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RHIZOME ROOT STRUCTURE AND BIOMASS CONTENT CAJUPUT PLANT (*Melaleuca Cajuput*) IN NAMLEA VILLAGE, BURU REGENCY

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ABSTRACT

The pitch cajuput plant (*Melaleuca cajuput sub sp. cajuput*) is a type of plant that belongs to the guava family (*Myrtaceae*), Which can produce one of the essential oil products in Indonesia. Cajuput plants can be cultivated by generative (seed) and vegetative propagation methods (shoot cuttings with rejuvenation techniques, branch cuttings, shoot cuttings, root cuttings, and gafts). However, related to the root structure of the rhizome and the value of the biomass content of this plant, it has not been widely published. This is the impetus to conduct research related to the root structure of rhizomes and the biomass content at the seedling level to be able to calculate the stored carbon content by direct measurement in the field and analysis in the laboratory. From the measurement plot of cajuput plants at the seedling level, it can be seen that the selected sample has sturdy rhizome roots with similar plant height characteristics, both for the gowth rate of the mother plant and the saplings generally have relatively the same plant height and do not show any difference between each seedling. The results of the measurements of the seedling biomass of cajuput plants in a rhizome root structure were 337 g/m^2 or 0.336 kg/m^2, while the estimated stored carbon was 0.168 kg/m^2. The value of biomass content at the seedling level of the cajuput plot scale is 85 g/m^2 or 0.085 kg/m^2, and stored carbon is 0.042 kg/m^2. The potential biomass and stored carbon content of the plot scale results of the calculation of leaf, twig, and root biomass in seedling-level cajuput plants will be the basis for estimating the expanse of cajuput plants in a larger area in Buru Regency, which is known as the largest cajuput producing area in Maluku.

Keywords: *Rhizome Root Structure, Biomass Content, Cajuput Plants in Namlea Village*

INTRODUCTION

The cajuput plants (*Melaleuca cajuput*) gow both in the lowlands in the tropics and subtropics, with altitudes up to 800 m above and rainfall of 800-1,400 mm/year. It usually gows for moist soil types with a pH value of 6-7, fertile soil conditions, and gets full sun irradiation all the time. Cajuput plants with natural characteristics can gow in various conditions, but with slightly extreme rather dry climatic conditions, they can be better able to survive on coastal plains than mountains (Widiyanti et al., 2022.).

In Indonesia itself, this plant gows naturally in very large quantities and even hundreds of hectares in the Seram Island and Buru Island areas. According to the data from the research results, there are 4 varieties of known cajuput plants (Rimbawanto, et al. 2017) including;

- Rich land white (*Melaleuca cajuput*): This variety is most widely gown in Indonesia, and is the main producer of cajuput oil. It is suiTable for gowing in lowlands with moderate to high rainfall. Rich white land, also known as Melaleuca cajuput.
- Mountain white kaew (*Melaleuca leucadendron*): This species gows in highland areas that have high rainfall. This variety of cajuput oil has a higher sineol content and a stronger aroma.
- Rich white coast (*Melaleuca viminalis*): this variety gows in coastal areas with sandy soils. Its cajuput oil has a higher cineol content and a fresher aroma.
- Rat cajuput (*Melaleuca viridiflora*): This species gows in swamps and wet soils. This variety has a higher terpinen-4-ol content and a sweeter taste.

The distribution of cajuput in Maluku is Buru Regency around ha, West Seram Regency is about 50,000 ha, West Southeast Maluku Regency is around ± 20,000 ha, and Central Maluku Regency is around 60,000 Cajuput plants in the tropics will have a long life with fairly fast gowth (Budiadi et al., 2005) Data from the Buru Regency Industry and Trade Office in 2005, stated that the area of cajuput plants on Buru Island is around 11.03% of the total area of Buru Island or ± 122,600.23 ha. Data from the Buru Regency Industry and Trade Office in 2005, stated that the area of cajuput plants on Buru Island is around 11.03% of the total area of Buru Island or ± 122,600.23 ha. The assumption of the availability of cajuput leaf raw materials that can be processed into cajuput oil is 1,336,342,507 tons/year, assuming a cajuput oil yield of 1%. For this reason, it is predicted that the potential yield of cajuput oil can reach 13,000 tons/year ha (BPS" 2014; Rimbawantoet 2021). Currently, cajuput oil production from Buru Regency has only reached 259,371 tons/year, (Bula, M., Cahyono, T. D., & Yusuf, N. 2023) .

