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Morphological Characteristics and Kinship Relationships of Salak Pace, Salak Hitam, and Salak Kuning in Bedahlawak Jombang

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ABSTRACT
Indonesia has a lot of fruits. One of them is salak fruit. This study was prepared to determine the morphological characteristics and kinship relationships of salak pace plant, salak hitam, and salak kuning. This research was conducted in Bedahlawak Village, Tembelang District, Jombang Regency. This research was conducted in February-April 2021 by selecting 5 samples from each type of salak plant with research parameters of plant height, leaf length, leaf width, leaf tip shape, leaf tension distance, top surface color of leaves, color of the underside surface of the leaves. The research was conducted by conducting direct observations and compiled using descriptive methods and analyzed using cluster analysis in the form of similarity dendograms. Based on vegetative morphological observations, characteristics on the parameters of plant height, leaf length, upper surface color of leaves, color of the underside of the leaves, length of the pelepah, length of thorns, shape of thorns, texture of thorns, distance of thorn density, length of roots and have a distant kinship relationship by showing a similarity value of 56%-63%.

Keywords: *Salak Pace, Salak Hitam, Salak Kuning, Kinship.*

INTRODUCTION
Indonesia is an agrarian country that has a variety of fruit types. This diversity can be distinguished by its sweet, sour, sepat, or bitter taste, round or oblong shape, small and large size, smooth, notched, or prickly outer skin texture, even green, yellow, or red color (Hijjang etal., 2014). In Indonesia, salak farming has been known since the Dutch colonial era. Many varieties of salak can be grown in Indonesia. Some are young and it's sweet. Superior varieties that have been released by the government to be developed are salak pondoh, swaru, nglumut, enrekang, gula batu (Bali), and have been found about 11 varieties of local salak bangkalan (Tim karya mandiri, 2010) in (Zuraida &Wahyunigsih, 2015).

Salak *(Salacca zalacca)* is a plant native to Indonesia. Salak has economic value and market opportunities that are quite wide both domestically and export (Yani et al, 2021). Salak varieties are distinguished by the texture of fruit meat, the skin color of the fruit, the size of the fruit, the aroma and taste of the flesh of the fruit, as well as habitus (Ami & Yuliana, 2021). This difference occurs not only in salak plants from different production centers, but also between plants in one area (Harahap, 2013). Salak varieties are distinguished by the texture of fruit meat, the skin color of the fruit, the size of the fruit, the aroma and taste of the flesh of the fruit, as well as habitus (Khomsah & Zulfikar, 2021). This difference occurs not only in salak plants from different production centers, but also between plants in one area (Harahap, 2013).

In general in Jombang Regency, various types of salak fruit that we often know or meet is salak pondoh salak which is famous for its masir fruit, its sweet taste, without any sour taste and sepetnya. In addition to salak pondoh there is also salak pace. It is called salak pace because it is different fromother salaks in general. Salak Pace is identical to its small size, although the age of this salak fruit is old but the size remains small, it tastes sweet there is a little bit of sepetnya and fresh contains a lot of water. In contrast to salak in general, The older the age of the fruit the larger the fruit, this species can be found in the Surgical Village Surgical Hamlet Of Bedahlawak District Tembelang Jombang.

Environmental variations can cause the diversity of plants, one of which is influenced by the height, the difference in altitude of a place will cause differences such as temperature, humidity, rainfall and others. Thus resulting in the spread of different types of plants and influenced by a very sharp geographical location such as the difference in seasons, soil and intensity of sunlight (Nasirudin & Qomariyah, 2021). Therefore, it is necessary to do research on salak because it has never been explored before. Before exploring the problem of molecular studies about salak, there needs to be a fundamental research that analyzes the character of salak itself. Therefore, research on the analysis of salak diversity based on morphology and anatomy in Tembelang Subdistrict, Jombang Regency needs to be done.

METHOD

This research was conducted starting in the month februari-april 2021 in the Village Bedahlawak District Tembelang Jombang. Tools used in morphological observation include roll meter, raffia, tbalance, alat tulis, jnumbersorong, handphone (HP), kantong plastik, kertas label, and cutter. Materials in this study there are 3 types of salak plants, namely salak pace, salak hitam, and salak kuning obtained from the Village Bedahlawak District Tembelang Jombang. The data in this study is a description of morphological character obtained from identification in the field and analyze the data in the form of a dendogram. The determination of samples is done randomly (Random) by selecting 5 samples of plants of each type, so there are 15 samples in total. This study consists of several samples including, namely salak pace(sp), salak hitam (sh), salak kuning (sk).

The data was obtained through careful and thorough observation of the morphology of salak plants at the research site and interviewsto the ownersof k ebun salak plants. And also pay attention to the study of literature and conducted photo documentation on the sample attached. The implementation of the research began with the determination of the location with farmers. Then conducted sampling on each type of salak plant including salak pace, salak hitam, salak kuning with purposive sampling method of all populations of salak disentra cultivation.

