

Perceptions and attitudes of the community in Patutrejo Village, Purworejo, Central Java towards Jalawure

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Abstract. Jalawure (*Tacca leontopetaloides* L) is a type of plant that has a habitat in the coastal. Tubers of jalawure are used as alternative food ingredients because they contain starch (amylose and amylopectin). Jalawure is known by the coastal communities in Patutrejo Village Grabag Purworejo, Central Java as *mureng*. However, many people have not known its use. This study aims to determine the perception and attitude of the community towards jalawure. Data was collected through interviews with members of the local community and village head. The data obtained were tabulated and analyzed using a Likert Scale. The study was conducted from October 2020 to March 2021. The results showed almost all respondents know jalawure because they had seen jalawure directly either in the yard or garden or in forest areas in their villages. In total, the perception and attitude of the community on cultivation, benefits, processing, and marketing of jalawure are moderate, this is indicated by the value of all statements which show a value of more than 50%. These positive perceptions and attitudes can be used for the development of jalawure through jalawure cultivation activities so that the community does not depend on jalawure plants that grow wild/ naturally.

1 Introduction

Even though Indonesia has high biodiversity, the level of food security is still low. This is because the staple food of the Indonesian people is only rice. In fact, foodstuffs derived from carbohydrates from tubers are still widely spread in all corners of Indonesia which can be a source of carbohydrates as an alternative food [1]. Jalawure (*Tacca leontopetaloides* Kunz.) is a bulbous herb [2, 3], up to 2 meters in height. The tubers are rounded, the midrib leaves are wide, the stems are grooved, and the fruit is dark green [4].

This tuber can store water and carbohydrates. Its advantages have the potential as an alternative carbohydrate source for dry and coastal areas [3,5,6] because a high carbohydrate content, which is equal to 80-88% [5, 1] and because its composition is comparable to the starch of potatoes and corn and can be used to replace rice and flour as a staple food [1]. However, despite its promise, jalawure is underutilized due to farmers' restricted cultivation [7] and is restricted due to a scarcity of resources [6].

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In Indonesia, jalawure is known as Kecondangin Central Java, Mure in Yogyakarta, Jalawure in Garut, Taka in Sumatra, and Lorkongoto'o in Madura[4], Anuwun [8].The community of Patutreja Village calls it Muring. The mention of the name Muring is rather close to Mure. This is thought to be due to the geographical proximity between Purworejo and Yogyakarta from a geographical aspect. Besides, in Indonesia, jalawurecan befoundgrowing in tropical parts of Africa South Asia, Southeast Asia, northern Australia, Papua, Samoa, and Micronesia [9].

Knowledge of jalawure can help local communities to improve their living standards by creating a wide variety of food products for their market. Its starch flour is also recommended for functional food ingredients[1]. The perceptions or attitudes of local communities can provide insight into people's behaviors and the extent to which they are willing to coexist with a particular resource [10]. This study aims to determine the perception and attitude of the community towards jalawure.

2 Methods

2.1 Time and research location

The research was conducted from October 2020 to March 2021 in Patutreja Village Grabag Subdistrict Purworejo District, Central Java Province.

2.2 Methodology for data collection and analysis

This research was conducted using a survey method. Determination of respondents using the random sampling method. The respondents in this study consisted of 38 people. The data collected consists of primary data and secondary data. The primary data consists of respondents' characteristics, knowledge, perceptions, and attitudes of the community towards jalawure.

Every question wasrated on a three-point Likert scale (0 = not agree, 1 = do not know, 2 = agree). The level of knowledge/understanding, perception and attitude were categorized based on the percentiles of the total score (< 25 percentiles = verypoor; 25–50 percentiles = poor; 51–75 percentiles = moderate and > 75 percentiles = good) [11]. The data collected was processed and analyzed using narration and tabulation.

3 Result and discuss

3.1 Characteristics of respondents

Characteristics of the respondents are presented in Table 1.A total of 38 heads of households or family members were involved in the interviews, 7,8% being women and 92,2% men. The averageage of the respondents was 48 years. They can be grouped of production laborage, they were 31 to 50 years old. Living in a productive age group, physically having a *greater* ability to generatestuff and services [12].

