ANALYSIS OF FLAVONOID CONTENTS FROM EXTRACT ETHANOL BILAJANG BULU LEAF (*Merremia vitifolia*)

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Abstrak. Penelitian ini bertujuan untuk mengetahui kadar senyawa flavonoid ekstrak etanol daun Bilajang Bulu (*Merremia vitifolia*). Secara empiris tumbuhan *Merremia vitifolia* dimanfaatkan oleh masyarakat Kabupaten Luwu Provinsi Sulawesi Selatan sebagai obat penyembuhan luka Diabetes mellitus, hal ini dikarenakan daun *Merremia vitifolia* memiliki senyawa aktif berupa flavonoid yang berfungsi sebagai antivirus, insektisida dan antibakterisida. Metode pada penelitian ini melalui preparasi sampel daun *Merremia vitifolia* yang dikeringkan dengan diangin-anginkan, ekstraksi sampel dengan metode maserasi menggunakan etanol 96%, kemudian uji kadar dengan menggunakan spektrofotometri UV-Vis dan kuersetin sebagai larutan standar. Hasil penelitian diperoleh kadar flavonoid sebesar 163,4 mg/L atau setara dengan 0,01634%.

Kata Kunci: Ekstrak etanol, ekstraksi, flavonoid, *Merremia vitifolia*, spektrofotometri UV-Vis

Abstract. The aim of this research is to find out content of flavonoid compounds extracts from ethanol Bilajang Bulu (*Merremia vitifolia*). Empirically, *Merremia vitifolia*was used by people in Luwu, Southern Sulawesi as a cure for diabetes mellitus injury, it was caused *Merremia vitifolia* had an active compound was flavonoid that worked as anti-virus, insecticides, and anti-bacteria. Methods of this research were through preparation sample of a *Merremia vitifolia* leafs which dried to aired, extraction sample by maseration method using ethanol 96%, then testing of flavonoid content using spectrophotometry UV-Vis and quercetin as standard solution. The result obtained that content of flavonoids was 163,4 mg/L or equivalent to 0,01634%.

Keyword: Ethanol extracts, extraction, flavonoid, *Merremia vitifolia,* spectrophotometry UV-Vis

INTRODUCTION

Indonesian is a wealth country of its plants which are used as a food source, nor as medicines for certain diseases, as the healthy-care media. Thesedays, one of plants is used as medicine by the people, especially in the LuwuSouthern Sulawesi, called bilajang bulu (*Merremia vitifolia*). Exstract bilajang is believed by local community to reduce blood-sugar level and used as a cure to speed up recovery injury of a diabetes patient. Whereas, the people of Mamuju (Western Sulawesi) also believe that bilajang bulu (*Merremia vitifolia*) can cure malaria (Sukarti, 2016).

One of important active compound in *Merremia vitifolia*which as the medicine is flavonoids. Flavonoid isone of the secondary metabolic and natural compound materials of the phenolic class (Mukhriani *et.al*, 2015). Flavonoids are found in all the green. Therefore it can find in any plant extract (Andersen and Markham, 2006). A pharmacological study of flavonoid compounds indicates that some flavonoids show activity such as anti-fungi, diuretics, anti-histamine, anti-hypertension, insecticide, anti-virus, and bacteria (Subandono, 2006).

Bidara upas (*Merremia mamosa*) has a closed genetic relationship with *Merremia vitifolia* which have active content is flavonoid from flavonoid class. Kate's (2014) research explains that Bidara upas tuber had flavonoid content highly around 1,96 mg.

Based on analysis, then it needs to be done research is more intensive about flavonoid content assay from extract ethanol bilajang bulu leafs (Merremia vitifolia). The potential of this plant as medicine materials to some disease can be developed maximally.

MATERIALS AND METHODS

Materials

The materials used in this study were *Merremia vitifolia* leafs, mother liquor (quercetin p.a) 1000 ppm, standard solution quercetin (1 ppm, 5 ppm, 10 ppm, 10 ppm, 15 ppm, and 20 ppm), $AlCl_3$ p.a 10%, NaNO p.a 5%, NaOH p.a 4%, ethanol 96%, whatman filter paper, aquades, and aquabides.

