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The Potential of *Purun* Plants as a Source for Learning Biology

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Abstract: West Kalimantan has different types of wetlands spread across highland and lowland areas , including rivers, swamps, coasts, mangrove forests, lakes, ponds, reservoirs, and paddy. One of these areas is Mempawah Regency, which is the habitat of various aquatic plants. One of the prominent species in this area is Purun, a type of weed from the Cyperaceae family. *This* study explores the potential of Purun plants as a source of contextual learning and its use by the community in Segedong District. The method used is qualitative descriptive, with data collection techniques through observation, interviews, identification, documentation, and questionnaires to teachers. This study identified two types of Purun, namely the rat *Purun* (*Eleocharis dulcis*) and the lake *Purun* (*Lepironia articulata*), which are used by residents in two villages to making craft products. This plant has great potential to be integrated into the junior high school biology curriculum, particularly in biodiversity, classification, and ecology materials. The results of the evaluation showed a positive perception of Purun as a learning resource: clarity of potential (72.91%), clarity of goals (66.66%), clarity of purpose (70.83%), clarity of information (68.75%), exploration clarity (75%), and yield clarity (70.83%).

Keywords: Biology; Learning resources; Plant; Potential; Purun

Introduction

Wetlands play an important role as natural habitats, providing food and breeding grounds for various organisms. Environmental conditions in wetlands, such as moisture content, soil pH, and nutrient content, can affect the growth of living organisms in them. One type of wetland ecosystem is rice paddies, which serve as habitats for a variety of plants, including species from the family *Cyperaceae* (Putri et al., 2022). *Purun* (*Eleocharis dulcis*) is a type of shrub that thrives in swamp ecosystems. Geographically, the location of the village in the lowlands with wetland conditions supports growth Natural and abundant *Purun*. The abundance of vegetation encourages the local community to cultivate and utilize *Purun* as a raw material for the manufacture of various handicraft products that are not only of high aesthetic value but also of high economic value. Processing *Purun* It is carried out by considering the preservation of the ecosystem, because the existence of these plants continuously plays an important role in maintaining environmental balance and providing significant socio-economic benefits to the local community (Rahmadi et al., 2023). Plant *Purun* Generally used by the surrounding community to make handicraft products such as doormats, hats, sandals, bags, and various other items

This plant belongs to the reed family (*Cyperaceae*). In the dry season, *Purun* become flammable if dried and can cause land and forest fires, especially in peatlands. Therefore, proper ecosystem management is essential to prevent *Purun* become a source of fire hazard and on the contrary increase its use in a sustainable manner. Plant *Purun* has a rapid population growth so it has high business potential. This plant is generally used as a raw material for handicrafts (Pangaribuan et al., 2017).

Purun It has long been used by some people in various fields, such as livestock (animal feed), health

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(herbal medicine), and beauty (acne treatment). However, its use must be accompanied by efforts to preserve the plant. As an endemic species in peatlands and swamps, *Purun* It plays an important role in maintaining biodiversity by providing habitat for various species such as waterbirds, insects, and small fish. Therefore, the preservation of the ecosystem *Purun* It is essential to prevent environmental damage. One of the concrete efforts that can be made is to include *Purun* in environmental education materials, such as in wetland conservation programs or development traditional weaving skills (Dari et al., 2022).

Learning resources are not only limited to textbooks and classroom props, but also include teachers, school facilities, funds, and the surrounding environment that supports learning. With the advancement of science, teachers can use nature as a contextual and interactive learning medium. For example, the biodiversity found around schools can be used to train students' hands-on observation skills, so they can gain a deeper understanding of the concept of biodiversity through real-life experiences involving all five senses (Situmorang, 2016). Learning resources are everything that learners can use to learn content and gain learning experiences aimed at achieving a specific goal. These resources include people, tools and materials, activities, and learning environments (Nasruri et al., 2021).

