The Effect of Maturity Level on Chemical Properties of Asam Gelugur (*Garcinia Atroviridis*)

Mimi Nurminah[1,2], Terip Karo-karo[1,2], Elisa Julianti[1,2], and Vivi Andriani Ginting[1]
[1]*Department of Food Science and Technology, Faculty of Agrculture, Universitas Sumatera, Medan, Indonesia*
[2]*Centre for Tuber and Roots Crop Study, Faculty of Agriculture, Universitas Sumatera Utara*

Keywords: maturity level, chemical properties, asam gelugur.

Abstract: Asam gelugur (*Garcinia atroviridis*) is a plant that grownwidely in Indonesia. Asam gelugur is used always for traditional dishes like laksa, asampedas, and manisan. This research deal about effect of maturity level of asamgelugur from 5 region at Province Sumatera Utara (Tapanuli Tengah, Batubara, Delitua, Sembahe, and Simalungun). The result showed that moisture and ashcontent increased when the level maturity increased. Acid total and vitamin C decreased when the level of maturity increased.

1 INTRODUCTION

Asam gelugur (*Garcinia atroviridis*) is an annual plant that can grow in tropical and sub-tropical regions, originating from South Asia and Southeast Asia (Heyne, 1987). Asam gelugur fruit with a round shape with a diameter of 7-10 cm. Fruits weight ranges from 250-600 gr (Hutajulu and Eddy, 2014).

Fruit production can occur through out the year, but big harvest generally only occur twice a year. The farmer dry the slices of asam gelugur fruit under the sun, before selling, and in North Sumatera we call asam potong (slice acid). The dry slice of gelugur acid can be used for juice, syrup, jam, preservative for fish and for latex processing (Nainggolan, 1997). This research dealsthe effect of maturitylevel on chemical properties of asam gelugur (*Garcinia atroviridis*).

2 MATERIAL AND METHOD

This research was conducted at Analisa Kimia Bahan Pangan Laboratory, Universitas Sumatera Utara. Asam gelugur were obtained from farmer at Tapanuli Tengah, Batubara, Deliserdang-1 (Deli Tua), Deliserdang-2 (Sembahe) and Simalungun, Indonesia. The maturity level of asam gelugur consist raw (green ripe), half ripe (yellow ripe) and ripe (the yellow coloris avenly distributed on the entire surface of the fruit).

The analyis were conducted through moisture content analyis using oven method (AOAC, 1995), ash content using dry ashing method (Sudarmadji and Suhardi, 1997), acid total analysis (Ranganna, 1978), and vitamin C content (Apriyanto et. al., 1989). The data analysis using randomized design were nalyzed using SPSS version 22 for windows. The results reported in all tables are average of triplicate observation subjected to one way analysis of variance (ANNOVA). Different among the ranges of the properties were determinate using the method of Least Significant Differences (LSD) tests at 95% confidence level ($P<0.01$). The best treatment was then compared with the control treatment T-test De Garmo was used in determining the best treatment method.

3 RESULTS AND DISCUSSIONS

3.1 Moisture Content

Table 1 showed that the moisture content on raw level of asam gelugur was the lowest content. The moisture content on half ripe and ripe level increased, but the higher content on ripe level. The moisture content of asam gelugur of these five

Nurminah, M., Karo-karo, T., Julianti, E. and Ginting, V.
The Effect of Maturity Level on Chemical Properties of Asam Gelugur (Garcinia Atroviridis).
DOI: 10.5220/0008547001280130
In *Proceedings of the International Conference on Natural Resources and Technology (ICONART 2019)*, pages 128-130
ISBN: 978-989-758-404-6

regions (Tapanuli Tengah, Batubara, Deliserdang-1, Deliserdang-2 and Simalungun) varies from 73.0506 until 92.2051. Fruit water content is influenced by the level of maturity. The difference of moisture content is influenced by the level of maturity and age of the plant, so the growth process still occurs so that it becomes heavier and bigger (Santoso, 2005) and difference of location and climate (Zulkarnain, 2009). Ripening process in fruit can make a change in the moisture content of a plant (Kader, 2002).

Table 1: The effect of maturity level on maturity content of asam gelugur from 5 area

Location	The level of maturity (%)		
	Raw	Half Ripe	Ripe
Tapanuli Tengah	78.9522 ab,AB	81.5001 b,AB	84.3126 b,AB
Batubara	73.0506 a,A	77.0010 ab,AB	80.4592 ab,AB
Deliserdang-1	88.4933 b-AB	89.9309 c,C	92.2051 g,G
Deliserdang-2	89.0400 b,B	89.8900 de,DE	90.3100 e,EF
Simalungun	90.0950 d,D	90.3100 de,DE	90.3350 f,F

3.2 Ash Content

Table 2 showed that the ash content of asam gelugur of 5 area (Tapanuli Tengah, Batubara, Deliserdang-1, Deliserdang-2 and Simalungun) varies from 0.2020 until 2.1497. Ash content indicates the amount of minerals in a material. We can see from table 2 indicated the more ripening, the more ash content, but there is no significant effect on ash content of asam gelugur. The difference of ash content is influenced by land conditions in the area where the plant grows suchs topography, soil type, soil fertility and climate of an area (Zulkarnain, 2009).