Table 1. Characteristics of respondents

No	Characteristics	Number
1.	Age (year)	
	Minimum	30
	Maximum	79
	Average	48
2.	Level of education (year)	
	Minimum	6
	Maximum	12
	Average	9
3.	Number of family dependents (people)	
	Minimum	1
	Maximum	5
	Average	3
4.	Land ownership (gardens and paddy field) (hectare)	
	Minimum	0
	Maximum	1,95
	Average	0,55
5.	Total land ownership (hectare)	
	Minimum	0
	Maximum	2,08
	Average	0,77
6.	Farming experience (year)	
	Minimum	8
	Maximum	45
	Average	19

The level of education of the respondents was generally low. Most of the formal education respondents were from primary school to junior high school, with an average household size of three people. The average amount of land owned per household was 0,55 hectares (garden and paddy fields and the average amount of land owned total (including yard) was 0,77 hectares, with an average farming experience of 19 years. Gardens and ricefields are the dominant sources of income for the respondents. Besides that, there are yards (0.13 hectares on average) and ponds (0.1 hectares on average). Respondents acquired land through inheritance (84,2%) and village government allocations/bengkak (15,8%). Agriculture is the principal economic activity of 87% of the respondents. Farming technology was poor, dominated by the hand hoe and a low level of input used by almost all the respondents. Agriculture is rainfed and farmers follow a rotational system.

3.2 Knowledge of Community of Jalawure

Loan the forest area, Forest Management Unit (FMU) South Kedu belongs to Perhutani, is a place for jalawure to grow. The forest area, with an area of 112 hectares, is administratively included in the Patutrejo Village area. Jalawure grows under stands such as malapari (*Pongamiapinnata*), kayuputih (*Melaleuca leucadendron*) and other species in the forest area.

Not many people know about Jalawure [4] including the community of Patutrejo Village. The community of Patutrejo Village rarely interacts with the forest area and utilizes forest products because of its forest status as a protected forest. So, almost most people rarely know about jalawure that grows in the forest area. Jalawure, according to its

characteristics, appears only during the rainy season and at the same time, other types of tubers such as suweg appear.

The growth of jalawure seems to be influenced by the percentage of sun exposure. It usually starts to grow in October to May/June when the percentage of long sunshine is around 60%, then the canopy starts to dry in June/July when percentage of long sunlight increases again to close to 70% [6]. This condition is in accordance with the results of research by [13] which stated that jalawure in South Garut began to grow before the rainy season in October or November.

Information about the marketing of jalawure at the research location is not yet available because jalawure is a species that is not widely known or used, even though it grows wild around the community. Unlike the case with the existence of jalawure in Garut District, where jalawure is currently starting to be developed and available on the market. Even though the marketing patterns are still very simple, the farmers (in the form of tubers or flour) are sold directly to consumer where the consumers are neighbours or cake makers. The marketing opportunities for jalawure tubers and flour are very open, but due to limited raw materials, the market demand for jalawure has not been fulfilled. The selling price of jalawure flour is currently unable to compete with other similar flours (wheat, tapioca) due to limited tuber raw materials and production.

3.3 Community perceptions of Jalawure

Community perception on jalawure are presented in Table 2. Jalawure is one kind of minor tuber that is wild and not yet widely cultivated [1]. The major constraints facing farmers wishing to grow jalawure and many other indigenous crops is the lack of scientific information [2]. Jalawure in the development process does not require special treatment like other agricultural crops, giving about 1 kg of manure/ hole and planting coincides with the rainy season. The seeds being used are old enough with the size of the seeds being around 50-100 g. Usually the planting is done by using the mounds, the purpose is to make it easier to harvest. The harvesting is done by reaching the age between 8-10 months. Harvesting time of jalawure is the same as harvesting in cassava plantations, but jalawure is harvested at the peak of the dry season, because the starch produced can be maximally produced [14].

Table 2. Community perception on jalawure

No	Statement	Percentage (%)		
		Agree	Not agree	Do not know
I. Cultivation of jalawure				
1.	Jalawure is a plant that is rarely found	52,63	26,32	21,05
2.	The community does not know jalawure yet	66,84	43,16	-
3.	Jalawure only grows in coastal areas (sandy soil)	100	-	-
4.	Jalawure grows wild	92,11	7,89	-
5.	Jalawure seeds are easy to obtain	52,63	26,32	21,05
6.	Jalawure is easy to grow or cultivate (Placeholder1)	52,63	47,37	-
7.	Jalawure is easy to care for	52,63	47,37	-
8.	Jalawure grows well understands	52,63	47,37	-
9.	Demonstration plots as a means of learning about the cultivation process	100	-	-
II. Benefit of jalawure				
1.	Jalawure leaves can be used for animal feed	52,63	-	47,37
2.	Community is not used to processing jalawure into flour	100	-	-
3.	Jalawure flour contains high starch/carbohydrates	52,63	-	47,37