The gowth of cajuput plants with several varieties when viewed from morphological conditions is very different based on the type of nutrient content received and interacting with other local plants. Information from several literatures shows that there are two varieties of cajuput leaves that can be distinguished, namely red leafy shoots and white-leaved shoots. The biological cycle of cajuput plants is usually long and fast, gowing both in well-drained to poor soils with high salt content and acidic. Cajuput plants that gow well and adapt to extreme environmental conditions in the rainy season and dry season have the ability to adapt to climate change. The roots of cajuput plants play a role in helping to restore degaded or eroded land, especially vegetation replanting activities on critical land arela. As for understanding the root structure of rhizomes, we can carry out strategies for handling flood-prone conditions with conservation techniques in contour areas, in addition to cajuput plants are very good as a tolerant species in open land areas because they are quite resistant to extreme conditions when environmental changes occur or due to human activities.

The plant species cajuput, genus Melaleuca, family Myrtaceae was formerly known as *Melaleuca leucadendron*, but the nomenclature of the species has been revised to *Melaeuca cajuputi* sub sp cajuputi gows naturally in the Maluku islands and northern Australia (Rimbawanto et al., 2021). This type has gown widely in Indonesia, especially on the islands of Java and Maluku, by utilizing its leaves to be traditionally distilled by the community and commercially to produce highly profiTable essential oils. Meanwhile, cajuput plant biomass is very important for essential oil needs, especially leaf biomass. Biomass stored in cajuput stands can help scientists to estimate the content of stored carbon so that it can help predict stored carbon stocks that can support strategies to handle and mitigate climate change.
In the photosynthesis process of cajuput plants, it has a fairly effective carbon sequestration. By measuring the amount of carbon stored in each stand, we can determine the contribution of trees in absorbing carbon dioxide emissions from the atmosphere. The amount of total biomass assessment for all trees in the measured transect can be converted to biomass in tons per hectare (Hairiah et al., 2011). The need to determine how much biomass content of cajuput

plants in a seedling level measurement plot needs to be designed so that the amount of biomass content of the seedling goup from the rhizome root arrangement can be estimated. Based on SNI No. 7724 concerning the measurement and calculation of carbon stocks, field measurements for the assessment of carbon stocks are the results of the calculation of the amount of biomass used as the basis for calculating the content of carbon stocks which is the dry weight of the kiln of a vegetation level (National Standardization Agency, 2019).

Research related to the benefits and functions of stem structure and root structure has not been widely done. The root structure of cajuput rhizomes plays an important role in the need for adaptation of the plant to environmental conditions. For this reason, information is needed regarding the change in the amount of cajuput leaf biomass at the seedling or shrub level from wet weight to dry weight and the results of the calculation of the carbon content. This is important to research considering that studies or research related to the root structure of rhizomes and the biomass content of cajuput plants for the seedling or shrub level have not been widely published. Therefore, through the results of this study, it is possible to describe the root structure of rhizomes and biomass content of cajuput plants at the seedling or shrub level with a height of between 10 – 100 cm on the gound surface at the location of the hill around Namlea City, Buru Regency.

METHOD

The location of the research was determined by the Purposive Sampling method, which is a sampling technique or data source with certain considerations (Sugiyono, 2013). The sample was determined by Simple Random Sampling, where in selecting a sample from n units, each combination of n units that may have the same chance to be selected (Simon, 2007), so that 3 location points were obtained which became the research plot with a plot size of 1 × 1 m. Each sample plot is the location of the research sampling.

Research Location

The location of the research took place in Namlea City, the capital of Buru Regency in May 2023. Geogaphically, the research location is located at 127° 4'33.49"E – 3°14'47.89"S, as shown in the following Figure 1.

