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Identification of Phytochemicals Compound On the Ethanol Extract of Banana Peel *Musa Balbisiana* Colla *"Kepok Putih"* and *Musa X Corniculata* Lour. *"Tanduk"*

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Abstract

Indonesia is the largest banana producer in Asia and each year continues to increase its production. The number of banana production in Indonesia reached 4,177,155 tons in 2003 and increased continuously to 6,373,533 tons in 2009. The abundance of banana peel is not comparable with the utilization of a banana peel in the society which has so far not been processed much apart from being animal feed. Two types of bananas that are often processed but the peels have not been optimally utilized yet are "kepok putih" and "tanduk". Banana peel of "kepok kuning" extract contains alkaloids, flavonoids, quinones, saponins and tannins. However, the phytochemical compounds of banana peel "kepok putih" and "tanduk" have not been widely studied. Thus, this research aims to identify the phytochemical compounds from banana peel of "kepok putih" and "tanduk". The extraction method which used in this experiment was the maceration method using 96 % ethanol solvent. Based on the test results, which may be obtained, it is known that the ethanol extract of banana peel "kepok putih" contains flavonoids, tannins, alkaloids, while "tanduk" contains flavonoids, saponins, tannins, and alkaloids.

1. INTRODUCTION

Indonesia is a well-known leading producer of bananas among Asian countries and each year its production increases continuously. However, the more increase in banana production, the more increase banana peel waste (DILAPANGA, 2013). In 2003, banana production in Indonesia reached 4,177,155 tons until continued to increase to 6,373,533 tons in 2009 (BPS (2011) in (Akli et al., 2012). According to FAO (2003), banana peel waste accounts for 40% of the total weight of bananas. The abundance of banana peels is not comparable to the utilization of banana peels in the society

which has so far not been processed much apart from being animal feed. The banana cultivars that are often processed but the peels have not been optimally utilized yet are the banana "kepok" (Musa balbisiana Colla) and the banana "tanduk" (Musa x corniculata Lour.). Banana "kepok" is divided into two variants, namely banana "kepok putih" and "kepok kuning". (Munadjim, 1988) explains that the differences can be seen when the pulp is sliced and banana "kepok kuning" tastes sweeter than the banana "kepok putih". According to (Suyanti, 2008), banana "tanduk" has a large fruit size, horn-like shape, thick peel, and the peel of ripe banana has a reddish brown color with speckles.

By this time, the phytochemical compounds of banana peel "kepok kuning".

2. MATERIALS and METHODS

This research was conducted in October and November 2016 at the Plant Physiology Laboratory, Plant Tissue Culture Laboratory, and Biology Education Laboratory, Department of Biology, Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim, Malang, Indonesia. The equipment used were oven, knives or cutting tools, rotatory evaporator, freezer, filter paper, beaker glass, bottles, measuring cylinders, glass funnels, dropper pipettes, rubbing alcohol and bunsen, test tubes, and test tube clamps. The samples used were have been reported by many researchers, yet not as much as banana "kepok putih" and "tanduk". (Saraswati, 2015) reported that the ethanol extract of banana peel "kepok kuning" contains alkaloids, flavonoids, quinones, saponins, and tannins. According to (Fitrianingsih & Purwanti, 2012), a type of antioxidants that can be isolated from banana peels is flavonoids. Based on research by (Jalani et al., 2014), the phytochemical compounds of banana peels are tannins and quonins which have antibacterial activity. Other compounds that are described by (Jalani et al., 2014)are alkaloids, flavonoids, and saponins.

Interestingly, based on several studies, it is expected that banana peel "kepok putih" have similar phytochemical compounds and in particular, high flavonoid compounds. By using phytochemical tests or bioactive screening, the phytochemical compounds can be identified from banana peel "kepok putih" and "tanduk". Hopefully, the banana peel waste can be utilized more optimal as an anticancer, antibacterial, or other agents as well as reducing banana peel waste pollution after the study of phytochemical compounds is revealed. Thus, this research is required to be conducted and aims to investigate the phytochemical or secondary metabolite compounds in the ethanol extract of banana peel "kepok putih" and "tanduk".

Banana peels "kepok putih" taken from Merjosari Village, Lowokwaru District, Malang City, East Java and banana peel "tanduk" waste obtained from one of the fried banana traders in the Sidomulyo area, Batu City, East Java. The materials used were water, distilled water, 1% $FeCl_3$, H_2SO_4, Meyer Reagent, Dragendrof Reagent, 96% ethanol, HCl, and Chloroform.

a. Sample Preparation

1) Banana Peel "kepok putih"

Fresh banana peels "kepok putih" were washed thoroughly to discard the dust and dirt. Then the clean banana peels were drained and cut into small pieces with a knife to escalate the drying process. 900g banana peels were dried in an oven at 60°C and resulted in 183g dried simplicia of banana peels "kepok putih". The dried simplicia was then grounded until it became a powder which was performed by Materia Medica, Batu.

2) Banana Peel "tanduk"

The banana peels were cleaned, drained and chopped. Then, 3.5kg banana peels were dried using an oven for 2 days at 45°C and resulted in 350g of banana peels that have

been mashed using a blender until became a powder.

b. Extraction

1) Banana Peel "kepok putih"

The extraction method was using maceration with 96% ethanol solvent. Briefly, the banana peel simplicia (100g) were macerated with 300ml of 96% ethanol for 1x24 hours. Remaceration was carried out once. The extract obtained was then filtered with filter paper and followed by evaporation with a rotary vacuum evaporator until a crude extract was obtained and stored in an incubator 20°C for maximum evaporation. Storage in the freezer was carried out after the extract was in a paste-form until it was ready for use. However, the extraction of banana peels "kepok kuning" was not performed because it had been done by several previous studies, such as Saraswati, et al (2015).