The purpose of this study is to explore the potential of purun plants as a source of contextual biology learning as well as knowing the various forms its use by the people in Segedong District in their daily lives. (1) To explore the potential of planting an purun as a source of biology learning. (2) To find out theutilization of purun plants by the community in Segedong District.

Method

This research is descriptive and exploratory. This method of research is used to describe and interpret the data obtained to explain the phenomenon that occurs. The research was conducted in December 2024 for 4 days, namely on the 17th to the 21st, in Peniti Dalam I Village and Peniti Dalam II Village, Segedong District, Mempawah Regency, West Kalimantan Province. Exploration was carried out to collect data on the types of *Purun plants*, their potential, and the parts of the plants used by the local community. The respondents in this study amounted to 22 residents of Segedong District. The instruments used in this study included observation sheets, interview guidelines, identification sheets, and questionnaires. The questionnaire contains indicators of alignment between the potential *of Purun* plants and biological content. The questionnaire is validated by a panel of experts before use. Data analysis was carried out using qualitative descriptive analysis, which aims to provide a detailed description of the potential of *Purun plants* that can be used as a source of biology learning for students and teachers in schools.

The data was analyzed using the Likert scale which contains a list of statements with a choice of answers: SS/S (Strongly Agree/Agree), TS/STS (Disagree/Strongly Disagree). To calculate the percentage of the teacher's answer, the following formula is used:

$$P = f/n \times 100\% \quad (1)$$

Information:
P = Percentage
f = Total score obtained
N = Maximum score

The following is the range of percentage values of the results of the plant potential questionnaire which is analyzed based on the criteria indicators of the potency category rubric, as seen in Table 1.

Table 1. Teacher Response Criteria (Pratiwi et al., 2019)

Score	Featured Categories
76-100%	Very good
51-75%	Good
26-50%	Adequate
0-25%	Not Enough

Result and Discussion

The Potential of Purun Plants as a Learning Media

Purun has the potential to be a source of biology learning in junior high schools (SMP) for the subjects of Biodiversity, Classification of Living Things, and Ecology and Environment. Based on the observations, there are two types of *purun* plants used by the community in Peniti Dalam I Village and Peniti Dalam II Village. *Purun* lake and *Purun* rat are cultivated wild plants, and some people still use *these purun* plants in their daily lives because of the potential they have that can provide economic value.

The Importance of Planting Trees in Segedong District

Mempawah Regency is one of the areas where the majority of the population is Malay. The Malay community in Mempawah Regency still preserves the tradition of handicrafts (weaving), such as the use of *Purun* plants which are still widely used by the community to produce economic value.

Here are some *Purun plants* that can be used for weaving materials in Peniti Dalam I Village and Peniti Dalam II Village:

Table 2. The Importance of Planting Trees in Segedong District

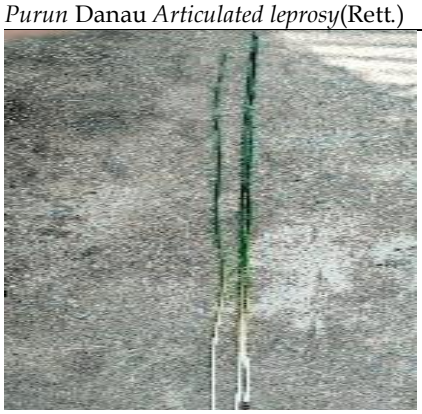
Picture	Classification	Parts Used	Products Produced
 *Purun* Danau *Articulated leprosy*(Rett.)	Kingdom: Plants Order: Pole Family: *Cyperaceae* Genus; *Lepironia* Species: *Lepyronia articulata (Rett.) Love*	Stalk	Broom, Bag, and Doormat.
 Purple Mouse *Eleocharis dulcis (Burm.f.)*	Kingdom: Plants Class: Liliopsida Order; Cyperals Family: *Cyperaceae* Genus: *Eleocharis* Species: *Eleocharis dulcis (Burm.f.)*	Stalk	Weaving Hats

Table 1 presents information about the various uses of *Purun* plants in the village, along with the parts used, classification, and products produced. Each plant has its own benefits. The following are the products that have been produced from *Purun plants*:

Broom

Purun is a traditional cleaning tool that is commonly used by the village community because it is easy and comfortable to use. But over time, *purun woven brooms* began to be replaced by plastic brooms because plastic brooms are more durable and not easily broken.