Observations can be made by looking at specific differences regarding the morphology of vegetative plants. The observed parameters are as follows:

- Vegetative Morphology
  - Stem : Can be seen starting from the height (Length) of the trunk, the color of the stem, the shape of the stem,
  - Leaves : Can be seen starting from the color of the upper surface of the leaves, the color of the lower surface of the leaves, the arrangement of leaves, the number of children leaves, the length and width of the child leaves, the color of the pelepah, the length of the stalk of the mother leaf, the shape of the tip of the leaf.
  - Flowers : Can be seen ranging in shape from male and female flowers, stamen color, flower crown color, Flower length, flower size.
  - Fruit : Can be seen from the shape of the scales of the fruit skin, skin color, shape and tip of the fruit, diameter of the fruit, number of seeds, color of seeds, number of fruit or bunches, light weight of fruit (weight) fruit flesh color, and fruit flavor.
  - Spines : Can be seen from the large shape of the spines, the color of the spines, the length of the spines, the texture of the spines, the density of the spines, and the tips of the spines.

Quantitative data analyzed using UPGMA method (*Unweighted Pair-Group Method With Airthimetic Mean)* with NTSYS program (*Numerical Taxonomy and Multivariate System)* version 2.11 with gerombol analysis (Cluster) that produces a similarity dendogram to assess the similarity between types of salak in Desa Bedahlawak District Tembelang Jombang.

The stages of data management of the research results are carried out as follows:

- The initial stage of analysis is to edit the data that has been collected that aims to make the data to be analyzed more accurately and completely.
- After that encode each character in the form of numbers.
- Perform cluster analysis with UPGMA *(Unweighted Pair-Group Method With Airthimetic Mean)* method.
- Interprets the clusters that form a dendogram.

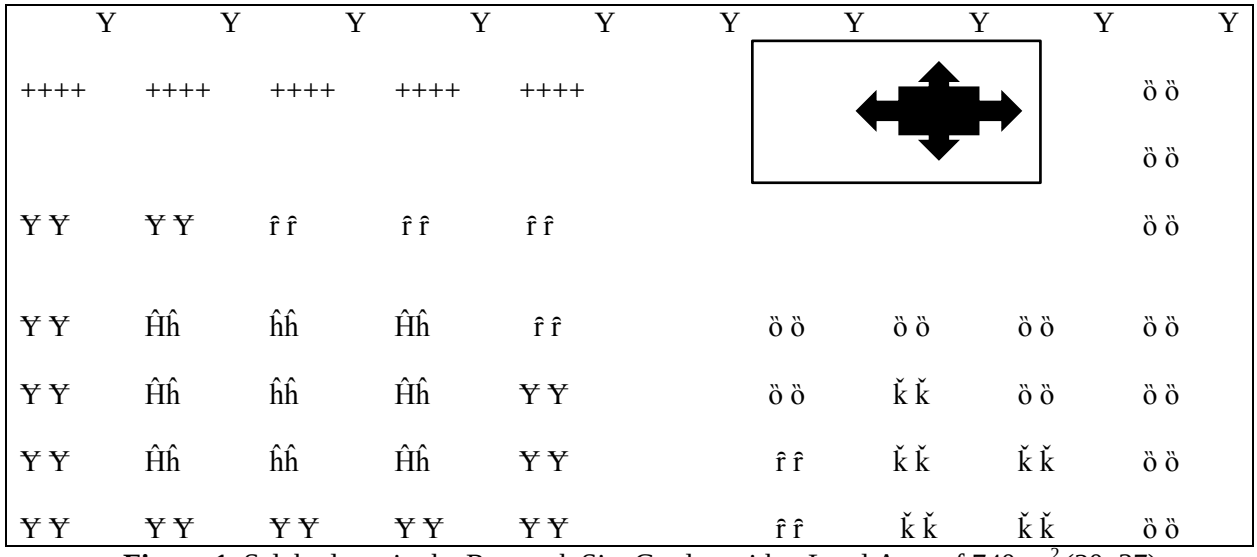

Figure 1. Salak plants in the Research Site Garden with a Land Area of 740 m^2 (20x37).

information:

ȍ :	Salak Pace	**f̂**	: Other Salak
ǩ :	Yellow Salak	**Ɏ**	: Banana Tree
Ĥ :	Salak Hitam	**+**	: Yam Plant
ψ :	Bamboo Tree		: Electric Tower Building

RESULT AND DISCUSSION

Based on the results of research that has been conducted in the observation of vegetative morphology types of plants salak pace, black salak, yellow salak with exploration and interview and conducted random sampling by selecting each of the 5 plant samples. According to the results of exploration salak *(Salacca Zalacca)* type salak pace, black salak, yellow salak obtained vegetative and generative morphological data (Table 1 and Table 2). This result was obtained while conducting salak plant research in The Village of Bedahlawak Tembelang District jombang during the salak season, so that vegetative and generative morphological data was obtained on the salak plant. According to the results of interviews with salak garden owners stated that there has been no research that examines the generative morphological characteristics of the three types of salak. As for this study from the data is interrelated and complementary to characterize each type of salak by knowing the kinship relationship.

