PROCEEDINGS
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IDENTIFICATION OF SECONDARY METABOLISM COMPOUNDS FROM THE SEPTUM OF DURIAN (*DURIO ZIBETHINUS*)

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Abstract

Societies generally utilize durian rind as drugs based on their knowledge from generation to generation. However, the utilization of durian rind as traditional medicine has not furnished scientifically convincing data regarding the content of active compounds that make efficacious drugs. Durian rind in order to use as a traditional medicine accountable, then the necessary scientific research in the form of identification of secondary metabolites contained therein. The method used in this research was extraction maceration method. A total of 50 grams of powder share durian rind soaked with 96% ethanol was performed for 3 days. Furthermore, the identification of secondary metabolites were done by Gas Chromatography-Mass Spectroscopy (GC-MS) Agilent 7890A-5975C. Secondary metabolites which identified from extracts of durian rind showed that compound 1-butyl (dimethyl) silane with high peak silyloxypropane 5961, hexadecanoic acid with high peak 17 363, 1- (1-methylene-2-propenyl) cyclopentanol with high peak 7958, 9 -octadecenoic acid with high peak 11 437, 1, 2-benzenedicarboxylic acid with a high peak 13765, 2-ethylacridine ciclotrisiloxane with high peak 13318, and beta-sitosterol with high peak 56534. Compounds secondary metabolites were identified beta-sitosterol steroids that have the highest peak with 91 qualities.
Keywords: *Secondary Metabolism Compounds, Septum Of Durian*

Background

Indonesia is a country with abundant natural resources. Almost any kind of plant can be grown in this country. Most have been used since ancient to treat various diseases. The herbs are in use known as traditional medicine. The popularity and development of traditional medicine is increasing along with the development slogan back to nature so much interested in researching the repertoire of this plant.

Plants are natural materials that are widely used as traditional medicine and have been used since long by the people of Indonesia, even more popular for both health maintenance, treatment, and beauty. Examination of the chemical components of each plant is very important to look for active ingredients that can serve as a drug (Rusdi, 1988).

One of the plants commonly used by the people of Indonesia for traditional medicine is durian (*Durio zibethinus*). Societies generally utilize durian rind as drugs based on their knowledge from generation to generation. Durian rind was believed to be used as a drug for menstruation and abortion. The pulverized was used topically to rashes and ringworm pepper, and facilitates defecation as constipation. However, the utilization of durian rind as traditional medicine has not furnished scientifically convincing data regarding the content of active compounds that make efficacious drugs. To be part of the utilization of traditional medicinal plants as accountable will require scientific research such as the identification, assay, and isolation of the active chemicals found in plants.

The purposes of this study were to know about the class and kind of secondary metabolites contained in the septum of durian (*Durio zibethinus*). The benefits of this research were as follows as the material information to the public about the content of secondary metabolites in the septum of durian (*Durio zibethinus*); provided that the scientific data on the share of the durian skin are secondary metabolites, so that more

people can take advantage as a natural herbal remedies; and also adding to the repertoire of science and as a basis for further research.

Methods

a. Equipment and Materials Research

The equipments used in this study were a knife, blender, jars, aluminum foil, funnels, beakers, measuring cups, measuring pipette, analytical balance, spatula, stir bar, a small bottle, a sieve, a set of tools Gas Chromatography-Mass Spectroscopy (GC MS) Agilent 7890A-5975C. Materials used in this research were the septum durian rind, 96% ethanol, and filter paper.

b. Retrieval and collection of samples

The sample used in this study is the septum of fresh durian rind (Durio zibethinus) which obtained from the Village Tompotikka, Kec.Wara, Palopo

c. Pulverizing skin durian

Durian rind that used was the share or the inside of the durian skin so it must first be separated from its outer skin (thorny part). Separation was done by slicing the outer skin or by means chopped. Once the separation is complete the inner rind of durian cut into small pieces and dried with aerated for 8 days. Dried durian rinds were weighed and then crushed using a blender. Furthermore, powder and fibers are separated using a sieve, the powder is to be extracted due to the shape of the powder will facilitate the extraction process.

d. The extraction process

About 50 grams of dried durian rinds were macerated with 96% ethanol and soaked for 3 days at room temperature and protected from light.

e. Analysis of secondary metabolites by GC-MS

Analyses were performed using Agilent Technologies 7890A GC system equipped with Agilent Technologies 5975C inert XL EI / CI MSD with Triple-Axis detector and a capillary column Agilent 19091S-433, 325 ° C (30m x 250 μm, coating thickness 0,25μm).