No	Statement	Percentage (%)		
		Agree	Not agree	Do not know
4.	Jalawure can be used as an alternative food substitute for flour	52,63	-	47,37
5.	The community does not yet know the benefits of jalawure	100	-	-
III.	Processing of jalawure			
1.	To be consumed, jalawure must be processed first	92,11	-	7,89
2.	Jalawure flour is easily processed into various forms of food	65,79	-	34,21
3.	Processing of jalawure into flour is not difficult	65,79	-	34,21
4.	Processing jalawure into flour does not require modern equipment/machines	65,79	-	34,21
5.	Cheap jalawure processing costs	60,53	-	39,47
6.	The community does not yet know about jalawureprocessing	100	-	-
IV.	Marketting of jalawure			
1.	Jalawure tubers are easy to obtain	68,42	-	31,58
2.	Jalawure flour is easy to sell	50	-	50
3.	The community does not yet know about jalawure marketing	100	-	-

The distribution pattern of jalawure in groups maybe influenced by generative propagation through seeds from the jalawure plant where the number of jalawure seeds is quite large and the number of small tillers is found to be quite dense and relatively the same age, especially in Pantai Sayang Heulang, Garut [15]. The influence of seeds on the distribution of plants in groups was quite large because the seeds did not fall far from their mother, as happened with bamboo plants in Gunung Baug Nature Park [9], according to [3] the clustered distribution pattern of jalawure plants is caused by the large number of jalawure seeds not dispersed far from the parent In addition, information on the role of seeds in the distribution of jalawure plants shows that jalawure can be propagated through seeds even though to producing large tubers takes quite a long time or more than one season.

Based on Table 2, it is known that the public perception of the cultivation, benefits, processing, and marketing of jalawure is moderate. This is indicated by the value of all statements which show more than 50%. This perception can be used for the development of jalawure, coupled with the potential/existence of jalawure around the community. However, jalawure cultivation must continue to be developed so that people do not depend on wild/naturally grown jalawure plants.

Most of the use in jalawure tubers of the Garut community still comes from nature without cultivation, so the iravailability is decreasing[15]. Jalawure cultivation activities are still minimal eventhough many people have used them. People usually take jalawure tubers that grow wild in nature without any effort to preserve them. People are reluctant to cultivate jalawure because it takes too long. Based on preliminary empirical observations, jalawure tubers weighing 2-3 kg per tuber are usually harvested from plants that have gone through two rainy seasons [6].

The mechanical process of scarring, the time needed is faster and the operational funds are less. Previously, the community was still traditional, so that the selling price of Jalawure flour was more expensive than the selling price of wheat flour in the market. Therefore, with improved technology, it was expected that the selling price of jalawure starch flour would be equal to or lowerthan the price of flou r[14].The development of Jalawure needs attention from the local government to improve the economy of coastal

communities. Jalawure has considerable potential that can be used as a solution to deal with food insecurity.

3.4 Community attitude of jalawure

Community attitude of jalawure in presented are Table 3. The attitude of the community towards jalawure is also, as shown in Table 1, moderate, where almost all statements are more than 50%. These positive perceptions and attitudes can be utilized for the development of jalawure, coupled with the potential for jalawure around the community, especially in the Loano RPH forest area. However, jalawure cultivation must continue to be developed so that people do not depend on jalawure plants that grow wild / naturally.

Table 3. Community attitude of jalawure

No	Statements	Agree	Do not know
I.	Cultivation of jalawure		
1.	I am willing to collect wild-growing jalawure tubers	65,79	34,21
2.	I am willing to buy jalawure seeds	39,47	60,53
3.	I am willing to plant jalawure on my land because of a project/activity	78,95	13,16
4.	I am willing to plant jalawure on my land because of my own awareness (know the benefits)	78,95	13,16
5.	I am willing to maintain jalawure plants (fertilization, weeding)	52,63	47,37
6.	I am willing to plant jalawure between other plants	52,63	47,37
7.	I am willing to learn jalawure cultivation	100	-
II.	Processing of jalawure		
1.	I am willing to learn how to processing jalawure	100	-
2.	I am willing to take advantage of the wild growing jalawure	92,11	7,98
3.	I am willing to take advantage of jalawure that is planted on my own land	100	-
4.	I will process the jalawure into flour myself	60,53	39,47
5.	I will combine jalawure flour with other food ingredients	60,53	39,47
6.	I will eat food processed by jalawure flour	60,53	39,47
III.	Marketing of jalawure		
1.	I will only use jalawure flour for my consumption	63,16	36,84
2.	I would sell jalawure flour if there was a market	65,79	34,21
3.	I will sell groceries from jalawure flour	63,16	36,84

Based on the measurement of people's perceptions and attitudes towards jalawure which showed a positive value, the research team then followed up by conducting training in jalawure processing to attract more public interest in the cultivation and processing of jalawure by utilizing the potential of jalawure around the community. Jalawure processing training activities involve instructors from agricultural extension agents in Cikelet Subdistrict, Garut District, who are used to training and developing Jalawure, including processing it into flour and processing it into various foods.