- **Morphological Observations**

The observation of morphology salak pace, black salak, yellow salak in the village surgical village Bedahlawak district Tembelang Jombang district both in the form of quantitative and qualitative data that include: height of plants, length of leaves, width of leaves, length of leaf fronds, color of the upper surface of leaves, color of the lower surface of the leaves, shape of leaf tips, distance of leaf tension, length of thorns, thorn shape, distance density of thorns , and the texture of thorns, the length of the roots. Here are the data of observations and observations in the field.

Table 1. Quantitative and Qualitative Data of Vegetative Morphology of Salak

PARAMETER	JS	Sample					AVERAGE
		1	2	3	4	5	
Plant Height (cm)	SP	360	515	470	487	485	463,4
	SH	335	326	342	321	317	328,2
	cs	524	476	497	515	483	499
Leaf Length (cm)	SP	58	64	61	65	60	61,6
	SH	54	51	47	46	50	49,6
	cs	61	34	59	60	56	54
Leaf Width (cm)	SP	6,4	5	5,3	5,7	6,1	5,7
	SH	6	5,7	5,5	6,2	5,8	5,84
	cs	4,5	3	6	3,5	4,2	4,24

PARAMETER	JS	Sample					AVERAGE
		1	2	3	4	5	
Leaf Tip Shape	SP	pointed					
	SH	pointed					
	cs	pointed					
Leaf Stretch Distance (cm)	SP	6,5	4,5	4,3	5,2	5,3	5,16
	SH	4,5	4,8	3,9	4,1	4	4,26
	cs	4,8	5,5	5,5	4,5	4,6	4,98
Leaf Top Surface Color	SP	Dark green					
	SH	Dark green					
	cs	Dark green					
Surface Color Under The Leaves	SP	Grayish green					
	SH	Grayish green					
	cs	Grayish green					
Pelepah Length (cm)	SP	320	495	456	459	476	441,2
	SH	315	305	327	304	304	311
	cs	463	357	385	484	475	432,8
Spine Length (cm)	SP	5	4	4,3	3,9	4,5	4,34
	SH	3,5	3,7	3,1	3,4	3,5	3,44
	cs	5,3	4	5,5	4,7	5	4,9
Thorn Shape	SP	thin, taper, small					
	SH	thin, taper, small					
	cs	thick, taper, big					
Thorn Texture	SP	soft					
	SH	Soft slightly stiff					
	cs	soft					
Distance Density Of Spines (cm)	SP	4,3	2	2,5	3,2	2	2,8
	SH	1,3	1,2	1,6	1,4	1,5	1,4
	cs	1,6	2	1	1,5	1	1,42
Root Length (cm)	SP	69	39,5	44	65,2	53	54,14
	SH	53,5	49,5	56	64	51	54,8
	cs	70	37,5	58	47,5	52	53

Table 2. Generative Morphological Character Salak

No	Parameter	Cultivars		
		01 (Salak Pace)	02 (Black Salak)	03 (Yellow Salak)
1	Number of bunches pertangkai	2 sd 3	1 sd 3	3 sd 4
2	Number of bunches	28 – 34	20 – 27	17 – 21
3	Length of fruit bunches (cm)	17,3 (15,2 - 19,1)	15,5 (13 - 17)	14,2 (12 - 15,5)
4	Fruit shape	Oblong cone with the base of a taper fruit	Round blunt base	Taper base cone
5	Fruit weight (grams)	47,4 (39,2-54,1)	89,3 (81,4-94,1)	67,5 (59,9-73,4)
6	Fruit skin color	Blackish brown	Blackish brown	Yellowish brown
7	Length of fruit	5,5 (5-7,5)	5,3 (5-6,5)	8,5 (6,5-9)
8	**Color of fruit scales**			
	- Scale tip	Blackish brown	black	Yellowish brown
	- Middle scales	A little yellow	Blackish brown	yellow
	- Base of scales	Yellowish brown	brown	Yellowish brown
9	Color of fruit flesh	Yellowish white	Yellowish white	Yellowish
10	Thick flesh of fruit (cm)	2,5	3	2
11	Texture of fruit meat	soft	soft	Soft a little hard
12	Fruit meat flavor	Sweet, there's a little water.	Sweet, a little bit, with more water	Not too sweet, more sepetnya, with more water
13	Number of wedges per fruit	3	3	3

14	**Properties**			
	- Ripe fruit	Not too watery	Watery	A little watery
	- Not cooked yet	basket	basket	basket
	- Durability of storage power	3 - 5 days	1 - 7 days	1 -3 days

Based on the data in Table 1 and 2 shows from the three types of salak Pace, salak Hitam, salak Kuning has a morphological character that is not much different, following the morphology of each salak.

