

VARIATIONAL CHARACTERIZATIONS AND PROXIMATE SUBSTANCE ANALYSIS OF THOUSAND ISLANDS TAKA PLANT (TACCA LEONTOPELALOIDES. L KUNTZE)

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ABSTRACT

In 2017, the researcher discovered taka germplasm in Thousand Islands. Taka conservation research and variations in taka characters need to be done to preserve taka in an effort to make taka as tuber as well as an alternative food. The previous results showed that Thousand Islands were one of the suitable locations for taka growth. Besides conducting research on character variations, a proximate analysis of taka from the Thousand Islands was also carried out. This research used survey method with the analysis of vegetation in the field and the proximate analysis in the laboratory. The research was conducted from April to November 2017. Erlinawati et al (2018) stated that kecondang plants / taka were used in several regions in Indonesia as alternative food if there were large waves and difficult transportation to the city. This study aimed to determine variational characterization in plant growth, plant ecological conditions and analyze the proximate content of kecondang / taka tuber from Thousand Islands. Kecondang plants / taka (Taka leontopetaloides (L.) Kuntze) is a bulbous tuber plant that reaches up to 2m in height. (Erlinawati et al. noted that taka umbulbulb are flat, wide, thin-skinned, light brown when young and gray, dark brown when old. The inside is milky white, it grows below the soil surface to a depth of 50 cm. In its growth the first formed tubers are usually small and change into larger ones. The leaves consist of 1-3 strands, in the form of a broad breach of egg breed, soaring round, boned, runny, greenish white (green variant), or purplish (black variant). Each segment is pinned pinnate, its lobes are broken. The stems are perforated, leafy, vertical grooved, blackish or purplish (black variant). The inflorescence has flowers 1,2,5 and 20 -40.

The flowers are protected by outer and inner bandages, green or yellowish, purplish green, rhombic, breach-faded egg, filiform leaf-shaped leaves like sticks, green in purple. Flowers do not open perfectly, arranged in (3 + 3) in which the inner part of the egg is broadly colored purplish green. As for the outer part, it forms a melanin purplish green, black, or white with white glands (green variant shape of the tuber can expand up to 10 cm. This study aims to determine variational characterizations in plant growth, ecological plant conditions and analysis of proximate content of kecondang tuber / taka from Seribu Islands. for the community nutrition. Presently, tubers that are consumed by the community, are cassava and sweet potatoes. Taka (Taka leontopetaloides L. Kuntze), which Javanese people call kecondang and while among the Madurese it is better known as lorkong and o'to as sources of carbohydrates. More information on its local use however has yet to be discovered. Taka leontopetaloides in Thousand Islands are known as "Tongkat Nenek Lampir" which in ancient times had also been consumed before the presence of wheat flour which were imported. which in ancient times had also been consumed before the presence of wheat flour which were imported.

The proximate analysis shows that taka leontopetaloides have sufficient nutrient substances of carbohydrates and minerals. Taka leaves are used as vegetables, while its leaf and flower stalks produce fibers that can be used to make hats and ropes. Taka plants are used by a small number of people in several regions in Indonesia, but are not as popular as other tubers such as cassava, sweet potato and gadung. In researching taka / kecondang tubers that are still growing wildly, some steps are taken which is the first step that must be studied is to determine the variational characterization of taka / kecondang plants that are spread across the Thousand Islands. Taka needs certain ecological conditions for its growth. Efforts in conserving wild growing kecondang plants is the first step to describe the potential of various types of kecondang spread across Thousand Islands. Characterization of kecondang germplasm is necessary, it can be done through determining the condition of germplasm in Thousand Islands. This germplasm can be characterized in the field or in a laboratory. There are three islands targeted at Thousand Islands, namely Pulau Pramuka, Pulau Karya and Kotok Besar. Characterization needs to be done thoroughly in the regions. Proximate analysis is also needed to determine the carbohydrate content in taka tubers. These efforts are essential in order to support food diversification programs that are part of government agenda.

