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ORIGINAL ARTICLE

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IDENTIFICATION OF HEXADECANOIC ACID IN GEDI EXTRACT (*Abelmoschus manihot L medik)*

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ABSTRACT

The needs of medicine in Indonesia will be rapidly developed, based on the analysis result of Health Department, the growth of pharmacy industry is growing around 10-14%. This will encourage the action of medicine sources both chemical and natural. The purpose of this research is to find out the *Hexadecanoic acid* in Gedi leaf (*Abelmoschus manihot L medik)* Gc-Ms method.

The research is experiment research. Gedi leaf (*Abelmoschus manihot L medik)* was taken in the morning, washed, then dried. After being dried, it was grinded became powder, then processed by *maserasi* with metanol, then the metanol liquid of gedi leaf extract *(Abelmoschus manihot L medik*) was taken, then it was made the evaporation so that the thick extract of Gedi leaf metanol *(Abelmoschus manihot L medik*) released. Based on the research by using the Gc-Ms method, it was found that Gedi leaf *(Abelmoschus manihot L medik*) contained *Hexadecanoic acid* with potentially as antioxidan.

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INTRODUCTION

One of the causes of the increase of using herb medicine is the low risk (Patra *et al* 2010). WHO had recommended the using of herb medicine because it was easyly found and the price is cheap (Raina *et al* 2003).

The product of herb medicine according to the data of POM Republic Indonesia, the number of herb medicine which were registered until 2005 was increasing. This showed that product of herb medicine was very potentially developed.

The kemotaxonomi approach can be done in selecting the herbs, that is based on the closenes of the genetic relationship of the herb which has been known that it contained certain chemical. The herbs or other organisms in one family often found that it produces similar compound naturally. The etnobotany approach is often done as the first exploration of the active substance at certain herb based on the knowledge and habit of traditional people in utilizing herbs as the treatment for certain disease (Moris *et al* 2006).

Gedi (*Abelmoschus manihot L medik)* is tropical vegetation included in Malvaceae family, traditionally known in North Maluku especially Nort Halmahera as vegetables. Many of Indonesian people haven't known or awared that any vegetables have special benefit as medicine because it contains of certain chemical compound. The chemical compound has pharmachology effect to help the treatment of various diseases (Sitanggang *et al* 2005). Various compounds which are recently used on medicines in developed countries is breaked down directly from the compound in any herbs or in the form of it's synthesis. The selection process (screening) of bioactivity is a method which is most used by big industry in finding the bioactive compound in the nature. This way is more effective if the selection of the herb is combined with the criteria of herb which is traditionally used as medicine.

People use gedi leaf which is boiled without salt as traditional medicine, such as renal, maag, and cholesterol. Theoretical review showed that the fitochemical investigation of gedi plans as traditional medicine in North Sulawesi hasn't been reported previously. The degenerative disease which caused by free radical effect is increasing. So that, it is very important to find potential compounds of antioxidant. Polifenol and flavonoid in the plans are assumed prospective as the source of antioxidant, as stated by the research of (Mamahit L 2009), that in the isolation result from gedi extract (*Abelmoschus manihot L medik)* was found eikodekana compound.

Hexadecanoic acid (palmitat acid) is saturated fat acid which formed from 16 carbon atoms with the chemical formula CH3(CH2)14COOH. At the room temperature, *Hexadecanoic acid* (palmitat acid) is solid with white colour and has melting-point of 64 ^{o}C. *Hexadecanoic acid* (palmitat acid) was found in animals, herbs, and microorganism.

Name of IUPAC : Hexadecanoic acid
Other Name : Asam Palmitat
Chemical Formula : CH3(CH2)14COOH
Molecule Formula : C16H32O2

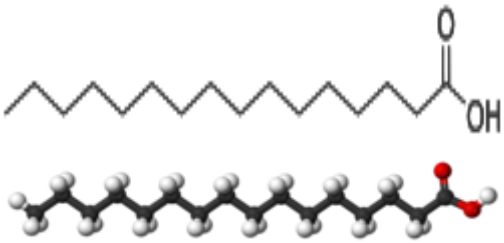

Figure 1. Structure of Hexadecanoic acid.

