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IDENTIFICATION OF COMPOUNDS CONTAINED IN METHANOL EXTRACT OF SUCH AS BANANA HALMAHERA SUCH AS BANANA (*MOSES PARADICIACA*)

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ABSTRACT

Background: such as banana (*Moses paradiciaca*) is one type of tropical fruit that has a high enough potential. such as banana has become an export and import commodities in the international market of this plant originated from southeast Asia is then spread widely the African and American .tropical climates of wet, and can flourish in lowland and pcs banana plants such as banana can also be used as a traditional medicine (temporary medicine). Undp diseases that can be cured ie dental disease, diabetes mellitus, high blood pressure, obesity, and receiving complain health microflora Intestine.It shows the chemical characteristics of such as banana tuber starch that is moisture content of 6.69 qur % of 0.11 % and HCN content 2.6 mg / kg. And from result of GC-MS test of such as banana thick extract (*Moses paradisiaca* L) there are compound of Hexadecanoid acid ethyl ester 1.31%.

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INTRODUCTION

Indonesia has plants and plants that potential as a herbal medicine that is very easy to found. Even the parents in the family we often use plants and plants as medicine.1

With the growth of the pharmaceutical industry in Indonesia around 10-14% year on year, meanwhile Indonesia itself still raw material shortages of drug so that the raw material must be imported from outside. Thus the Indonesia still dependency on raw materials that potentially create Yogyakarta country into a consumptive. Almost 96 percent of raw material is still imported from

abroad. The strategies that need to be done so that Indonesia mandiri in raw material needs one only by strengthening research.²

According to the data of the porch of the POM of the Republic of Indonesia, the number of registered herbal medicines until 2015 greatly increased. One of the causes of the increased use of herbal medicines is the low potential risks posed. One of the tanaman often used daily good days as food or used as traditional medicines is banana plants (*Moses sp*) is a plant that comes from Southeast Asia which has now spread to all over the world including Indonesia. Almost all the region of Indonesia is suitable for the growth of the banana plants.¹

Banana plants spread from the lowlands to the highlands, both grown in special land and planted vain in the garden or in the page. Nearly every house in Indonesia there are banana plants, this is due to the fast plants produce, can long easily planted and easily kept.³

Banana plants used for various needs the life of man. In addition to its fruit, the other plants such as a hump made out the leaf, bars and the heart can also be used. But from all parts of the banana plants, fruit and banana leaf pisanglah that many used by the community. The bananas in addition to be eaten in the form of fresh, can also be processed into fried banana crackers, bananas, sale and others. Banana Leaf to be used by the community as a food wrapper. Heart banana (flowers bananas) also can be processed into Braised beef heart banana or as other vegetable materials.⁴

From all parts of the banana plants, section that is rarely used by the public is a hump made out of bananas. The utilization of the banana plants is very limited. One of them is a hump made out of bananas can be made chips, besides a hump made out of bananas can be made alcohol through fermentation.⁴

The fermentation Diman itself is a process of decomposition of sugar into alcohol and carbon dioxide caused by the activity of the cells. leavened because a hump made out wet banana contains carbohydrates of 11.6 g and a hump made out of dry banana contains carbohydrates of 66.2 g, so that it can be used as raw material in the manufacture of vinegar through the process of fermentation. And a hump made out of bananas can be used as a raw material in the manufacture of vinegar through the process of fermentation. This can be used as one way to meet the needs of the vinegar increases, where vinegar needed by industry of food, laboratory (chemicals, biology), pharmaceutical factories and so on. According to research from Eko Prasetyo time permentasi and concentration in permentasi optimum a hump made out of bananas is 4 days of fermentation and the level

of leaven 0.6 % in this research will be optimum on various types of a hump made out of bananas that produce the concentration of bioethanol optimum.⁵

In addition to a hump made out this banana can be used to flour based that a hump made out is a component of the polysaccharide that can be a source of which will the new flour. a hump made out of bananas rich food fibers, fiber food according to Astawan coarse fibers proved to be able to prevent various diseases, including teeth disease, *diabetes mellitus*, high blood pressure, obesity and improve the health of the microflora in the intestines. show the chemical characteristics of the Pati a hump made out of bananas are the level of water by 6,69%, the level of abu 0.11 percent and concentration of HCN 2.6 mg/kg. A hump made out of bananas is the bottom of the banana stem is shaped menggembul fennel. According To Rosdiana, a hump made out of bananas have the composition that consists of 76 percent pati and 20% water. Pati resembles pati sago flour and tapioca flour. nutritional a hump made out of bananas that high enough allows a hump made out of bananas to be made as an alternative for food that potential enough.⁶

Starting from the background above, researchers and researchers take research title: "Chemical Senayawa identification that there is in Extracting Mtanol a hump made out yellow kepok banana (*Moses paradisiaca*) using GCMS method.