Table 2: The effect of maturity level on ash content of asam gelugur from 5 area

Location	The level of maturity (%)		
	Raw	Half Ripe	Ripe
Tapanuli Tengah	1.3501	1.8511	2.1497
Batubara	0.7875	1.0473	1.1680
Deliserdang-1	0.5683	0.7684	1.1474
Deliserdang-2	0.2020	0.2290	0.2940
Simalungun	1.2605	1.4610	1.5290

3.3 Acid Total

Table 3 showed that the acid total of asamgelugur of 5 area (Tapanuli Tengah, Batubara, Deliserdang-1, Deliserdang-2 and Simalungun) varies from 30.4500 until 54.1300.The process of ripening on fruit can make acid total decreased. When the ripening process still in going or are in progress, organic acid will be converted into monosaccharide like glucose and fructose (Mahmood, et. al., 2012). The difference of acid total from five area in North Sumatera is influenced by land conditions in the area where the plant grows (Zulkarnain, 2009). Tapanuli Tengah is at an altitude of 0-1226 m above sea level, Batubara (0-80 m above sea level), Deliserdang (1-8 m above sea level), and Simalungun (average 10-1500 m above sea level).Acid total will decrease according to the maturity of the fruit (Kartasapoetra, 1994).

Table 3: The effect of maturity level on acid total of asam gelugur from 5 area

Location	The level of maturity (%)		
	Raw	Half Ripe	Ripe
Tapanuli Tengah	52.8551 a,AB	49.1333 b,bc	46.4882 bcd,BD
Batubara	54.1300 a,A	47.8558 bc.BC	45.2133 cd,D
Deliserdang-1	35.7563 e,E	31.9157 f,FG	30.6501f ,G
Deliserdang-2	44.7000 d,D	31.8000 f,FG	30.4500 f,G
Simalungun	35.0200 e,EF	32.0500 e,EF	30.5500 f,G

3.4 Vitamin C Content

Table 4 showed that vitamin C content of asamgelugur of 5 area (Tapanuli Tengah, Batubara, Deliserdang-1, Deliserdang-2 and Simalungun) varies from 31.1802 until 47.5787.The more ripening on asam gelugur fruit, the lower vitamin C content. Deliserdang is a lower area than the others. Asam gelugur from Deliserdang had the lower vitamin C content. The activity of the ascorbate oxidase enzyme in harvested fruit will caused a decrease in vitamin C levels (Kartasapoetra, 1994). The difference of vitamin C content is influenced by land conditions in the area where the plant grows suchs topography, soil type, soil fertility and climate of an area (Zulkarnain, 2009).

Table 2: The effect of maturity level on vitamin C content of asam gelugur from 5 area

Location	The level of maturity (%)		
	Raw	Half Ripe	Ripe
Tapanuli Tengah	47.2398 a.A	46.9301 cd,CD	46.8734 e,E
Batubara	47.5787 a,A	46192 a,A	46.5192 bcb,AB
Deliserdang-1	32.6930 d,B	31.9597 i,G	31.1802 h,F
Deliserdang-2	45.4000 i,G	37.9200[i] ,H	37.6400 g,E
Simalungun	47.4150 ab,A	45.3450 e,C	41.2500 f,D

4 CONCLUSIONS

The result showed that moisture and ash content increased when the level maturity increased. Acid total and vitamin C decreased when the level of maturity increased.

REFERENCES

AOAC. 1995. *Official methods of analysis. Eleventh Edition. Association of official Analytical Chemists* Inc. Washingto D.C.

Apriyanto A, D Fardiaz, NL Puspitasari, Serdanawati and S Budiyanto. 1989. Analysis of food. *PAU Pangan dan Gizi IPB (Centre between universities food and nutrition IPB)*. Bogor.

Heyne K. 1987. *Useful plant in Indonesia*. 3th edition. Jakarta: Yayasan Sarana Warna Jaya.

Hutajulu, T.F., Eddy S.H. 2014. Extraction and Identification of Gelugur Oleoresin (*Garcinia atroviridis* Griff ex T. Anders). *Jurnal Rekayasa Pangan dan Pertanian*. 27(1): 19-26.

Kader, A.A. 2002. Post-harvest technology of horticultural crops. *Oakland Agricultural and Natural Resources Publication*, California.

Kartasapoetra, A. G. 1994. *Post harvesting handling technology. Rineka cipta*, Jakarta

Mahmood, T., Anwar, F., Abbas, M., Boyce, M.C., Saari, N. 2012. *CompositionalVariation In Sugars and Organic Acids At Different Maturity Stages In Selected Small Fruits From Pakistan*. Int. J. Mol. Sci. 13 (2), 1380–1392.

Nainggolan, M. 1997. Isolation of colloidal compound of asam glugur. *Kultura, Majalah Ilmiah Pertanian*, Fakultas Pertanian Universitas Sumatera Utara, Medan.

Ranganna, S. 1978. *Manual of analysis for fruits and vegetable product*. Mc-Graw Hill Publishing Company Limited, New Delhi.

Santoso, B. B. 2005. Maturity of product and harvesting index. Fakultas Pertanian.Universitas Mataram.

Sudarmadji S. B Haryono, and Suhardi. 1997. *Analysis of food and agricultural materials*. Liberty. Yogyakarta.

Zulkarnain. 2009. *Basic science of horticulture.* Bumi Aksara, Jakarta.