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Growth Of 2 Ambon Banana Varieties (Musa Paradisiaca L.) Local Dlock On Some Plant Media At The Acclimatization Stage

Ari Pramuja Aditya[1], Adnan[2], Rizky Septika Utami [3], Mardia Apriani[4], Rini Suryani[5]
[1,2,3,4,5]Universitas Pat Petulai, Bengkulu, Indonesia
*Corresponding author : aripramuja36@gmail.com

ABSTRACT. Curup local ambon bananas are a leading commodity in Rejang Lebong district. Therefore it is necessary to maintain its genetic resources so that they do not become extinct. Tissue culture technique is the most modern method of propagation because it can grow uniformly, is free from pests and diseases, and produces quickly. However, maintenance of tissue culture seedlings at the acclimatization stage needs attention. Therefore researchers will examine the treatment of media and local banana varieties Curup on growth. The research was carried out in the plastic house at Pat Petulai University from December 2022 to March 2023. The materials used were yellow and green Ambon banana seeds resulting from tissue culture, a fungicide with an active ingredient of 80% monkozeb. This study aims to determine the best media and varieties that grow best at the acclimatization stage. The design of this study was a completely randomized design (CRD) with two factors, namely the planting medium and the local Ambon banana variety Curup. Each treatment was repeated 3 times with 2 plant samples so that there were 36 experimental units. Observations were made at the end of the study on all observation variables. The data obtained was then analyzed using the Analysis of Variance (ANOVA) with a level of 1% if there is a difference then it will be tested further with the BNT Test (Smallest Significant Difference). The results showed that good planting media treatment was seen in soil + coffee husk media because it could increase the growth of plant height by 41.02 cm, the number of leaves was 6.92 strands, the stem diameter was 12.3 mm. However, the variable leaf width and leaf length showed good growth in soil + rice husk treatment. The longest leaf width is 12.35 cm and the length of the leaf is 13.51 cm. A good variety is ambon kuning because it can increase the leaf width by 11.65cm. The soil + coffee husk planting media is more dominant in influencing several variables because of the high nutrient content in the media. It can be recommended to Ambon kuning farmers to give good results.

Keywords : *Bananas, varieties, acclimatization, rice husks, coffee husks.*

INTRODUCTION

Banana (*Heavenly Muse L)* is a fruit that is often found in everyday life. This fruit is consumed to meet daily nutritional needs because the nutritional content in banana plants is quite high, the taste of bananas is delicious and the texture is soft. (Hamid, 2018) In addition, bananas are included in plants that do not know the season and can bear fruit at any time. Recently, bananas have become an industrial commodity. Indonesia is known to have a very rich variety of banana species. Some of them are bananas which are often consumed by Indonesian people including Ambon banana (*Musa paradisiaca St*.), horn banana (*Musa paradisiaca fa. Cornucopia*) and sky banana (*Musa troglodytarum L.)*Apart from the three types of bananas above, Indonesia has various other varieties of bananas that grow in various regions. Bananas are a very important fruit in the daily diet in Indonesia, and play a major role in culinary culture as well as a source of high-value nutrition.. (Arifki and Melisa, 2018).

These ambon bananas have been spread in various regions in Indonesia and have their own distinctive flavors, one of which is the local Ambonese banana which is typical of Rejang Lebong Regency, Bengkulu Province, of course, is one of the unique products which has become a favorite souvenir for immigrants who visit. to the area. These local Ambon bananas may have different characteristics and taste from other varieties of Ambon bananas, which makes them special and attractive to visitors. Local produce like this is often an important part of regional culture and economy, and promotes the uniqueness and diversity of food in Indonesia. Local Ambon bananas from Rejang Lebong Regency can be one good way to support tourism and local economic growth, as well as promote the area's natural and cultural wealth.