- **Salak Pace**

Salak pace has a plant height ranging from 360-515 cm with an average of 463.4 cm. The shape of the leaves is pinnate with a leaf length of 441 cm and a leaf length of 61.6 cm. The leaves are arranged pinnately, including perfect leaves that have leaves, stalks and pelepah. The basic shape of the leaves is all the same i.e. lanset. The shape of the tip of the leaf salak tapered, the arrangement or layout of the leaves salak pace uniform and parallel that is the pattern 1 2 3 4. The top surface color of the dark green leaves and the color of the lower surface of the grayish-green leaves (Table 1). Pelepah salak leaves are round only the size of salak pace leaf pelepah is slightly smaller than black salak and yellow salak. On the leaf there are thorns, salak pace spines have a soft texture, thin shape, taper, small, and also have a density of thorns between 2-4.3 cm, with an average of 2.8 cm. And it has a root length between 39.5-69 cm with an average of 54.14 cm (Table 1).

Salak pace fruit that has been cooked has a sweet taste there is little water and has a soft texture of fruit meat, and the color of yellowish-white fruit flesh, in uncooked fruit has a taste sepet. The shape of the cone is oblong with the base of the taper fruit. The base color of the fruit scales is yellowish brown, the middle of the fruit scales is slightly yellow, the color of the scales of the fruit scales is blackish brown and the skin of the fruit is more predominantly blackish brown. Salak pace has 2-3 bunches of pertangkai with a total of 28-36 bunches and a length of fruit bunches of 17.3 (15.2-19.1) cm. The length of the fruit is 5.5 (5.7.5) cm, the weight of the fruit is 47.4 (39.2-54.1) grams with a thickness of 2.5 cm of fruit flesh and has a total of 3 wedges / pieces (Table 1).

- **Black Salak**

Black salak has a plant height ranging from 317-342 cm with an average of 378.2 cm. The shape of the leaves is pinnate with an average leaf length of 331 cm and a leaf length of 49.6 cm. The leaves are arranged pinnately, including perfect leaves that have leaves, stalks and pelepah. The basic shape of the leaves is all the same i.e. lanset. The shape of the tip of the leaves of the tapered salak, the arrangement or layout of the black salak leaves is not aligned or not uniform ie pattern 3 2. The top surface color of the dark green leaves and the color of the lower surface of the grayish-green leaves. Pelepah salak leaves are round only the size of the black salak leaf pelepah is slightly larger than salak pace. On the leaf fronds there are thorns, black salak spines have a slightly stiff soft texture, thin shape, taper, small and has a density of thorns between 1.2-1.6 cm with an average of 1.4 cm. And it has a root length between 49.5-64 cm with an average of 54.8 cm (Table 1).

The ripe black salak fruit has a slightly sweet taste with more water, has a soft texture and yellowish white flesh color, on uncooked fruit has a taste that is sepet. Round fruit shape with blunt pangakal. The base color of the scales of the brown fruit, the middle of the scales of the blackish brown fruit, the tip of the black scales and the skin of the fruit is more predominantly blackish brown. Black salak has 1-3 bunches of pertangkai with the number of 20-27 bunches and the length of fruit bunches of 15.5 (13-17) cm. The length of the fruit is 5.3 (5-6.5) and has a fruit weight of 89.3 (81.4-94.1) grams with a thickness of 3 cm of fruit flesh and has a total of 3 wedges / fruit (Table 1).

- **Yellow Salak**

Salak yellow has a height ranging from 476-524 cm with an average of 499 cm. The shape of the leaves is pinnate with an average leaf length of 432.8 cm and a leaf length of 54 cm. The leaves are arranged pinnately, including perfect leaves that have leaves, stalks and pelepah. The basic shape of the leaves is all the same i.e. lanset. The shape of the tip of the leaf is tapered salak, the arrangement or layout of the yellow salak leaves almost have similarities to form a pattern that is 2 3 but not uniform. The top surface color of the dark green leaves and the color of the lower surface of the grayish-green leaves. Pelepah salak leaves are round only the size of the yellow salak leaf pelepah is slightly larger than the pelepah salak pace leaves and almost similar in size to the black salak leaf fronds with yellow salak leaf fronds. On the leaf leaf there are thorns, yellow salak spines have a soft texture, thick shape, taper, large.

It has a thorn density between 1-1.6 cm and an average of 1.42 cm. And it has a root length between 37.5-70 cm with an average of 53 cm. (Table 1).

Ripe yellow salak fruit has a taste not too sweet, more sepetnya, with more water and has a soft texture of fruit flesh and yellow flesh color, on uncooked fruit has a sepet taste. The shape of the cone fruit with the base of the taper, the base color of the yellowish brown scales, the middle of the yellowish scales, the tip of the yellowish-brown scales and the skin of the fruit is more predominantly yellowish brown. Yellow salak has 3-4 bunches of pertangkai with a total of 17-21 bunches and a length of fruit bunches of 14.2 (12-15.5) cm. The length of the fruit is 8.5 (6.5-9) cm and has a fruit weight of 67.5 (59.9-73.4) grams with a thickness of 2 cm of fruit flesh and has a total of 3 wedges / fruit (Table 1).

