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Identifying the Potential Medicinal Plants in Tualang District, Siak Regency

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Abstract

Many individuals residing in the Tualang District cultivate various medicinal plants; however, a significant portion of the population lacks awareness regarding the specific types and associated therapeutic properties. In general, only parents possess this knowledge. Therefore, further research is necessary to explore the variety and advantages of medicinal plants. The primary objective of this research is to categorize different varieties of therapeutic flora, their advantages, methods of application, and techniques for cultivation within the Tualang District. This research was carried out utilizing a survey methodology, employing various data collection methods, including interviews, and identifying and documenting medicinal plants. The study involved conducting observations and collecting data on the various types of medicinal plants, their associated benefits, methods of utilization, and cultivation practices as practiced by the residents of Tualang District. The data analysis in this research employed quantitative descriptive and qualitative descriptive methods. The information is displayed in tabular format. The research findings demonstrated that the respondents in Tualang District utilized and cultivated 41 different types of medicinal plants. Participants employed different methods to use medicinal plants. Participants cultivated medicinal plants through stem cuttings, rhizome cuttings, grafting, and direct seed planting. Medicinal plants are maintained through various agricultural practices, including watering, weeding, hilling, fertilizing, and implementing measures to control pests and diseases.

Keywords: Celery, Galangal, Ginger, Lemongrass, Moringa

1. Introduction

Medicinal plants are defined as those species whose entire structure or specific parts can serve as standard materials or components in preparing traditional medicinal concoctions (Qamari et al., 2017). A diverse array of these plants is commonly cultivated in domestic gardens and yards. The utilization of plants with medicinal properties can commence right from the home garden (Mindarti and Nurbaeti, 2015).

Indonesia is rich in medicinal plant resources, boasting over 30,000 species (Fernandes et al., 2019). These plants are distributed across nearly all provinces in the country, including Riau Province. Within Riau, the Tualang Sub-district is notable for its variety of medicinal plants that are actively employed by the local population.

People in Tualang District encounter difficulties accessing medical supplies, which challenges the local health sector. According to preliminary research observations, the prevalent health issues within the community include gout, hypertension, high cholesterol, cough, fever, and stomach ulcers. The community needs to know the proper utilization of medicinal plants in order to reduce the potential adverse effects associated with the use of pharmaceutical drugs. Utami (2018) asserts that traditional medicinal plant treatment has inherent advantages due to its use of natural materials, which allows for minimized side effects and optimal effectiveness.

Following a pre-research observation of the Adventure District community, it was noted that numerous residents cultivate medicinal plants in their home gardens, including lemongrass, turmeric, galangal, and various other plant varieties. After conducting brief interviews, observations, and preliminary research, it was discovered that individuals still lack knowledge regarding the types and benefits of medicinal plants.

The understanding of the various types and medicinal uses of plants is typically only possessed by individuals of a certain age. Without passing down this knowledge, it is at risk of being lost over time (Noorcahyati, 2012). In a study conducted by Maulidiah in 2019 at the District Sugarcane

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Plantation in West Lampung Regency, it was discovered that 81 out of 100 participants aged 25 and below do not use medicinal plants as a form of medicine. Additionally, some of these respondents expressed a lack of understanding of the proper medicinal plant methods.

Efforts to address this issue are essential for identifying diverse plant species that serve as effective medicines. It is important to acknowledge that public awareness regarding these medicinal plants is currently limited. The identification process is crucial in recognizing medicinal plants that have not yet gained widespread recognition. According to Suryadarma (2008), identifying medicinal plants can be achieved through documentation and ethnobotanical studies. Ethnobotany leverages traditional community knowledge, offering insights and values that enhance the understanding of cultural practices related to the use of medicinal plants.

In recent years, various researchers have conducted studies focusing on the types of medicinal plants and their applications within local communities. For instance, Suhendra et al. (2022) identified 35 species of medicinal plants utilized as traditional remedies in Dahari Indah Village. Similarly, Warida et al. (2017) discovered 26 types of medicinal plants employed for traditional medicine in Rambah Hilir District. However, there is currently a lack of literature examining the types of medicinal plants in Tualang District, indicating a need for further research to gather information on traditionally used medicinal plants.