The research result of (Mercy Taroreh,et al. 2015), fenolik compound in gedi leaf is polar so that it produced the highest antioxidant activity and reinforced by the research of (Elly Suoth,et al. 2013), that gedi extract contains of polifenol and flavonoid.

From the previous research, it was known that gedi leaf infus contained chemical compound which is useful for health (Tea 2012). This was proven by the research of effectiveness test on gedi leaf as antidiabetes.

Based on the research result of Arend Mapanawang et al. (2016) with the identification of Steron and Gedi Leaf (*Abelmoschus manihot L medik),* it was found that gedi leaf (*Abelmoschus manihot L medik)* contained of *Hexadecanoic acid* (palmitat acid) of 12,26%.

RESEARCH METHOD

The research is kind of experiment research which was done in Integrated Laboratory of Pharmacy Department of Sekolah Tinggi Ilmu Kesehatan halmahera.

RESEARCH TIME

The research was done on May until June 2016.

RESEARCH SAMPLE

The sample of this research is fresh Gedi Plan (*Abelmoschus manihot L medik)* taken from West Halmahera Regency, Ibu Utara Subdistrict, podol Village.

RESEARCH VARIABLE

The research variable is anything which is stated by the researcher to be examine until it was found the information about it and then collected the conslusion. Sugiyono (2009).

KINDS OF VARIABLE

Independent Variable / Free Variable

The independent varriable is variable which influence or become the change or cause the dependent varfiable.

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Dependent Variable / Bound Variable

Dependent variable is variable which is influenced or result of independent variable.

TOOLS AND MATERIALS RESEARCH

A. TOOLS:

1. Oven
2. Stirring spoon
3. Chemical glass
4. Bunsen
5. Erlenmeyer
6. Rotavavor
7. GC-MS tools
8. Measuring glass
9. Three ports
10. Aluminium foil

B. **MATERIALS**

1. Gedi extract (*Abelmoschus manihot L Medik*)
2. Metanol
3. Spirtus

PROCEDURE

a. Making the Gedi Extract (*Abelmoschus manihot L Medik*)

Gedi leaf is taken in the morning, that are started from the fifth leaf from the tip, picked directly by using the hands. The leafs which have been collected from Tangewango Village were cleaned or washed by using flow water, then dried. The dried leafs were dry sorted and powdered. The gedi powder was extracted by the *maserasi* and *infundasi* methods. Firstly, 800 grams gedi powder 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.

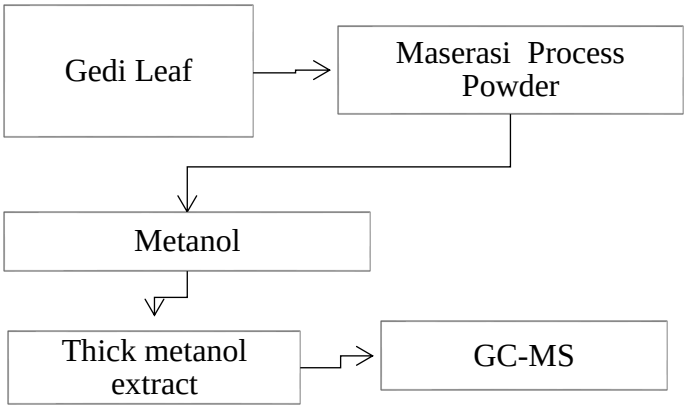

Figure 2. The Schema of Making Gedi Leaf Extract (*Abelmoschus manihot l medik*)

b. Ways of working to identify Cara Hexadecanoic Acid by using GC-MS tools

The thick extract of Metanol was fractionated in the Chemical Glass, continued with using GC tool which has the fucntion 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.