2) Banana Peel "tanduk"

The extraction used is also maceration and the simplicia (100g) was macerated with 96% ethanol (300ml) for 2x24 hours (replaced with a new solution after 24 hours). The extract obtained was filtered with a funnel and Whatman filter paper and the filtrate obtained was evaporated with a rotary vacuum evaporator until a crude extract was obtained.

c. c. Phytochemical Tests

This test was performed to screen the phytochemical compounds including.

1) Flavonoid;

96% ethanol banana peel "kepok putih" extract (0.5g) was heated for 5 minutes then H_2SO_4 was added to the filtrate. Besides, banana peel "tanduk" extract (0.1g) was dissolved in 96% ethanol solvent (10mL) then divided into several test tubes. Flavonoid compound is detected in reddish color due to the addition of H_2SO_4.

2) Saponin;

Saponin was evaluated by a foam test in hot water. A total of 0.5g and 1g extracts of banana peels "kepok putih" and "tanduk", respectively, were placed in a test tube added with distilled water, then heated until the alteration of solvent color. Moreover, the sample was filtered and the obtained filtrate in the test tube was shaken vigorously. The saponin test is confirmed by the presence of a stable foam.

3) Tanin;

The sample extract (0.5g) in 3mL of warm water was dripped with 3 drops of 1% $FeCl_3$. The test result indicates positive when the color solution changes to dark blue or blackish green (Mubarokah, 2014). Similarly, according to Miranda (Sangi et al., 2008), this test is performed by adding 2-3 drops of 1% $FeCl_3$ solution to the extract.

4) Alkaloid;

The banana peel extract "kepok putih" (1g) was divided into 2 test tubes. The first tube was added 3 drops of Dragendorff reagent and the second tube was added 3 drops of Mayer reagent. The presence of alkaloids is detected through an appearance of orange precipitation in the first tube and yellow precipitation in the second tube. Furthermore, the extract of banana peel "tanduk" (3g) was added sufficiently with chloroform and mixed thoroughly, and then 10mL of ammonia and 10mL of chloroform were added before the addition of 10 drops of H_2SO_4 2N. The filtrate was then shaken and let it take a while until it was separated into two layers then the top layer was transferred into the three test tubes.

The data obtained from the research results were analyzed descriptively and presented in table form.

3. RESULTS

The phytochemical test that has been carried out aims to identify the phytochemicals or secondary metabolite compounds of banana peel "kepok putih" and "tanduk". Secondary metabolites are metabolite compounds that are not essential for the growth of organisms. The function of

secondary metabolites is to defend themselves from unfavorable environmental conditions (Rasyid, 2012). This method is also often referred to as phytochemical screening. According to (Rasyid, 2012) Harborne (1987), phytochemical screening is a qualitative examination of chemical compounds to determine the category of compounds contained in a plant.

Phytochemical compounds or secondary metabolites in plants can be terpenoids, tannins, alkaloids, flavonoids, steroids, glycosides, phenolic, and others. The results of phytochemical tests on 96% ethanol extract of banana peels "kepok putih" and "tanduk" as shown on following Tabel 1.

Tabel 1. Phytochemical Test Results of 96% Ethanol Extract of Banana Peels "Kepok Putih" and "Tanduk"

Secondary Metabolite Compounds	Banana Peel "Kepok Putih"		Banana Peel "Tanduk"	
	Test Result	Observation Result	Test Result	Observation Result
Flavonoid	+	A brownish- yellow coloration 	+	A yellow coloration 
Saponin	-	No stable emulsion 	+	Stable emulsion 
Tanin	+	Black coloration 	+	Blackish blue coloration 
Alkaloid (Mayer's test)	-	Yellow precipitation 	+	Creamy white precipitation 
Alkaloid (Dragendorff's test)	+	Red precipitation 	+	Red precipitation 

4. DISCUSSION

Identifying the secondary metabolites is an important first step in the observation for new bioactive compounds from natural resources that can be precursors for the synthesis of new drugs(Rasyid, 2012). (iqbal & khan, 2012) also said that the use of phytochemical methods is very important, for instance, to filter and

analyze bioactive components, and not only to control the quality of simplicia, but also to explain the therapeutic mechanism.

Two types of bananas that are often processed but the peels have not been optimally utilized yet are "kepok putih" and "tanduk". The results obtained showed the similar results with (Supriyanti et al., 2015) that there are secondary metabolite compounds in the banana peel "kepok kuning" extract using water solvent and interestingly it has potential to be an antioxidant due to flavonoids, tannins, terpenoids contents. However, there were differences in the study results between these two types of bananas. The saponin test revealed the positive result in the banana peel "tanduk" extract with the formation of stable foam as high as 0.8 cm for 13 minutes after heating and shaking vigorously. Thus, the ethanol extract of banana peel "tanduk" was found to contain saponin compounds. The different results in the two types of banana peels were possible due to differences in the content of secondary metabolites in different species and environmental factors.

5. CONCLUSION

Based on the results of the study, it can be concluded that the 96% ethanol extract in the banana peel "kepok putih" contains flavonoids, tannins, and alkaloids, while the banana peel "tanduk" contains flavonoids, saponins, tannins, and alkaloids compounds.

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