This study aims to identify the various types of medicinal plants, their benefits, methods of utilization, and cultivation practices within Tualang District, Siak Regency.

2. Material and Methods

This research was conducted for 3 months from March to May 2024 in six villages in Tualang District, Siak Regency. The villages selected as research locations were Perawang Barat Village which is located between 0°42′10.8″N 101°33′3.6″E with an altitude of 20 m above sea level, Pinang Sebatang Barat Village which is located between 0° 44′ 2.4″ N, 101° 36′ 21.6″ E with an altitude of 26 m above sea level, Pinang Sebatang Timur Village is located between 0° 43′ 44.4″ N, 101° 39′ 21.6″ E with an altitude of 9 m above sea level, Tualang Village is located between 0° 38′ 27.42″ N, 101° 36′ 23.65″ E with an altitude of 20 m above sea level, Perawang Subdistrict which is located between 0° 39′ 54″ N, 101° 35′ 38.4″ E with an altitude of 25 m above sea level and Pinang Sebatang Village which is located between 0° 40′ 26.4″ N, 101° 39′ 25.2″ E with an altitude of 9 m above sea level. The sample plots of the research location in Tualang District can be seen in Figure 1.

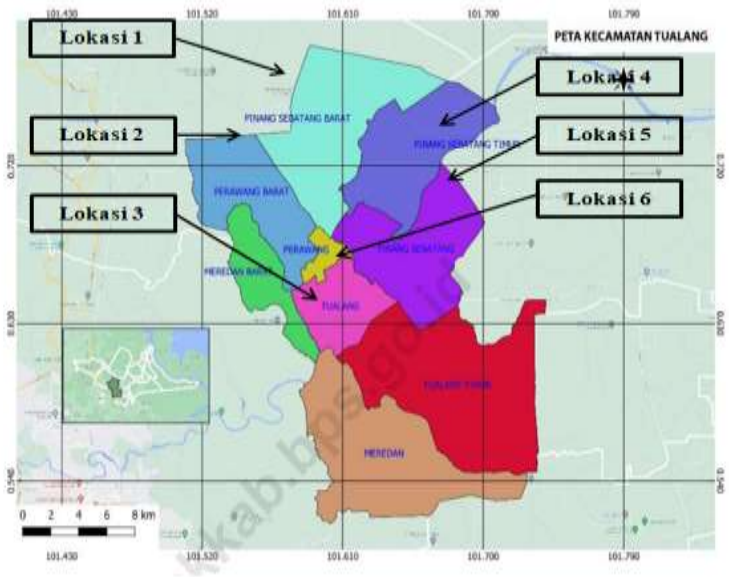

Figure 1. Sample plot of research location in Tualang District.

The study utilized medicinal plants sourced from respondents' yards in Tualang District, Siak Regency, Riau Province. The research employed various tools, including questionnaire sheets, reference texts for plant identification, cameras, voice recorders, and stationery.

The sampling method applied in this research was purposive sampling, which involves selecting samples based on specific criteria or considerations (Sujarweni, 2023). 127 respondents were identified, all possessing medicinal plants in their yards and knowledgeable about their uses. This number was determined through preliminary observations and brief interviews conducted within each village.

The research employs a survey methodology. The stages of the research process are as follows: (1) initial observation, which involved examining the yards and surrounding environments of residents in Tualang District. This observation aimed to provide a comprehensive

understanding of the local population's utilization of medicinal plants. (2) Interviews were conducted to gather information from various sources. The data collected included the names of plants, their benefits, the specific parts used, processing methods, and cultivation techniques. (3) Direct observation of plants in their natural settings was carried out in collaboration with respondents. (4) The identification of medicinal plants involved comparing the morphological characteristics of the plants cultivated by respondents with those documented in the book "Family Medicinal Plants, Ancestral Heritage" authored by Nurchayati, Hasyim, and Ikhwanul in 2021, along with other relevant literature that aids in plant identification. (5) Documentation was utilized to reinforce the observational data collected in the field, primarily through photographic evidence. (6) The validity of the data was assessed using the triangulation method, which involved cross-checking and comparing the observational data with the information obtained from interviews.