Keywords: Taka / kecondang (tacca leontopetaloides), characterization, proximate, thousand islands

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INTRODUCTION

Kecondang plants are plants that will become alternative food crops that support food independence in Indonesia. Researchers previously knew kecondang / takka plants in several regions of Indonesia, such as Madura Island, Garut Region, Karimunjawa Island, Kangean Island, Belitung Island and Bangka. Research on taka in the area closest to Jakarta has never been done. This study tried to dig taka plants in the Thousand Islands island area closest to Jakarta. Researchers found taka in three regions namely Pramuka Island, Karya Island and Kotok Besar Island (2017). Erlinawati et al (2018) stated that kecondang plants / taka were used in several regions in Indonesia as alternative food if there were large waves and difficult transportation to the city. This study aimed to determine variations in plant growth characteristics, plant ecological conditions and analysis of the proximate content of tuber tanaaman kecondang / taka from Kepulauan Seribu. Is the condition the same as other islands in Indonesia ?

Kecondang plants / taka (Tacca leontopetaloides (L.) Kuntze) is a bulbous tuber plant that reaches up to 2m in height. Taka umbulbulb, flatten or push (Erlinawati et al.)

wide, thin-skinned, light brown when young and gray, dark brown when old. The inside is milky white, grows below the soil surface to a depth of 50 cm. In its growth. the first formed tubers are usually small and change into larger ones. The leaves consist of 1-3 strands, in the form of a broad breach of egg breed, soaring round, boned, runny, greenish white (green variant), or purplish (black variant). Each segment is pinned pinnate, its lobes are broken or memita. Perforated, leafy stem, vertical grooved, blackish hijqu mudq or purplish (black variant). The inflorescence has flowers 1,2,5 and 20 -40. The flowers are protected by outer and inner bandages, green or yellowish, purplish green, rhombic, breach-faded egg, filiform leaf-shaped leaves like sticks, green in purple. Flowers do not open perfectly, arranged in Tajuk (3 + 3) in which the inner part of the egg is broadly colored purplish green. As for the outer part forms a melanet, purplish green. black), or white with white glands (green variant). Fruit rotates with beririran, fruit diameter 1.5-2.6 cm, rarely push, hang, pale green to dark green, yellowish ripe fruit, thickness of the inner layer is 1.5 mm. Seed lots, round shaped eggs hingg flat flat, grooved surface, 5-8 mm

long, 1.5 - 3 mm wide, bald, colored kunkan brown with testa like sponges, white grooved 15-19. Under certain conditions the shape of the tuber can extend 10 cm. This study aims to determine variations in plant growth characteristics, plant ecological conditions and analysis of proximate content of tanaaman kecondang tuber / taka from seribu Island

The condition that are desired to be implemented for Food Security according to Law No. 7, 1996, is the adequate food availability, both in quantity and quality, safe, equitable and affordable for everyone. Food diversification efforts are carried out in efforts to fulfill community nutrition. By this time, tubers that are consumed by the community, are cassava and sweet potatoes. Taka (*Tacca leontopetaloides* L. Kuntze), which Javanese people call kecondang and madura are known as lorkong and o'to as sources of carbohydrates, we do not find much information about their local good sense (1). *Tacca leontopetaloides* in Thousand Islands are known as "Tongkat Nenek Lampir" which in ancient times have also been consumed normally before the presence of wheat flour which were imported and these days wheat flour is very easily found by the society. The proximate analysis shows that *tacca leontopetaloides* have sufficient nutrient substances of carbohydrates and minerals. Taka leaves are used as vegetables, while leaf and flower stalks produce fibers that can be used to make hats and ropes. Taka plants are used by a small number of people in several regions in Indonesia, but are not as popular as other tubers such as cassava, sweet potato and gadung. In utilizing taka / kecondang tubers that are still growing wildly, the steps are taken which is the first step that must be studied is to determine the characteristics variations of taka / kecondang plants that are spread across the Thousand Islands. Taka needs certain ecological conditions for its growth. Efforts in saving wild growing kecondang plants is the first step to describe the potential of various types of kecondang spread in Thousand Islands. Characterization of kecondang germplasm Thousand Islands is necessary. Determine the condition of germplasm in Thousand Islands. This germplasm can be characterized in the field or in a laboratory. There are three islands targeted at Thousand Islands, namely Pulau Pramuka, Pulau Karya and Kotok Besar. Characterization needs to be done thoroughly in the regions. Proximate analysis is also needed to determine the carbohydrate content in taka tubers. This is needed to support food diversification programs that are part of government programs.

Problem of the Research

Characterization of variations in taka plants as germplasm from thousand islands.