When visiting this area or other places with interesting local produce, it is important to support local farmers by buying and tasting their produce. Apart from that, it also provides an opportunity for tourists to try authentic local food and products and help the local community. Rejang Lebong. Curup typical ambon bananas are much sought after because Curup ambon bananas have a sweet taste and smell good. (Nur, 2021).

The success of plant growth is influenced by several factors, one of which is planting bananas. Growing media can be combined to get the various nutrients plants need to grow. Planting media is defined as a container or place to live for plants. As a good place to live, the planting medium must be able to support plant growth and life. Soil is the main planting medium, apart from other planting media soil, namely coffee husks/coffee grounds (Febriani,*et al.*,2021).

Bananas can also be planted using rice husk media. Because rice husk media has large pores and can bind nutrients as a source of nutrition. So that later superior seeds can be obtained through tissue culture techniques (Fahmi, 2013).

Tissue culture is a method of plant propagation in a laboratory environment that is capable of producing offspring that have the same genetic characteristics. The advantages of seed multiplication by tissue culture include the ability to obtain large and uniform numbers of seedlings with the desired traits. In addition, this process also makes it possible to obtain plants that are free from microbial contamination so that they are more resistant to disease. Seedlings produced through tissue culture can be used as the basis for further propagation. (Saty, 2016).

The success of plant tissue culture techniques is influenced by the explants/tissue used and the composition of the media. The media used for tissue culture/tissue culture consists of several components, namely organic nutrients, sources of iron, vitamins, amino acids, growth regulators, carbon sources, compactor/agar and distilled water. (Triatminingsih, 2016).

The plant tissue culture method makes it possible to obtain large amounts of plant material in a relatively short time. The advantages of propagating banana seedlings through this tissue culture technique include: being able to produce large quantities of seeds in a relatively short time, the seeds produced have the same genetic characteristics as their parents, can be done throughout the year regardless of the season, and the health of the seedlings is more guaranteed (Asmita*et all.*, 2017).

Banana seeds produced through tissue culture are usually available in the market at affordable prices. The use of these seeds is expected to help reduce losses in banana yields due to attacks by Plant Destruction Organisms (OPT). Although tissue culture techniques have been proven to increase the production of banana seedlings, planting tissue culture banana seedlings requires special attention, especially in the acclimatization phase. The acclimatization phase is an important stage where tissue culture banana seedlings must be adapted to the environment outside the laboratory. This process allows the seedlings to adapt to different environmental conditions, such as temperature, humidity and light. By going through the correct acclimatization phase, tissue culture banana seedlings can grow well in the field and produce a successful harvest. (Syaiful,*et al.*, 2019).

Ambon banana is a local commodity of Lebong rejang which must be maintained where production levels must be further increased. One way to increase banana production is to produce superior and disease-resistant seeds, one of which is tissue culture. The virtue of this tissue culture seed is being able to produce superior seeds, which in the presence of superior seeds will result in high production levels. (Anya, 2020).

Even though Ambon bananas are a valuable local commodity, people tend not to care about it, or they lack understanding about the promising prospects of the banana plant itself. Most people plant bananas only to fill in the sidelines of the garden, and not too many people have banana gardens. For the propagation of banana plants, the community still uses vegetative propagation where planting by taking saplings where the seeds are susceptible to disease can damage production. Apart from that, the people of Rejanh Lebong have not cultivated banana plants culturally (Suryani, 2022). For this reason, the researcher is interested in taking the title (Growth of Two Local Ambon Banana (Musa paradisiaca L.) Varieties Curved Against Several Planting Media at the Acclimatization Stage).

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MATERIALS AND METHODS

The time for conducting research, starting from December 2022 until the end of March 2023, at Pat Petulai University, Rejang Lebong Regency, Bengkulu Province. The materials used include: 2 Curup local Ambon banana varieties (ambon green and yellow ambon), planting media (coffee husks, soil, rice husks), polybags measuring 15×15 and fungicides with active ingredientsMancozeb 80%.