Woven brooms are cleaning tools made from various natural materials such as bamboo, palm oil, *Purun* , or rattan, through a distinctive weaving technique. This product generally functions to clean the floor while reflecting local wisdom in utilizing available natural resources. Economically, an ideal product should provide extensive benefits to its users, just like a woven broom *Purun* which, although it has limitations in terms of its durability, still provides economic value for the people who make it. Through this production process, people not only preserve traditional skills but also gain economic opportunities that can improve their well-being (Sulaksono et al., 2023).

Figure 1. Broom woven

Figure 1 shows *Purun brooms* which have the advantage of being environmentally friendly because they are made of natural materials. Purun broom is also effective in cleaning dust and dirt efficiently, and has quite good durability. However, this broom also has some drawbacks, such as being less practical for cleaning hard-to-reach areas, and it tends to break down more quickly.

Weaving Hats

Purun weaving is beneficial for farmers because it helps protect the head from heat, rain, and insects. The Purun hat manufacturing industry in Peniti Dalam II Village is still traditional, with a production pattern that tends to be individual and home, so the production capacity is still limited.

The process of making hats *Purun* It is generally done manually, relying on hand skills at every stage of production, including sewing techniques that are still done conventionally without the help of modern machines (Stai et al., 2022).

Figure 2. Weaving hats (personal source)

Figure 2 shows the *Purun hat*. The advantages of *Purun hats* include lightweight, easy to use, and environmentally friendly. However, *Purun hats* also have disadvantages, such as a poorly developed design, so they are less in demand by the public.

Bag Wavens

Bags are one of the items that are still used by the people in Peniti Dalam I Village and Peniti Dalam II Village to this day. People there use bags for shopping and during celebrations.

Bags are one of the functional items used by various age groups so that they become a universal need. Even though it is woven Purun It has interesting characteristics and aesthetics, but its existence continues to experience fluctuating dynamics along with changing trends and the development of the times. From year to year, woven handicraft products Purun continue to undergo adaptation to remain relevant in society. One of its most common uses is woven bags Purun which is often used by women in various daily activities, such as attending prayers at mosques, shopping at the market, socializing with friends, or traveling for recreational purposes (Latte et al., 2022).

Figure 3 shows *Purun* bags that have several advantages: eco-friendly, unique, and stylish, and play a role in peatland conservation. In addition, these bags can help build the local economy. However, *Purun* bags also have some drawbacks: their durability is low, so they are easily damaged if exposed to water or moisture.

Figure 3. Woven bags

Weaving Mat

Purun woven mats are generally used by people in villages as a sitting and sleeping mat. However, this mat is also used for large events such as yasinan, celebrations, women's gatherings, and many more.

Mats, which are traditional weaving, are commonly used as a seating or sleeping mat. These mats are used by the community in various important events, such as yasinan, celebrations, and other religious social events that involve many people and require spacious and comfortable seating. The process of making woven mats *Purun* it consists of five stages, namely drying, mashing, dyeing, drying again, and weaving (Mulyana et al., 2017).

Figure 4. Weaving mats (private source)

Figure 4 shows the *Purun mat*. The advantage of *this Purun mat* is that it is environmentally friendly, easily decomposed, and made of natural materials that help maintain the peat swamp ecosystem. However, *Purun* mats also have some drawbacks: their processing takes

a long time and is more complicated compared to synthetic materials. In addition, *Purun mats* are more susceptible to damage and become dirty if exposed to water or moisture, especially during the rainy season.