Analyze the carbohydrate substance of taka tubers in thousand islands to develop and preserve taka plants as an alternative food source.

Purpose

1. Preservation of taka / kecondang germplasm (*tacca leontopetaloides*) in Thousand Islands region
2. Characterization of taka / kecondang (*tacca leontopetaloides*) species in Thousand Islands region
3. Proximate analysis of taka / kecondang tuber substances (*tacca leontopetaloides*, L. Kuntze)

This plant has great potential to be an alternative source food and as a source of carbohydrates. Taka tuber is one of the sources of raw material for flour industry because it has a higher amylose substance compared to maiseña flour. Taka / kecondang tuber has adequate nutrition (minerals, lipids, vitamins) that can be used as a food source and to improve malnutrition.

RESEARCH METHOD

MATERIALS AND METHOD

COLLECTION OF RESEARCH MATERIALS

Experiments were carried out in the Thousand Islands, the closest characterization and analysis was to find out plants in their natural habitat. Furthermore, the process of analyzing the proximate Taka plants from the Thousand Islands area will be carried out at the Chemical Laboratory of the National University of Jakarta. This research was conducted in April to November 2017. This research was conducted in three thousand islands, namely Pramuka Island, IKotok Besar and Pulau Karya.

To obtain data on the variation of characteristics, some equipment and research materials are needed, they are; measuring devices, guarding altimeters, compasses, ahygrometers, thermometers, ropes, pegs, plastic, newspapers, labels, sasak, sacks, and alcohol. In addition, some equipment for analyzing the proximate spectrophotometer area are thermometer, analytical scale, digestive tube, evaporator, filter paper, and chemicals.

LABORATORY ANALYSIS

Analysis is carried out to determine several proximate levels. Analysis includes the level of ash measured in gravimetry; protein level in Kjeldahl; level of fat in Soxhlet; crude fiber in gravimetry; carbohydrates in titration; energy in calculations, Mg, Fe, Ca, K in AAS (Atomic Absorption Spectrophotometry and P in Spectrophotometry). This proximate and mineral analysis is repeated twice.

RESEARCH MECHANISME

The method of the research were carried out based on explorative surveying and opened interview with twenty-five persons participants are twenty-five persons. The data were obtained through interview with the local society. The topic is about *Taccaleontopetaloides* plant. In addition to interview another way such as collecting specimen of *Taccaleontopetaloides*. The sample of *Taccaleontopetaloides* can be seen in Herbarium Bogoriense, Botanical field, Biological Research Centre, LIPI, Cibinong-Bogor.

Part of plants that can be utilized such as tuber by doing proximate analysis (AOAC, 1984). Proximate analysis was carried out in chemical laboratory, Industry Teknologi Bogor. The analyses are done to determine some levels of proximate. The analyses covered level of ash which is measured in gravimetry; level of protein in Kjeldahl; level of fat in Soxhlet; crude fiber in gravimetry; carbohydrate in titration; energy in calculation, Mg, Fe, Ca, K in AAS (Atomic Absorption Spectrophotometry and P in Spectrophotometry). These Proximate analysis and mineral were carried out twice.

Explorative research is done to determine sampling purposively in transects method. In one transect has ten swath with its size is 5x5 m, the length each swath is 50 m while the length each transect has five m. *Tacca* is analyzed in vegetation in order to know the growth rate. According to Indriyanto (2005), description of structure can be known by doing vegetation analysis, namely by counting important index score, dominance of type analysis, variant of type and index of type similarity. In order to do that we need a parameter to count analysis of vegetation as follows:

Vegetation analyses

Density

It is individual number per wide unit or per unit volume. In other words, density is the amount of individual organism in each unit space and it is used more often by term of density which is noted as K notation (Indriyanto, 2005)

$$\text{Density (D)} = \frac{\text{Number of individual types}}{\text{Wide unit}}$$

$$\text{Relative Density (RD)} = \frac{\text{density of certain type}}{\text{density of all types}} \times 100\%$$

$$\text{Domination (D)} = \frac{\text{Number of basic field}}{\text{wide of swath model}}$$

$$\text{Relative Dominance} = \frac{\text{Dominance of certain type}}{\text{Dominance of all types}} \times 100\%$$

$$\text{Frequency (F)} = \frac{\text{number of certain type}}{\text{Number of all plot}}$$

$$\text{Relative Frequency (RF)} = \frac{\text{Frequency of certain types}}{\text{Frequency of all types}} \times 100\%$$