The data analysis for this study involved the utilization of both quantitative descriptive analysis and qualitative descriptive analysis, which was rooted in the respondents' knowledge regarding the usage of medicinal plants within traditional medicine. In Tualang District, the community's use of medicinal plants and their methods for propagating them were evaluated using qualitative descriptive analysis. The analysis involved an in-depth examination of the data using Microsoft Word 2010, focusing on qualitative descriptions. The study employed quantitative descriptive analysis to assess the distribution of respondent characteristics, the utilization of medicinal plants, the application of fertilization, and the management of pests and diseases in medicinal plants. The information is displayed in a table format. Quantitative descriptive analysis was conducted utilizing the software Microsoft Excel 2010.

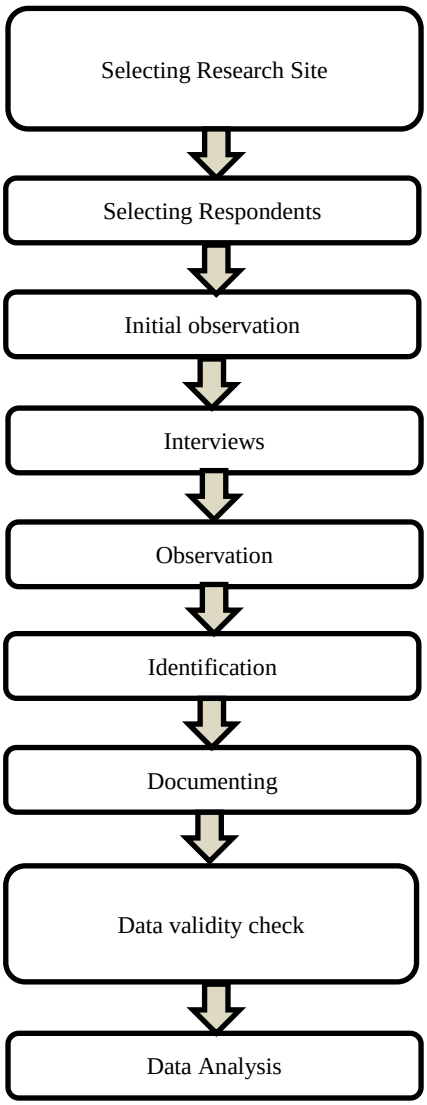

Figure 1. Research flow diagram

3. Results and Discussion

The survey results obtained from 127 respondents indicated variations in their characteristics. The characteristics of respondents in Tualang District are delineated in Table 1 below.

Table 1 indicates that the youngest participant in the study was 25 years old, while the oldest was 65. It is observed that younger participants tend to possess less knowledge than their older counterparts, which subsequently affects their engagement with using plants for medicinal purposes. Tima et al. (2020) noted that knowledge regarding medicinal plants is traditionally transmitted through generations; however, with the advancements in the medical field, this information is increasingly not shared with younger individuals. Consequently, there is a notable lack of understanding regarding the application of medicinal plants among respondents under the age of 20.

Table 1. Respondent Characteristics Subdistrict Adventure

Respondent Age (Year)	Amount (Person)	Percentage (%)
25 – 35	22	17
36 – 45	36	29
46 – 55	42	33
56 – 65	27	21

The identification process carried out across six villages in the Tualang District—namely Tualang Village, Pinang Sebatang Timur Village, Pinang Sebatang Barat Village, Pinang Sebatang Village, Perawang Barat Village, and Perawang Sub-district—revealed that the local community utilizes 41 different types of medicinal plants, which are cultivated in their home gardens. A comprehensive list detailing the plants, the specific parts used, methods of utilization, and the associated benefits can be found in Table 2.