Tools

The tools in this study were analytical balance, volume pipette 5 mL, beaker glass, volumetric flask, dropper, cuvet, jars, spectrophotometry UV-Vis, rotary evaporator vacuum, mortar and pestle.

Methods

1. Sample preparation

*Merremia vitifolia*leafsware cleaned and dried to aired without sunlight. *Merremia vitifolia* leaves were softened to a powder (simplicia).

2. Sample extraction

Merremia vitifolia leaves were weighted by 500 g. Put into a maseration vessel (jars). Afterwards, 2050 mL as of ethanol 96% were added. Maseration was done in three times by replacing solvent every 24 hours. Filtrats were obtained to combined and covered using a rotary evaporation with temperature of 40^oC.

3. Standard Quercetin Preparation

Quercetin was weighed about 0,050 g to make a standar solution. After that it was dissolved with 50 mL of ethanol 96% to obtain standar solution 1000 ppm.

Standard solution was made by dissolved the in some concentrations such as 1 ppm, 5 ppm, 10 ppm, 15 ppm, and 20 ppm, where each of solution were diluted with ethanol 96% in a 50 mL volumetric flask to the boundary mark then homogenized. About 0,5 mL were pipetted from standard solution. Total of 0,15 mL of $NaNO_2$ 5% were added and silenced for 6 minutes, total of 0,15 mL of $AlCl_3$ 10% were added and silenced for 6 minutes again. Furthermore, 2 mL of NaOH 4% was reacted with solution and deluted with aquabides until 5 mL. At the end, the absorption was measured in maximum wavelength between 250-317 nm by UV-VIS spectrophotometry.

4. Sample Preparation

Extract ot ethanol *Merremia vitifolia*was weighted 0,050 g, then dissolved with ethanol 96% in 50 mL volumetric flask until the boundary mark 100 ppm. Solution was stretched 0,5 mL, reacted to 20 mL aquades and $NaNO_2$ 5% by 0,15 mL,then silenced for 6 minutes. Added 0,15 mL of $AlCl_3$ 10% into solution and silenced again for 6 minutes. The solution was reacted by 2 mL NaOH 4%, diluted with aquabides to 5 mL, then silenced 15 minutes. Afterwards filtered using whatman filter paper (Nur, 2014). Absorption of solution was measured using maximum wavelength UV-VIS spectrophotometry.

6. Calibrating the result of measurement by standard

Absorbance fraction of flavonoids were calibrated with the standard concentration curve versus standard absorption with linear regression equation. The results were calculated by the dilution factor and thus by the concentration of flavonoids found in extract of *Merremia vitifolia* leaf.

RESULTS AND DISCUSSIONS

The extraction results

This research used 500 g of maserated *Merremia vitifolia*leaf in ethanol of 96% for 24 hours. Maseration method intended to attract metabolic compounds that can resist and cannot resist warming like flavonoid. Maseration has some advantages suchas, simple procedures and equipment;the process is not using a heat to prevent natural substances from easily straggling and ecstatic (Istiqamah, 2013). Ethanol solvent was selected in this research because of its non-toxic, volatile, and easily to dissolve almost all substances including polar, semipolar, nonpolar, and being able to pull up optimum flavonoid compounds. According of to the results of extraction about 500 g the *Merremia vitifolia*leaves were obtained randemen extract ethanol *Merremia vitifolia*2,61%. Process of producing maseration *Merremia vitifolia*can be seen at Table 1.

Table 1. Maseration results of simplicia *Merremia vitifolia*

	Sample (Gram)	Repetation	Macerat (mL)	Filtrate (mL)	Concentrated Extract (Gram)
		I	2050	920	
	500	II	1450	950	-
		III	1180	920	
Total	500	-	4.680	2.790	13,05

Determination of maximum wavelength quercetin

In this research maximum wavelength was determination by using spectrophotometry UV-VIS between 250-317 nm (Nugrah and Ghozali, 2014) with concentration of 15 ppm, and acquired maximum wavelength was 285 nm. The determination of maximum wavelength to recognize absorption areas from quercetin solution. Data wavelength results can be seen in Figure 1.