Value Index can be written as follows; $VI = RD + RF$

$$\text{Summed Dominance Ratio (SDR)} = \frac{VI}{3}$$

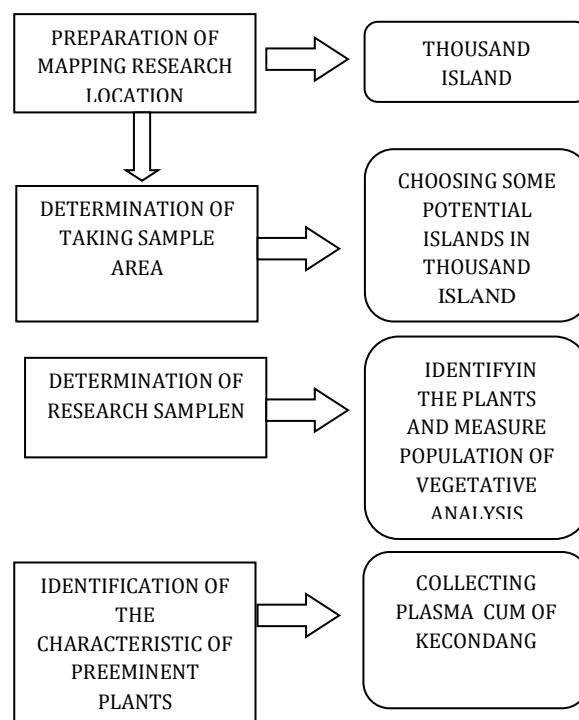
The diversity of types are determined by using formula of index diversity Shannon-Wiener:

$$H' = - \sum_{i=1}^n \left[\frac{n_i}{N} \ln \frac{n_i}{N} \right]$$

In Which: H' = Index of diversity Shannon-Wiener
 n_i = number of individual types
 N = Number of all individual

The index of high important value describes that the type is dominant in a community of plant. In addition to unknown type of plant, we made its herbarium to be identified in Botani laboratory, Nasional University, Jakarta.

Figure 1. The steps of research implementation



RESULT AND DISCUSSION

Based on the research study in Thousand island found two types of *tacca* in Karya island and Pramuka island, namely trunked black *tacca* and trunked green *tacca*. *Taccaleontopetaloides* in local language is called *kecondangor gadung tikus* belongs to *Taccaceae* family is high annual herb reach three meters and its bulbed rhizome which shaped-rounded and flattened has diameter until twenty cm and its weight can reach more than one kilogram. The tubers are renewable every year. The old tubers will be brown and greyish while the young ones are bright pink. On the top of tubers sprout leaves that have variant numbers is about one to three strand and one flowering with their stalk can reach two meter. The leaf is sole and it has a long stem and also has a hole in the middle of the leaf. The flowers are clusterly in terminal and those are protected by two kinds of bractea which shaped green lancet or sulfur and sometimes violet. The flower is yellow, its fruit is rounded and corrugated, the seed has variant shape. (figure 1) by Setyowati N et al. (2012) *Kecondang* is one of plants whose potentially as carbohydrate producer because it has carbohydrate content in its tuber reach 89,4%, eventhough the tuber can not be consumed directly because the taste is bitter. The society in Karimunjawa utilize starch of the tuber. The society in Sukabumi also use *Kecondang* as snack and in Jogjakarta use it as animal feed. The various uses of *tacca* plants include the skin of the plant will react with cholesterol in the membrane of cancer cells and is useful in reducing the growth of cancer cells, also serves as an antioxidant that prevents free radicals that reduce the risk of cancer. *Tacca / kecondang* tuber flour is useful as a traditional medicine for drying dysentery, diarrhea and malnutrition. *Tacca / kecondang* leaves are used as vegetables, while the leaf and flower stalks produce fibers that can be used to make hats and strings.