This study used a completely randomized design (CRD) with 2 factors, namely: The 1st factor was planting medium M1= Soil + Coffee husks (1:2) M2= Soil + rice husks (1:2), and M3= Soil (3). The second factor was the variety consisting of V1=green Ambon banana and V2=yellow Ambon banana. Each treatment was repeated 3 times with 2 plant samples so that there were 36 experimental units.

Research Stages

1. Preparation of planting media: The planting media used is in accordance with the treatment consisting of soil, coffee husks and rice husks, then mixed together and then stirred until all the media is mixed evenly and finally, put all the media that has been mixed into a polybag.
2. Expenditure of banana plantlets/seeds :(a) Age of cultured banana seedlings ready for planting is around 1-2 months old. (b) The banana seeds that have been removed are then washed with running water to clean any remaining media residue. (c) The long plantlet roots/banana seeds are cut using scissors. (d) Plantlets soaked with a fungicide solution of 2 grams of fungicide with active ingredientsMancozeb 80%. for 10 minutes. (e) Plantlets are ready to be planted in each treatment medium.
3. Planting planting material: When planting planting material, each polybag contains 1 banana stem which has been removed from the culture bottle, the plantlets planted in each planting medium are planted only to the extent of the covered roots.
4. Maintenance: Watering is done in the morning or evening using a handspayer and controlling weeds and pests by manually removing sugar that grows around the research site or removing insects that perch around the research site.

The variables observed were: plant height, number of leaves, stem diameter, leaf width, leaf length, leaf greenness. Data were analyzed statistically using ANOVA analysis of variance at the 1% level, if there was a significant difference then it would be followed by the LSD test (Lessest Significant Difference) at the 1% level.

RESULTS AND DISCUSSION

Based on the results of the study, it was found that the treatment of the growing media had a very significant effect on the variables of plant height, number of leaves, stem diameter, leaf width, and leaf length, but had no significant effect on the variable greenness of the leaves. The varietal treatment showed that plant height, number of leaves, stem diameter, leaf length, and leaf greenness had no significant effect but had a significant effect on leaf width. This can be seen in table 1 below.

Table 1. Results of ANOVA analysis at 1% level on variables, plant height, number of leaves, stem diameter, leaf width, leaf length and leaf greenness.

No	Observational Variables	variety (IN)		Media Treatment (M)		Combination (V × M)		Coefficient of Diversity (KK)
1.	Plant height	0,35	ns	8.37	**	0.89	ns	29.03
2.	Number of leaves	0.69	ns	5.74	**	0.05	ns	19.74
3.	Stem Diameter	1.35	ns	7.32	**	0.81	ns	30.53
4.	Leaf width	12.53	**	8.57	**	15.79	**	30,09
5.	Leaf length	0.29	ns	5.86	**	1.04	ns	22,60
6.	Green Leaf	3.09	ns	0.16	ns	0.43	ns	23.06

*Note: ** = Very significant effect at the 1% level ns = No significant effect*

Because the treatment given had a significant effect, the researchers continued with the LSD test at the 1% level. The results of the analysis can be seen in table 2 below.

Table 2. The results of the LSD test at the 1% level in the treatment of growing media on the variable plant height, number of leaves, stem diameter, leaf width, and leaf length.

Growing media	Plant Height (cm)	Number of Leaves (sheet)	Stem Diameter (mm)	Wide Leaves (cm)	Leaf Length (cm)
M0 (Ground)	28,94 a	5,25 a	8,43 a	6,48 a	10.59 a
M1 (Soil+Coffee Husk)	41,02 b	6,92 a	12, 3 b	9,87 a	12. 07 b
M2 (Soil + Rice Husk)	26,18 a	6,17 ab	8,18 a	12,35 b	13,51 b

Note: Numbers followed by the same letter horizontally are not significantly different in the 1% BNT test results

Based on table 2 above, it can be seen that the treatment of soil + coffee husk media produced good growth of banana seedlings because it increased plant height by 41.02 cm, while soil + rice husk media produced the lowest plant height of 26.18 cm. In the variable number of leaves and stem diameter, the treatment of soil + coffee husk growing media also provided good seedling growth because it increased the number of leaves by 6.92 (strands) with a stem diameter of 12.3 mm. However, the variable leaf width and leaf length gave good growth in the soil + rice husk treatment because it increased leaf width by 12.35 cm and leaf length by 13.51 cm.

