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A Qualitative Analysis of Tannin Type and Tannin Content in Meniran Tea (*Phyllanthus Niruri* Linn.) with Permanganometry Method

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Abstract—Meniran (*Phyllanthus niruri* Linn.) extract is known to be a source of antioxidants and non-toxic. The content of antioxidants in meniran is donated by tannin. The use of meniran (*Phyllanthus niruri* Linn.) extract as an herbal medicine has been widely used. Meniran (*Phyllanthus niruri* Linn.) can be brewed as tea and made into a drink, but the content of antioxidants in meniran tea is not widely known. The use of meniran (*Phyllanthus niruri* Linn.) tea can directly avoid the effects of residual solvents on extracting. The purpose of this study is to determine the type of tannin and tannin content in meniran (*Phyllanthus niruri* Linn.) tea with the permanganometry method. Meniran tea (*Phyllanthus niruri* Linn.) was made by washing and drying at room temperature. Meniran (*Phyllanthus niruri* Linn.) was collected from grass or roadside in the Tasikmalaya Regency. The research were conducted at the Basic Laboratory of the Faculty of Health Sciences, Siliwangi University. The results of the qualitative analysis showed that tannins contained in meniran tea are included in a group of hydrolyzed tannins with tannin content of catechol complex. The tannin content contained in 1 gram of meniran tea is 7.56 mg (7.56%).

Keyword: meniran, tannin, permanganometry, qualitative, antioxidants

1. INTRODUCTION

Meniran (*Phyllanthus niruri* Linn.) is an herbaceous plant that can live in tropical climate grasses. Meniran has been known as a drug in Asia, Africa and South America¹. The Latin name meniran in India is *Phyllanthus amarus*^{2,3}. Phytochemical analysis of meniran extract gave a positive reaction for groups of carbohydrates, alkaloids, flavonoids, glycosides, saponins, steroids and tannins⁴ that provide antioxidant activity⁵.

Various studies on meniran extract showed that meniran extract was hypoglycemic, lowered cholesterol and triglycerides in alloxan-induced mice⁶ and streptozotocin-induced⁷, hypotensive in male rabbits⁸. It can be used as the healing and / or prevention of infectious and degenerative diseases⁹, for improving insulin resistance in 10% sucrose-induced mice¹⁰, for providing anti-apoptotic effects and inhibiting inflammation¹¹, and for reducing the weight of diabetic mice induced by alloxan^{12,13}. In obese male rats, meniran water extracts can control weight gain, decrease blood glucose levels, increase HDL levels and reduce triglyceride levels¹⁴.

The flavonoid content in antioxidant meniran tea is partly contributed by tannin compounds. Tanin is a natural compound with a molecular weight of 500 - 3,000 with several free

hydroxyl phenol groups, forming stable bonds with proteins and biopolymers. The phenol groups found in tannins cause astringent, antiseptic effects that cause color if reacted with iron salts¹⁵

Meniran water extract (*Phyllanthus niruri* Linn.) can be produced in daily life by brewing directly with hot water and drink it like a tea. However, there is no research on the type of tannin and the levels of tannins in meniran tea. The importance of this research is to determine whether meniran tea is brewed directly containing tannins which have antioxidant activity for the body or not. If the meniran tea contains tannins with large amount then drinking meniran tea can be used as an option to consume medicinal plants.

2. MATERIALS AND METHOD

This research is an experimental research in the laboratory. The plant material used in this research was meniran tea (*Phyllanthus niruri* Linn.) taken from the area of Tasikmalaya Regency, with an antioxidant content of 74%¹⁴. Meniran tea used for each test was 2 grams. The chemicals used for this research were simplicia *Phyllanthus niruri* Linn powder, aquades, KMnO_4 0.1N, indigo sulfonate acid LP, iron (III) ammonium sulfate or FeCl_3 , ammonia Potassium iron (III) cyanide, hydrochloric acid, acetic acid, 10% Pb acetate, KBr 1% gelatin solution, Na acetate. Stiasny Formaldehyde.

The process were: weighed each ± 2 grams of meniran tea powder, given 50 ml of aquades, heated in water for 30 minutes then deposited and filtered with filter paper, and the filtrate was taken.

3. RESULTS AND DISCUSSION

The Qualitative Analysis Results

The results obtained by reacting meniran tea with a solution of 1% FeCl_3 , gelatin and a mixture of potassium ferisianida with ammonia, as shown as follows:



(a)



(b)

(c)

- (a) Change color to blue after addition of FeCl_3 3% (positive tannin)
- (b) Formation of white deposits after the addition of 1% gelatin (positive tannin)
- (c) Change color to a collate after adding potassium cyanide and ammonia (positive tannin)

Hydrolyzed tannin

Table 1. Results of hydrolyzed tannin type analysis test

Type test	Result
Meniran tea water plus FeCl_3	blue black color is formed
Meniran tea water plus HCl and then heated	red does not form
Meniran tea water plus 2 ml acetic acid and 1 ml Pb acetate solution 10%	formed sediment
Meniran tea water plus bromine (KBr) reagent	does not give sediment

Condensed Tannin

Table 2 Results of condensed tannin type analysis test

Type test	Result
Meniran tea water plus FeCl_3 gives a greenish black color	Negative
Matchstick is forced into the meniran tea water, dried. Moistened with HCl and heated, phloroglucinol is formed which causes the matchstick to turn pink or red	Negative
Meniran tea water with HCl and heated, the red color of insolubela phlobagphenes	Negative
Meniran tea water plus 2 ml acetic acid and 1 ml Pb acetate solution 10%, do not cause sediment or remain in the form of solution	Negative
Meniran tea water plus bromine reagent (KBr), will give sediment	Negative

Tannin Complex

Table 3 Results of complex tannin type analysis

Type test	Result
Meniran tea water is added with Stiasnyn L 3% formaldehyde - hydrochloric acid (2: 1) and refluxed for 30 minutes	Positive Red sediment
Meniran tea water plus FeCl_3	Negative greenish black color

The Quantitative Analysis Result

Table 4 The results of quantitative analysis of 2 grams meniran tea with permanganometry

No sampel	Massa tannin (mg)	Tannin content
1	69	6,9%
2	80	8,0%
3	80	8,0%
4	80	8,0%
5	69	6,9%
Total	378	37,8
Average	75,6	7,56

CONCLUSION

Meniran tea (*Phyllanthus niruri* Linn.) made by drying and brewing with hot water (without extraction) was positive for tannins. The types of tannins contained in meniran tea were hydrolyzed tannins and complex tannins containing catechol and galat. The content of tannins in 2 grams of meniran tea was 7.56%.

Meniran tea can be used as an alternative drink that contains antioxidants with various benefits. Further research is needed to analyze the levels of antioxidants contained in 1 cup of meniran tea because of antioxidants and not only given by tannins.

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