In addition to being a woven material, plants *Purun* It also has an important ecological role, such as as a biological control agent for rice stem borer pests by catching their eggs. In addition, the ability of the plant *Purun* In absorbing heavy metals, it makes it an effective biofilter to filter and neutralize various toxic compounds dissolved in water, thereby contributing to improving water quality in the environment (Suprapto, 2019).

Cyperaceae is a family of plants consisting of 80 genera and more than 3,000 species. The distribution of Cyperaceae is extensive, flourishing all over the world. This plant is found in polar regions, temperate regions, to dry areas in the northern and southern hemispheres. Species of the Cyperaceae family grow in terrestrial ecosystems and near waters (Sarah et al., 2022).

The potential of *Purun plants* as a source of biology learning, through the results of observations, interviews, documentation, and filling out teacher response questionnaires, shows that *Purun plants* are considered suitable for use as a source of biology learning. The potential *of Purun plants* is in accordance with the biology curriculum for junior high school students.

Learning resources must meet certain criteria, including: clarity of potential, alignment with goals, clear goals, clear information conveyed, clear exploration, and clarity of expected outcomes. Learning resources are an important element in supporting the learning process (Kabani et al., 2023).

Feasibility of Purun Plants as a Source of Biology Learning

The feasibility of *Purun plant's potential* is determined based on the criteria of learning resources, including clarity of potential, clarity of purpose, alignment of goals, clarity of information that can be disclosed, clarity of exploration guidelines, and clarity of expected outputs.

Table 3. Feasibility of Purun Plant Potential as a Source of Biology Learning

Aspects	Percentage	Interpretation
Clarity of Potential	72.91%	Good
Clarity of Purpose	66.66%	Good
Clarity of Purpose	70.83%	Good
Clarity of Information Presented	68,75%	Good
Clarity of Exploration Guidelines	75%	Good
Clarity of Expected Outcomes	70.83%	Good
Average	70.83%	Good

The feasibility of plant potential was obtained based on the results of questionnaires from 5 respondents (science teachers) from 3 schools, namely: SMP Negeri 01 Segedong, SMP Negeri 02 Segedong, and SMP Negeri 03 Segedong.

Clarity of Potential

The clarity of the potential of an object is determined by the availability of the objects and problems that are revealed, in order to produce research outputs that are in line with the objectives of the curriculum. The object of this research is plants *Purun*, with information obtained from the potential of the plant *Purun* itself. Meanwhile, the problem raised is the limited availability of research-based learning resources from the surrounding environment that can be used for biology learning on the topics of Biodiversity, Classification of Living Things, and Human Ecology and the Environment (Purbosari et al., 2022).

Clarity of Purpose

Based on the validation results, the alignment of learning objectives, namely providing an understanding of the diversity of living things and their roles, can support a systematic, structured, and relevant learning process. A thorough and systematic alignment of learning objectives is necessary to ensure that the learning process is aligned with the expected learning outcomes (Fendiyanto, 2025).

Clarity of Target Materials

The clarity of the target material refers to the object of observation and the subject of the research (the intended target). The object of observation is the result of observation of the potential *of Purun plants*, while the subject matter (target) is junior high school students, especially in science subjects class VII (Classification of Living Things) and class IX (Human Ecology and Environment). This is known through the results of the analysis that have been verified, showing that the results of this study are in accordance with the Basic Competencies (KD) of junior high school.

Biology material mostly discusses living things, the natural environment, and the phenomena that exist in them. One of the topics studied in biology is living things, specifically the classification of living things. The classification of living things in the surrounding environment makes it easier for students to observe different types of plants *Purun* by using his five senses (Fitri et al., 2021).

Clarity of Information Revealed

The clarity of the information revealed in this study is that there are two types of *Purun* plants, namely *Purun* rat and *Purun* lake. The information obtained from the observation results is clearer and according to the facts because students are directly exposed to the environmental conditions of Peniti Dalam I Village and

Peniti Dalam II Village. This is in line with the results of research by Rachmasari et al. (2016) who stated that research that is used as a learning resource must provide clear information/material which is then revealed and communicated through learning resources.

