Research Article

COMPARISON STUDY OF RENDEMEN AND POTASSIUM LEVEL OF ETHANOLIC AND N-HEXANE GEDI LEAVES (*ABELMOSCHUS MANIHOT* L.) EXTRACT

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ABSTRACT

Indonesia, known as equator emerald zone, is rich of natural resources and plants which is potential to be used as food, drug and even as raw materials used for not only for the big but also the small industry. Gedi or gedi leaves (*Abelmoschus manihot* L.) are plenty found in some areas in Indonesia such as Sulawesi, Maluku, NTB and Papua. Recently, the selection of efficacious drug to treat gall bladder (urolithiasis) and blood weapon penetration for kidney failure patients still becomes a serious problem. The efficacious gedi plant has lithotriptik characteristic. The determination of extraction rendemen with the same treatment on stick and leaf of gedi, the extraction was conducted with a various n-Hexane and ethanol solvent using Soxhlet method. The level of potassium in N-hexane and ethano were measured using AAS method. The result of study is showing that the highest extract was ethanolic and the highest level of potassium was of stick.

Keywords: *Abelmoschus manihot* L., Rendemen, Potassium.

INTRODUCTION

The plenty natural resources are the priceless wealth for society and nation of Indonesia given by Allah swt. It is also the reason why Indonesia known as equator emerald zone, rich of natural resources and traditional medicine. One of them is gedi plant or gedi leaf (*Abelmoschus manihot* L) which is plenty found in Sulawesi, Maluku, NTB and papua. In previous research, it explained that there were 30.000 species plants found in Indonesia or 10 % of world flora. From 30.000 kinds of plant, 7500 of them are potential recently; the plants used as traditional medicines were only 406 or 5, 4 %[1]. Until now, the selection of efficacious drug to treat gall bladder (urolithiasis) and blood weapon penetration for kidney failure patients is still becoming a serious problem. The drug data in Indonesia shows that the number of patent drug limited and expensive, alternatively, there are some efficacious medicine plants having lithotriptic characteristic. One of them is Gedi plant (*Abelmoschus manihot* L.) from Malvaceae group[2]. Lithotriptic is a solvation of crystal in urinary system. It has to contain potassium and flavonoid which are able to dissolve the kidney stone. According to the research which was conducted by Tresnabudi (1994)[3]. It explained that in gedi plant extract contain flavonoid that is flavon and flavonol 3-OH and its family such as glicosidarutin, isoquersetin, glikosidakaemferol, glikosidaramnetin and kuersimeritin[4].

MATERIALS AND METHODS
Extraction of Gedi Leaves (*Abelmochus manihot* L.)
The leaves of gedi is chopped up into at least 1 cm in size and weighed for about 30 grams then wrapped by using filter. After that, it is poured into soxhlet tube and 700 mL of N-Hexane solvent is added intolabu andset in soxhlet. If the soxhlet has been set well and then samples are extracted, after it has reached the time of circulation, extraction is stopped to take the extract. Then, it is distilled (solvent + extract) then it is weighed and put into a bottle. The procedure above is repeated with a different of time circulation, other solvent (ethanol) and the other part of plants[6,7,9].

Analysis of Potassium using AAS
Weigh 1, 9067 gram of extract and dissolve it in aquadest and then move it volumetric flask 1 L, added up to 1 L that 1000 ppm potassium standard solution ready to use. Make some series of standard solution 1000 ppm, 2000 ppm, 3000 ppm, 4000 ppm, then 5000 ppm by using pipette from stock solution then put it into each volumetric flask 50 mL, added until 50 mL in volume using aquadest. Measured the absorbance using AAS and determine standard curve. Then, n-hexane and ethanolic extract solution are also measured and determined the level of potassium in each extract[5,8].

RESULT AND DISCUSSION
Effect of time to % of extract rendemen
N-Hexane solvent
From the observation, it is resulted the effect of extraction time to % rendemen on 52 minute is highest 5, 3 % from 33 minute and 52 minute. From the Table 1, it is known that the longer time we need to extract the samples, the higher % of rendemen we produce. To be clear, the correlation between % rendemen and circulation as time in leaf and stick can be seen Figure 1. From the graphic above, it is known that the highest extract s 30 times circulation in 52 minutes and % rendemen is about 11, 8 %. From the graphic above, it can be known that the highest amount of extract is on 30 times circulation in 67 minutes and its % rendemen is 5, 3 % (Figure 2).