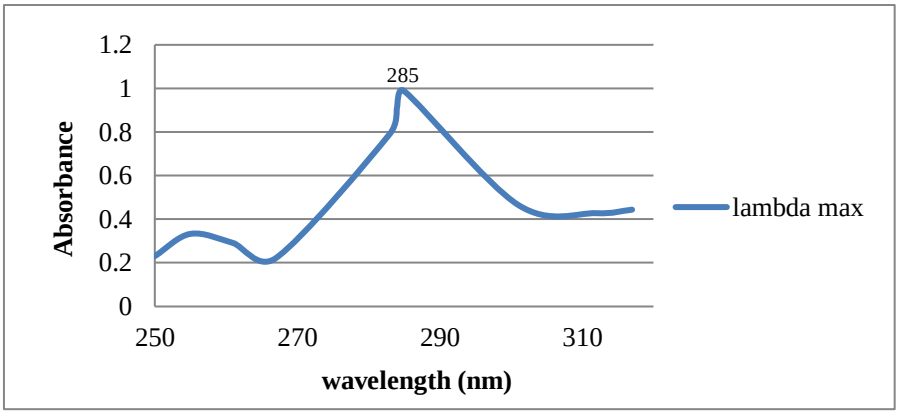

Figure 1. Results of max wavelength quercetin 285 nm

Quercetin calibration curve

Based on production of calibration curve with spectrophotometry UV-Vis method that connects concentration with absorbance there would be linear equations y = 0,005x + 0,171 coefficient correlation = 0,981. Data curve calibration results can be seen in Figure 2.

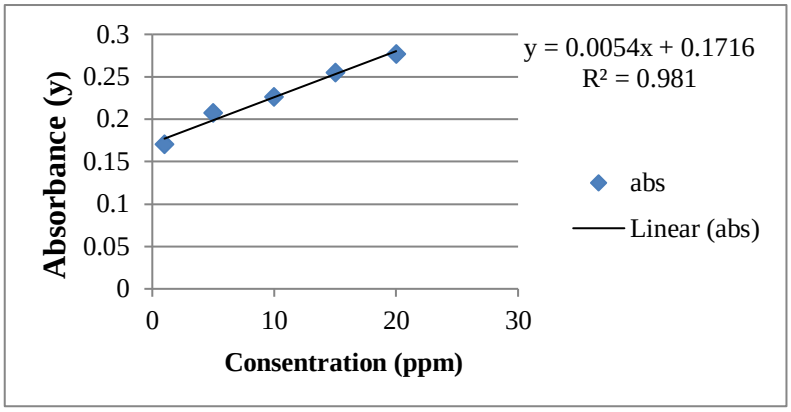

Figure 2. Comparison graph of standard consentration quercetin by rate absorption

The results of flavonoids content

The first flavonoid total measured and calculated using equation of a basic linear curve regency that is y = ax + b, and resulted in a concentration of a flavonoid at 163,4 mg/L or equivalent to 0,01634%.Equality curve can be used as a comparison in determining level of flavonoids. Determination level of ethanol extract *Merremia vitifolia*used complex methods of calorimetry between $AlCl_3$ and $NaNO_2$ and reacted with strong bases (NaOH), where principles of this methods used measurement based on colour. Complex $AlCl_3$ can be used to detect flavonoid with orto hydroxide and dihydroksil carbonil group or just some hydroxide group (Kusnadi and Egie, 2017). Moreover, this complex can detect keto group forming on C-4 atom and also with hydroxide group in C-3 or C-4 atoms adjacent to flavon and flavonol (Nur, 2014). The total was proven by UV-VISspectrophotometry. Through the precision analysis which are measures for conformity in result and obtained individually from the average samples by repeatingthe sample that taken from homogeneous blend. Besed on the analysis gotten Standar Devation (Standard Corner) and Relatif Standar Devation (Standard Of Row Relative) which used in measurement(Kusnadi and Egie, 2017)

CONCLUSION

Analysis of the flavonoids level using UV-VISspectrophotometry from extract ethanol of *Merremia vitifolia*were obtained flavonoid content 163,4 mg/L or equivalent to 0,01634%.

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