The seeds of this taka / *kecondang* plant are used by a small number of people in several regions in Indonesia, but are not as popular as other tuber-producing plants like cassava, sweet potato and gadung. Efforts to save taka / *kecondang* plants that are still growing wild, are the initial steps for domesticating of wild cultivation crops. To illustrate the potential of various types of conditions spread across the Thousand Islands, it is necessary to examine how the ecological conditions of taka / *kecondang* plants in Thousand Islands, so it needs ecological analysis in Java and its surroundings and also Thousand Islands. Characterization of variations in taka / *kecondang* germplasm in Java island and the Thousand Islands needs to be done to determine the ecology of taka / *kecondang* germplasm in Java and the Thousand Islands. This germplasm can be characterized in the field or in a laboratory. There is a targeted area which is Thousand Islands. Characterization of needs must be carried out thoroughly in the area. This process is needed to support food diversification programs that is part of government programs. The use of taka in various regions are varied. In Yogyakarta, the leaves are used as animal feed. Unlike the people of Garut, the islands of Karimunjawa and Madura, they use taka flour to make cakes. After the toxic compounds have been removed by washing several times in the water stream, amylose substance in taka tuber is higher than corn and the content of the starch is equivalent to a number of commercial starch products, such as cassava, potatoes, wheat, and rice that's why taka flour is suitable for cooking.

As a new commodity to be developed, there are many things about taka and its development technology that need to be prepared. By this time, research on several aspects of the development of taka in Indonesia has been carried out, ranging from ecology, ethnobotany, tissue culture technology, physiological responses to certain conditions, to process food made from taka tuber (2.);

Syarif, 2014,. However, ecological studies that reveal variations in taka growth between regions have not been carried out, especially in Thousand Islands and its surroundings. Based on this information, this research has been conducted on the characteristics of taka growth in Thousand Islands to reveal the prerequisites for the growth of taka plants. The results of this research can be used as a baseline data to develop the next taka plant for taka cultivation recommendations. This data is also very useful as a baseline for future taka breeding programs..

As we know that *tacca* is a plant that rich of carbohydrate content however *tacca* have not been developed as food sources. In addition, *tacca* is classified as minor tuber plants because *tacca* is untapped extensively and is uncultivated intensively. The result of previous observation research in herbarium specimen which are stored in Herbarium Bogoriense mentioned that *tacca* spread in West Java (Pelabuhan Ratu), DKI Jakarta (Pulau Seribu), Central Java (Banyumas, Pekalongan, Jepara dan Rembang), East Java (Pulau Madura, Kediri dan Perigi). Based on herbarium data we choose Pulau Seribu as our research location. *Taccaleontopetaloides* in Seribu Island commonly is known as *kecondang* or a flowered plant *tongkat nenek lampir*. Based on the previous result correspondence, society used *tacca* as

A number of were exploring following what was have been made in the figure in february april, to september 2017 shows that in various environmental conditions to grow mostly plant taka flowering. The condition specifically each area is presented as being follows. Seribu islands: areas have the temperature range 30-40 °c network and moisture air 45-70 %. Taka only found limited from coastal areas in a Seribu islands. in three islands This location close to the tourist area of the Pramuka island. In this region taka clusters of plant life (table 1) whether under a shade tree until the open.

Table 1. The data fields of taka in a great variety of habitats and species of wading around (ecapitulated data of taka growth in a variety of habitats and surrounding)

Location	Exploration time	Canopy color)	Reproductive phase	number of peripheral tuber	Habitus
Species surrounding taka					
location 1 (80 m above sea level)	February 2017	(Green)	100 % (Flowering)	1 (Group)	<i>Cymbopogon nardus</i> (L.) Rendl: Poaceae
Location 2 (60 m asl)	February	(Green)	100 % (Flowering)	1 (Group)	<i>Dioscorea hispida</i> (Dioscoreaceae)
Lokation 4 (60 asl)	February	(Green)	100 % (Flowering)	1 (Group)	<i>Imperata cylindrica</i> : Poaceae
Lokation 5 (61 m asl)	February	Green)	100% (Flowering)	1 (Group)	<i>Imperata cylindrica</i> : Poaceae
island. Karya P (10 m asl)	September 2017	Green)	Germinatet)i(Vegetative	1	<i>Casuarina equisetifolia</i> (Casuarinaceae), <i>Barringtonia asiatica</i> (Barringtoniaceae), <i>Hibiscus titiaceous</i> (Malvaceae), <i>Morinda citrifolia</i> (Rubiaceae), dan <i>Terminalia catappa</i> (Combretaceae).