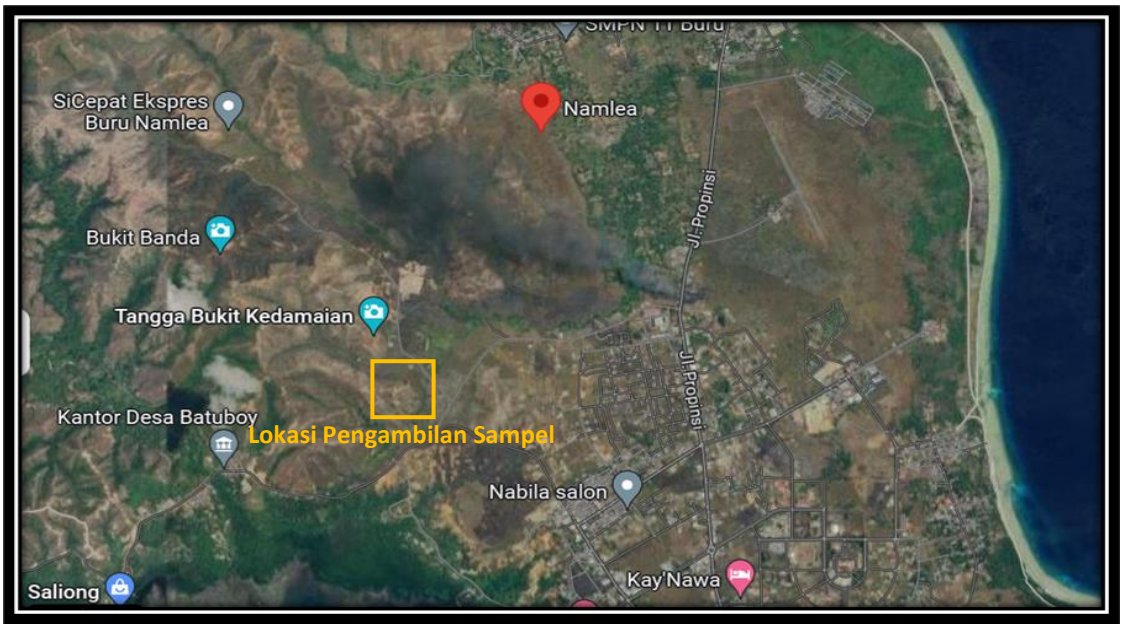

Figure 1. Research Location

Materials and Tools

The material used for this study is cajuput plants at the seedling level (roots, stems and leaves) with a plant height of 0.50 m-1.50 m). The tools used include suunto m, pH m, roller/hand m, cutters, buckets, clear plastic, crackle bags, scissors, digital scales, digital cameras, newsprint and writing stationery.

Sampling Techniques

At the time of data collection in eucalyptus land, it began with the creation of a measurement plot of 3 fruits with the same size of 1 x 1 m2, representing the distribution of rhizome roots (Rhizome is a stem at the bottom of the surface in the soil as a support for fibrous roots with horizontal growth usually unlimited and covering the soil surface widely). One rhizome root is usually overgrown with seedling broodstock and several saplings of eucalyptus plants with a height of 0.20 cm to 1 m and seedling broodstock 1,2 to 1,5 m. Observation of rhizome root samples and biomass sampling of each rhizome root structure with seedling-level saplings were carried out directly (destructive for leaves and twigs) in three plots.

Data Analysis Techniques

This field sample data was analyzed quantitatively to determine the weight of biomass content and the estimated carbon content of each representative sample of 300 g measured using a formula;

a. The mean equation for calculating the data of the results of sampling the seedling level biomass sample is $X = \sum Xi / n$.
b. The calculation of the dry weight of undergowth plants uses the formula of (Kurniatun Hairiah,. et al 2011). Total BK (g) = BK subexample (g)/BB subexample (g) x Total BB (g). where BK = Dry Weight, and BB = Wet is Weight.
c. Determination of carbon potential value obtained from biomass value, based on (SNI 7724 2011), estimation of carbon from biomass using the formula: Cb = B x % C organic Ket: Cb = carbon content of biomass (kg) B = total biomass (kg) % C organic = percentage value of carbon content, of 0.47 or using the percent value of carbon obtained from the results of measurements in the laboratory.
d. The rhizome root structure (horizontal root length) of cajuput plants was observed, and the number of seedling seedlings per sample plot was calculated.

RESULTS AND DISCUSSION

Cajuput Plant Gowing Requirements

The Cajuput plants (*Melaleuca cajuput* sub sp. cajuput) are plants with very good pioneer plant properties gowing on marginal lands with rocky conditions that dominate the location where they gow. Cajuput plants can in principle gow well on land located in relatively flat lowlands because this plant has high adaptability to environmental conditions (Sudaryono, 2010 and Dibia, 2015). Cajuput (*Melaleuca cajuput*) is a tropical plant that gows widely in Southeast Asia such as Indonesia (Java, Sumatra, Maluku, NTT, West Papua), Burma, Thailand, Vietnam, Australia and Papua New Guinea. This plant can gow in a variety of suiTable environmental conditions. These factors include:

- Climate: Cajuput can gow in areas with moderate to high rainfall, with air temperatures ranging from 20°C to 35°C.
- Soil: Cajuput can gow in a variety of soil types, but it is more optimal in loose, fertile, and well-drained soils.