A hump made out Banana (*Moses Paradisiaca*)

(*Moses Paradisiaca banana*) is one of the types of tropical fruits that have the potential for high enough to managed. Bananas has become export and import commodities in the international market. This plant comes from Southeast Asia which then spread to the African continent and America. Its Habitat is the tropical regions that wet weather and can grow in the lowlands and high. ⁷

The banana is one of the fruit that developed throughout the territory of Indonesia. Bananas generally can grow in the lowlands to the mountains with the height of the 2000 m pl. Bananas can grow on wet tropical climate, damp and heat with optimal rainfall of 1.520 3.800 mm/year and 2 months dry. ⁷

The banana plants in the taxonomy of plants classified as

The Kingdom : Plantae

The location of : Spermatophyta

Sub. The Division : Angiosperms

Class : Monocotylae

The nation : Musales

The tribe : Musaceae

Marga : Moses

The type of : *Moses paradisiaca* L⁷

Banana plants consists of the root, a hump made out, Batang, leaves, flowers and fruits. The roots of the roots of the coir drawing on fennel batang (a hump made out). The root of the most votes there are at the bottom of the land who grow until the depth of 75 until 150 cm in the land. The root which is located in the side of fennel batang (a hump made out) grew sideways or horizontally. The banana plant is a plant that versatile, starting from the root to the leaves can be used, so banana plants have usability including : 4

A. The trunk of the tree

Can be used as fodder dimusim lack of water and simply can be used as the raw material of compost humusnya value is very high.

B. Banana Leaf

Fresh leaves can be used as fodder dimusim dry and used by the community as a wrapper food traditionally.

C. Banana Flowers

The banana flower is still fresh banana (heart) can be made by the food as vegetables.

D. The bananas

Delicious eaten directly, can be made a banana jam high awetnya power and can produce more money and also can be made banana flour from the fruit of the elders that have not yet been cook.

E. The skin of bananas

The skin can also for fodder, besides to produce alcohol namely ethanol because it contains sugar that have an interesting aroma. The skin of bananas can also be used to declaring the glucose syrup sweetener natural food.

F. Fennel batang (a hump made out)

Pati contained in uncooked banana stem can be used as a source of carbohydrates can even be dried to be ashes. Where the ashes of fennel is contain soda that can be used as material for the making of soap and fertilizer Pati a hump made out of bananas can also be used as the raw material of bioethanol, because it has the amount of sugar high enough.

In many cases, a hump made out of bananas can be used for taken patinya, pati resembles pati tapioca flour, potential reserves of pati a hump made out of bananas that can be used as an alternative fuel namely, bioethanol. A hump made out of bananas has the composition as follows. 4

Table 1. The chemical composition of a hump made out of bananas per 100 gr ingredients.

The Components	Wet	Dry
Calories (shallow)	43	245
Protein (g)	0.6	3.4
Fat (g)	-	-
Carbohydrates (g)	11.6	66.2
Ca (mg)	15	60
P (mg)	60	150
Fe (mg)	0.5	2
Vitamin A (SI)	-	-
Vitamin B (mg)	0.01	0.04
Vitamin C (mg)	12	4
Water (%)	86	20



Figure 1. Hump Made Out Banana (*Moses Paradiceae* L.)