Kotok Besar Island	Bambu forest	February 2011	(Green)	(Vegetative)	1	(Group)	Bambu, <i>Ficus septica</i> (Moraceae), <i>Acacia mangium</i> (Fabaceae), <i>Annona</i> sp. (Annonaceae), <i>Tinospora</i> sp. (Menispermaceae), dan <i>Kylinga monocephala</i> (Cyperaceae).
	Teak forest	February	(Green)	30% (Flowering)	1	(Group)	Jati, <i>Ficus septica</i> (Moraceae), <i>Acacia mangium</i> (Fabaceae), <i>Annona</i> sp. (Annonaceae), <i>Tinospora</i> sp. (Menispermaceae), dan <i>Kylinga monocephala</i> (Cyperaceae).

Results of proximate content analysis in Table 1. And 2.

Table 2. Proximate analysis of black-tacca tuber from the Thousand Islands

no	parameter	Unit/ per percent	Result	method
1	protein	%	7.25	SNI 0128911992
2	Fat level	%	0.45	SNI 0128911992
3	Water level*)	%	7.16	SNI 0128911992
4	Ash level *)	%	3.11	SNI 0128911992
5	Carbohydrate level	%	69.65	SNI 0128911992
6	Crude fiber	%	12.38	SNI 0128911992

Note : *) KAN accredited

Table 3. The proximate analysis of taka tuber with green stalks from Thousand Islands

no	parameter	Unit/percent	result	method
1	protein	%	7.64	SNI 0128911992
2	Fat level	%	0.55	SNI 0128911992
3	Water level*)	%	7.57	SNI 0128911992
4	Ash level *)	%	3.23	SNI 0128911992
5	Carbohydrate level	%	69.78	SNI 0128911992
6	Crude fiber	%	11.23	SNI 0128911992

Note : *) KAN accredited

Based on this research on Thousand islands, it is found that there are two types of tacca that were found on Pulau Karya and Pulau Pramuka, namely trunked black tacca and trunked green tacca. *Taccaleontopetaloides* in the local language are called *kecondang* or gadung mice which belongs to the Taccaceae family. It is a tall herbaceous plant that can reach three meters and its rhizome is round and flat which has a diameter up to twenty cm and can reach more than one kilogram. Tubers are renewable every year. Old tubers will be brown and grayish while the young are bright pink. At the top of the leaves are sprouted roots that have a variant number of about one to three strands and one flowering with the stems can reach two meters. The leaves are single and have long stems and also have a hole in the middle of the leaf. The flowers are cluster in the terminal and they are protected by two types of bractea which are green lancet or sulfur and sometimes violet. The flowers are yellow, the fruit is round and wavy, the seeds have varied shapes. (figure 1) by Setyowati N et al. (2012)

Kecondang / taka is one of the plants that has the potential to produce carbohydrates because it has a carbohydrate content in its tuber and reached 89.4%, although the tuber

cannot be consumed directly because it tastes bitter but can be removed by washing several times. The people in Karimunjawa uses tuber starch. People in Sukabumi also use *Kecondang* as snacks and in Jogjakarta people use it as animal feed.

As we know that tacca is a plant that is rich in carbohydrates, but tacca has not been developed as a food source. In addition, tacca is classified as a small tuber plant because tacca has not been used extensively and explored intensively. That tacca is spread in West Java (Pelabuhan Ratu), DKI Jakarta (Thousand Islands), Central Java (Banyumas, Pekalongan, Jepara and Rembang), and East Java (Pulau Madura, Kediri and Perigi). Based on herbarium data, we chose Pulau Seribu as the location of our study.

Taccaleontopetaloides in Thousand Islands are generally known as *kecondang* or Tongkat Nenek Lampir plants. Based on the results of previous correspondence, people use tacca as their flour. However, nowadays they replace tacca with wheat flour that they can get easily. This is because tacca processing is more difficult to remove bitter in tacca. Another problem is that the raw material for tacca tuber is still rare and has not been cultivated.

