ISSN: 2581-1274

Nutmeg Pulp Herbal Tea Produced Using Shredding Method

Asbahrul Amri[1], Devi Satria Saputra[2], Ria Darma[3]
[1,2,3] *Program Studi Dilploma III Teknik Industri, Politeknik Aceh Selatan*
[1,2,3] *Jl. Merdeka, Komplek Reklamasi Pantai, Tapaktuan 23751, Aceh Selatan, Indonesia*
E-mail: asbahrul.arl@gmail.com

ARTICLE INFO

Article history:
Accepted

Keywords:
Nutmeg pulp
Herbal tea
Vitamin C
Shredded Method

ABSTRACT

The existing nutmeg pulp herbal tea is produced from slice process which resulted with hard and big particle size of the powder. It is estimated to negatively affect the packaging process and defective product might be possible to occur when distribution taking place. Consequently, the study need to be done to produce nutmeg pulp herbal tea with small particle size of the powder using shredding method and define one of its substance quantity, Vitamin C as the comparable data towards the existing nutmeg pulp herbal tea product. The study reveals that the tea powder produced from shredding method is greatly smaller than slice method. Idiometri titration analysis of 5 nutmeg pulp herbal tea produced from shredding method samples shows that the average quantity of Vitamin C quantity is less significant than slice method which is only 3.514%. Thus, shredding method produces small particle size of nutmeg pulp herbal tea powder and containing less Vitamin C.

I. Introduction

Nutmeg pulp is agricultural waste during harvest time where the process of taking nutmeg seed leaves nutmeg pulp. While the nutmeg pulp is used as raw material for various processed foods and drinks that produce some products such as candied nutmeg, nutmeg syrup, jam, candy, sweets, etc [5].

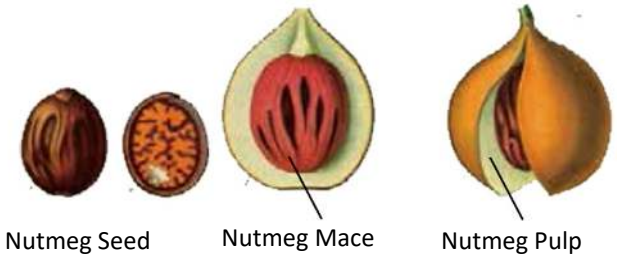


Figure 1. Nutmeg and its parts [1]

In a study that has been done as an effort to increase the economic value of nutmeg plants through the diversification of processed products of nutmeg, nutmeg herbal tea is then produced. Nutmeg herbal tea is an herbal tea made from pure nutmeg pulp that has been cleansed from dirt and stalk and the process of making consists of 4 stages: cleaning, processing, drying and packaging [2].

Processing is the most crusial stage considered to have a significant influence on the shape and size of the resulting tea powder, where the nutmeg pulp is physically transformed into small sections which then become tea powder.

In that study the method used in the processing of nutmeg pulp into small parts is slice method. By using slice method the resulting tea powder is still very rough. So the packing process into the tea bag has a little difficulty. In addition, the powder is also hard and rigid so feared the possibility of tea bags torn before use [2].

Figure 2. Processing Herbal Tea by Using Sliced Method [2]

Beside the highest possibility of producing excess fluid/solution, the smaller tea powder will be easier to fill the powder into the package that is in the form of tea bags. Makanjuola (2017) says that powder with the smallest particle size of 0.425 mm is more likely to produce an excess fluid/solution of tea, ginger and ginger tea with the highest antioxidant content [3]. For example Matcha green tea products only have a large particle average of 5-10 microns.

Therefore, this study was conducted to obtain smaller powder size of nutmeg pulp herbal tea without ignoring one of the useful content in nutmeg pulp herbal tea, that is Vitamin C and become the comparison data with previous research.

II. Research Method and Tools

In order to get smaller powder size of nutmeg herbal tea compared to the slice method, the shredding method will be used in this research in processing the nutmeg pulp. The shredding method will use one of grater sides to transform nutmeg pulp into long-tiny strip shape. The shredding method will require the materials and tools which will be discussed in sub-chapters 2.1 and 2.2.

2.1. Material Preparation

There are some materials which have to be prepared in conducting this research, such as fresh nutmeg pulp that has been cleaned from the dirt and stem and tea bags that used as a packaging. The whole materials can be seen in Figure 3 below.

