, spread linearly, whole strands. The flowers are trumpet-shaped, have 6 stamens. The fruit includes <i>buni</i> fruit and the seeds are endosperm shaped with fleshy Flat institution</p>
19.	Asparagales	<p><i>Manganan</i>, buffalo slaughter, the peak of the Jembul Tradition (kitchen ingredients) Symbol: Have a good heart</p>	 <p><i>Allium sativum</i></p>	<p>Fibrous roots, short and plunged into the ground. The stem is small, upright and is a pseudo-stem formed from thin but strong leaf fronds. The leaves are single in shape that resemble a ribbon that extends to the top. The stems are compounded, which have a stem and produce seeds.</p>
20.	Myrtales	<p><i>Manganan</i>, buffalo slaughter, the peak of the Jembul Tradition (kitchen ingredients) Symbol: Honor and success</p>	 <p><i>Cyssidium Polyantum</i></p>	<p>Habitus of woody plants, the leaves are single with sitting leaves crossed facing each other, without a concentrator, the leaf sheets have oil glands. The flowers are single-sex with a clear floral ornament distinguishable in the petals and corolla of the flowers, sometimes without a</p>

No	Order	Uses and Symbols	Plant Name & Picture	Characteristics of Each Order
				crown, actinomorphic, mostly naubering four.
21.	Vitales	National and cultural carnival (treat) Symbols: good luck, abundant wealth and prosperity	 <i>Vitis vinifera</i>	Annual (perennial) vine shrub. The roots are slender, the stem is woody with an elongated rounded shape, the leaves are shaped like a heart with serrated edges, generally the leaves are single, the flowers are perfect (bisexual) are fertile and the male and female flower sexes are located separately. The fruit is small ovoid and the seeds are inside an elongated round shape
22.	Lamiales	Manganan and the peak of the Jembul Tradition (food base) Symbol: True seriousness	 <i>Tectona grandis</i>	Dicotyledon plants that have flowers with a simple crown. plants that have a habitus of shrubs, trees and herbs

Based on [Table 3](#). grouping 35 types of plants into 22 orders. Based on Table 1, it can be seen that the most widely used plants during the peak activities of the Jembul Tradition are as many as 23 types of plants. As for the least plants, namely in *istighosah* and *kenduri* activities, as well as puppet shows, there is only 1 type of plant. The following are the procession activities that took place in the Jembul Ceremony Tradition according to an interview with the village head of Tulakan and the key keeper of the Hermitage Ratu Kalinyamat are as follows; (1) The Iftar *Luwur* procession is the opening of the Jembul Tradition. The procession was carried out by changing the mori cloth at the hermitage of Ratu Kalinyamat; (2) *Manganan/Tasyakuran* is a procession of eating together which is followed by the village head and all residents of Tulakan Village at the hermitage of Ratu Kalinyamat which aims to pray together because they are grateful for the blessings of Allah that have been given to Tulakan Village, asking for Tulakan Village to be given security and prosperity by Allah; (3) The National and Cultural Kabumi Kirab is a series of Jembul Traditional processions which is carried out by prayer and prayer together; (4) *Istigosah* and feast are a series of processions of the Jembul Tradition which was carried out by the village head's family, the family of the village apparatus and the residents of Tulakan Village. The event was carried out by praying together as a form of gratitude to the people of Tulakan Village for the blessings given, which is hoped that the Jembul Tradition event can run smoothly, the community can also live in harmony, peace, prosperity and prosperity; (5) Buffalo Slaughter is used as a side dish that has a symbol of prosperity; (6) The puppet show was carried out to entertain the residents, following the performances held by the ancestors in the past; (7) The peak of the Jembul Tradition event was carried out with a Jembul procession from each *kamituwo* there were representatives of a pair of male and female jembul. On each Jembul there is a doll as a symbol of the figure in each Tulakan hamlet, the first is Jembul Krajan with the characteristic of Sayyid Uthman Sodiq dolls, Jembul Ngemplak with the characteristics of Mbah Suto Mangun Jaya dolls, Jembul Winong with the characteristics of mighty warrior dolls and Jembul Drojo and Pejng with the characteristics of Mbh Leseh dolls.

Based on the grouping of the order level, the number of plants used during the preparation and implementation of the activity can be seen in [Figure 2](#).