Table 2. Benefits of Plants Medicinal properties

Plant Name	Parts used	How to use	Benefits of plants
Avocado	Leaf	Boiled	Lowering blood pressure and cholesterol
Bangles	Rhizome	Boiled to drink or grated and applied to warm the body.	Treats stomach aches, scabies, ulcers, stomach disease, coughs in children, colds in children, warms babies, prevents flu in babies and can be used as a *Parem.*
Binahong	Leaf	Boiled to drink or pureed to apply to the area affected by breast cancer.	Treats back pain, cholesterol, and gout and relieves breast cancer pain
Brotowali	Leaf	Boiled to drink	Lowering tension
Plant Name	**Parts used**	**How to use**	**Benefits of plants**
Ginger	Rhizome	Boiled to drink	It treats colds, lowers cholesterol and blood pressure, treats coughs, and warms the body.
Red ginger	Rhizome	Boiled to drink	Warms the body, treats coughs and treats bloating.
Guava	Leaf	Boiled to drink	Treat stomachache and diarrhea.
Fence distance	Leaf	It is kneaded to be rubbed on the body, roasted to be applied to the stomach, and the sap from the stem is used for wounds and toothache.	Treating fever, colds, treating wounds and treating toothache
Jeringau	Rhizome	Boiled to drink or can also be grated to be applied to a baby with a fever.	Treating fever in babies and treating colds
Lime	Fruit	Squeeze the fruit	Treating cholesterol and cough
Katuk	Leaf	Boiled as vegetables	Facilitates breast milk (mother's milk)
Cruel glass	Leaf	Boiled to drink	Lowers blood sugar, treats tingling, gout, high blood pressure, cholesterol and back pain
Green coconut	Fruit	Consume the water and fruit flesh directly	Treats internal heat, fever, and stomach ache and increases body ions.
Plant Name	**Parts used**	**How to use**	**Benefits of plants**
Moringa	Leaf	Boiled to drink and ground to make a mask	Remove wrinkles, lower cholesterol, lower blood sugar, treating aches and pains and as an anticancer
Basil	Leaf	Eat it straight away	Eliminate bad breath
Hibiscus	Leaf	Knead with added water to drink or apply to the body	Treating fever and internal heat
Aromatic ginger	Rhizome	Boiled to drink and grated to extract the juice	Increases appetite, warms the body, treats colds, aches and pains, chronic ulcers, coughs, constipation and can be used as a *Parem*
Kitolod	Leaves and flowers	Boil or soak in plain water, then drip into the eyes.	Treating the eyes
Cat whiskers	Leaf	Boiled to drink	Lowers high blood pressure, treats gout, liver disease or jaundice, back pain, aches and pains, diabetes, kidney disease, fever, kidney stones, cholesterol, and rheumatism and facilitates urination.
Turmeric	Rhizome	Boiled to drink and grated to apply to injured areas.	Treating stomach aches, ulcers, gastric diseases, healing internal wounds during childbirth, bloating, aches and pains, coughing or shortness of breath, treating external wounds, facilitating digestion, reducing fever, refreshing the body and increasing stamina.
Black turmeric	Rhizome	Boiled to drink	Treating the stomach