(a) (b)

Figure 3. Required Materials: (a) Nutmeg pulp (b) Tea bag

2.2. Tool Preparation

The tools required in the process of shaping the nutmeg pulp into smaller parts to be more easily packed and brewed by shredding method are the knife and grater shown in Figure 4. A knife is used to clean the pulp from the dirt and stem while grater is used to transform nutmeg pulp into a smaller shape.

Figure 4. Knife and grater

2.3. The Process of Shredding the Nutmeg Pulp

All stages are the same as in the slice method, the only difference is the transform tool. In the shredding method, the tool used to transform the physical shape of the nutmeg pulp is grater. The nutmeg pulp is rubbed manually against one of grater sides that shown in Figure 4. As a result, shredded items tend to become smaller and longer that are cut away from the sharp edges of the grater surface. The process and the results of its grief can be seen in figure 4.

Figure 4. The process and result of shredding nutmeg pulp using a grater

The nutmeg pulp produced from the shredding method takes only 2 - 3 days of drying under the sun with an average temperature of 30 - 35 ° C. The pulp of nutmeg needing treatment to dry evenly at the time of drying, that is by reversing it at least 2 times a day of drying. The drying process can be seen in figure 5.

Figure 5. The Process of drying the shredded nutmeg pulp

After all the above process is completed, then proceed to the packaging of products by using tea bag so it is not contaminated with other materials and make it easy to be used.

2.4. Iodimetric Titration Analysis

The level of Vitamin C contained in the nutmeg herbal tea products will be found by using iodimetric titration analysis. Iodimetric titration is a type of redox reaction that measures the amount of iodine left over from the redox reaction between vitamin C and the reactants. The indicator used is the starch added as it approaches the end point of the titration. This is done so that the starch does not wrap the iodine so that the determination of the end point can be determined precisely. This titration using standard iodine (I2) is used for compounds that are strong reducing agents such as vitamin C [4].

The process of analyzing the levels of Vitamin C was done by using 5 samples of herbal nutmeg tea from the shredded method which was carried out in Analytical Unit and Chemistry Study, Chemistry Department, Faculty of Mathematics and Natural Sciences, Syiah Kuala University.

III. Research Finding and Discussion

3.1. Nutmeg herbal tea powder

By going through all the process, started from washing, shredding and drying hence it brings the result to the powder of herbal tea which differ from the slice method powder. It is differed in term of shape and size. Most of the powder is in shape of small and long like a small rope and the rest is in the shape of tiny fragments. In terms of size, tea powder from shredding method is ranging from 1 – 13 mm long and 1 – 2 mm wide. The nutmeg herbal tea powder produce from the shredding method can be seen in Figure 6 below.

Figure 6. Nutmeg herbal tea powder resulted from shredding method

As shown in Figure 6, the resulting tea powder is not so rough that it is expected to contribute positively to the packaging process. In addition, the tea powder is not so rigid that it is safe enough for the possibility of leakage in the tea bags. Hence, it is most likely acceptable for packaging process in accordance with the shape and size.

3.2. Vitamin Level Assessment

A total of 5 five samples of herbal nutmeg tea from shredding method were tested for Vitamin C content. The result of Vitamin C content analysis by using iodimetric titration analysis can be seen in Table 1 below. The table shows that vitamin C levels contained in 100 grams of nutmeg herbal tea resulted from the shredding method has an interval 3.51% to 3.52%. The highest vitamin C content was 3.52% and the lowest was 3.51% while the mean vitamin C content was 3.514%.

Table 1. Vitamin C levels in 100 grams of nutmeg herbal tea resulted from Shredding method

SAMPLE	VITAMIN C LEVEL (%)	AVARAGE (%)
Sample 1	3,52	
Sample 2	3,52	
Sample 3	3,51	3,514
Sample 4	3,51	
Sample 5	3,51	

IV. Conclusion

4.1. The Comparison of Nutmeg Herbal Tea Powder

The visual appearance of the nutmeg herbal tea powder produced by shredding method has different size and shape compared to the nutmeg herbal tea powder produced by the slice method. The difference in shape and size can be seen in Figure 7 below and Table 2 will visually show the shape and size of each nutmeg tea powder produced from both treatment methods.