- **Differences in Morphology And Kinship Relationship Type Salak**

Overall there are many similarities in the morphological character of salak plants. In addition, there are also differences from each type of salak in the village of Bedahlawak district Tembelang Jombang.

- **Differences in Salak Morphology In Bedahlawak Village**

Salak pace plant, black salak, yellow salak has a slightly different plant height that ranges from 3.1m – 5.2 m. This is in line with Harsoyo's research in Harahap (2013), Salak resembles a palm tree that seems untangy, low and upright with a salak plant height between 1.5-7 meters, depending on the type. In the parameters of leaf length there is no difference, it's just that the length of the black salak leaf pelepah is slightly shorter than salak pace and yellow salak. Similarly, the parameters of leaf length are also no difference far, it's just that the length of the black salak leaves is slightly shorter than salak pace and yellow salak. Of the three types of salak has the exact same morphological character that is in the parameters of the upper surface color of the leaves are dark green (Table 1), the color of the lower surface of the leaves are grayish green (Table 1), and have similarities at the tip of the leaves are pointed.

Figure 2. Leaf Top Surface Color (Wahyudi, 2021)

The color of the lower surface of salak pace leaves, black salak, yellow salak has the same color.

Figure 3. Underside Color (Wahyudi, 2021)

In the parameters of thorn density, of the three types of salak has a different density whereas in salak pace has a density of thorns of 2-4.3 cm, black salak 1.2-1.6 cm and yellow salak of 1-1.6 cm. In the texture of salak plant spines show that black salak spines are stiffer compared to salak pace spines and yellow salak. In the form of thorns there is a slight difference that the form of salak pace spines and black salak have the same form of thorns that are thin, taper, and small. While the shape of yellow salak spines have the form of thick thorns, taper, and large. (Table 1).

Based on the nature of the fruit (Table 2), of the three types of salak has a slight difference in the taste of fruit. In salak pace fruit has a sweet fruit taste a little bit there is water, black salak has a slightly sepet sweet fruit flavor with more water, yellow salak has a fruit flavor not too sweeter sepet with more water. Salak fruit has a soft texture, soft, rather juicy and yellowish white fruit flesh color. This is in accordance with the research rismawati (2016), which states that salak fruit has a distinctive taste sepat. However, there are some varieties of superior salak that taste sweet and not at all as fast.

- **Kinship**

Based on the vegetative morphology of the three types of salak, it can be known the kinship relationship of the three types of salak. To find out the relationship of kinship morphology salak can be analyzed by looking at the relationship of similarity of slak processed using the method UPGMA *(Unweighted Pair-Group Method with Airthimetic mean)* with ntsys program (*Numerical Taxonomy and Multivariate System)* version 2.11 with gerombol analysis (cluster) that produces a dendogram of similarity of 15 salak samples based on the characteristics of morphology formed salak.

NTSYS is a program created to perform kinship analysis. This program can be used to see the kinship relationship between several samples (species) by looking at the emergence/absence of a parameter or physical factor in each sample. In molecular biology, binominal data is used in RAPD as well as AFLP. The absence of tapes in each parameter can be categorized as binomial data. Starting by entering sample count data and physical factor data into numerical methods, performing a similarity/disimilarity analysis, and then grouping the data to create a dendogram.

According to Cahyarini (2004) in Trimanto (2010) the similarity index is said to be far if less than 0.60. The similarity index approaching the number one or 1.00 is a completely similar one, while the distance of similarity close to the number 0 has a distant kinship. In terms of differences in morphological character based on observations dendogram is different from the results of field observations that have been done as seen in Table 1 and Table 2 because the binary numbers used are only 2 ie 0 and 1. Here's the coding of each parameter:

- The height of salak plant can be said to be 0 when the height of the plant is below 400 cm and the mourning of 1 when the height of the plant is above 400 cm.
- The length of salak leaves can be said to be 0 when the length is below 50 cm and it is said to be 1 when the length is above 50 cm.
- The width of the leaves can be said to be 0 when the width is below 4 cm and it is said to be 1 when the width is above 4 cm.
- The shape of the tip of the leaf can be said to be 0 when it is pointed and said to be 1 when rounded.
- The distance of the dau can be said to be 0 when the distance is below 5 cm and it is said to be 1 when the distance is above 5 cm.
- The top surface color of the leaves can be said to be 0 when light green and said to be 1 when it is dark.
- The color of the lower surface of the leaves can be said to be 0 when brownish green and said to be 1 when it is grayish green.
- The length of salak leaf fronds can be said to be 0 when the length is below 400 cm and it is said to be 1 when the length is above 400 cm.
- The length of the spine can be said to be 0 when the length is below 4 cm and it is said to be 1 when the length is above 4 cm.
- The shape of the spine can be said to be 0 when the shape is thin small taper and said 1 when the shape is thick large taper.
- The texture of thorns can be said to be 0 when soft textured and said to be 1 when textured rigidly.
- The distance of thorn density can be said to be 0 when the distance is below 3 cm and it is said to be 1 when the distance is above 3 cm.
- The length of the root can be said to be 0 when the length is below 60 cm and it is said to be 1 when the length is above 60 cm.