The benefits and content of banana plants

To generation, humans have made use of bananas as traditional medicines drugs while) prior medical Wardhany actions in the benefits of bananas for the health of potential enough because the bananas contain nutritious food complete. According to the scientists from Johns Hopkins University in the United States that the potassium (calcium) in banana leaves very help facilitate the transfer of salt (sodium) in the body, so it will quickly lower blood pressure.⁷

Rural Communities take advantage of banana leaf as a Cladding Material food. The old leaf after for chopping, usually used for, livestock such as goats, buffalo or cow for many method for the elements that are required by the animals. The banana leaf that is still young can be used as a traditional medicine to heal inflammation mucous eyes and burns .⁷

Banana also regulates to remove sputum, healing patients with anemia, lower blood pressure, give the power to think, rich fiber and help to diminish the influence of nicotine, prevent stroke, controlling body temperature especially for pregnant, neutralize stomach acids, helps the nervous system, and the seeds of

bananas can be used to heal lenter membrane inflammation of the bowel, mouth sores. The fruit of *Musa paradisiaca* and *Moses sapientum* by tradisionl can be used to treat diarrhea, dysentery, intestinal lesions, on ulcerative ulseratif, diabetes, mouth sores, uremia, nefritis, uric acid and hypertension and heart disease.⁸

In addition to a hump made out this banana can be used to flour based that a hump made out is a component of the polysaccharide that can be a source of which will the new flour. a hump made out of bananas rich food fibers, fiber food, coarse fibers proved to be able to prevent various diseases, including teeth disease, *diabetes mellitus*, high blood pressure, obesity and improve the health of the microflora in the intestines. show the chemical characteristics of the Pati a hump made out of bananas are the level of water by 6,69%, the level of abu 0.11 percent and concentration of HCN 2.6 mg/kg. A hump made out of bananas is the bottom of the banana stem is shaped menggembul fennel. According To Rosdiana, a hump made out of bananas have the composition that consists of 76 percent pati and 20% water. Pati resembles pati sago flour and tapioca flour. nutritional a hump made out of bananas that high enough allows a hump made out of bananas to be made as an alternative for food that potential enough.⁶

A hump made out of bananas can be used for taken patinya that resembles pati sago flour and tapioca flour. potential reserves of pati a hump made out of bananas that can be used as raw material creation alternative roots, namely bioethanol. Berpati material used as the raw material for bioethanol recommended characteristics are highly bioavailable pati high, have the potential for high results, flexible in the business tani and the age of the harvest.

According to Wulandari a hump made out of bananas contain Carbohydrate 66.2%. In 100 g ingredients, a hump made out of dry banana contains carbohydrates 66.2 g and on a hump made out of fresh banana contains carbohydrates 11.6 g. The womb khigh arbohidrat will spur the development of mikoorganisme. Carbohydrate content is high in a hump made out of bananas allows for fermented to produce vinegar. In the process of fermentation, carbohydrates will be changed into sugar by *S. cerevisiae*, sugar converted to alcohol and alcohol will be changed by *A. aceti* become acetic acid. In addition to the potential in the fermentation also potentially as bioaktivator in pengomposan.⁹

Extracting

Extracting is bicarbonate dry, thick, or liquid made with penyari simplisia according to the way that matches, outside of the influence of direct sunlight. Dry extract must be easily digerus become powder Extraction is the process of separating materials from mixed with Zanjabil with used solvent in accordance. The process of extraction dihentikn when achieved a balance between the concentration of a compound in the solvent with a concentration in plant cells. After the extraction process, solvent separated from samples with filtering. Unpack the beginning difficult separated through a single separation techniques to isolate single compounds. Therefore, unpack the early need to be separated into fractions that have incorrect polarity and the size of the same molecules

METHODS

Research Samples

The sample in this research is a hump made out of bananas Halmahera (*Moses paradisiaca* L) fresh taken from the sub-district WKO Village Tobelo Among Counties North Halmahera

The appliance and research material¹³

1. The appliance

- A. The Oven
- B. Stirrer bars
- C. Chemical beaker
- D. The Measuring cup
- E. Bunsen
- F. Erlenmeyer
- F. Rotavator
- H. Three Feet
- I. Aluminum foil
- J. The paper filter
- K. Blender Jar
- L. The sieve mesh 65
- M. The appliance GC-MS

2. Ingredients

- A. Extracting a hump made out of bananas (*Moses paradisiaca* L)
- B. Methanol
- C. Spritus

Work Procedures

A. The making of extracting a hump made out of bananas (*Moses paradisiaca* L)

The steps the making of extracting a hump made out of bananas:

1. A hump made out of bananas taken/obtained from the inside of the banana stem is still fresh was around 2-3 months later washed with water flow
2. After being washed a hump made out of bananas cut in small.
3. A hump made out of bananas and then dried with direct sunlight (hours 7-10 morning)
4. Simplisia a hump made out of bananas that is dry weighed then made into powder with the appliance pollination until smooth.
5. The pollen simplisia a hump made out of bananas that have smooth sieving and weighed and put in the container and given label.
6. The pollen simplisia a hump made out of bananas is inserted into the compartment maceration and anointed penyari liquid methanol until passing through simplisia powder.
7. The lid and leave for 5 days are protected from the light of the sun with done stirring each day.
8. 5 days versus the sieve and oily residues pressed.
9. Residual simplisia a hump made out of bananas plus liquid penyari again daily bread and stirring.
10. The container closed and left for 2 days and protected from light matahar.i
11. After two days, separate with soaks.
12. Filtrate simplisia a hump made out of bananas evaporated on the water or with rotavator penangas until obtained extracting thick.
13. Unpacking with thick a hump made out of bananas that obtained weighed and given label.

How identifikasi compounds using GC-MS¹³

Unpack the thick methanol difraksinasi in chemical beaker and done using the identification GC that function to test the purity of certain ingredients, or separate the various components of the mixture that can help in identifying the complex compounds. Then followed by using the appliance MS that functioned as a compound converter samples become the ions positive signals and negative ions produced from the source of plants (Budiadji et al., 2016).

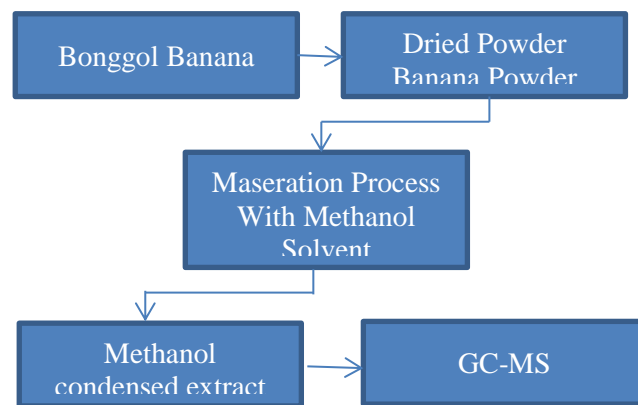


Figure 2. The workflow of the identification of the compound a hump made out of bananas (*Moses paradisiaca* L).¹³

RESULTS

The collection of samples of a hump made out of fresh yellow kepok banana (*Moses paradisiaca* L) done Villages Wosia Tobelo Sub-district in North Halmahera, from July and August. Samples have been collected and then washed with water flow and cut them into small pieces and dried small. Dried Simplisia smoothed with the blender and soaked with methanol for 5 days with done stirring each day. After 5 days of being immersed and then filtered and residual soaked back with methanol for 2 days and after two days done re-filtering. Filtrat or liquid methanol filtration results with greenish black color evaporated until obtained extracting thick.

Extracting the obtained viscous greenish colored with the weight of the 10 grams. Thick extract obtained the test is done active substance in Gc-Ms, extracting samples given the pressure of helium or nitrogen so that the sample is in the form of steam before were injected into the column (Gc). From the Gc column to detector systems (MS) to separated splits into fragments. Fragments produced indicates the existence of these compounds that will appear in the appliance Gc-Ms.

Table 2. The Test Results Table Gc-Ms Thick extract a hump made out of dry yellow kepok banana Halmahera (*Moses paradisiaca* L).