Varietal treatment has a significant effect on leaf width variables. The results of the follow-up test analysis are presented in table 3 below.

Table 3. The results of the 1% level BNT follow-up test on the leaf width variable through the treatment of Ambon banana seed varieties.

variety	Leaf width(cm)
V1 (Green)	7.53 a
V2	11.65 b

Based on table 3 above, it can be seen that Ambon kuning banana seeds give good results because they can increase the leaf width by 11.65 cm.

Influence Tana cmm Media on Ambon Banana Growth

Mariana (2017) said that a good planting medium is a medium that is able to provide water and nutrients in sufficient quantities for plant growth so that it is able to absorb nutrients in sufficient quantities.

Plant height is an important component in growth because to determine the response of plant growth to environmental influences or the treatment given (Jirmanova*et al.*,2016). The research showed that coffee-mixed soil media (M1) produced the highest plant height, namely 41.02 cm, this is in line with Apriansi's research.*et all*,(2021) that coffee compost media provides the best plant height, which is 16.49 cm when compared to fern root media. The longest leaf length seen in coffee compost media was 14.34 cm. This is presumably because the coffee husk media is able to bind water so that it easily absorbs the nutrients available in the coffee compost (Apriansi*et all*., 2021).

The results of research by Widiastoety (2004) and Tirta (2005) reported that coffee compost media has good criteria for the growth of orchid plants, because it is able to bind and store water properly, has good aeration and drainage, and contains sufficient nutrients.

According to Patty*et al*., (2013) Nitrogen is very important in the formation of chlorophyll, protoplasm, proteins, and nucleic acids. Nitrogen is also a component of auxin, where auxin plays a role in the growth of apical meristem tissue which causes plants to increase in height. Referring to the research above, it can be explained that not only lettuce plants, banana plants also need nitrogen, used coffee husks are good for banana trees because they add nitrogen and a little acidity, which banana trees like. The number of leaves is affected by the nutrients N, P and K that are in the soil, (Fahrudin, 2009) The planting medium affects the number of leaves in the growth of curup local Ambon bananas. Mixed coffee soil planting media has an effect on the number of leaves where soil + coffee media (M1) gives the best results but has similarities in mixed soil + rice husk media (M2) this is in line with Andri*et all*., (2016) states that the availability of adequate and balanced nutrients in the soil causes normal plant growth. This is in line with Gustria's researc*het all*., (2022) showed that the

results of plant height, diameter and number of kepok banana leaves with M2 media (soil, manure and cocopeat (1:1:1) and chitosan concentration (8 mL L water-1), were better than media husk charcoal with the same concentration of chitosan and at the same age to Raja Bulu banana.Stem diameter is a measure that is defined as the length of the line connecting two points around the tree trunk circle and passing through the center point (axis) of the trunk.This is a relative tree dimension easy to measure, especially at the bottom of the tree trunk. Stem diameter is often used as a parameter to assess the size or growth of a tree and can also provide an indication of plant health and development. around 2.5-4.5 cm. in the research studied showed that coffee mixed soil media (M1) had an effect on the stem diameter variable, this is in line with Norasyifah's research*et al*., (2019) that growth in plant stem diameter still occurs at the end of the vegetative period, this is because the absorption of nutrients by plants cannot be absorbed simultaneously for growth in height and stem diameter.

At the beginning of planting the nutrients will be focused on the growth of plant height so that it will increase the diameter of the stem. Because according to Puspadewi*et al.*,(2016), coffee husks contain nutrients N, P, K that are high enough to be good for growth.