- Altitude: Cajuput can gow in lowlands to highlands, with an ideal elevation between 0 and 1,000 m above sea level.
- Soil acidity: Cajuput can gow in soils with acidity levels (pH) between 5.5 to 7.5.
- Cajuput plants are plants that gow both on barren and infertile land. Generally, cajuput plants can gow well at an altitude of 5 - 400 m above sea level, with rainfall of 1,300-1,750 mm/year.

Morphologically, cajuput plants have root types such as lateral roots, taproots, and secondary roots. Meanwhile, the white wood trunk consists of a wooden clite that looks peeling and layered and yellowish in color. Cajuput leaves are elongated in shape, tapered in size, resembling needles. The flowers are yellowish-white and the fruits are round, small, hollow. The selection of the right cajuput variety to plant is essential for optimal yields (Rimbawanto et al, 2014) said that cajuput plants do not have specific gowing conditions.

Measurement and Sampling of Cajuput Plants

Sampling was carried out for 10 shrub-level cajuput plants where there was one parent plant as a sapling so that the distribution of existing saplings and related to the parent could be known. This right is deliberately exercised to be able to observe the root structure of the rhizome which is closely related to each individual shrub with the parent in an observation plot sample. The selection of cajuput plant types representing the plot sample was determined based on the measurement of the height of the tiller, the distance of the plant and the relationship of rhizome roots that connect one type of plant to another. The data from the measurement of the height of each individual plant is presented in the Table 1 and Figure 2.

Table 1. Individual Measurements of Cajuput Plants

No	Host Sample	Plant Height	Root Structure
1.	Horst	76	Rhizome
2.	Horst	72	Rhizome
3.	Horst	65	Rhizome
4.	Horst	104	Rhizome
	- Seedling 1	84	Rhizome
	- Seedling 2	76	Rhizome
	- Seedling 3	70	Rhizome
	- Seedling 4	66	Rhizome
	- Seedling 5	60	Rhizome
	- Seedling 6	30	Rhizome
	- Seedling 7	28	Rhizome
	- Seedling 8	30	Rhizome

Source: 2023 Research Data

Figure 2. Cajuput Plant Samples at the Location of Namlea Village
(a. Host, b. Seedling, c. Host & Seedling Spread)

The information in Table 1 and Figure 2 shows that the number of samples taken for individual cajuput plants is four samples, and for sapling samples, there are eight samples with plant height values varying according to the size of the individual plant height level. For the highest parent plant with a size of 104 cm and the lowest size of 65 cm. For the lowest sapling sample with a height of 30 cm and the highest size 84 cm. The observation results showed that all cajuput plant samples had rhizome roots that allowed plant gowth to be generally evenly distributed with altitude conditions that were not too different from one individual to another.) Ariyanti, 2022, described cajuput plants as trees with a height of up to 10 m. In the territory of Australia, cajuput can reach a height of more than 40 m and a trunk diameter of 1.2 m. It appears that the white wood trunk is usually gay to white with slightly silvery tree tops. On the other hand, cajuput leaves are generally geen and not shiny, the edges of the leaves are somewhat flat, the length of the leaves is between 5-10 cm, the shape of the leaf width is 1-4 cm, and the leaves are hairy. On each leaf, there are 5-7 leaf bones with a length of 3-11 mm.