Based on the linear number (encoding) is obtained dendogram results as follows:

- **Kinship between Salak Pace (1) and Salak Hitam (2)**

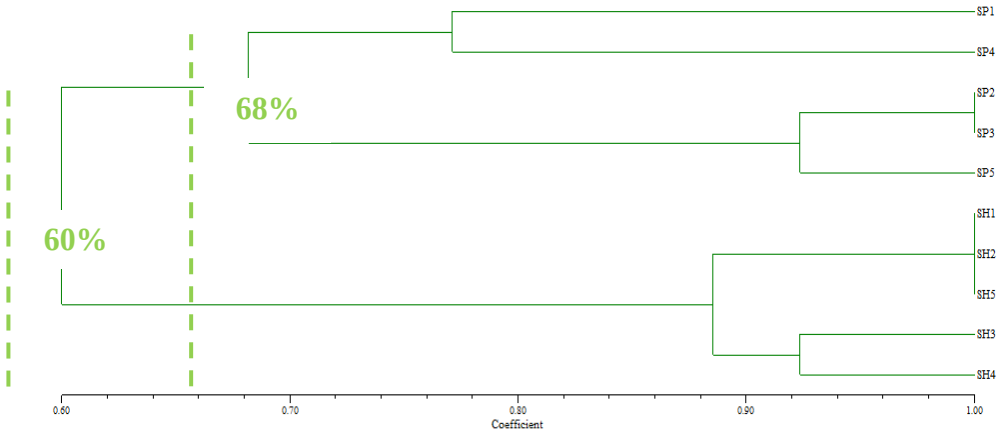

Figure 4. Dendogram 10 Salak Pace Trees and Black Salak in The Village Surgical Village Bedahlawak District Tembelang Jombang.

Based on vegetative morphological character, salak pace and black salak in bedahlawak village village of Tembelang subdistrict have kinship relationship with similarity of 60% with coefficient value of 60% - 68%. This indicates that the kinship relationship between salak pace and black salak has a close kinship relationship. This is according to Cahyarini's statement (2004) in (Amaludin 2019) that the similarity index is said to be far if less than 0.60 (60%) and the likeness index is close to 1 or 1.00 (100%) is a wholly similar one.

- **Kinship between Salak Pace (1) and Salak Kuning (3)**

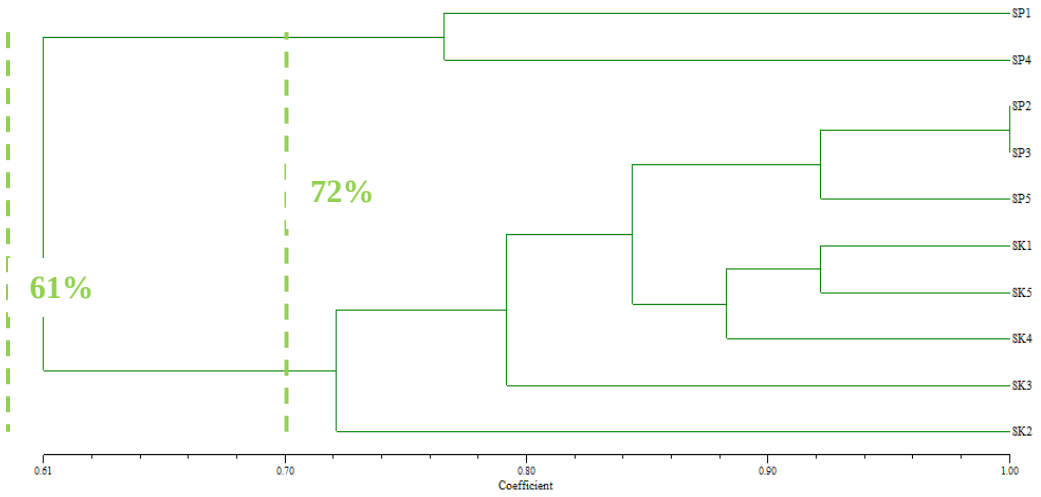

Figure 5. Dendogram 10 Salak Pace Trees and Black Salak in The Village Surgical Village Bedahlawak District Tembelang Jombang.

Based on vegetative morphological character, salak pace and yellow salak in bedahlawak village village of Tembelang subdistrict have kinship relationship with similarity of 61% with coefficient value of 61% - 72%. This indicates that the kinship relationship between salak pace and yellow salak has a close kinship relationship. This is in accordance with Cahyarini's statement (2004) that the similarity index is said to be far if less than 0.60 (60%) and the likeness index is close to 1 or 1.00 (100%) is a wholly similar one.