The leaves of the Banana tree are quite distinctive and unique because they are large and wide. The shape is like a lancet that grows elongated and has a bone in the middle. In the research that has been done, it shows that coffee-mixed soil media (M1) has an effect on the leaf width variable, this is in line with research You try*et all*., (2022) that the treatment of growing media had no significant effect on leaf area variables. The highest leaf area was the M3 treatment, which was 116.40 cm2, and the lowest was the M1 treatment, which was 89.22 cm2, with an increase in M3 percentage of 5.52% of the control. The increase in plant leaf width is affected by the availability of nutrients absorbed by plants.

Soil mixed with rice husk (M2) has an effect on leaf length, this is in line with Rana's research*et all*., (2019) the content of elements that affect the length and width of leaves, namely the element nitrogen (N) found in the skin of kepok bananas, the element N also functions in influencing the measurement of leaf length and width, as well as increasing the protein and fat levels of plant nutrients N which is found in the rice husk is also enough to affect the growth of banana on the length of its leaves.

Coffee mixed soil planting media (M1) is good for growing banana plants where in the growth of plant height, number of leaves, stem diameter, and leaf length gives the best results because in coffee, according to Cruz*et all*, (2012), coffee waste contains 1.2% Nitrogen, 0.02% Phosphorus, and 0.35% Potassium. Using coffee waste as organic fertilizer is a common way to increase soil fertility and provide necessary nutrients for plants. However, keep in mind that the use of coffee waste or other organic waste in agriculture must be properly managed to avoid problems such as soil or environmental pollution. Meanwhile, potassium is useful in enzyme activation, photosynthesis, sugar transport and protein formation. (Surtina, 2009).

Setiawan (2017) explained that the content of coffee grounds has important functions, such as phosphorus which is useful for transporting energy produced by metabolism in plants, stimulating flowering and fertilization, stimulating root growth, stimulating seed formation and stimulating plant cell division and enlarging cell tissue; potassium which functions to maintain plant immunity from disease attacks, strengthens the woody parts of plants, improves fruit quality, increases pest and disease resistance and drought; Magnesium as an activator that plays a role in energy transportation for several enzymes in plants facilitates the process of photosynthesis; Calcium is the most important element in cell growth; and sulfur or sulfur that plants need in the formation of the amino acids cystine, cysteine and methionine (Wulandari, 2022).

Effect of Varieties on Ambon Banana Growth

Based on the results of the study it was found that not all variables had an effect on the variety, the effect of the variety was found on the leaf width variable. Bella*et all*. (2016) stated that the difference in the number of shoots produced by each type of banana could be influenced by plant genotypes or the ability of explants to absorb nutrients contained in the culture media.

The Yellow Ambon banana variety was more dominant in influencing the growth of the length and width of the Curup local Ambon banana leaves, although the results obtained were not different between the yellow Ambon bananas and the green Ambon bananas. This is in line with Ainun's researc*het al.*,(2012) research results. The results showed that variety had an effect on plant height aged 15 and 30 DAP. Higher soybean yields were obtained in Grobogan and Anjasmoro varieties. Spacing only had a significant effect on plant height at 45 HST, the tallest plants were obtained by using a spacing of 20 cm x 30 cm. There is a significant interaction between varieties and spacing on the number of pods per plant, the number of fruitful pods per plant and the weight of seeds per plant. The best results were obtained for the Anjasmoro variety with a spacing of 40 x 40 cm.

According to Subandi (1990) the success of the production of a plant depends on how much the plant can supply the nutrients it needs. Differences in growth power also depend on genetic factors (Pramanda 2015). Different plant varieties show different growth and yield even though they are grown in the same environmental conditions (Jumin, 2005).

CONCLUSION

The treatment of good planting media was seen in soil + coffee husk (M1) media, which could increase the growth of plant height, number of leaves, stem diameter. However, variable leaf width and leaf length showed good growth in the soil + rice husk treatment (M2). Ambon kuning gives good growth on variable width of the leaves.

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