Morphological Conditions of Cajuput Plants

The Cajuput is one of the non-timber forest products that is in geat demand by the community because it can be used to treat flatulence, and nausea, antiseptic, antiviral, antibacterial, anti-inflammatory, antioxidant, and as an aromatherapy ingedient (Keereedach et al., 2020; Zielihska-Blajet & Feder-Kubis, 2020). The existence of cajuput plants that gow rhizomes has morphological conditions that can gow and adapt to barren soil conditions, withstand heat, and resprout if a fire has occurred. Generally, the condition of cajuput plants is able to adapt and gow to relatively low plains with an altitude of about 400 m above sea level. Condition, cajuput plants can gow at a distance close to the beach which is directly opposite the mangove forest area. Meanwhile, in swampy or watery soils, cajuput plants can gow to form a forest area. In addition, the morphological characteristics of cajuput plants with the types of stems, leaves, flowers, and fruits that they have are distinctive. Cajuput plants (Melaleuca cajuput) can gow on marginal land and are a potential type for reclaimed crops of ex-mining land, both from an ecological and economic perspective (Kartikawati and Rimbawanto, 2010). The results of the field study according to the conditions of the gowing place and environment of cajuput plants in the study location of Namlea City, the capital city of Namlea District, are presented in Table 2 and Figure 3.

Table 2. Morphological Conditions of Cajuput Plants Study Location

No	Plant Samples	Number of branches	Number of leaves	Number of roots	Number of rhizomes
1.	Sapling 1	5	52	4	6
2.	Sapling 2	6	45	5	5
3.	Sapling 3	4	26	4	4
4.	Sapling 4	3	20	5	3
5.	Sapling 5	5	48	6	4
6.	Sapling 6	4	39	4	3
7.	Sapling 7	5	48	4	5
8.	Sapling 8	4	42	5	4

Source: 2023 Research Data

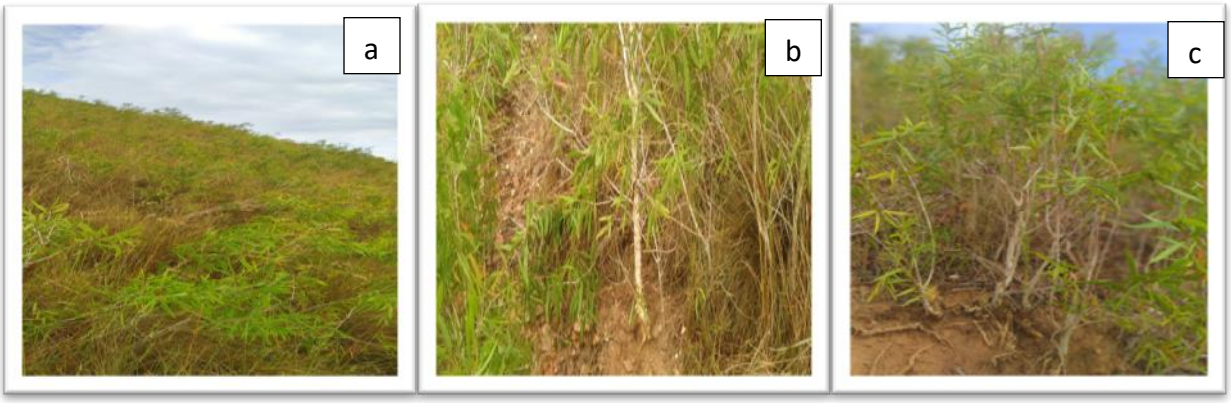

Figure 3. Distribution Conditions of Cajuput Plants in Namlea Village
(a. Cajuput land, b. Cajuput Sapling, c. Root Conditions)

The information in Table 2 and Figure 3 shows that cajuput plants in as their gowth and Development have their characteristics in adapting to the environment. This plant can gow well generally on less productive or infertile lands and is widely found in dry climate areas. The general characteristics of the gowth of cajuput plants start from the shape of elongated oval leaves like the tip of a spear. The bark of the stem is usually milky white, the fruit is shaped like a box, and the seeds are smooth in size is like a husk. Some are shrubs with a height of 40 cm to 1.2 m. If as a tree with a height of up to 35 m, the longounded trunk is wrapped in bark, somewhat straight. Approximately 60% is branch-free. The characteristics of this cajuput tree are easy to recognize from its bark the which is usually peeled, and the characteristic leaves that smell typical of cajuput (Aisha, ed. al, 2013). Cajuput plants have a narrow and thin leaf shape, the leaf surface is relatively flat, the stalk is generally short, the leaf width is between 0.5 – 1 inch, and the leaf length is between 2 – 4 inches. The leaves of cajuput plants are mostly pointed. When viewed from the shape and color of the leaf buds, it can be ascertained that cajuput plants have a variety of red, milky white, and yellowish-brown leaves and stems. The special feature of cajuput leaves is that they have a distinctive smell and taste, such as cajuput oil produced (Indriyanti, C.P., 2013).

