

Analysis of Levels Carbohydrate and Nitrogen Ratio Salak Sidimpuan Leaves (*Salacca Sumatrana* Becc.) on Two Different Flowering Periods

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Abstract: This study aims to determine the ratio of Carbohydrate and Nitrogen Ratios In Flowering Period from June to September 2016 and Flowering Period from January to April 2017 at Sidimpuan Salak Leaves (*Salacca sumatrana* Becc) .This research was conducted in Palopat Maria Village, Padang Sidimpuan Hutaimbaru Subdistrict, The city of Padang sidimpuan. and Carbohydrate and Nitrogen Nutrient Analysis at the University of Andalas Padang Soil and Plant Laboratory. The method used in this research is survey and purposive sampling. To know the ratio ratio of Carbohydrate and Nitrogen Leaves of Salak Sidimpuan In Two perioq of Flowering by analyzed using SPSS with independent t-test. The results showed that the ratio of Carbohydrate and Nitrogen Ratios was higher in the Flowering Period from January to April with an average of 44,809 while the June to September period averaged 29,032.

1 INTRODUCTION

Salak sidimpuan is one of the most famous fruit on the island of Sumatra and even the island of Java. Salak Sidimpuan spread almost in all subdistricts in Kabupaten Tapanuli Selatan. This salak began cultivated since 1930 in District West Angkola. Salaknya flavor is famous for the taste of spicy, sweet, slightly sour, or a mixture of flavor and aroma of taste and taste different from salak pondoh and bali salak and have different color characteristic that is red or also called salak narara (salak sidimpuan red) and there is barking nabontar (salak sidimpuan putih) and Salak Sibakkua (Kaputra, 2006).

Salak is included in the family palmae that blooms throughout the year like coconut. However, in reality the harvest season only reaches twice a year ie harvest (January-February) from the flowering of October and moderate harvest (July-August) from the flowering of April, even more frequent harvest only once a year harvest (Rai, et al. 2010).

One of the causal factors affecting the production of salak fruit sidimpuan is the unsuccessful interest developed into fruit (fruit-set failure). Differences in nutrient status such as nitrogen, Posfor, Potassium and the ratio of carbohydrates and nitrogen in the

leaves, are internal factors that affect the failure of the fruit set. N, P and K nutrient elements are the main nutrients used to promote the growth, production and quality of fruit trees. External factors such as rainfall, temperature, humidity, soil soil levels also influence the integration of the fruit set.

One of the triggers of the fruit set is the accumulation of carbohydrates produced by photosynthesis that is stored as a plant food reserve, Balance ratio of Nitrogen Carbohydrates will determine the balance of vegetative and generative phases. Higher amounts of nitrogen or a smaller ratio of Nitrogen Carbohydrates will keep plants in the vegetative phase of course will have problems in the flowering process and conception is imminent. However, carbohydrate values that are too high without being offset by sufficient nitrogen amount will cause plant death or will not bear fruit the following season (Endah, 2008). The high ratio of the Nitrogen and Carbohydrate has driven the plant towards a generative development

Based on the description above it is necessary to do research on studies of Analysis of level Carbohydrate and Nitrogen Ratios Leaf Salak Sidimpuan (*Salacca sumatrana* Becc) In Two Different Flowering Periode.

2 MATERIAL AND METHODS

This research has been conducted in Palopat Maria Village, Padangsidempuan Hutaimbaru Subdistrict, Padangsidempuan City, from January to April 2017, and Analysis of Carbohydrate and Nitrogen Nutritional content was done at Andalas University Laboratory of Padang. The flowering period of June Up to September has been done in Harahap (2016).

The tools used in this research are: oven, scale, Flame Emission Spectrophotometer (FES), meter, stationery, knife, camera, sign board, research sample label and other materials supporting this research. The material used is the leaf of salak sidempuan plant.

This research has been done by purposive sampling method, analysis of nutrient nitrogen and carbohydrate is done to the leaves with the following criteria are : DI (Leaf on the open midrib), DII (Leaves on the midrib there are flowers) and DIII (leaf on the midrib which is there are fruits).

The ratio analysis of nitrogen and carbohydrate two flowering periode is analyzed using Independent Test sample T-test. Method of analysis To see the nutrient content, ratio of Nitrogen Carbohydrate and to the flowering of salak was analyzed by T-Test.

Test t for different variants (unequal variance) using manual formula Separated Variance below :

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Note:

n_1 : Number of samples in flowering period from June to September

n_2 : Number of samples in flowering period January – April

\bar{X}_1 : Average sample during flowering period June - September

\bar{X}_2 : Average sample during the January-April flowering period

S_1^2 : Sample variance during flowering period June - September

S_2^2 : Sample variance in flowering period January-April

The null hypothesis is rejected if the t ratio or the result of the analysis goes beyond the critical point ($t_{an.> T}$ table). If the production and the large sugar content the null hypothesis is rejected if p value <alpha is set (Sarwono, 2006)

The research parameters were: ratio of carbohydrate and nitrogen leaf and production on one periode flowering (kg).

3 RESULT AND DISCUSSION

3.1 Production of Salak Sidempuan (Kg)

Production of Salak Sidempuan On Two Season of Flowering Through the result of observation of average production of salak sidempuan on 10 plants sample of salak sidempuan salak can be seen in Table 1.

Table 1. Average Salak Salak production in June Up to September 2016 and Salimp Sidempuan Salak Production Rate from January to April 2017 (kg).

