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IDENTIFICATION OF HEXADECANOIC ACID COMPOUND WHICH IN GOLOBE EXTRACT(*Hornstedtiazingiberaceae*)

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ABSTRACT

Indonesia is one of the centres of dills in the world. However, not all those dills are well known the benefit and special quality. Many kinds of herbs, roots, and other natural substances were mixed as the herb to cure diseases. Those ingredients were used to keep physical condition in order to be healthy, prevent the diseases, and also as self beautification. More than 400 ethnics of Indonesian have close relationship with forest in their daily life and they have advanced traditional knowledge in exploiting the dills. Golobe Halmahera is a herb which grows in trop, included Halmahera. The using of Golobe(*Zingiberaceae*) by the people in Halmahera, are as energy supplier when they hunting in the jungle, treating the injury and infection, and herb for peptic's problem. **Objectives of the Research:** Identify the compound which consisted in Golobe extract (*Hornstedtiaalliancea*). By using the Kromotografi Gas-Spektrometer Gas (GCMS) research method. The method is an experiment research with the sample which taken from fresh fruit picked directly. **Result of the Research:** Henceforth, it was made the powder and soaked with methanol, then it was made the distillation process so that the extract of thick methanol occurred. **Conclusion:** By using GCMS method, it was examined that Golobe fruit (*Hornstedtiaalliancea*) consists of *Hexadecanoic acid* (palmitat acid) of (7,29%).

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INTRODUCTION

The advancement of modern science which rapidly developed and sophisticated, cannot put beside the herb medicine. It was proven by the numbers of herb's devotee. What else, there are less of knowledge and information about many kinds of herbs which are used as natural medicine for certain medical therapy (Dalimartha, 2000).

Indonesia has more than 30.000 kinds of herbs where 960 species of them have been registered as the herbs with special quality, and 283 of them are the important herbs for traditional medicine industry, Harborne (2005). According to Sulandjari (2009) in (Herlina, 2010), that in recent time, the using of dills in Indonesia is increasing, whereas, the cultivation of dills are still very limited. There are also many kinds of herbs in tropical area which haven't been used optimally yet. More than 400 ethnics of Indonesian have close relationship with forest in their daily life and they have advanced traditional knowledge in exploiting the dills.

Those findings stimulate the researchers to do further research about the potential of Indonesian's herbs in order to create people's, animals', and environment's health. According to Tukiman (in a journal of HotnidaSitorus et al., 2011), the fact showed that with the help of medicine from natural substances, the people could solve the their health problems. It indicated that the medicine which proceed from natural substances herbs have showed their rules in implementations of efforts for people's health.

The beneficence of dills are no or very minor of side effect and the price is cheap if the people are able to plan or find it in the farms.

The characteristic of this herb medicine is safe so that it doesn't need strict control in it's using and oftentimes it also doesn't need any medical help in doing the treatment, but it is enough done by the member of family if the diagnosis is clear. Based on the previous research, it was known that herb medicine have been approved widely by almost all the states. As stated by WHO in Journal of HotnidaSitorus, et al. (2011), states of Africa, Asia, and Latin America used herb medicine as the complement of primary medicine. Moreover, in Africa, it was about 80% of the populations used herb medicine as primary medicine.

Hexadecanoic acid (palmitat acid) were found in animals, herbs, and microorganism. One of the Fat Acid which was easiest found was palmitat acid or Hexadecanoic acid. The herbs from Palmaceae family, such as coconut (*Cocos Nucifera*) and oil palm (*Elaeisqueensis*) are the main supplier of this fat acid.

The fat acid which has double bound at it's hydrocarbon chain has isomer structure of *cis* and *trans* which showed in the following sample. Most of the unsatiated fat acid has isomer stucture of *cis* which less stable than *trans*.