Samples	Compound	The womb (%)
A hump made out of dry yellow kepok banana Halmahera	Hexadecanoic acid ethyl	1.31
	Esther	10,02
	Hexadecanoic acid	4.81
	(2E)-3,7,11,15-tetremethyl-2-hexadecem-1-ol	2.13
		1.20
	The 3-Pyridine	1.92
	carboxamide, oxime, N-	12,10
	(2-	18,36
	trifluoromethylphenyl)	5.99
		5.00
	9 Of Tricosene	2.65
	Squalene	3.28
		3.62
	. Gamma-Tocopherol	5.03
		3.02
	Vitamin E	3,21
	Vitamin E	2.93
	Geranylgeraniol	
	21H-Bilin-1(2H)-one,	4.08
	3,17,18,23-tetrahydro-	3.84
3,3,7,8,12,13,17,17,19-nonamethyl	1.76	
Stigmasterol		
Stigmasterol		
The sitosterol beta.		
The sitosterol beta.		
The cyclotetradecatrien		
2,5,9-1-ol,2,6,10-trimethyl-13-(1-methylethenyl)-,[1S-(IR*,2E,5E,9E,13S*)]		
The-7,22 Ergosta dien-3-ol,(3.beta.,5.alpha.,22E)		
Vitamin E		
2 of 3-methyl-(3 of 2-butenyl methyl)-2-(4 of 3-methyl-pentenyl)oxetane		

DISCUSSION

A hump made out yellow kepok banana Halmahera (*Moses paradisiaca* L) is the parts of the plant from the family *Musaceae* or tribe of the bananas pisang. In the traditional banana a hump made out many used as a wrapper food and giver of flavors and none in food processing.4 Extracting methanol a hump made out of dry yellow kepok banana Halmahera contains one of vitamins namely vitamin E with the number of 18,36%. Vitamin E is one of the eight molecules that has kromanol ring (kroman ring with one hydroxyl group alcohol) 12-side chain carbon alifatis which contains two methyl groups in the middle and more than two methyl groups at the end of the. Vitamin E is a vitamin that have antioxidant activity that can neutralise free radicals. The intake of Vitamin E which penitents in food can prevent parkinson.15

One of the compounds are also found in Extracting a hump made out of dry yellow kepok banana Halmahera is Beta-sitosterol which is one of several Phytosterol Ester (sterol in plants) which has the same chemical structure with the structure of cholesterol. Sitosterol is white powder such as candles and special memilikibau. Is hidrofobik Sitosterol and dissolved in alcohol. Both himself and at the same time with the same Phytosterol Ester, Beta-sitosterol can reduce the amount of cholesterol in the blood and sometimes used in treating hypercholesterolemia.

Also a hump made out of bananas rich food fibers, fiber food, coarse fibers proved to be able to prevent various diseases, including teeth disease, *diabetes mellitus*, high blood pressure, obesity and improve the health of the microflora in the intestines. show the chemical characteristics of the Pati a hump made out of bananas are the level of water by 6,69%, the level of abu 0.11 percent and concentration of HCN 2.6 mg/kg. A hump made out of bananas is the bottom of the banana stem is shaped menggembul fennel. According To Rosdiana, a hump made out of bananas have the composition that consists of 76 percent pati and 20% water. Pati resembles pati sago flour and tapioca flour. nutritional a hump made out of bananas that high enough allows a hump made out of bananas to be made as an alternative for food that potential enough.6 According To Wulandari a hump made out of bananas contain Carbohydrate 66.2%. In 100 g ingredients, a hump made out of dry banana contains carbohydrates 66.2 g and on a hump made out of fresh banana contains carbohydrates 11.6 g. The womb khigh arbohidrat will spur the development of mikoorganisme. Carbohydrate content is high in a hump

made out of bananas allows for fermented to produce vinegar. In the process of fermentation, carbohydrates will be changed into sugar by *S. cerevisiae*, sugar converted to alcohol and alcohol will be changed by *A. aceti* become acetic acid. In addition to the potential in the fermentation also potentially as bioaktivator in pengomposan.⁹

CONCLUSION

After the identification of a hump made out yellow kepok banana Halmahera and then tested with the appliance Gc-MS it can be concluded that a hump made out yellow kepok banana Halmahera contain these compounds: Hexadecanoic acid ethyl ester 1.31%; Hexadecanoic acid 10.02%; (2E)-3,7,11,15-tetramethyl-2-hexadecem-1-ol 4.81%; 3 Pyridine-carboxamide, oxime, N-(2-trifluoromethylphenyl) 2.13%; 9-Tricosene 1.20%; Squalene 1.92%; Gamma. The Tocopherol 12.10%; Vitaimin E 18.36%; Vitamin E 5.99%; Geranylgeraniol 5.00%; 21H-Bilin-1(2H)-one, 3,17,18,23,tetrahydro-3,3,7,8,12,13,17,17,19-nonamethyl 2.65%; and contains 66% carbohydrate, as ingredients vinegar generator.