Figure 2. Order-Level Biodiversity

Based on the diversity of the order level in [Figure 2](#), the plants used in the Jembul Tradition use the most plants with the orders Poales, Fabales, Zingiberales. The order Poales, Fabales, Zingiberales are included in food plants and horticultural plants, namely in the form of rice, vegetables, fruits, ornamental plants and medicinal plants. Food and horticultural plants are suitable for planting on alluvial soil, such as in the Tulakan Village area located at an altitude between 0-154.00 meters above sea level or approximately 10-15 meters above sea level is a lowland so that this area has the potential to become agricultural land ([Maftukin, 2022](#)). According to Jepara Regency, it is an area with a high production of food crops (rice, corn, cassava, sweet potato). The agricultural sector has a major role in meeting food needs, while supporting local economic growth and creating job opportunities. In addition to the food plant sector which is the most agricultural product, Tulakan Village also has the potential to be planted with horticultural plants because of its fertile soil. [Angestyaningrum \(2018\)](#). Meanwhile, the plants that are least used in the Jembul Tradition are included in the orders Rosanales, Pandanales, Rosales, Papavorales, Apiales, Morales, Caryophyllales, Rhoadales, Arecales, Liliales, Asparagales, Myrtales, Vitales, and Lamiales. Because the types of plants are different, plants from these orders are rarely planted in Tulakan Village. Such as the Papavorales order, for example cabbage plants, the Apiales order, for example carrots, and the Vitales order, for example grape plants. Growing with these orders cannot be planted in Tulakan Village because these plants require cold temperatures while Tulakan Village has a hot temperature, so cabbage, carrots, and grapes are not suitable for planting in Tulakan Village because it has a hot temperature. According to the profile of Tulakan Village, the average daily temperature is 31 ° C and the height above sea level is less than 200 meters ([Maftukin, 2022](#)).

The characteristic of the Jembul Uapacara tradition is to use anak or iratan made of bamboo that is made into a mountain. Jembul is divided into 2, namely Jembul Lanang and Jembul Wadon. In Jembul Lanang it is decorated with thin bamboo slicing while for Jembul Wadon it does not use bamboo slicing. In Jembul Lanang it consists of snacks, such as foods made from sticky rice such as jadah, gemblong, sticky rice tape, apem and so on. Some of the offerings are wrapped in teak leaves and packed into bamboo weaves (*kreneng*). While Jembul Wadon contains main dishes and side dishes, such as rice made from rice, tofu and tempeh made from soybeans, lodeh vegetables which contain long beans, pumpkin, melinjo fruit, melinjo leaves, eggplant, and tempeh, jackfruit, and other types of fish. There are several other objects used in this ceremonial procession, namely *Manganan* rice, *Kembang Setaman* and *Kembang Telon*, *Apem* and *Gemblong*, Bitter Coffee and Bitter Tea, Banana *Raja*, Market Snacks and Frankincense ([Wardani et al, 2021](#)).

Phase II Research (Reference Book Development)

The book on ethnobotanical research of the Jembul Tradition in Tulakan Village, Donorojo District, Jepara Regency aims to expand the understanding of the ethnobotanical study of the Jembul Tradition. This reference book can be useful for students and the community who present information that can increase insight and knowledge. The design of this book displays the dominance of green with original images from the tradition. The content of the book is designed to be attractive and simple, making it easier for readers to understand it. The design of the book can be seen in [Figure 3](#).



Figure 3. Reference Book Design

Ethnobotany Yield Book Eligibility

The data obtained from the results of the research of validators material experts the ethnobotanical results book can be seen in [Table 4](#).

Table 4. Material Expert Validation Analysis

Assessed aspects	Percentage (%)	Eligibility Criteria
Completeness of contents	80	Proper
Eligibility of serving	75	Proper
Language Assessment	70	Proper
Average	75	Proper

From the feasibility analysis that has been carried out, the results of the material experts contained in [Table 4](#), which include 3 aspects, namely the completeness of the content, the feasibility of presentation and the assessment of the language obtained with a percentage score of 75% with a category suitable for use as a learning resource for the community because this book already contains ethnobotanical knowledge needed by the community.

The expert validator's assessment of the material obtained includes aspects of content feasibility consisting of five indicators, namely completeness of material, breadth of material, depth of material, accuracy of concept and resolution and accuracy of data and facts which get a score of 80 with a very feasible category because from the fifth chapter for book development, the material presented is complete, broad and deep. And it has been included in accordance with what is in the field. This is in accordance with what [Dewayani \(2018\)](#) said that book references should have up-to-date, accurate, valid, complete, authentic and accountable content according to the characteristics of the scope of the reference book and must pay attention to the development of science.

The second aspect of feasibility is the feasibility of presentation which consists of several indicators including material presentation techniques, conceptual sequence and completeness of material. Based on these four indicators, a score of 75 is obtained which is categorized as feasible, because in the development of picture books as a support, the selection of sub-titles is in accordance with material needs, and the concept of book development is presented coherently and completely, so that the book that is developed is complete in terms of material and systematic because it has been adjusted to the needs of ethnobotany reference books. As explained by [Siahaan et al., \(2018\)](#), an image or photo can provide a real picture that shows the actual object, which provides a more vivid and precise learning meaning than words, so that it stimulates thinking skills and has a positive effect on readers.