Name of IUPAC	: Hexadecanoic acid
Other Name	: AsamPalmitat
Chemical Formula	: $\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$.
Molecule Formula	: $\text{C}_{16}\text{H}_{32}\text{O}_2$

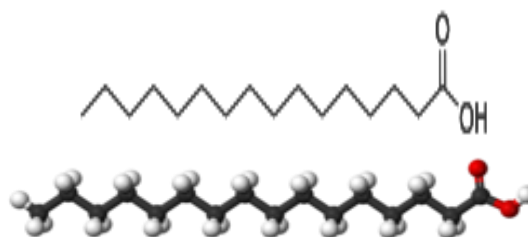


Figure 1. The structure of Hexadecanoic acid (palmitat acid)

Based on the research result done by Arend L. Mapanawang, et al.. (2016), by doing the antioxidant identification of golobe fruit (*Hornstedtiaalliacea*), it was found that golobe contains of antioxidant with concentration of 6,54 mg/ml. The preface research showed that golobe fruit (*Horstedtiaalliacea*) consisted of *Hexadecanoic acid* (palmitat acid) 7,29%.

According to the research which was done by I G.Tirta, I M. Ardaka, I Dw.Pt.Darma (2010) on *pronojiwo* plan (*Euchrestahorsfieldii* (lesch) Benn), it was found that *pronojiwo* plan consisted of *Hexadecanoic acid* (palmitat acid) at the root (16,07%), stem (34,79%), leaf (23,55%), bark of seed (13,79%), and seed (36,13%). And according to Benoid et al. (2009), *Hexadecanoic acid* (palmitat acid) is very useful to stimulate the growth of insulin which play a part in treating diabetes.

Based on the next research by Warsinah, EkaKusumawatiSunarto (2011), by the identification of antifungi from the bark of *kecapi's* stem (*Sandoricumkoetjape*), it was found that the bark of *kecapi's* stem consisted of *Hexadecanoic acid* (17,6%) which is potentially as antifungi.

METHOD OF RESEARCH

The research method was experiment method, with the sample of fresh Golobe fruit (*Hornstedtiaalliacea*) picked from West Halmahera Regency, IbuTenganSubdistrict, TonguteSungi Village.

TOOLS AND MATERIALS

A. TOOLS :

1. Oven
2. Stirring spoon
3. Chemical glass
4. Bunsen
5. Erlenmeyer
6. Rotavapor
7. Measuring glass
8. Aluminium foil
9. Three ports

B. MATERIALS

1. Golobe extract (*Hornstedtia alliacea*)
2. Metanol
3. Spirtus

PROCEDURE

Making the Golobe Extract (*Hornstedtia alliacea*)

The fresh Golobe (*Hornstedtia alliacea*) were taken, picked directly by using the hands. The Golobe (*Hornstedtia alliacea*) which have been collected from TonguteSungi Village were cleaned or washed by using flow water, then dried. The dried fruits were dry sorted and powdered. The golobe powder (*Hornstedtia alliacea*) was extracted by the *maserasi* method. Firstly, 1000 gr golobe powder (*Hornstedtia alliacea*) was proceed by *maserasi* with Metanol for about 3 X 24 hours in the glasses/stoples which had difference around 1 – 3 cm on the powder. Filtrat was gathered and then evaporated by rotavapor until produced the thick extract of Metanol.

The Procedure of identification the Hexadecanoic Acid by using GC-MS Tool

The thick extract of Metanol was fractionated in the Chemical Glass, continued with using GC tool which has the fuction to examine the purity of certain material, or separate any components for the mixture and could help in identifying the complex compound. Then, it was continued by using the MS tool which has the function to change the sample compound into positive and negative ions produced from the herbs.

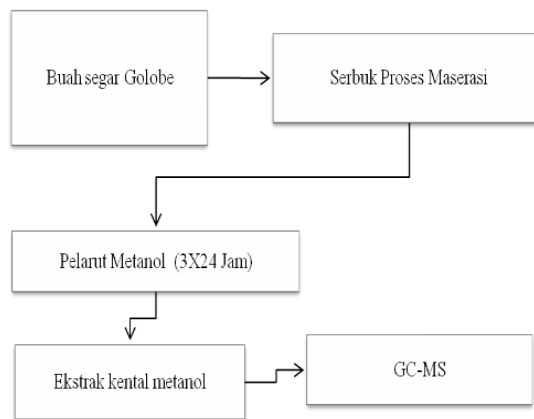


Figure 2. The Schema Of Making The Golobe Extract (*Hornstedtia alliacea*)

RESULT AND DISCUSSION

This research was done in West Halmahera Regency, Ibu Tengah Subdistrict, Tongute Sungi Village on 1 – 30 June 2016 with the purpose to take the main material or sample of fresh Golobe (*Hornstedtia alliacea*) which was taken in the morning.