Plant Name	Parts used	How to use	Benefits of plants
White turmeric	Rhizome	Boiled to drink	Treating stomach acid, preventing cancer, treating cancer, lowering blood pressure, treating headaches, treating stomach ulcers, facilitating bowel movements and reducing weight
Ginger	Rhizome	Boiled to drink and ground or blended to extract the juice, then drink.	Treating bloating
Galangal	Rhizome	Boiled to drink	Cures coughs, refreshes the body and treats shortness of breath
Aloe vera	Leaf	Apply the gel from the leaves to hair, eyebrows, or wounds, knead it to apply to the body when One has a fever, and boil it or juice it to drink.	Thickens hair, treats fever smoothes face, softens hair, thickens eyebrows, lowers cholesterol, treats wounds, makes eyes healthy and eliminates dandruff.
Noni	Fruit	Boiled or squeezed to drink	Prevent cancer, lower high blood pressure, and cure cholesterol.
Meniran	Leaves, stems and roots	Boiled to drink	Treats stomach ulcers, back pain and lowers blood sugar
Pawpaw	Leaf and fruit	Boil the leaves to drink and eat the fruit directly	Facilitates digestion, increases appetite and also treats diarrhea.
Rosella	Flower	Boiled to drink	Lowering tension
Regards	Leaf	Boiled to drink	Treats cholesterol, high blood pressure, gout, aches and pains, ulcers and can help refresh the body.
Plant Name	**Parts used**	**How to use**	**Benefits of plants**
Sambiloto	Leaf	Boiled to drink	Treating fever and kidney disease
Connect lives	Leaf	Boiled to drink	Cures gout, cholesterol and lowers high blood pressure
Celery	Leaf and stem	Boiled to drink	Lowering tension
Lemongrass	Stem	Boiled to drink	Treats coughs, colds, cholesterol, gout, rheumatism, cramps; treats heart disease, and shortness of breath, reduces body aches and refreshes the body and lowers blood pressure.
Betel	Leaf	Boiled to drink, squeezed and then filtered for eye treatment, and can also be boiled and then washed on the feminine area.	Eliminates bad breath, cleans eyes, eliminates body odor, eliminates vaginal discharge, refreshes the body and acts as an antibacterial.
Red betel	Leaf	Boiled to drink, squeezed and filtered for eye treatment, boiled and then washed on the feminine area.	Treats eyes, lowers blood pressure, lowers blood sugar, treats rheumatism and cleans the feminine area.
Soursop	Leaf	Boiled to drink	Treating cholesterol, diabetes, gout, colds, bleeding gums, treating aches and pains, treating lymph nodes, lowering blood pressure, preventing cancer and treating cancer
Telang	Flower	Brewed with hot water to drink	Treats the eyes, the heart, sore throat, gout, cancer, rheumatism, numbness, lowers blood pressure, lowers cholesterol and as an antioxidant.
Plant Name	**Parts used**	**How to use**	**Benefits of plants**
Key meeting	Rhizome	Boiled to drink or grated and then applied to the body to warm the body.	Treating colds
Curcuma	Rhizome	Boiled to drink	It increases appetite, treats colds, stomach aches, coughs, aches, and pains, and can be used as a parem or balm to treat sprained bodies.
Overlapping water	Leaves, stems and roots	Boiled to drink	Lowers blood sugar, treats gout, improves bone health and treats aches and pains

Table 2 illustrates that the inhabitants of Tualang District utilize 41 distinct types of medicinal plants to treat various ailments. Among these, the tumpang air plant is particularly esteemed for its therapeutic properties. Known scientifically as Peperomia pellucida (L.) Kunth, commonly referred to as Chinese sirih or Chinese spinach in the region, is believed to effectively lower blood sugar levels, alleviate gout symptoms, enhance bone health, and relieve general aches and pains. All parts of the plant—roots, stems, and leaves—are applicable for medicinal use. Consumption methods include boiling, brewing, or incorporating the plant directly into salads. A literature review by Evizal (2013) indicates that the tumpang air plant is rich in various bioactive compounds, including hydroxylated sesquiterpenes such as carotol, flavonoids like acacetin, apigenin, isovitexin, and pellucidatin, as well as phytosterols (e.g., campesterol and stigmasterol), arylpropanoids (e.g., piols), apiols, styrenes, pellucidin, sesamin, secolignans, isoswertisin, xanthones glycosides, and peperomin. Supporting this, research conducted by Pratiwi et al. (2021) suggests that herbal tea derived from the leaves of the tumpang air plant may possess significant potential in the prevention and management of diabetes mellitus.