The third aspect is the language assessment which consists of several indicators, namely in accordance with development, communication, conformity with Indonesian language rules and use of terms. Of the four indicators, a value of 70 was obtained which was categorized as feasible, because the book developed uses easy-to-understand language, so that the information provided is easy to understand, the writing is appropriate, there are no typos and uses foreign terms for scientific names of plants. This is as stated by [\(Ridianingsih & Aini, 2022\)](#) that the use of language is very important because it is a

means of opening up insights to absorb and develop knowledge. The data obtained from the results of the research of validators media experts on the ethnobotanical results book can be seen in [Table 5](#).

Table 5. Media Expert Validation Analysis

Assessed aspects	Percentage	Eligibility Criteria
Reference book size	100 %	Highly Worthy
Reference book cover design	68 %	Proper
Design the contents of the book	96 %	Highly Worthy
Typography of the contents of the reference book	100 %	Highly Worthy
Book illustration	100 %	Highly Worthy
Average	92,8 %	Highly Worthy

Then the results of the feasibility analysis of the media experts obtained which can be seen in [Table 5](#) which includes 5 aspects, namely the size of the reference book, the design of the cover of the reference book, the design of the book content, the typography of the book and the illustration of the book, a presentation score of 92.8% was obtained with a very feasible category because the book is in accordance with the criteria of ethnobotanical study books in accordance with UNESCO and suitable for use by the public. This is as it is said [Dewayani \(2018\)](#) that reference books should have up-to-date, accurate, valid, complete, valid and accountable for their truth in accordance with the characteristics of the scope of the reference book and must pay attention to the development of knowledge.

Furthermore, the results of the validation of material experts and the validation of media experts are averaged as seen in [Table 6](#).

After revisions were made in accordance with the expert media validator's assessment suggestions, the five aspects obtained were included. The first aspect is the size of the reference book with the indicator being the suitability of the size to the content of the reference book. From this indicator, a score of 100% was obtained with a very feasible category, which can be seen in [Table 5](#). This is because the development of the reference book uses A5 paper size which is in accordance with the reference book printing standards. In accordance with what was stated by [Dikti \(2009\)](#), the development of academic books uses at least 40 (forty) printed pages according to UNESCO and a book size of 15.5 cm x 23 cm. In addition to the UNESCO standard provisions, other sizes can also be used to print academic books, namely a maximum of A4 with a size of 21 cm x 29.7 cm or at least using the book size set by the Directorate General of Higher Education or Ditjen Dikti, namely A5 size with a paper size of 13 cm x 19 cm.

The second assessment aspect is the design of the reference book cover (cover) with a good center point indicator, the cover illustration uses animated images, the layout color is harmonious and clarifies the function, the letters used are attractive and easy to read, and the title color in this reference book contrasts with the background color. Of the five indicators, a score of 68% was obtained which is categorized as feasible, because in the development of the book with the book cover using the Canva and Figma applications with the Layiji Jarake Fad Hang font, size 40 pt, and the book cover uses the Jembul Tradition background of people lifting mountains/ancak and photos of mountains and the background color used is green which is adjusted to the topic to be discussed, namely ethnobotany. This is in line with what [Astuti \(2019\)](#) said that the provisions for cover design include illustrations, colors and typography.

The third aspect of the book content design is with the indicator of consistent layout element placement based on patterns, communication, layout accelerates understanding, complete layout elements, illustrations and image captions. Based on the five indicators, a score of 96% was obtained which is categorized as very feasible, because the book design was made using Word with a margin of 2 2 2 2, with the Cambria font and each table, image is given a caption so that the book that was developed looks neat, clear and easy to understand. This is in line with [Arifin et al., \(2009\)](#) that graphic science is a branch of design science that studies the visual presentation of media or textbooks by utilizing visual elements including images, symbols, illustrations, and text.

The fourth aspect of the typography of the contents of a simple reference book with indicators of not using too many fonts, using a variety of fonts (bold, italic, all capital, small capital) and not excessive, spacing between lines of text is normal. From the three aspects, a score of 100% was obtained which was categorized as very feasible, because in the development of the book using the Cambria font with a size of 11 pt, bold letters for the title and subtitles. Italic letters for scientific names and using capital letters for titles and subtitles, and using lowercase letters for the contents of the material so that the reference book can make it easier for readers to understand the contents. This is in accordance with [Sariyono & Muknim \(2016\)](#) that the selection of different font types and typography styles can make it easier for readers and is specific to important parts.

The fifth aspect is the illustration of the contents with indicators of accurate and proportional forms according to reality, creative and dynamic. From the two indicators, a score of 100% was obtained which was categorized as very feasible as seen in [Table 5](#), this is because the contents of the book/material used are in accordance with the results of the research that has been carried out, namely regarding the Jembul Tradition in Tulakan Village, then arranged creatively so that a book is formed with the title

"Ethnobotany Study on the Jembul Tradition in Tulakan Village" which can add information to the community. In accordance with what [Desriani & Franzia \(2017\)](#) said that the illustrations of the book's contents are adjusted by the target audience or readers, the images presented must also provide a more lively story and show conformity with the contents.