After it was taken, washed in the flow water, then broken from the bark. After that, it was dried under the sun at 07.00 – 10.00 am for 3 days. After it was dried, it was grinded by using mortar until become the rough powder and continued with making the refined powder by using a blender. Next, it was processed by *maserasi* with metanol during 3 X 24 hours for 3 days.

The sample which was processed with *maserasi* or soaked with metanol was filtered, then the brown golobe metanol liquid (*Hornstedtia alliacea*) was taken, next it was processed the evaporation and produced the thick brown extract of Golobe (*Hornstedtia alliacea*) for about 10 grams. It was continued with testing the active substance in GC-MS (Gass Cromotografi Mass Spectrometri), the sample of extract was given a pressure with helium or nitrogen so that the sample became vapor before being injected into column (GC).

The sample in the vapor form was injected into the column, from the column into the detector (MS) where there was separation became fragments. The fragments would indicate the fragmen compound produced, the product was checked with the result in GC-MS, then the device offered some compounds released, so that, what should be done was finding the most compounds with the percentage of >80%.

Table 1. The Table of Gc-Ms Test of Golobe fruit (*Hornstedtia alliacea*)

SAMPLE	COMPOUND	CONTENT %
GOLOBE	2,3,Dyhydro-3,5-Dthidroxi-6-methyl Beta-Caryophiline	5,31
	Alpha-Humulene	4,74
	Hexadecanoicacid,ethyl ester	12,46
	Palmitit Acid	1,22
	2-formyl-5-isopropil-8-methyispiro	7,29
	3,H-Cycloprop(1,2)-5-cholest-1-en	2,22
		1,40
	9,17-octadecadienal	14,19
	Nonacosane	2,81
	2,6-Dyethylpiridine	5,88
		2,94
	C6-d-indolinocodeine	6,13
	Docosane	1,38
	11-tricosane	1,96
	Heptacosane	1,99
	Transs-Caryophiline	1,57
	Cyclopentane	3,94
	Cyclohexane	

