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Research Paper

Effect of Water Time and Temperature Different Against Phenolics, Randemen Percentage, and Bacterial Bland Power *Escherichia Coli* in Infused Water Purple Eggplant (*Solanum Melongena L)* Afkir

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ABSTRACT
Solanum melongena L contains a lot of phytochemicals especially compounds phenolics that play a role as antimicrobial. The purpose of this research is to know phenolic, bland power against bacteria Escherichia coli and randemen percentage infused water with temperature and soaking time differently as feed additive quail laying. This study uses descriptive methods for phenolic test and bland power against bacteria Escherichia Coli and Complete Randomzed Design factorial pattern for parameters randemen percentage. This research consists of two factors. The First factor of temperature (9^o C, 27^o C dan 45^o C without maintaining the temperature), and the second factor long soaking (1 hour, 6 hours, and 12 hours). phenolic test results infused water purple eggplant get the best results with immersion during 6 hours and temperature 45^{o}C (without maintaining temperature) that is 0,1282 %, test the best taste on soaking for 6 hour and temperature 45^{o}C that is 13,02 mm, as well as the percentage of very real effect (P<0,01) to immersion temperature infused water purple eggplant, the best temperature for immersion On 45^{o}C (without maintaining the temperature) that is 85,01%.
KEYWORDS: *infused water, purple eggplant afkir, Phenolic, E-Coli, randemen percentage*

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I. INTRODUCTION

Infused water is a type of beverage that contains drinking water and fruits with immersion within a certain time (Harifah *et al.*, 2015). Infused water is used as an alternative *feed additive* for safe natural health for livestock. Infused Water involves immersion plant material in water or boiling water during a certain time to extract phytochemicals. Phytonutrients contained inside the purple eggplant that is, phenolic components like *caffeic* and *chlorogenic acid*, and flavonoids that are nasunin (Tiwari, 2009). USDA (2007), explained that purple eggplant is a good food source of fiber, Vitamin (vitamin B1 and B6), Mineral (potassium, magnesium), and phytochemicals especially phenolic compounds. Research results in Row & Ho (2009), phenolic acts as an antimicrobial. Soaking makes the chemical properties of white water are increasing according to the nutritional content and phytochemicals of the fruit soaked in it. Infused water no added sugar and other additives so that the aroma and taste come from the fruit soaked in it. However, Unknown is there any relationship between water time and temperature infused water in producing phenolics, randemen percentage, and bland power against bacteria *E-Coli* pada *infused water* purple eggplant (*Solanum melongena L)* afkir. This research aims to know the influence of water time and temperature infused water phenolic content, randemen percentage, and the blandness of Bacteria *E-Coli* on infused purple eggplant water (*Solanum melongena L*) afkir.

II. METHODS AND METHODS

Research Materials

Materials used to infused water purple eggplant afkir consist of purple eggplant afkir, water, knives, scales, measuring glass. Materials for phenolic testing are gallic acid, releases *folin-ciocalteu*, aqua bikes, sodium carbonate, *water bath* Temperature 45^{o}C, quiet and sodium carbonate. Materials used for bacterial bland

power testing consist of petri dish, Media *Brain Heart Infusion Agar* (BHIA), bacterial breeding *Escherichia coli* 18 to 24 hours old. Materials for testing randemen percentage are measuring glass and digital scales.

***Process Infus water* purple eggplant afkir**

Eggplant fruit cleaned and washed Then cut into pieces, provide water and cut eggplant by comparison 1:2 (weight/volume), then fill the water first into containers and insert the carved eggplant that has been cut into pieces let stand a few hours and store at different temperatures (9^oC, 27^oC dan 45^oC(without maintaining the temperature)).

Research Methods

This research was conducted by experimental method. The method used is descriptive to test phenolics and blandness against bacteria *Escherichia coli* and Complete Randomized Design factorial pattern 3 x 3 with 3 repeats for the percentage randemen, which consists of 2 factors, namely factor A (long soaking) and factor B (immersion temperature) in the making infused water purple eggplant rejected, which consists of:

Factor A: temperature in the manufacture infused water

A1: 9^oC (refrigerator temperature)

A2: 27^oC(room temperature)

A3: 45^oC((warm temperature, without maintaining the temperature)