RESULT AND DISCUSSION

This research was done in West Halmahera Regency, Ibu Tengah Subdistrict, Podol Village on 1 – 30 June 2016 with the purpose to take the main material or sample of Gedi leaf (*Abelmoschus manihot L medik).* It was was taken in the morning, the fifth leaf from the tip to bottom, picked by hands. The leafs were 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 refined powder. The gedi powder was processed by *maserasi* method. 800 grams gedi powder 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.

Evaporation Process

The gedi leaf which had been processed by *maserasi* was filtered into the chemical glass, evaporated by using konfor and stirred by using the stirring spoon until became thick bottle green extract with the total weight of 10 grams.

Table 1. Test Result of Gc-Ms in Gedi Leaf (*Abelmoschus manihot L medik*

SAMPLE	COMPOUND	CONTENT %
Gedi Extract	-Estra-1,3,5(10)-TRIEN-17-onc,3,15bis(trimethysilysilyl)oxyl-(15alpha)	3,43
	-1,3,3,3-tetrachioro-1-bromo-2,2-difluoropropane	1,97
	-(-)isolongifolol methyl ester	2,46
	-Cyelohexene,4-(4-ethylelohexyl)-1-pentyl	1,13
	-2,6,10-Trimethyl,14-Ethylene-14-pentadecane	1,97
	- (Hexadecanoic Acid)	12,26
	-11-Heradecanoic acid	2,97
	-(2E)-3,7,11,15-Tetramethyi-2-Hexadecen-1-Ol	4,96
	-9;12-Octadecadicnoic acid,ethyl ester	1,13
	-1-Cyelododecyne	1,23
	-(9E,12E)-9,12-octadecadienoic acid	31,64
	-2-1(hydroxymethyl)ethyl palmitate	4,57
	- Oleic acid	3,95
	- Z,Z-10,12-Hexadecadien-l-ol acctat	4,58
	-(6E,10E,14E,18E)-2,6,10,15,19,23-haxamethyl-2,6,10,14,18,22-tetracosahexaene	3,20
	-2-hydroxy-1-(hidroxymethyl)ethyl(9z,12z)-9-12-octadecadienoate	4,95
	-(24zeta.)-24-methyl-24-homocholestanol	1,35

DISCUSSION

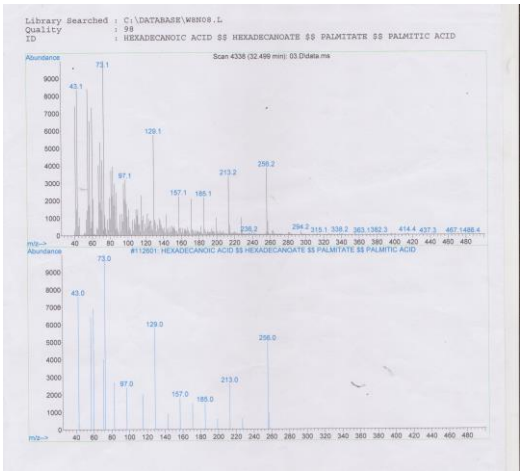

Figure 3. Identification of *Hexadecanoic acid* in Gedi with GCMS

Herb has many special benefit for the traditional or modern treatment. Empirically, the gedi leaf (*Abelmoschus manihot L medik)* has many special benefit in the medical treatment and as the food and is commonly as vegetable or mixed in Manado Pouride. This leaf is special of Manado and grow excessively in Manado.

The gedi leaf is also commonly examined and has many chemical compounds, one of them is *Hexadecanoic acid*, the natural antioxidant. This is the thing which became our foundation in doing the research, with the purpose to prove the *Hexadecanoic acid* in the gedi leaf (*Abelmoschus manihot L medik)* by using the GC-MS method.