Table 1: Extraction time and % rendemen from both of materials

No	Leaf			Stick		
	Time (minute)	circulation	Rendemen (%)	Time (minute)	circulation	Rendemen (%)
1	33	10	7	38	10	3,9
2	47	20	9,3	55	20	4,5
3	52	30	11,8	67	30	5,3

Table 2: Extraction time and % from both of materials

No	Leaf			Stick		
	Time (minute)	Circulation	Rendemen (%)	Time (minute)	Circulation	Rendemen (%)
1	55	10	8, 2	105	10	6, 6
2	120	20	9, 5	150	20	6, 8
3	195	30	11, 1	210	30	10, 3

Table 3: The analysis result of potassium to the extract

No	Action	Sample ID	Abs.	Conc (ppm)
1	Autozero	-	-	-
2	BLK	-	-0, 0149	-
3	STD	1.0000 ppm	0, 1345	1.0000
4	STD	2.0000 ppm	0, 2433	2.0000
5	STD	3.0000 ppm	0, 3736	3.0000
6	STD	4.0000 ppm	0, 4660	4.0000
7	STD	5.0000 ppm	0, 5715	5.0000
8	BLK	-	-0, 0288	-
9	UNK (1)	Leaf (Ethanol)	4, 3639	37,1344
10	UNK (2)	Stick (Ethanol)	4, 3850	37,3140
11	UNK (3)	Leaf (N-Heksane)	4, 3815	37,2842
12	UNK (4)	Stick (N-Heksane)	4, 3296	36,8425
13	BLK	-	-0, 0414	-
14	UNK (5)	Leaf 10x	0, 4364	3,7135
15	UNK (6)	Leaf 10x	0, 4362	3,7118
16	UNK (7)	Leaf 10x	0, 4385	3,7314
17	UNK (8)	Stick 10x	0, 4379	3,7263
18	BLK	-	-0, 0085	-
19	UNK (10)	Leaf 10x	0, 4383	3,7297
20	UNK (11)	leaf 10x	0, 4389	3,7348
21	UNK (12)	Stick 10x	0, 4341	3.6940
22	UNK (13)	Stick 10x	0, 4321	3,6769
23	BLK	-	-0, 0085	-

Table 4: The correlation between x (concentration) then y (absorbance)

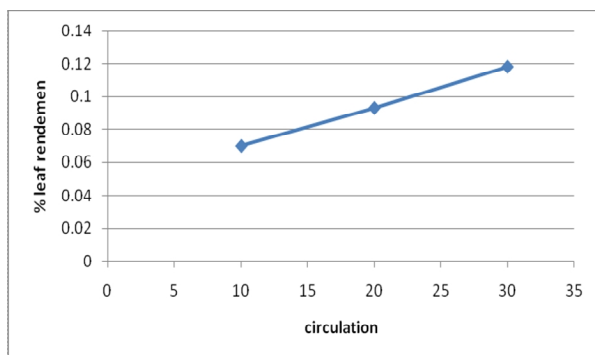| x concentration (ppm)	y (absorbance)
3,7135	0,4364
3,7118	0,4362
3,7314	0,4385
3,7263	0,4379
3,6940	0,4341
3,6869	0,4321
3,7297	0,4383
3,7248	0,4389

Figure 1: The influence of circulation time to % rendemen
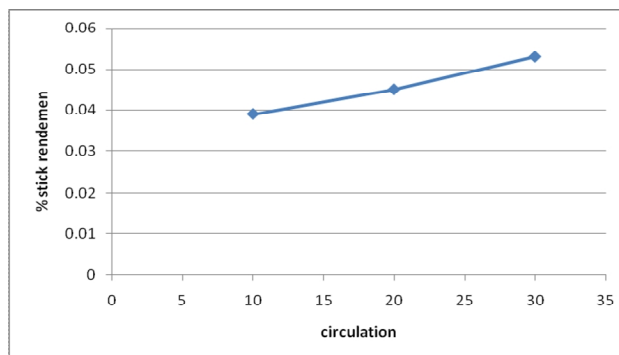

Figure 2: The influence of circulation to % rendemen
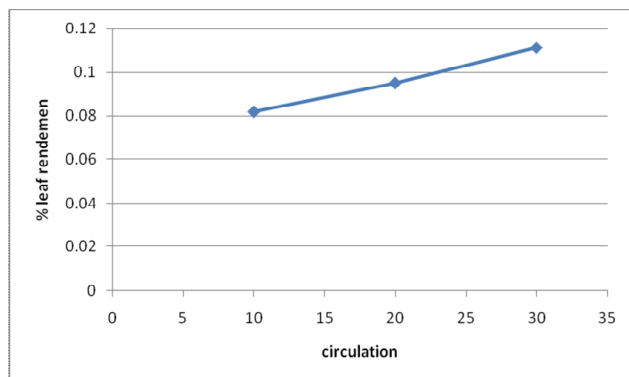
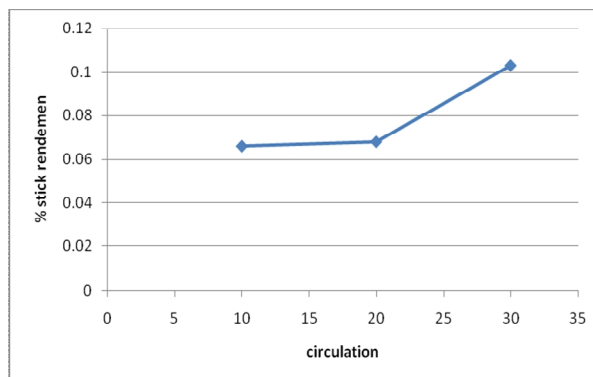Figure 3: The influences of time to % rendemen