Factor B: length of immersion

B1: 1 hour

B2: 6 hours

B3: 12 hours

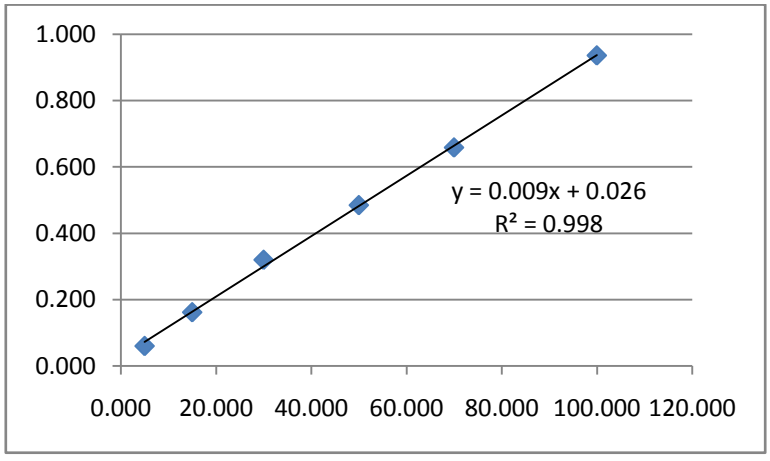
Observed Parameters

1. Phenolic content test (%) (Farmakope Herbal Indonesia, Suppl. 3, 2013)
2. Test the taste of bacteria *E-coli (*Harlis, 2012)
3. Percentage of randemen (%)

The data obtained is analyzed using ANOVA and when the results are significantly followed by Ducan's Multiple Range Test (DMRT)

1. The long soaking phenolic content test (%)

The phenolic content test did by the method of *Folin-Ciocalteu* (Farmakope Herbal Indonesia, Suppl, 3 2013). The linear regression equation used for determining total phenolic content tat is Y= 0,0091x + 0,0268 With a coefficient of collegiate (R^2) Is 0,9989, linear calibration curve on Pictures 1.



Pictures 1. Linear calibration curve gallic acid

Based on the results of calculation of phenolic content on the infusion of purple eggplant water (*Solanum melongena L*) afkir with long immersion and different temperatures samples capable of producing phenolic the highest content is by soaking in warm water temperature (45^oC, without maintaining the temperature) with a soaking time of 6 hours phenolic percentage of 0.1282%. phenolic test results from infused water purple eggplant (*Solanum melongena L)* afkir presented in Table 1.

Table 1. Phenolic test results infused water purple eggplant (*Solanum melongena L*) afkir

Number	Sample	Types of testing	Results (%)
1.	A1B1		0.0095(±0.00000007)
2.	A1B2		0,0273(±0,00000007)
3.	A1B3		0,0338(±0,00000276)
4.	A2B1	Phenolic Content (Compared	0,0110(±0,00000023)
5.	A2B2	To gallic Acid)	0,0596(±0,00000010)
6.	A2B3		0,1094(±0,00000061)
7	A3B1		0,0640(±0,00000191)
8.	A3B2		0,1282(±0,00000324)
9.	A3B3		0,1143(±0,00000332)

Description: A : Temperature:1= refrigerator temperature (9^{o}C)

2= room temperature (27^{o}C)

3= warm temperatures (45^{o}C without maintaining the temperature)

B: soaking time: 1 = 1 hours

2 = 6 hours

3 = 12 hours

In Table 1 it can be concluded that rising temperatures and long soaking in the making infused water purple eggplant can increase and decrease the phenol on infused water purple eggplant afkir. The highest phenolics are found in soaking with warm water (45^{o}C without maintaining the temperature) for 6 hours and the lowest on cold water soaking (9^{o}C) for 1 hour.

Measurement of phenolic content using gallic acid standard. gallic acid is chosen because it is a pure and stable substance. All phenolic compounds including simple phenols can react with reagents *Folin Ciocalteu* Although not an effective radical catcher. The presence of aromatic nuclei in phenolic compounds can reduce fosfomolibdat fosfotungstat to molybdenum tungsten. Phenolic compounds only react with reagents *Folin Ciocalteu* in the alkaline atmosphere to occur dissociation of protons in phenolic compounds into phenolate ions (Ukieyanna, 2012).

phenolic measurement of infused water purple eggplant *(Solanum melongena L)* afkir with different temperatures and immersion durations ranging between 0,0095% to 0,1282%. phenolic content of infused water the highest on the treatment of A3B2 by immersion in the temperature of the 45^{o}C (without maintaining the temperature). An increase in total phenol according to Silva *et al*. (2007), is caused by high extraction temperatures, resulting in the degradation of cell walls due to the destruction of carbohydrates and proteins by the heat that facilitates the exit of phenols from the plant tissues.