Jalawure is used by some people in Garut Selatan[1], Sukabumi, Gunung Kidul, Karimunjawa, Kepulauan Krakatau, Kepulauan Kangean[3], Madura [4], and Kabupaten Kepulauan Talaud Sulawesi Utara[8]. As an alternative to rice and wheat flour, jalawure is an excellent choice for overcoming food instability and famine seasons[14].

The potential jalawure flour is also used as a raw material for making biscuits because it contains amylopectin, which makes the biscuits hard to break and crunchy [11], for baby

meals for children aged 6 months and above, folded cakes, and rolls in Talud District[8].The people of South Garut, especially in Cikelet Subdistrict, usually use jalawure flour as a raw material for making wet cakes such as trays and pastries such as eggrolls and cheese steaks[15]. In Bangka Belitung, although abundant, but only in certain areas that are recognize and utilized. Also unlike other tubers that have been traded in the market, tacca is only for its own consumption [4].In Madura, jalawure flour is made into various foods, such as serpot, eped-eped/eseng-eseng with a mixture of grated coconut and sugar[4].

Tubers of jalawure are processed by the local community in the research sites to serve as a substitute for rice starch or flour to overcome food shortages and famine [1]. Although the tubers are poisonous, the poison is removed by soaking or washing and rinsing the starchy tubers at water repeatedly, after which they can be processed for food. The tuber contains starch, ceryl alcohol, steroidal saponins, and a bitter principle, Taccalin[9].

The training participants totaled 25 people, consisting of community/ farmers, including 15 women, 4 village officials, 7 employees of KPH Kedu Selatan (Perhutani), and 4 agricultural extension agents in Grabag District, Purworejo District. The participants' interest in the jalawure processing training was quite high. This was evident from the activeness of the participants in the discussion and the practice of processing jalawure flour into processed food (wet food and dry food), which was an added value that made this training very attractive to the participants.



Fig. 1. Jalawure flour dry food



Fig. 2. Jalawure flour processing into wet food processing

4 Conclusion

The results showed almost all respondents knew jalawure because they had seen jalawure directly either in their yard or garden or in forest areas in their villages. In total, the perception and attitude of the community towards the cultivation, benefits, processing, and

marketing of jalawure are moderate. This is indicated by the value of all statements that show a value of more than 50%. These moderate perceptions and attitudes can be used for the development of jalawure through jalawure cultivation activities so that the community does not depend on jalawure plants that grow wild/ naturally.

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References

1. Wardah, E. N. Sambas, A. Ridwan, D. Ariani. *IOP Conf. Series: Materials Science and Engineering* 193(2017)
2. T. I. Borokini, A. E. Ayodele. *Int. J. Mod. Bot.* **2**, 97–102 (2012)
3. F. Syarif, P. Lestari, H. Wawo. *Ber. Biol.* **13**, 161–71 (2014)
4. S. Susiarti. *Ber. Biol.* **14**, 97–103 (2015)
5. Q. T. H. Vu, P. T. K. Le, H. P. H. Vo, T. T. Nguyen, T. K. M. Nguyen. *AIP Conf. Proc.* 1878 (2017)
6. Ridwan, Wardah, D. Ariani. *J. Agron. Indones. Indonesian J. Agron.* **48** 150–6 (2020)
7. A. F. Martin, B. W. Hapsari, T. M. Ermayanti. *IOP Conf. Ser. Earth Environ. Sci.* 741 (2021)
8. Y. Yenishbar, L. P. Ekowahyuni, U. Y. Pratama. *Agrosains J. Penelit. Agron.* **22**, 52 (2020)
9. M Ardiyani, L.D. Sulistyaningsih, Y. N. Esthi. *Ber. Biol.* **13** 85–96 (2014)
10. A. Mir, Z. Rais, Z. R. Mir, A. Noor, B. Habib, G. G. Veeraswami. *Bioone Complet.* **35** 392–400 (2021)
11. B.J. Murtani, J.A. Wibowo, C.A. Liu, M. R. Goey, K. Harsono, A. Ayu, P. Mardani, T. Wiguna. *Asian J. Psychiatr.* **48** 101912 (2020)
12. A.D. Putri. *E-Journal EP Unud.* **2**, 173–80 (2013)
13. Wardah, D. Ariani. *Proceedings of the 5th ASIAHORCs International Symposium.* (Bali) (Jakarta, Indonesia: LIPI) 135-49 (2014)
14. Wardah, D. Ariani. *IOP Conf. Ser. Earth Environ. Sci.* **458** (2020)
15. A. Winara, Murniati. *J. Penelit. Hutan dan Konserv. Alam.* **15** 79–89 (2018)
16. S. Sofiah, D. Setiadi, D. Widiatmoko. *Ber. Biol.* **12**, 239–47 (2013)