Root Structure of Cajuput Rhizomes

The cajuput plants (Melaleuca cajuput sub sp. cajuput) have four varieties that characterize very different morphological conditions that can be displayed directly. According to the conditions where it gows, there are four varieties of cajuput plants, namely red cajuput (this variety has reddish wood and is known for its aromatic properties), white cajuput (this variety also has its aromatic qualities), Cajuput of the large-leaved variety and Cajuput of the small-leaved variety (both also have aromatic qualities). The four varieties are generally self-gowing and are often widely cultivated by the community to obtain the quality of their aromatic oils. This distinctive property is very beneficial and has a wide range of uses, especially for medical and medicinal purposes. Its distinctive properties are also a repellent of pests and plant diseases. Cajuput leaves for the production of essential oils contain 1.8 cineole, and have a distinctive aroma because they contain the compound Sineol (Helfiansah, R., & Sastrohamidjojo, H. 2013).

An interesting fact about cajuput plants (Melaleuca cajuput sub sp. cajuput) is that this plant is able to secrete certain chemical compounds from its leaves and roots that will affect other plants around it. This phenomenon is known as allelopathy (killing properties against other plants). The ability of the compounds produced by this cajuput plant so plant will dominate its habitat conditions. This phenomenon shows ecologically that cajuput plants can maintain their survival in diverse environments because they have inherited traits that are exactly the same as their parent plants. If viewed from the root system, the cajuput plants found at the study site have the characteristics of cajuput plants with varieties of smooth leaves, small stems, and the average height of seedling-level plants, while if you look at the root shape, it has rhizome roots (stem-shaped roots on the soil surface that can be overgown by several saplings at once). The shape of the root structure of cajuput plants is presented in Figure 4.

a. Elongated Root Shape b. Root Shape & Fibers c. Root Shape Rhizome

Figure 4. Root Structure of Cajuput Plants

The information in the picture above shows that cajuput plants with a fingered root structure (rhizome-Figure c) have the same characteristics as the rhizome root structure for all plants in general. The root system in cajuput plants at the study site spreads according to the morphological conditions of the plant and the condition of the soil as a medium where it gows. According to) (Hardjowigeno, 2011), soil with shallow effective depth will cause inhibition of plant root development, and soil with deep effective depth will have good aeration and drainages, and be able to support root development and plant gowth well. The root structure of cajuput plants (Melaleuca cajuput) when seen with the naked eye has a distinctive shape and is quite attractive, where the function of roots in absorbing nutrients can increase the gowth of cajuput plants. The root arrangement of plants is quite ideal according to Silviana, A. et al., 2022, among others;

- Primary Roots (Taproots): are the main roots that gow directly into the gound. Root gowth will usually become larger and longer over time.

- Lateral Roots (Lateral Roots) are roots branched from primary roots and are responsible for the storage and absorption of nutrient sources, especially water.
- Secondary Roots (Secondary Roots) are roots that gow from other root branches and help anchor the tree firmly to the gound.

The root system of cajuput plants will adapt to its environmental conditions, allowing the root system to thrive according to the soil conditions where it gows. This is by the statement; of Chairunnisak et al., 2018, that plant root types will usually easily penetrate the soil medium that has a good texture to absorb the available nutrients optimally to increase plant gowth periodically according to the size of time.

Estimation of Carbon Content from Cajuput Plant Biomass

Buru Island is one of the islands in Maluku that has a fairly wide expanse of cajuput plants with the potential for leaf raw materials for the production of cajuput oil that is quite large. Regarding information on carbon storage or carbon sequestration that is widely found in plant leaves, it is necessary to conduct a comprehensive study on the potential of carbon in the leaves of various types of plants. Based on the data from the research results of the biomass content of cajuput plant species conducted in Namlea City, Buru Regency, we can estimate the available carbon stores on a plot scale that focuses on the growth of cajuput plants at the seedling level. As for how much biomass content is stored in cajuput plants, the seedling level is presented in the following Table 3 and Figure 5.