2. Percentage of randemen

Table 2. Percentage randemen infused water of purple eggplant (*Solanum melongena L*) afkir

	factor B				
factor A	B1	B2	B3	Amount	Average
A1	80,03	75,67	74,00	229,70	76,56^{c}
A2	80,00	81,70	79,33	241,03	80,34^{b}
A3	86,00	84,70	84,33	255,03	85,01^{a}
Amount	246,03	242,07	237,66	275,86	
average	82,01	80,69	79,22	241,95	

Description:^{abc} Flattening with different lowercase superscripts shows very real different (P<0,01)

Renderman *infused water* purple eggplant *(Solanum melongena L*) afkir in this research obtained through the extract process using the infundation method. Consideration of the inundation method used in this research because the tool used is very simple. Water is considered a solvent liquid because it is cheap, easy to

obtain, Stable, non-toxic, not volatile, and is one of the most common solvents to look for water-soluble active substances from vegetable ingredients.

Table 2 the percentage of randemen is obtained infused water purple eggplant (*Solanum melongena L*) afkir (factor A) that is 76,56%, 80,34%, and 85,01%. The results of the fingerprint analysis showed that the percentage of different temperatures very real effect (P<0,01) on the percentage of randemen infused water purple eggplant afkir. The highest percentage of randemen on treatment (A3*)* infused water purple eggplant at temperature 45^{o}C (without maintaining the temperature) and the lowest infusion of water at temperature 9^{o}C (A1). This is because the lower the temperature then the more water is absorbed in purple eggplant so that the percentage of purple eggplant randemen Lower.

Salamah (2015) states that other factors that allow may affect the rendemen value the resulting extraction method used by the, sample particle size, storage condition and time, length of extraction time, a comparison of the number of samples to several solvents used, and the type of solvent used. Mardina (2015) states that the longer the extraction time, the higher the rendemen obtained, because of the opportunity to react between the material and the solvent the longer so that the penetration process solvent into material cells the better which causes more and more compounds to diffuse out of cells.

3. Test the taste of bacteria *Escherichia coli*

The bland power test is carried out using the disk method by observation of the diameter of the bland zone as an indicator of bacterial inhibition.

Table 3. Bland power test results infused water purple eggplant with temperature and long soaking different against bacteria *Escherichia coli.*

Number	Sample	Bland power (mm)
1.	A1B1	5,44
2.	A1B2	6,11
3.	A1B3	5,11
4.	A2B1	8,13
5.	A2B2	6,11
6.	A2B3	7,63
7.	A3B1	7,12
8.	A3B2	13,02
9.	A3B3	7,12

Darmayasa, Sudirga (2012), Anti-bacterial activity is characterized by the presence or absence of bland zones on media. Wider clear zones then the bland zone of bacteria that form the stronger active compounds in the growth of bacteria (Toy, Lampus, Hutagalung. 2015). Bland power testing infused water purple eggplant rejected with different temperatures and soaking lengths against bacteria Escherichia coli obtained results that infuse water purple eggplant afkir has a bland power against bacteria *Escherichia coli* Ranges 5,44 mm to 13,02 mm.

Differences in bland power test results against bacteria *Escherichia coli* on the infused water of purple eggplant afkir caused by the old differences in immersion and temperature in infused water purple eggplant afkir. Another possible cause Is the interaction between active compounds antibacterial contained in the purple eggplant afkir and the content of other compounds that can affect the work of the antibacterial. The number of bland zones also depends on factors such as diffusion speed, molecular size, the stability of antibacterial materials, fat media to be used, the number of inoculated organisms, speed of growing bacteria, the concentration of chemicals, and conditions during incubation (Iriano, 2008).

Results of blandness test against bacteria *E-coli* obtained results that infused water Purple eggplant afkir with different temperature and soaking length has a moderate bland zone. The best result was the A2B1 treatment (temperature 45^{o}C and soaking length of 6 hours) which was 13,02 mm and the lowest in the A1B3 treatment(temperature 9^{o}C and soaking length of 12 hours) which was 5.11 mm. Djaenudin (2016) temperature and time greatly influenced the total decrease of bacteria and antioxidant activity.

III. CONCLUSION

Based on the results of the study can be concluded that the infusion of purple eggplant water afkir has a bland zone against bacteria Escherichia coli medium category and total phenolic content in the infused water of purple eggplant afkir with a temperature of 45^{o}C (without maintaining the temperature) and the best 6 hours soaking duration, as well as the percentage of randemen at a temperature of 45^{o}C (without maintaining the temperature) the highest is 85,01%.

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