Table 6. Average Validation Results of Material Experts and Media Experts

Validation Results	Percentage (%)	Eligibility Criteria
Material Expert	75	Highly Worthy
Media Expert	92.8	Proper
Average	84	Highly Worthy

The percentage score obtained was analyzed using a likert scale based on the assessment of material expert validators and media expert validators using a validation sheet that included several aspects to assess the ethnobotanical results book developed. The validation results from material experts and media experts show an average percentage of 84% which indicates that the book is very feasible, as listed in [Table 6](#). This validation shows that the ethnobotanical results book is very suitable for use because it includes aspects and indicators that are in accordance with the criteria for the development of an ethnobotanical reference book. This assessment includes criteria such as clarity of the material, adequate coverage, and adequate depth of material, in accordance with reference book standards. According to which requires a problem formulation, a clear methodology, complete support of current data or theory, as well as adequate conclusions and bibliography [Dikti \(2009\)](#).

After validation by material experts and media experts and revisions. To determine the feasibility of the ethnobotanical book, a response test was carried out to the community in Tulakan Village. This response test was used to obtain suggestions and inputs as well as to determine the feasibility of the product with a total of 10 respondents from different backgrounds including village officials, villagers, and Biology Education students. The data obtained from the results of community responses can be seen in [Table 7](#).

Table 7. Community Response Analysis

No	Statement	Percentage (%)	Category
Product eligibility			
1	Suitability of material with sub-chapters	97	High
2	The material presented is relevant to the current conditions	100	High
3	Adding information to improve knowledge of ethnobotanical studies	96.7	High
4	The material presented is interesting and easy to understand	90	High
5	The concept presented does not give rise to many interpretations	90	High
6	Consistency of the systematics of the dish	93.3	High
7	The reference book contains ethnobotany-based material on the local wisdom of the Jembul Tradition	96.7	High
Average aspect		94.8	High
Serving Components			
8	Interesting developed products	93.3	High
9	The language used is simple and easy to understand	93.3	High
10	The images presented are relevant to the material	93.3	High
11	Graphic design of the reference book is interesting to read	96.7	High
12	Creative and dynamic according to today's conditions	90	High
13	Clarity of image presentation	90	High
14	The illustrations in the reference book are able to reveal the meaning/meaning of the object	93.3	High
15	Creative and dynamic according to today's conditions	93.3	High
Average aspect		92.9	High
Total average		93.8	High

From the overall assessment of the product by material experts and media experts in the form of ethnobotanical books, then a response from the community was carried out. The community readability test was carried out by 10 respondents which included village officials, communities and Biology Education students. The readability test of ethnobotanical study reference books obtained an average of 93.8% with High Category can be seen in [Table 5](#). which includes aspects of product feasibility and serving components that can be understood by the public because reference books are presented in simple and easy-to-understand language according to the reader's ability which means that this book is very worth using. This is in agreement with [Fajaraningtyas & Hidayat \(2019\)](#) that Reference books are considered good if the text is easy to understand according to the reader's ability, which affects the success of understanding the reading material.

From the data of a thorough evaluation of the reference book based on the research of the Jembul Tradition in Tulakan Village, it shows that the book meets the standards as a reference book with very feasible or good research results. This evaluation is in accordance with the eligibility criteria for reference books contained in the 4D Data Analysis Technique, covering aspects such as the suitability of material sources with research results, writing systematics compiled by the author, and the use of fonts and font sizes that facilitate reading and comprehension. The results of validation by material experts and media experts reached an average of 84% with a very feasible category. In accordance with the reference book developed entitled "Ethnobotanical Study on the Jembul Tradition in Tulakan Village" which can be declared "Very Feasible" to be used as a reference book.

Conclusion

Based on the research that has been concluded, the plants used in the Jembul Tradition in Tulakan Village use 35 Plant species grouped into 22 order-level botanical diversity which includes order Order Poales, United States Fabales, Zingiberales, Solanales, Rubiales, Magnoliales, Musales, Sapindal, Rosanales, Pandanales, Rosales, Papavorales, Apiales, Morales, Caryophyllales, Rhodales, Arecales, Liliales, Asparagales, Myrtales, Vitales, dan Lamiales. Feasibility of ethnobotanical reference books for research results obtaining a score of 84% is very feasible by expert validators, this is evidenced by the score obtained by material expert validators of 75% and media expert validators of 92.8%. The percentage of readability of reference books by the public was obtained at 93.8% with a high category.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Author Contributions

S.U.A : writing, S.B.C : Preview 1, E.D : Preview 2

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