Table 3. Biomass Value and Carbon Content of Cajuput (Host Plant)

Sampel Host	Leaf Biomass		Sample weight	Biomass value	
	damp	dry		g/m^2	kg/m^2
I	250	108	109.30	109	0.109
II	50	31	31.62	32	0.032
III	100	95	99.75	100	0.099
IV	90	94	96.09	96	0.096
				337	**0.336**
				Carbon Amount (kg/m^2)	**0.168**
				ton/ha	**4.21**

Source: 2023 Research Data

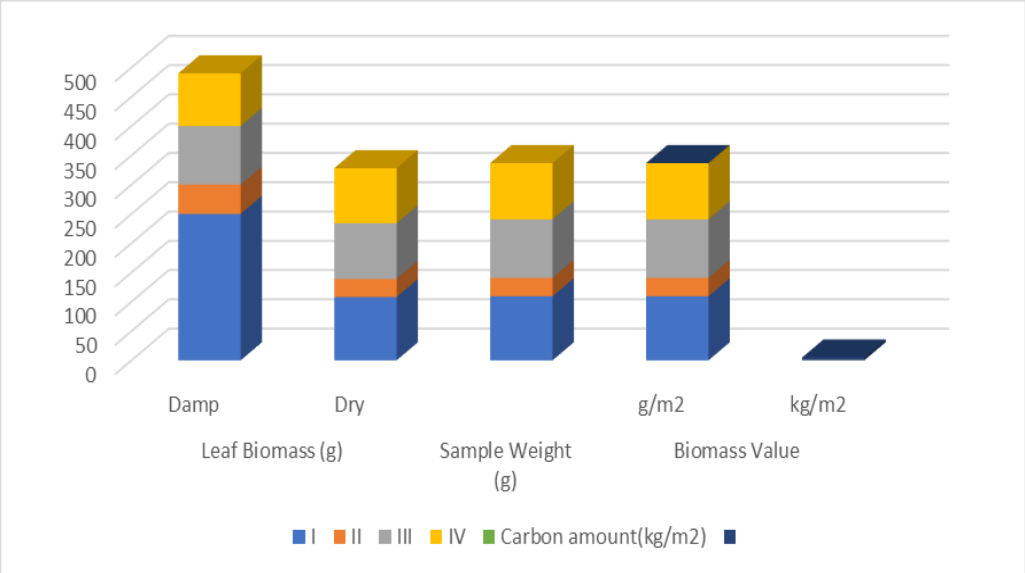

Figure 5. Distribution of Biomass Value and Carbon Content of Cajuput (Host Plant)

Information Table 3. It shows that the biomass samples of the parent plant taken are 4 seedling seedlings which are referred to as the mother of the rhizome root part representing each parent plant. If it is assumed that the parent plant in the rhizome represents a collection or goup of cajuput plant samples with an area of 1 x 1 m^2, then it is certain that the value of biomass content obtained from the results of biomass measurements is 337 g/m^2 or 0.336 kg/m^2, while the amount of carbon stored according to the calculation results is 0.168 kg/m^2. If the value of the calculation of the parent biomass of cajuput seedlings is converted to an area per ha of 4.21 tons/ha. These results when compared to the (Lukito., 2010)) *study showed that the average dry weight of cajuput branches for plants aged 20-40 years was 46.74% of the wet weight with an organic % C of 59.62%. These values were used in the conversion of the wet* weight of cajuput branches measured in plot 31 into the dry weight of the kiln and the carbon content of the cajuput leaves. This shows that the comparison of biomass content for each measuring plot has a different content value. Meanwhile, the values of biomass content and carbon content for the seedling or shrub level that are categorized as saplings from the parent plant are presented in the following Table 4 and Figure 6.

Table 4. Biomass Value and Carbon Content of Cajuput (Seedling Plants)

Seedling Sampel	Leaf Biomass		Sampel Weight	Biomass value	
	Damp	Dry		g/m^2	kg/m^2
1	13.3	17	19.17	19	0.019
2	8.6	12	13.95	14	0.014
3	7.5	10	10.67	11	0.011
4	4.1	8	11.71	12	0.012
5	4.5	6	8.00	8	0.008
6	6	8	10.67	11	0.012
7	1.2	2	5	5	0.005
8	1	2	6	6	0.006