Different components of medicinal plants, such as leaves, stems, rhizomes, fruits, flowers, and roots, are utilized in various methods to produce traditional herbal remedies. The leaves of the plant are utilized to the greatest extent. According to the study carried out by Hidayah et al. In 2022, leaves are commonly preferred due to their widespread availability and the perceived ease of harvesting and processing them. Furthermore, there is a

belief that leaves possess more beneficial properties than other plant components.

According to the data presented in Table 2, there are various methods available for processing plants, such as brewing in hot water, extracting sap, squeezing, juicing, grating, soaking in plain water, consuming directly, and the most frequently utilized processing method is boiling. This discovery aligns with the study conducted by Musaicho et al., as previously discussed. In 2021, a study conducted in Sebalo Village, Bengkayang District, Bengkayang Regency, found that boiling is the most commonly utilized method for plant processing. Puspitasari et al. (2016) state that boiling medicinal plants is a prevalent method individuals use to consume herbal remedies. This is because this procedure is widely regarded as straightforward and can be accomplished with basic tools. The method for boiling is discussed in the research conducted by Lestari Susanti (2019).

There is a widely held belief that applying this substance to plants can effectively eliminate germs, is comparatively safer than alternative methods, and releases a greater number of compounds from the plants.

The results of interviews with 127 respondents indicated that medicinal plants in Tualang District are propagated using a variety of methods. The propagation methods employed for medicinal plants in Tualang District are delineated in Table 3.

Table 3. Methods of Propagating Medicinal Plants

Name Plant	Generative	Vegetative		Picture Plant
	Seed	Cuttings	Graft	
Avocado	✓			
Bangles		✓		
Binahong	✓	✓		
Brotowali		✓		
Ginger		✓		

Name Plant	Generative	Vegetative		Plant Images
	Seed	Cuttings	Graft	
Red ginger		✓		
Guava	✓	✓	✓	
Fence distance	✓	✓		
Jeringau	✓	✓		
Lime	✓	✓		
K- duck		✓		
Cruel glass		✓		

Name Plant	Generative	Vegetative		Picture Plant
	Seed	Cuttings	Graft	
Coconut in	✓			
Moringa		✓		
Basil	✓			
Hibiscus		✓		
Aromatic ginger		✓		
Cat whiskers		✓		
Turmeric		✓		

Name Plant	Generative	Vegetative		Plant Images
	Seed	Cuttings	Graft	
Black turmeric		✓		
White turmeric		✓		
Ginger		✓		
Galangal		✓		
Aloe vera		✓		
Noni	✓			
Pawpaw	✓			

Name Plant	Generative	Vegetative		Picture Plant
	Seed	Cuttings	Graft	
Rosella	✓			
S nature	✓	✓		
Sambiloto	✓			
Connect lives		✓		
Celery	✓			
Lemongrass		✓		
Betel		✓		

Name Plant	Generative	Vegetative		Picture Plant
	Seed	Cuttings	Graft	
Red betel		✓		
Soursop	✓	✓		
T eagle	✓	✓		
Key meeting		✓		
Curcuma		✓		

According to the interview, participants propagate plant medicinal properties vegetatively, utilizing methods such as cuttings and grafting, and generatively, through seed propagation. Medicinal plants such as kitolod, meniran, and tumpang air exist in the Tualang District and can be found in their natural wild state.

According to the results of interviews with 127 respondents, most participants grew medicinal plants directly in their yards without incorporating additional planting media mixtures. However, some respondents reported incorporating rice husks, goat manure, or chicken manure into the planting media mixture at the onset of planting.

Overall, participants tended to water the plants daily in the dry season but refrained from watering them during the rainy season. As indicated by Nurwardani (2008), irrigation is conducted using a sprinkler system during the dry season or periods of no rainfall. Watering should be conducted in the morning or evening, as doing so during the day can harm plants, specifically causing a sudden surge in transpiration rates.