Results and Discussion

The extraction of durian rind through re-maceration method using amount of 50 grams of powder durian rind then dissolved 96% ethanol for 3 days, gained amount of 1020 mL of crude extract.

1. Results of Secondary Metabolite Identification Using GC-MS

Identification of secondary metabolites of durian rind was performed by gas chromatography then continued by mass spectroscopy, obtained the spectrum peaks of a sample that has been analyzed using gas chromatography (produced 7 peaks) beta-sitosterol is the highest peak at a retention time of 34 474 minutes with high peak 56534. It can be showed in the following figure 1 below.

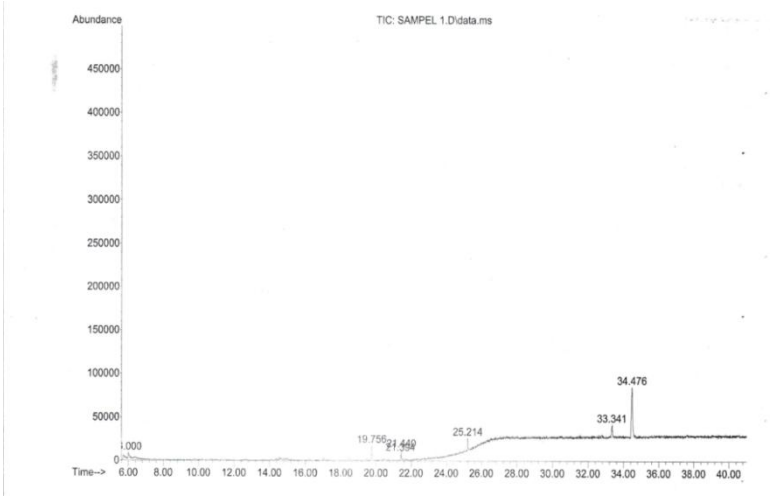

Figure 1: GC-MS analysis of durian rind

The retention time (RT) and % area results from GC-MS analysis of extracts of durian rind can be seen in the table below

Table 1. The results of GC-MS analysis

Peak	RT	name of compound	*Peak height*	Corr. Area	% Area	Quality
1.	6.000	1-Butyl (dimethyl) silyloxypropane silane	5961	251559	5.57	43
2.	19.755	Hexadecanoic acid	17363	306949	6.80	98
3.	21.394	1-(1-methylene-2-propenyl) cyclopentanol	7958	135917	3.01	58
4.	21.438	9-Octadecenoic acid	11437	185571	4.11	72
5.	25.216	1,2-Benzenedicarboxylic acid	13765	273207	6.05	46
6.	33.342	2-Ethylacridine ciclotrisiloxane	13316	564398	12.50	43
7.	34.479	beta-sitosterol	56534	2796054	61.95	91

From the results in the table above, it can't be exactly determined how much amount of the concentration of these compounds. But the results of the curve can be calculated the area of each peaks. Comparison between the area of each peak area to the total area of the graph as a whole generate data % area as shown in the table 1. The percentage of this area shows how much the content of these compounds in the samples tested. The data above shows that the beta-sitosterol compound is 61.95% majority of the total compounds contained in the sample.

The result of durian rind extract was analyzed using Gas Chromatography-Mass Spectroscopy (GC-MS). From the library was obtained 7 peaks, the first peak has a higher area, ie peak to 7. Compound at the peaks 7 appeared at a retention time of 34 474 minutes by area% 61.95, and has a molecular weight of 414.0 followed fragment m / z 396.0, 354.0, 329.0, 303.0, 273.0, 255.0, 231.0, 213.0, 185.0, 163.0, 145.0, 123.0, 105.0, 81.0, 43.0, 18.0 respectively. it has many similarities with the fragmentation pattern compound beta-sitosterol (Library Search Report) with the molecular formula C29H50O. Compound structure can be showed in Figures 2 and fragmentation of beta-sitosterol was showed in figure below.