Figure 7. Nutmeg herbal tea powder produced by shredding and slice methods

Table 2. The size comparison of nutmeg tea powder produced by shredding and slice method.

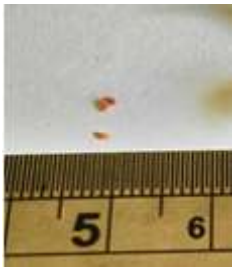
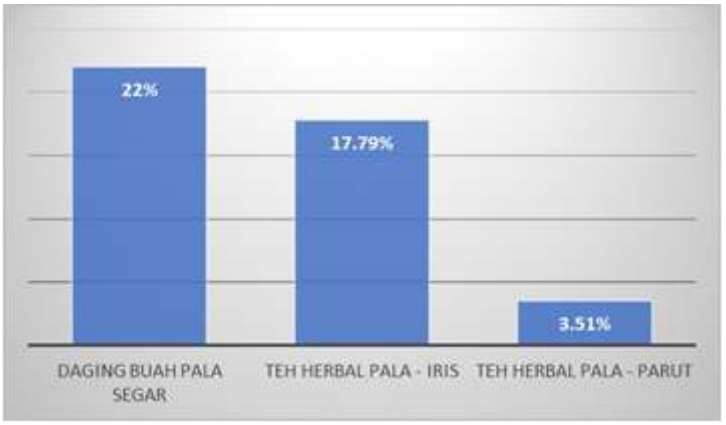
SIZE	SHREDDING	SLICE
The biggest powder		
The smallest powder		

Table 2 shows that the smallest size of nutmeg pulp herbal tea powder produced by slice method is 10 – 15 mm and the biggest size is 20 – 23 mm. While the tea powder from shredding method is ranging from 1 – 13 mm where smallest size is 1 – 2 mm and the biggest size is 10 – 13 mm. Hence, the both methods resulted in a significant difference size of nutmeg pulp herbal tea powder where the powder from shredding method is smaller than slice method.

4.2. The comparison of Vitamin C Level

The results found that the levels of Vitamin C through iodimetric titration analysis showed a significant difference between the nutmeg herbal tea produced by shredding method and the slice method. The nutmeg herbal tea produced from the shredding method contains vitamin C levels between 3.51% - 3.52% with an average level is 3,514%. While the herbal nutmeg tea produced by the slice method contains vitamin C levels between 17.57% - 18.23% with an average level is 17.79%. Figure 7 below shows a comparison chart of Vitamin C content of nutmeg herbal tea from each method by using a fresh nutmeg pulp.



Fugure 8. Comparison Chart of Vitamic C Level

From the discussion above, it can be concluded that the nutmeg herbal tea powder produced by shredding method is smaller than those which is produced by the slice method. However, In terms of Vitamin C, it is found that the slice method contains higher Vitamin C level compared to the shredding method. Both methods have been used to produce nutmeg herbal tea, but the methods are not succesfully produce the smallest powder size that have a high level of Vitamin C. So it is required to do further research to find a suitable method in producing nutmeg herbal tea product that can combine both quality indicators mentioned above.

REFERENCES

[1] Alegantina & Mutiatikum. (2009). Pengembangan dan Potensi Pala (*Myristica fragransi), Jurnal Kefarmasian Indonesia Vol 1*, No.2, 2009

[2] Amri. A, Darma. R & Maulina. D. (2017). *Pemanfaatan Daging Buah Pala Sebagai Teh Herbal: Kajian Kadar Vitamin C Terhadap Teh Herbal Pala Yang Dihasilkan Dari Proses Pengirisan: Seminar National Teknologi dan Rekayasa 4, 02 Desember 2017 (pp. 23-26).* Tapaktuan: Politeknik Aceh Selatan.

[3] Makanjuola, S. A. (2017). Influence of particle size and extraction solvent on antioxidant properties of extracts of tea, ginger, and tea–ginger blend. *Food Science and Nutrition*. https://doi.org/10.1002/fsn3.509.

[4] Mursyidi, A. & Rohman. A. 2007. *Pengantar Kimia Farmasi Analisis Volumatri dan Gravimetri*. Yogyakarta: Gadjah Mada University Press.

[5] Nurdjannah, N. (2007). Teknologi Pengolahan Pala. Badan Penelitian dan Pengembangan Pertanian, Balai Besar Penelitian dan Pengembangan Pascapanen Pertanian.