- **The kinship of Salak Hitam (2) and Salak Kuning (3)**

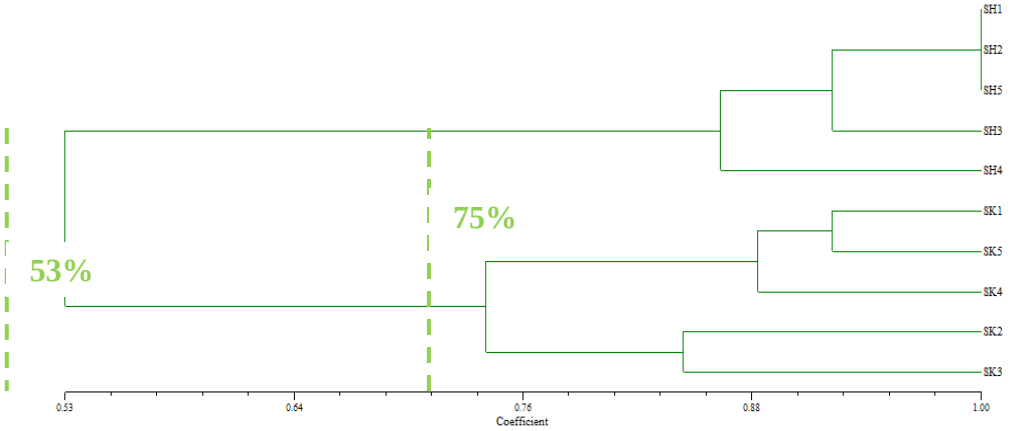

Figure 6. Dendogram 10 Black Salak Trees and Yellow Salak in The Village Surgical Village Bedahlawak District Tembelang Jombang.

Based on vegetative morphological character, black salak and yellow salak in Bedahlawak village village of Tembelang subdistrict have kinship relationship with similarity of 53% with coefficient value of 53% - 75%. This indicates that the kinship relationship between black salak and yellow salak has a distant kinship relationship. This is in accordance with Cahyarini's statement (2004) that the similarity index is said to be far if less than 0.60 (60%) and the likeness index is close to 1 or 1.00 (100%) is a wholly similar one.

- **The kinship of Salak Pace, Salak Hitam, and Salak Kuning.**

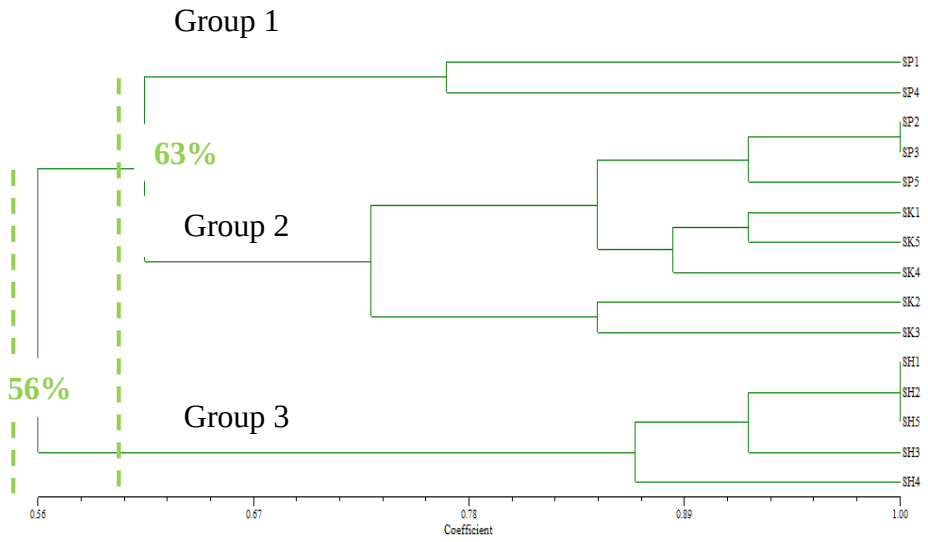

Figure 7. Dendogram 15 Salak Trees *(Salacca zalacca)* from 3 Types of Salak in The Village Surgical Village Bedahlawak District Tembelang Jombang.

Based on vegetative morphological character, salak plant *(Salacca zalacca)* of 3 types of salak in bedahlawak village village of Tembelang subdistrict has kinship relationship with similarity of 56% with coefficient value of 56% - 63% which can be grouped into 3 large groups. In general, the results of the morphological dendogram of salak do not group into 15 samples based on the location of the garden, but based on the similarity of its morphological character that can be seen in (Table 1).