Table 4. The composition of plant species on Pramuka Island

No	Local Name	Types	Individual amount	Family
1.	Tacca seedling	<i>Tacca leontopetaloides</i>	106	Dioscoreaceae 1
2.	Cyperus Grass	<i>Cyperus sp</i>	10	Gyperaceae 2
3.	Chinese Petai	<i>Leucaena leucocephala</i>	44	Fabaceae 3
4.	Kikolot	<i>Isotoma longiflora</i> (Wild.) Presl	4	Campanulaceae 4
5.	Ketapang	<i>Terminalia catapa</i> L.	11	Combretaceae 5
6.	Morinda	<i>Morinda citrifolia</i> L	10	Rubiaceae 6
7.	Dioscorea	<i>Dioscorea</i>	5	Dioscoreaceae 1
8.	Ciplukan	<i>Physalis peruviana</i>	12	Solanaceae 7
9.	Nyamplung	<i>Calophyllum inophyllum</i> L.	8	Clusiaceae 8 (Guttiferae)
10.	Adam hawa	<i>Rhoe discolor</i>	38	Commelinaceae 10
11.	Breadfruit	<i>Artocarpus altilis</i>	4	Moraceae 11
12.	Banana	<i>Musa paradisiaca</i> L	6	Musaceae 12
13.	Waru	<i>Hibiscus tiliaceus</i> L	1	Malvaceae 13

Quantitative analysis on Pramuka Island was carried out on species, namely density of each type, frequency, dominance and important value index. It can be seen in

Table 5. Relative density, frequency, relative dominance and the highest INP are in the soybean plants (*Tacca leontopetaloides*).

Tabel 5. Vegetation Analysis of Pulau Pramuka

No	Types	KR (%)	FR (%)	DR (%)	INP (%)
1.	<i>Tacca leontopetaloides</i>	39,40	25,92	43,32	109,22
2.	<i>Cyperus sp</i>	3,72	3,70	4,35	11,77
3.	<i>Leucaena leucocephala</i>	16,36	11,11	6,15	33,62
4.	<i>Isotoma longiflora</i> (Wild.) Presl	1,49	3,70	0,36	5,55
5.	<i>Terminalia catappa</i> L	4,09	11,11	5,06	20,26
6.	<i>Morinda citrifolia</i> L	3,71	11,11	1,81	16,63
7.	<i>Dioscorea</i>	1,86	3,70	2,53	8,09
8.	<i>Physalis peruviana</i>	4,46	3,70	2,17	10,33
9.	<i>Calophyllum inophyllum</i> L.	2,97	7,40	2,54	12,91
10.	<i>Imperata cylindrica</i>	7,43	7,40	14,49	29,32
11.	<i>Rhoe discolor</i>	14,13	7,40	7,60	29,13
12.	<i>Artocarpus altilis</i>	1,46	3,45	4,35	9,26
13.	<i>Musa paradisiaca</i> L	2,15	3,45	4,35	9,95
14.	<i>Hibiscus tiliaceus</i> L	1,37	3,70	0,36	5,43

Pulau kotok besar

The composition of plant species found on Kotok Besar Island can be seen in Table 6. It is found 123 individuals consisting of 13 types and included in 13 families. It can be seen in Table 6 that the most plants that were found

were *Imperata cylindrica* with 40 individuals followed by 20 *Echinochloa cruss-gall* and *Centella asiatica* and 16 individuals *Tacca leontopetaloides*.

Tabel 6. Vegetation Analysis in Kotok besar Island

No	Nama Jenis	KR (%)	FR (%)	DR (%)	INP (%)
	<i>Tacca leontopetaloides</i>	13,01	40,54	0,37	53,92
	<i>Cocos nucifera</i> L.	2,44	4,50	0,03	6,97
	<i>Echinochloa cruss-gall</i>	16,26	4,50	0,06	20,82
	<i>Hibiscus tiliaceus</i> L	0,81	4,50	0,02	5,33
	<i>Terminalia catapa</i> L.	0,81	4,50	0,06	5,37
	<i>Morinda citrifolia</i> L	0,81	4,50	0,03	5,34
	<i>Calophyllum inophyllum</i> L.	1,63	4,50	0,02	6,15
	<i>Lilium candidum</i>	0,81	4,50	0,03	5,34
	<i>Pteridium aquilinum</i>	4,07	4,50	0,03	8,6
	<i>Rhoe discolor</i>	8,13	4,50	0,02	12,65
	<i>Euphorbia</i> sp	2,44	4,50	0,02	6,96

<i>Imperata cylindrica</i>	32,52	4,50	0,24	37,26
<i>Centella asiatica</i> L	16,26	9,01	0,06	25,33

a. Pulau Karya

The composition of plant species found in Karya Island can be seen in Table 8. Found 634 individuals consisting of 8 types and included in 7 families. It can be seen in

Table 8 that the most found species were *Tacca leontopetaloides* amounted to 358 individuals *Cyperus* sp as many as 152 individuals.