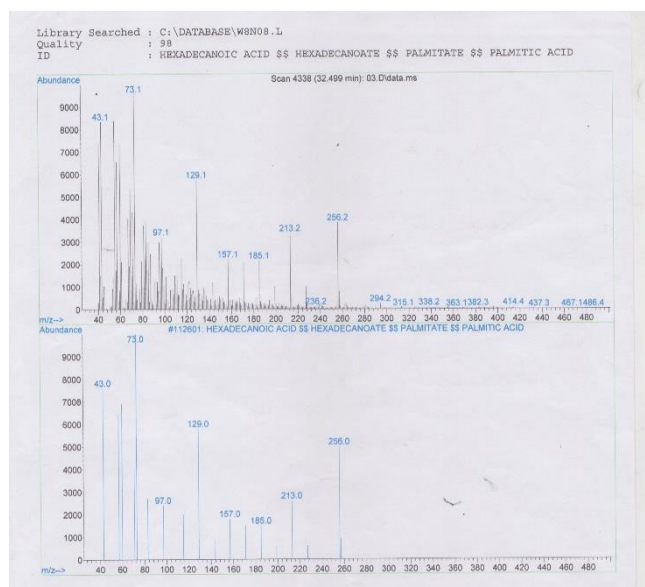


Figure 3. GCMS Identification of Golobe

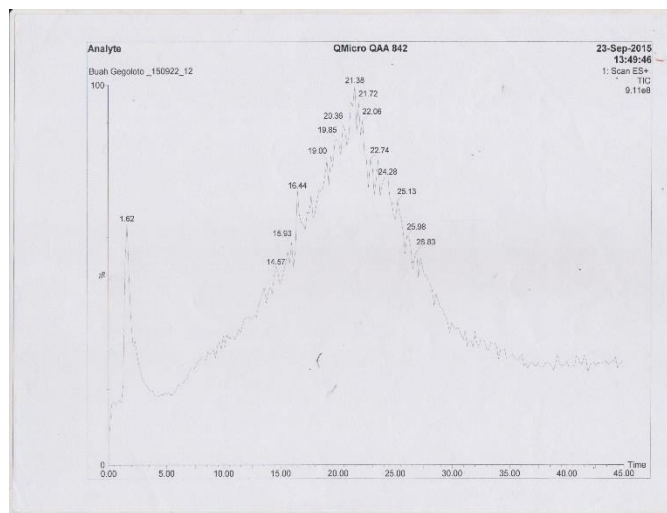


Figure 4. Identification Hexadecanoic Acid in Golobe (*Hornstedtia alliacea*) with GC-MS

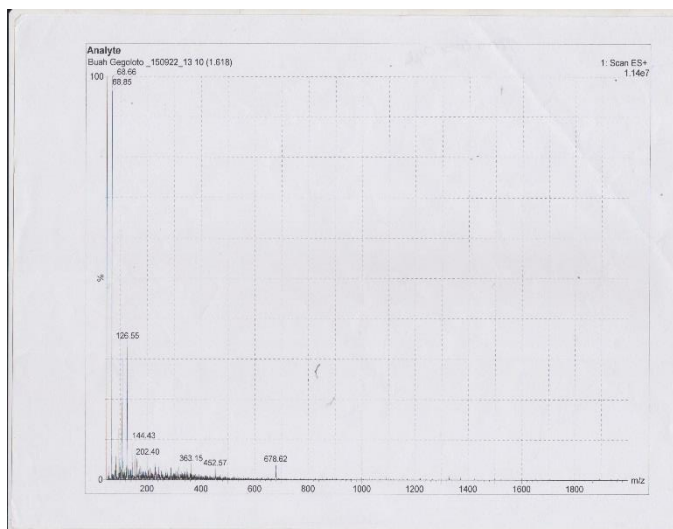


Figure 5. Result Identification the Hexadecanoic Acid of Golobe (*Hornstedtia alliacea*) with GC-MS Tool.

DISCUSSION

The Golobe fruit of Halmahera Buah (*Hornstedtiaalliacea*) or Pining onion is kind of herb which is producing fruits the member of ginger family (*Zingiberaceae*). It's fruit is sweet-sour, usually eaten in fresh condition. The Golobe fruit (*Hornstedtiaalliacea*) contains of *Hexadecanoic acid* (palmitat acid). Compound is composite of some elements which formed through chemical reaction. The compound has different characteristic with the elements composer. For example, 2 atoms hydrogen and 1 atom oxygen could gather into water molecule (H_2O).

Hexadecanoic acid (palmitat acid) was found in animals, herbs, and micoorganism. One of the easiest fat acid which was easiest found is palmitat acid or *Hexadecanoic acid*. There are some herbs which consist of *Hexadecanoic acid* (palmitat acid), that is golobe fruit contains antioxidant with concentration of 6,54 mg/ml. And the result of the previous research on Golobe(*Horstedtia alliacea*) contained *Hexadecanoic acid* (palmitat acid) of 7,29%.

Then, on *pronojiwo* plan (*Euchrestahorsfieldii* (lesch) Benn), it was found that *pronojiwo* plan consisted of *Hexadecanoic acid* (palmitat acid) at the root (16,07%), stem (34,79%), leaf (23,55%), bark of seed (13,79%). And according to Benoid et al. (2009), *Hexadecanoic acid* (palmitat acid) is very useful to stimulate the growth of insulin which play a part in treating diabetes. Then, on bark of *kecapi's* stem (*Sandoricumkoetjape*), it was found that the bark of *kecapi's* stem consisted of *Hexadecanoic acid* (17,6%)

which is potentially as antifungi.

CONCLUSION

According to the research result, by using the Gc-Ms (Gass Cromotografi Mass Spectrometri) method, it could be concluded that Golobe Fruit Halmahera (*Hornstedtia alliacea*) contains of *Hexadecanoic acid* (palmitat acid) which was used in cosmetic and pigmentation and also used to stimulate the growth of insulin and potentially as antifungi.

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