	85	**0.085**
	Carbon Amount (kg/m^2)	**0.042**
	ton/ha	**1.06**

Source: 2023 Research Data

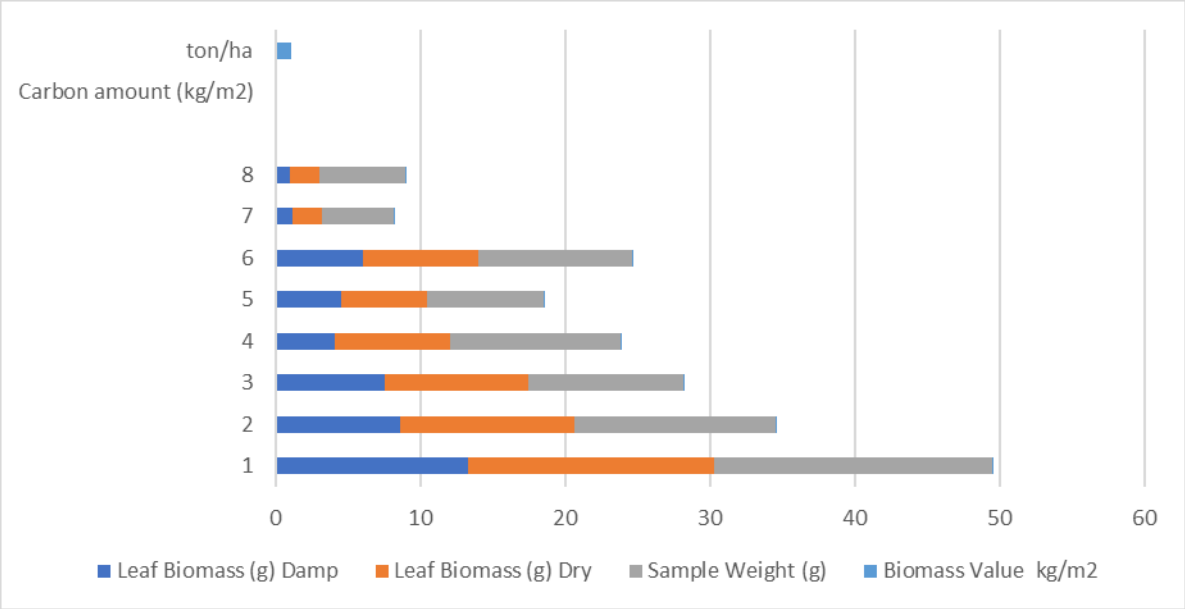

Figure 6. Distribution of Biomass Value and Carbon Content of Cajuput (Seedling Plants)

Information Table 4. Explained that biomass samples from the mother plant saplings were taken as many as 8 saplings with rhizome roots for the calculation of biomass content. The saplings of this cajuput plant are taken from each parent in a goup or goup of cajuput plants with an area of 1 x 1 m2, the value of biomass content obtained from laboratory measurements is 85 g/m^2 or 0.085 kg/m^2 of biomass content, while the amount of stored carbon is 0.042 kg/m^2 so that if converted to an area per ha of 1.06 tons/ha. The biomass potential and stored carbon content for this plot scale are important information in the calculation of leaf and root biomass of seedling-level shrubs for the type of cajuput plant studied. Cajuput plants will usually gow well if the planting medium or soil type used has a good soil structure composition and is rich in organic matter, and is able to provide nutrients and water needed by plants in the appropriate amount and capacity so as to spur plant gowth (Rahmania, M., & Nahlunnisa, H., 2020). The process of absorbing carbon from the air and subsequently accumulating in parts of the plant body such as stems, branches, twigs, leaves, flowers, fruits, roots, and soil. This process is commonly known as Carbon Sequestration (EPA, 2008; Jana et al, 2009). Based on the results of literature studies and research results conducted, it shows that the presence of carbon components on the soil surface contributes the largest potential for storage and can be more than 95% of the total carbon storage followed by litter, undergowth, necromas and various types of plants in various types of land cover (Samsoedin et al., 2016).

CONCLUSIONS

The cajuput plant sample (*Melaleuca cajuput*) studied had rhizome roots that were stems that gew horizontally and were overgown by several seedling-level saplings. The rhizome is also the stem and root of the node that allows the gowth of saplings from the mother cajuput plant. The value of biomass content measured from cajuput plant mothers was 337 g/m^2 or 0.336 kg/m^2, while the amount of carbon stored was 0.168 kg/m^2. The biomass sample of saplings from cajuput plants was calculated as 85 g/m^2 or 0.085 kg/m^2 and the value of stored carbon content on the plot scale was 0.042 kg/m^2. The results of the calculation of biomass value and carbon content. The seedling level for this plot scale is used as a basis for estimating the biomass content and carbon content in a wider expanse of cajuput land in the Buru Island area.

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