No	Production Juni- Sept	Production Jan-April
1	2.8	3.5
2	4.4	4.7
3	4.6	5.2
4	2.4	1.3
5	4.4	4.6
6	2.5	3.8
7	3.7	5.7
8	4.6	4.7
9	3.5	3.8
10	3.6	6.4
Average	3.65	4.37

Average production of salak Sidempuan on flowering periode June to September that is: 3.65 kg. While in January to April that is 4.37 kg. The average production of salak plants in January Up to April is higher than the average production of salak from June to September. This condition is in line with the fact that the ratio of Nitrogen Carbohydrate to Salak plants in January to April is higher than the ratio of Nitrogen Carbohydrate from June to September (table 2). According to the study of Liferdi et al. (2005) found that the ratio of carbohydrate and nitrogen to four rambutan varieties increased sharply from the vegetative phase ranging from 0.85 to 0.90 and towards the generative phase (fruit formation) ranging from 1.03 to 1.27. The high ratio of Nitrogen Carbohydrate has encouraged the plant towards generative development. 3% glucose content both for flowering and fruit formation process (Diah, 2012).

3.2 Results Analysis of Carbohydrate and Nitrogen Ratios Leaf Salak Sidempuan

Carbohydrate and Nitrogen ratio analysis on leaf tissue of salak sidempuan with leaf criteria that is

midrib fully open leaves of leaf (DI), leaf on the midrib which is there are flowers (DII) and leaf on the midrib which is there is fruit (DIII) can be seen in table 2 below.

Table 2. Average Carbohydrate Ratio, Nitrogen Flaring Results In Flowering Periode June-September 2016 and January-April 2017.

Leaf Criteria	Juni-Sept 2016 (%)	Jan - April 2017 (%)
D I	31.614	46.489
D II	24.330	35.626
D III	17.020	52.563
Total	29.203	44.809

Based on table 2, it can be seen that the result of average analysis of ratio of Carbohydrate, highest Nitrogen In flowering season of January-April 2017 is highest in type of leaf of DIII(Leaves on the midrib there are fruit) 52.563% and the lowest is in DII leaf type (Leaves on the midrib there are flowers) is 35.626%.

Ratio C / N imbalances can disrupt vegetative phases (developmental periods of roots, stems and leaves) and the generative phase (the time of flower and fruit formation) of plants. High C / N ratio will encourage rapid flowering and fruit formation. (Liferdi et al., 2000). This is seen in table 2 C / N ratio of the highest obtained on DIII is the leaves of the stem which in the armpits there were fruits.

Based on rainfall data, high production in flowering periode January to April is caused by high intensity of precipitation in September, so the production of salak during flowering period of January to April is higher that is 4.37. According Sofyan et. al (2002), states that water for plants is one of the main ingredients to increase the rate of photosynthesis. The presence of water is required in the nitrogenase process. The high rainfall then the process of nirogenase in leaf cells run smoothly so as to support the process of flowering and fruit set in salak plants. The availability of essential elements such as the N elements that are part of the protein, the enzyme of the biological catalyst agent helps the formation of leaf chlorophyll.

Table 3. Independent T Test Analysis Results Carbohydrate and Nitrogen Ratio In two flowering periode

Description	Juni-September 2016	Januari-April 2017
Number of sample (N)	30	30
Average Carbohydrate and NitrogenRatio (%)	29.023	44.809
Signifikansi	: 0.000 < 0.05	
t-count	: 5.176	
t-tabel (0.05,28)	: 2.048	
Comparison	: 0.220- 9.492 %	
Note	: * (significant)	

Based on the results of the independent t-test test obtained a significance value of 0.000 (<0.05) which means there is a significant difference between Flowering June to September 2016 with the flowering period January-April 2017. T-count value obtained for 5.176 larger than t-table (0.05,28) = 2.048 which means RI (Average Nitrogen Carbohydrate Ratio In June of June) rejected and R II (Average Carbohydrate Ratio in January April 2017) accepted which means tested statistically average Carbohydrate ratio, Nitrogen Leaf of salak Sidimpuan in Flowering from January to April 2017 is higher, significantly different from the ratio of Carbohydrate, Nitrogen in flowering period June to September 2016. This is caused by external factors such as temperature, humidity With the knowing change of ratio of Carbohydrate, Nitrogen from each phase growth, allowing for flowering arrangements outside the seasons through cultivation manipulation (Pidkowich et al., 1999).

Environmental factors will affect the physiological processes in plants. All physiological processes will be affected by temperature and some processes will depend on light. Optimum temperature is required for plants to be utilized as well as possible by plants. Temperatures that are too high will inhibit the growth of plants will even be able to cause death for plants, and vice versa too low temperature (Sarief, 1984).

The existence of the nitrogen element is also very important especially in relation to the formation of chlorophyll. Chlorophyll is considered as a "machine" of plants because it is able to synthesize carbohydrates that will support plant growth. The presence of nitrogen in the structure of plants is influenced by several factors, especially the availability of water, nutrients in the soil, especially

nitrogen. Intensitas of light affects the activity of photosynthesis. To form chlorophyll, a high enough ATP (energy) is needed and for the assimilation of CO₂ is also required enzyme which is largely protein (Liferdi et al, 2005).

4 CONCLUSION

Carbohydrate Ratio, Nitrogen flowering periode June-September 2016 is 29.203 while in the flowering periode January-April 2017 is 44.809. Based on the results of t test analysis, the ratio of carbohydrate and nitrogen flowering period of January to April 2017 was significantly different with the ratio of carbohydrate and nitrogen periode flowering June to September 2016

The highest carbohydrate and nitrogen ratio is obtained in the flowering periode of January-April 2017, which is 44,809 where the highest value is at D III (Leaves of the armpits there were fruits) 52,563 and the lowest in D II (Leaves of there were flowers) that is 35.626.

Based on the results of observations in this study The average production of salak flowering period of January-April 2017 is higher than the average production of salak in the period of flowering from June to September 2016.

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