Table 7. The composition of Plant Types on Karya Island

No.	Nama Lokal	Nama Jenis	Jumlah individu	Famili
1	Tacca p	<i>Tacca leontopetaloides</i>	358	Dioscoreaceae 1
2	Rumput teki	<i>Cyperus sp</i>	152	Gyperaceae 2
3	Petai cina (anakan)	<i>Leucaena leucocephala</i>	98	Fabaceae 3
4	Akkasia	<i>Acasia auriculiformis</i> L	2	Fabaceae 3
5	Sirih	<i>Piper betle</i> L.	20	Piperaceae 4
6	Kikolot	<i>Isotoma longiflora</i> (Wild.) Presl	1	Campanulaceae 5
7	Ketapang	<i>Terminalia catapa</i> L.	1	Combretaceae 6
8	Morinda	<i>Morinda citrifolia</i> L	2	Rubiaceae 7

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Table 8. Vegetation Analysis in Karya Island

No	Nama Jenis	KR (%)	FR (%)	DR (%)	INP (%)
	<i>Tacca leontopetaloides</i>	55,15	40,00	58,00	153,15
	<i>Cyperus sp</i>	24,76	15,00	17,00	56,76
	<i>Leucaena leucocephala</i>	15,96	20,00	15,00	50,96
	<i>Acasia auriculiformis</i> L	0,33	5,00	2,00	7,33
	<i>Piper betle</i> L.	3,25	5,00	2,00	10,25
	<i>Isotoma longiflora</i> (Wild.) Presl	0,16	5,00	1,00	6,16
	<i>Terminalia catapa</i> L.	0,16	5,00	2,00	7,16
	<i>Morinda citrifolia</i> L	0,33	5,00	2,00	7,33

DISCUSSION

Based on observations on the three islands of Thousand Islands with a transect area of 2x2 m² and 5x5 m² showed the highest Important Value Index (IVI) was the *Kecondang* (*Tacca leontopetaloides*) plant on the scout island followed by the *Leucaena leucocephala* plant on the Kotok Besar island after the *kecondang* plant was followed by *Imperata cylindrical* and *Echinochloa cruss-gall* and finally Karya island with white plants followed by *Cyperus sp* and *Leucaena leucocephala*. INP is the sum of the three important values, namely KR, FR, DR. According to Kimmins (1987) variations of the composition and structure of vegetation in a community are influenced by vegetation, dispersal and birthrate. Its success in becoming

a new individual is influenced by fertility and fecundity that are different from each type so that there are differences in the composition and structure of each type. The distribution value of rice plants can be seen in their frequency values. The highest value of *kecondang* plants on the three islands that we studied on Pramuka island showed the highest value as important value index of 20.52 on the large island of Kotok 40.54 and on the island of the highest 40 as INP. This shows that the Thousand Islands have become suitable planting sites for *kecondang* plants.



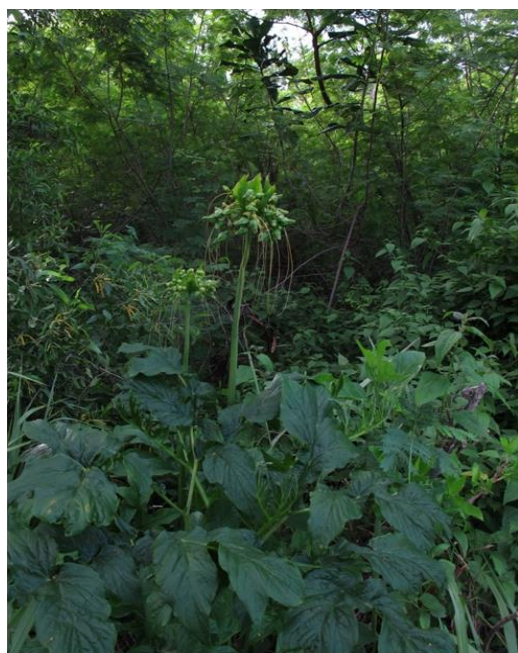


Figure 2. Taka tuber from Pramuka Island

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