Clarity of Exploration Guidelines

The clarity of the guidelines for exploring field work procedures begins with the determination of research objects, tools and materials, work methods, data analysis, and drawing conclusions. In this study, the use of *Purun* plants as natural facilities and laboratories for biology learning, because there are no practical instructions prepared by the researcher. Learning can be done outside the classroom by utilizing the natural environment (outdoor education). This is in line with the opinion of Ridwan et al. (2023) who states that the experience gained by students from outdoor learning will have a longer impact, because by observing, hearing, and experiencing firsthand the phenomena in the surrounding environment will increase students' interest in learning.

Clarity of Expected Outcomes

The potential of *Purun* plants in Peniti Dalam I Village and Peniti Dalam II Village, Segedong District, Mempawah Regency, with its extraordinary natural resources, can be used as a source of biology learning. This is expected to improve cognitive, affective, and psychomotor aspects.

The cognitive aspect obtained from the utilization of local potential in Peniti Dalam I Village and Peniti Dalam II Village is that students are able to think at a high level to gain knowledge by describing, classifying, and analyzing the types of *Purun* plants found.

Affective achievements for students include honesty, meticulousness, discipline, cooperation, and responsibility for the results of their activities. In addition, students develop positive scientific attitudes, such as protecting, caring for, and utilizing nature and the environment responsibly. His psychomotor achievements include developing students' skills in using tools and organizing research data by making observation tables, as well as fostering student independence.

The learning process is an integration of the teaching and learning process. For students, learning is not just a transfer of knowledge from teachers or material from textbooks. In general, conditions in the field show that learning is a process of transferring information from teachers to students (Harahap et al., 2020).

Plant *Purun* the lake is a type of shrub that is used by the people of Peniti Dalam I Village and Peniti Dalam II Village. However, people tend to make more use of *Purun* Rats compared *Purun* Lakes due to quality *Purun* Rats are better, and the stems are stronger. Plant *Purun* São Paulo (*Lepironia articulata*) is a wild shrub that grows in wetland ecosystems, such as flooded swamps, shallow peat river banks, and acidic soils. This plant is often considered a weed due to its abundant growth in the area. The stem is glossy green, 2–8 mm in diameter, cylindrical in shape, grows upright, and does not branch (Abdan et al., 2023).

Figure 5. Purun lake and *purun rats plants*

Purun Rats are wild plants that grow in tidal areas with acidic sulfate soils and swampy areas. The local community uses it as a raw material for handicrafts and to increase soil fertility. This plant serves as a source of organic matter and a natural biofilter that is able to absorb heavy metals such as iron (Fe), aluminum (Al), sulfate (SO_4), lead (Pb), mercury (Hg), and cadmium (Cd). *Purun* Rats have rhizome roots that begin to form buds at age 6 – 8 weeks. Flowers appear after the buds grow above the surface of the water, reaching a height of about 15 cm. The rhizome is short, with long stolons with flattened and rounded ends, and brown to black. The stem is erect, not branched, with a length of 50–200 cm and a diameter of 2–8 mm (Nurhayati et al., 2024).

Conclusion

Based on the results of this study, it shows that Purun plants, which grow abundantly in wetlands in Segedong District, West Kalimantan, have great potential as a source of learning contextual biology at the junior high school level, especially in biodiversity, classification, and ecology materials. Two types of Purun identified, namely *Eleocharis dulcis* and *Lepironia articulata*, have been used by the local community as raw materials for handicrafts. The results of the evaluation showed that teachers had a positive perception of the use of Purun as a learning medium, seen from various aspects of clarity of potential, goals, objectives, information, exploration, and results. The author would like to express his deepest gratitude to all parties who have contributed to the implementation of this research.

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