Suggestions

From the conclusion above, researchers suggested as follows:

- 1) For the Government to the fore more support and more help again in terms of adequate facilities and infrastructure in the examine the ingredients of natural medicine so that the students can improve their work.
- 2) For Educational Institutions, so that the results of this research are in addition of science for students in the broaden especially drugs.
- 3) For the community to be able to increase the knowledge about medicinal plants and can take advantage of it in the daily life of both to prevent and treat the disease that allows with natural materials.
- 4) For the next researcher, the results of this research is expected to be a reference to develop further research in order to become bicarbonate and herbal useful for broader society and can be developed to as the raw material of vinegar.

REFERENCES

1. Badan POM, *Acuan Sediaan Herbal* Vol V. Jakarta: Badan POM, 2010.

2. Anonim, Permenkes No 87 Tahun 2013 Tentang Peta Jalan Pengembangan Bahan Baku Obat Jakarta: Kemenkes, 2013.
3. Mastuti, T. S., & Handayani, R.. *Senyawa Kimia Penyusun Ekstrak Ethyl Asetat dari Daun Pisang Batu dan Ambon Hasil Distalasi Air*. Universitas Pelita Harapan, Tangerang. 2014.
4. Rosdiana R, *Pemanfaatan Limbah dari Tanaman Pisang*. Jakarta: Bharatara Karya Aksara, 2009.
5. Prasetyo Eko, *Pengaruh Konsentrasi Ragi Tape dan Lama Fermentasi dalam Pembuatan Bioetanol menggunakan Substrat Bonggol Pisang*. Yogyakarta: FMIPA Kimia UNY, 2012.
6. Budi HS, IL Kriswandini, & SA, Sudjarwo, Ambonese banana stem sap (*Musa paradisiaca* var. *sapientum*) effect on PDGF expressions and fibroblast proliferation in socket wound healing. *International Journal of ChemTech Research*, 2016; Vo 9(12): 558-564, DOI : 87558IJCT-564.
7. Yuliasih P D, *Biosistematika Berbagai Varietas Pisang (Musa paradisiaca L.) Berdasarkan Karakter Morfologi Melalui Metode Fenetik*. Surabaya: Universitas Airlangga Surabaya, 2016.
8. Pratama NR, Meiyanto, E, *Banana Peels (Musa paradisiaca L.) Extract as Phytoestrogen on Ovariectomized Mice Mammary Gland Development by Inducing c-Myc Expression*. *Indonesian Journal of Cancer Chemoprevention*. 2011; Vol 2(1): 151-159, DOI : 098JCI/45/098.org.
9. Sukmawati, Yuliet, & Hardani, R, *Anti-Inflammatory Activity Test of Ethanolic Extract Of Banana Leaf (Musa paradisiaca L.) on Carrageenan-Induced Paw Edema in White Rats (Rattus norvegicus L.)*. *Galenika Journal of Pharmacy*, 2015; Vol. 1 (2) : 126 - 132, 458JOIF.2300.12 .
10. Mukhriani. (2014). *Ekstraksi, Pemisahan Senyawa, dan Identifikasi Senyawa Aktif*. *Jurnal Kesehatan*, 2014; Vol VII (2): 1-9.
11. Rama Prihandana, *Bioetanol Ubi Kayu Bahan Bakar Masa Depan*. Jakarta: Agro Media Pustaka. 2007.
12. Bahti H H, *Kromatografi Gas Teori dan Aplikasinya*. Bandung: Alfabeta, 2013.
13. Budiadji, A. F., Mapanawang, A. L., Sedeng, D., Muh, N., Tualeka, A., Fambrene, B. T., *Identification of Hexadecanoic Acid Compound which in Golobe Extract (Hornstedtia*

zingiberaceae). International Journal Of Health
Medicine and Current Research, 2016; Vol.
1(01): 53-58, DOI : 10.22301/IJHMCR.2528-

3189.48.
14. Mapanawang A L, *Riset di Bidang Kesehatan*.
Tobelo: Yayasan Medika Mandiri, 2016.