The interviews indicate that nearly all participants engage in weeding activities around their cultivated plants. The method employed by these respondents for weeding is primarily mechanical, involving manually removing weeds surrounding the plants. As noted by Nurwardani (2008), weeding aims to eliminate unwanted vegetation from the land. Weeds pose a threat as they compete for essential resources such as water, nutrients, and sunlight. Additionally, they can serve as hosts for specific pests and

diseases or facilitate cross-pollination with cultivated plants. During the weeding process, respondents typically also perform hilling to enhance aeration near the plant roots. The analysis of interviews with 127 respondents revealed a variety of fertilizers utilized, as detailed in Table 4.

Table 4. Fertilizing nutritious plants drug

Types of Fertilizers	Number of people)	Percentage
Do not do fertilization	71	56%
Fertilizer pen chicken	22	17%
Fertilizer waste fish washing	2	1%
Rice husk fertilizer paddy	1	1%
Washing water fertilizer rice	5	4%
Empty bunch fertilizer	1	1%
Fertilizer skin onion red	1	1%
Fertilizer N	4	3%
Fertilizer NPK compound	20	16%

Based on the findings from interviews with 127 participants, it was generally observed that the majority, i.e. 56%, did not use fertilizers. However, it was also revealed that respondents engage in fertilization, utilizing both inorganic and organic fertilizers. The respondents utilized various types of organic fertilizer, with 17% using chicken manure, 1% using fish waste wash, 1% using rice husk, 4% using rice washing water, 1% using an empty bunch, and 1% using red onion skin as fertilizer. The respondents utilized inorganic fertilizers, specifically a 3% nitrogen fertilizer and a 16% compound nitrogen-phosphorus-potassium (NPK) fertilizer. One of the fertilizers in which survey participants have confidence for enhancing crop productivity is using rice washing water as fertilizer, according to the findings of Kustiawan and colleagues. In the year 2024, it was found that the water used to wash rice can significantly improve plant growth. The use of rice washing water not only supplies the necessary hydration for Caisim mustard greens but also provides vital nutrients for the plant.

The findings from the conducted interviews revealed that respondents in the Tualang District utilized various approaches to manage pests and diseases, as outlined in Table 5.

Table 5. Pest control and medicinal plant disease

Types of Pest and Disease Control	Number of people)	Percentage
Not doing pest and disease control	105	83%
Pesticide from onion white	4	3%
Pesticide from lemongrass	1	1%
Pesticide from onion red	3	2%
Pesticide papaya leaves	1	1%
Insecticide Decis	3	2%
Pesticides from dishwashing soap	3	2%
Pesticide from cigarette butts	1	1%
Control in a Mechanic	6	5%

The findings presented in Table 5 indicate that the interviewed respondents employed various methods for pest and disease management, including the use of botanical and chemical pesticides and mechanical control techniques. Specifically, the pesticides utilized by the respondents comprised a 3% garlic pesticide, a 1% lemongrass pesticide, a 2% shallot pesticide, a 1% papaya leaf pesticide, a 2% Decis insecticide, a 2% dishwashing soap pesticide, and a 1% cigarette butt pesticide, alongside a 5% implementation of mechanical control. Notably, a significant majority, approximately 83%, of the respondents did not engage in any form of pest and disease control. This lack of action can be attributed to the infrequent pest and disease attacks on the medicinal plants cultivated by the respondents. Among the various pesticides, the shallot-based pesticide was particularly regarded by respondents as effective in managing pest and disease issues. Supporting this belief, research conducted by Maryanti et al. (2024) demonstrated that an increase in the concentration of onion skin enzyme solution correlates with a higher mortality rate of armyworms (Spodoptera litura).

4. Conclusion

The research findings indicate that 41 different types of plant-based therapeutic remedies were utilized and propagated by the participants in the Adventure District. The participants use medicinal herbs in a range of methods. The participants propagate medicinal plants through stem, rhizome cuttings, grafting, and direct seeding. The care of medicinal plants involves regular watering, removing weeds, forming hills, applying fertilizers, and managing pests and diseases.

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