In groups 1 and 2 showed a kinship relationship that is almost the same as the similarity value of 60% with a coefficient value of 60% - 68% so that in groups 1 and 2 can be said to have a close kinship relationship, this is due to factors of soil conditions that are almost the same even though the distance of salak pace plants with black salak far apart does not close the possibility of making a close kinship

relationship. While in groups 1 and 3 show the same kinship relationship with similarity value of 61% with coefficient value of 61% - 72% so that in groups 1 and 3 can be said to have close kinship relationship, this is due to the layout factor of salak pace plant and yellow salak close together. In groups 2 and 3 showed the same kinship relationship with similarity values of 53% with a coefficient value of 53% - 75% so that in groups 2 and 3 can be said to have a distant kinship relationship, this is due to the location of the sample far from the sample 1 to the next sample and most likely due to different soil conditions that make the kinship relationship of groups 2 and 3 far away. While in groups 1, 2 and 3 showed a kinship relationship that is almost the same as the similarity value of 56% which is not much different from group 2 and 3 so that in groups 1, 2 and 3 can be said to have a distant kinship relationship.

CONCLUSION

Salak pace has a plant height ranging from 360-515 cm with an average of 463.4 cm. The shape of the leaves is pinnate with a leaf midrib length of 441 cm and a leaf length of 61.6 cm. The leaves are arranged pinnate, including perfect leaves that have a leaf blade, petiole and midrib. The basic shape of the leaves are all the same, namely lanceolate. The shape of the tip of the salak leaf is tapered, the color of the upper surface of the leaf is dark green and the color of the lower surface of the leaf is grayish green. On the leaf midrib there are thorns, salak pace spines have a soft texture, are thin, pointed, small, and also have a thorn density between 2-4.3 cm, with an average of 2.8 cm. And has a root length between 39.5-69 cm with an average of 54.14 cm. The ripe salak pace fruit has a sweet taste with little water and has a soft flesh texture, and the color of the flesh is yellowish white, the unripe fruit has a sepet taste. The shape of the fruit is oval with a pointed base.

Black salak has a plant height ranging from 317-342 cm with an average of 378.2 cm. The shape of the leaves is pinnate with an average leaf midrib length of 331 cm and leaf length of 49.6 cm. The leaves are arranged pinnate, including perfect leaves that have a leaf blade, petiole and midrib. The basic shape of the leaves are all the same, namely lanceolate, and the shape of the tip of the salak leaf is tapered. The color of the upper surface of the leaves is dark green and the color of the lower surface of the leaves is grayish green. And has a root length between 49.5-64 cm with an average of 54.8 cm. Black salak fruit that is ripe has a slightly sweet taste with more water, has a soft texture and yellowish white flesh color, the unripe fruit has a sepet taste. The shape of the fruit is round with a blunt base. The color of the base of the fruit scales is brown, the middle of the fruit scales is blackish brown, the tip of the black scales and the skin of the fruit is blackish brown. Black bark has 1-3 bunches of stems with a number of 20-27 bunches and fruit bunches length of 15.5 (13-17) cm. The length of the fruit is 5.3 (5-6.5) and has a fruit weight of 89.3 (81.4-94.1) grams with a thickness of 3 cm of flesh and has a number of corners of 3 pieces.

Yellow bark has a height ranging from 476-524 cm with an average of 499 cm. Pinnate leaf shape with an average leaf midrib length of 432.8 cm and leaf length of 54 cm. The leaves are arranged pinnate, including perfect leaves that have a leaf blade, petiole and midrib. The basic shape of the leaves are all the same, namely lanceolate, and the shape of the tip of the salak leaf is tapered, the color of the upper surface of the leaf is dark green and the color of the lower surface of the leaf is grayish green. And has a root length between 37.5-70 cm with an average of 53 cm. Yellow salak fruit that is ripe has a less sweet taste, more sepetnya, with more water and has a soft flesh texture and yellow flesh color, the unripe fruit has a sepet taste. The shape of the fruit is conical with a pointed base, the color of the base of the scales is yellowish brown, the middle of the scales is yellow, the tip of the scales is yellowish brown and the skin of the fruit is more dominant yellowish brown. Yellow bark has 3-4 bunches of stems with a total of 17-21 bunches and a fruit bunch length of 14.2 (12-15.5) cm. The length of the fruit is 8.5 (6.5-9) cm and has a fruit weight of 67.5 (59.9-73.4) grams with a thickness of 2 cm of flesh and has a total of 3 pieces.

Pace salak, black salak, yellow salak have morphological differences, namely the density of thorns, fruit taste, fruit shape, fruit skin color and fruit size and have different kinship relationships. In salak pace and black salak, there is a 60% kinship relationship with a coefficient value of 60% - 68%. This shows that salak pace and black salak have a close relationship. In salak pace and salak kuning, there is a kinship relationship with a similarity of 61% with a coefficient value of 61% - 72%. This shows that the kinship relationship between salak pace and salak kuning has a close kinship. While the black salak and yellow bark have a kinship relationship with a similarity of 53% with a coefficient value of 53% - 75%. This shows that the kinship relationship between black bark and yellow bark has a distant kinship relationship.

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