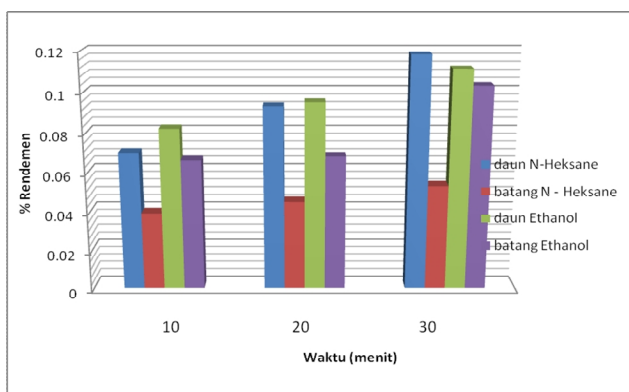Figure 4: The influence of circulation to % rendemen

Figure 5: % rendemen profile with extraction time function for a various materials and solvents
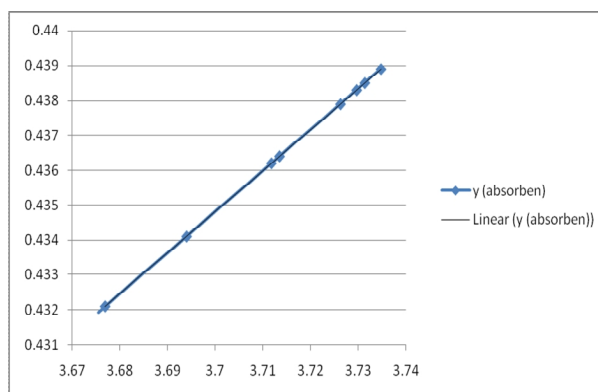

Figure 6: The correlation between absorbance and level of potassium

Ethanol 96 % solvent
From the result of observation, it was found the influence of time extraction to % rendemen. The result on the minute 195 the maximal % rendamen of the leave 11, 1 % and stick 10, 3 % (Table 2), from the table above, it is known that the longer time needed to exract the samples, the higher % of extract got. And for detail, correlation between % rendemen and circulation as time function in leaves and sticks, it can be seen in Figure 3 and Figure 4. From the graphic above, it can be seen that the highest extract is in 30 times circulation in 195 minutes and the % rendemen is 11, 1 %. From the graphic above, it is known that the highest amount extract is on 30 times circulation in 210 minutes and % rendemen is 10, 3 %. Figure 5, the correlation between extraction time to % rendemen of two materials and solvents, it is clearly seen that the average % rendemen not show specific differences, for N-Hexane got optimum % rendemen on leaf in 52 minutes and on stick in 67 minutes with each % rendemen is 0, 118 and 0, 053. While for ethanol solvent to get the optimum % rendemen, it needs 195 minutes on leaf and 210 on stick with each % rendemen is 0, 111 and 0, 103. From the result above, it can be concluded that from the circulation time point of view, the best solvent for the research is N- Hexane because the process time is shorter than ethanol. While, from the extract and % rendemen point of view, ethanol is the best one because it produce the much more and more concentrated extract compared with N- Hexane. But it is different with number circulation point of view; N- hexane produced higher extract than ethanol. It is because when the distillation process, the solvents and extracts have not separated completely, that the solvent is also weighed with the extract.

Quantitative assay of potassium level using (atomic absorbance spectroscopy) AAS method
The correlation between x and y, between absorbance and level of potassium in samples can be seen in the Table 3 and linear correlation. The Figure 6, shows that the absorbance directly proportional with concentration, the higher of absorbance, the higher level of potassium. The highest level potassium from the samples is in stick.

CONCLUSION
The result of research shows that:
- Between both of the solvent used that are (n- Hexane and ethanol), each of them has its own the lackness and excess such as in N- Hexane is better than ethanol from the time because it is faster than ethanol. While, from the % rendemen ethanol is better than n- hexane because it results the higher and concentrated extract.
- The content of potassium is higher in stick than in leaf. The comparison between absorbance and concentration of potassium is directly proportional, where the higher absorbance, the higher concentration of potassium.

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