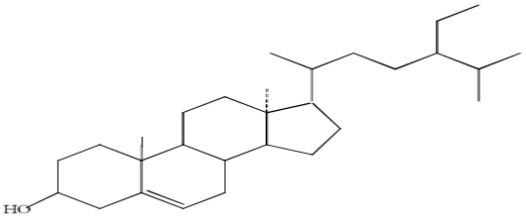

Figure 2: The structure of beta-sitosterol

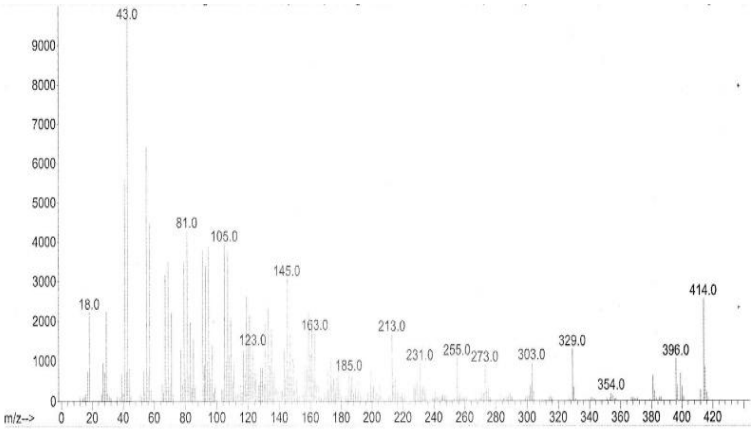

Figure 3: Fragmentation of beta-sitosterol

Beta-sitosterol is a secondary metabolites of the steroid biosynthetic pathway at the direction of the terpenoids. Beta-sitosterol is well known to have antiviral activity, antibacterial and antifungal. Beta-sitosterol is used in various purposes such as dietary supplements, drugs benign prostatic hyperplasia (BPH), anti-cancer, anti-aging, and can be used as anti-cholesterol, because of its similarity to cholesterol (beta-sitosterol). It can prevent cholesterol get into in the gut by his competitive inhibition. An in vitro study, beta-sitosterol can activate sphingomyelin cycle and induces apoptosis in LNCaP human prostate cancer cells (Berges, 1995).

Beta-sitosterol has the ability to emulsify the fat and reduce the cholesterol levels in the body. Besides, beta-sitosterol can also increase the flow of urine and reduce the urine volume significantly. The study says that beta-sitosterol inhibits prostaglandin synthesis, thereby reducing inflammation and can be used to reduce the symptoms of a dangerous tumor. It concluded that the greater the content of beta-sitosterol in a product. (Wholefoods, 2003).

Peak 1 compared with the database has many similarities with the compound of 1-butyl (dimethyl) silanesilyloxypropane with retention time of 6,000 minutes with the high peaks appear at area 5961 5:57%. Peak 2 appeared at a retention time of 19 755 minutes with high peaks in the area of 17 363 compared to 6.80%, the database has many similarities with hexadecanoic acid. 3 peaks appeared at a retention time of 21 394 minutes with high peaks in the area 7958 3:01% when compared with the database it has many similarities with 1- (1-methylene-2-propenyl) cyclopentanol. 4 peak appeared at a retention time of 21 438 11 437 minutes with a peak height at 4:11% area has many similarities with the compound 9-octadecenoic acid. 5 peak appeared at a retention time of 25,216 minutes with high peaks in the area 6:05 13765% have similarity with the compounds 1, 2-benzenedicarboxylic acid. 6 peak appeared at a retention time of 33 342 minutes with high peaks in the area 12:50% 13318 has many similarities with the compound 2-ethylacridine ciclotrisiloxane. This data was showed in Table 1. These results are also evident quality of the extract of the durian rind. Peak 2 with a quality 98 is a compound hexadecanoic acid, commonly known by the name of palmitic acid

(C13H27COOH) and peak 4 with a quality 72 compounds 9-octadecenoic acid or stearic acid (C17H35COOH) both compounds is a carboxylic acid group or commonly known as fatty acids, this class of compounds suspected to be toxic and used as an antibiotic.

Conclusion

Based on the research that has been done on the identification of secondary metabolites from the septum of durian (*Durio zibethinus*) concluded that class of secondary metabolites contained in the septum of durian (*Durio zibethinus*) is a steroid. Secondary metabolites contained in the septum of durian (*Durio zibethinus*) varieties namely beta-sitosterol with peak high quality 56 534 and 91.

Further research is needed to determine the main components to share durian skin that can be utilized in the field of health. It is expected that further research to determine the levels of secondary metabolites contained in the durian's septum to be used as a drug or other beauty products.

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