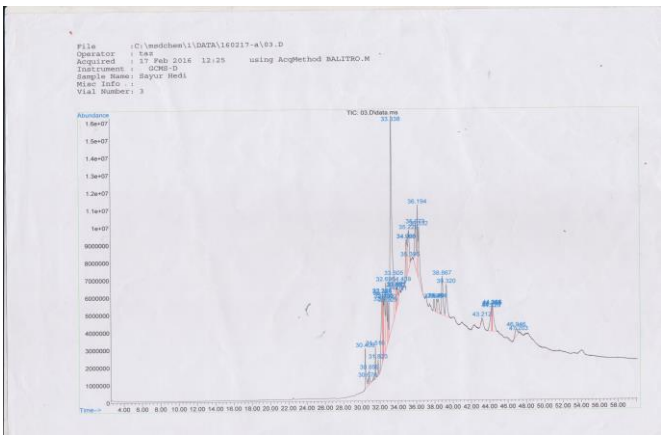

Figure 4. Result identification of *Hexadecanoic acid* in Gedi with GCMS Tool

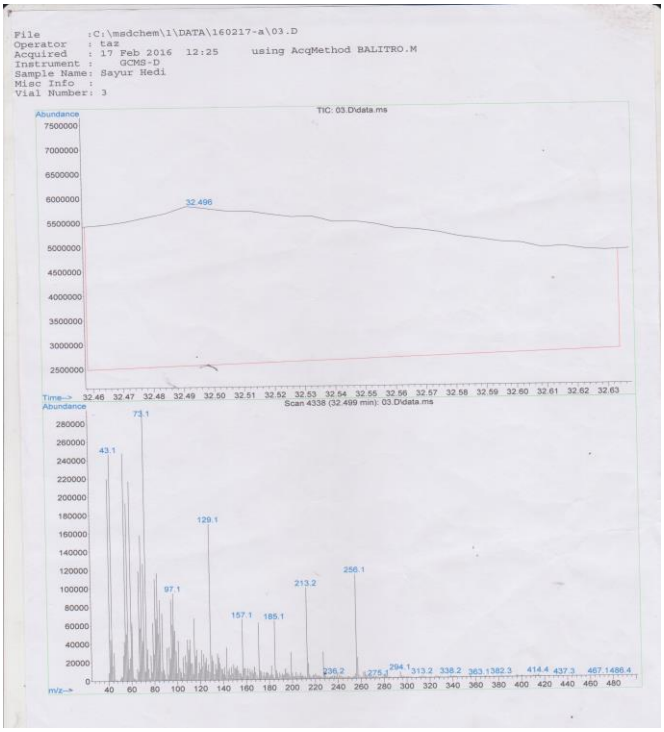

Figure 5. GCMS Identification of Gedi

The part of Gedi (*Abelmoschus manihot* (L.) Medik) which was used is it's leaf. Gedi grows in Asiatrop and Nort Queesland, and also in tropical and subtropical area. Although this herb grows as parrenial plan, but it can be plant as annual plan in temperate area, well flower in the first year and produced the seeds. The main stem can reach 2 meters and has short branch.

Gedi is kind of hard plan and prefer the sun with vertile soil, humid, and well drainage. The flower is king sized (until the diameter of 15 cm) and the colour is yellow-lime with purple inside.

The composite compound from some elements which formed through the reaction of chemical compound, has different characteristic with the elements composer, for example, 2 atoms hydrogen and 1 atom oxygen could gather into water molecule (H_20). Gedi plan *(Abelmoschus manihot L medic*) contains *Hexadecanoic acid* (palmitat acid) which found in herbs, animals, and microorganism. Then, on *pronojiwo* plan (*Euchresta horsfieldii (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 seeds (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.

Then, based on the next research result by Warsinah, Eka Kusumawati Sunarto (2011), by the identification of antifungi from the bark of *kecapi's* stem (*Sandoricum koetjape*), it was found that the bark of *kecapi's* stem (*sandoricum koetjape*) contained of *Hexadecanoic acid* (palmitat acid) of 12,26%.

By the finding of *Hexadecanoic acid* in Gedi leaf, it is expected that it could be developed and next could be consumed by the people widely as the alternative of herb treatment.

CONCLUSION

Based on the research result by using the Gc-Ms method, it was found that Gedi leaf (*Abelmoschus manihot L medik)* contains *Hexadecanoic acid* which is potentially as antioxidant.

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