PROFILE TOTAL POLYPHENOLOF THE ETHANOL EXTRACT FROM DENGEN (*Dilleniaserrata*) LEAF AND STEM BARK WHICH COMES FROM MALANGKE CITY LUWU DISTRICT

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ABSTRACT

Plant contain metabolite Secondary various kind of type . Product waste from plant this on the principle could made into to be medicine. In the urban era now this , more degenerative diseases suffered by society . Diseases that including diabetes, disease heart , cancer and aging early. Diseases this caused by the presence of ROS (reactive Oxygen Species) or usually called free radical. Dengen have long been used by the community as medicine. The fruit is used as an enhancer of sour taste in dishes while the stem bark is boiled and orally as a treatment for vomiting blood.Based on research, this fruit contains vitamin C more than 84%, the ethanol extract of Dengen fruit contains tannin, saponins , alkaloid compounds, flavonoids, polyphenols and triterpenoids.The aim of this research was to determinethetotalpolyphenolsfromethanol extract leafandstem bark of Dengen(Dilleniaserrata).Leafandstem bark extracted by macerationby usingethanol 70%.Ethanol extract of leafmadeinconcentration of500µg/ml.Whileethanol extract of stem bark madeinconcentration of100ug/mlwithadditionsFolin-Coicalteau (1:10) and $Na_2CO_3$7.5%.Absorbance of samplebe measuredusespectrophotometerUV-Visat a wavelength of745nm.The measurement results are based on absorban color intensity calibrated in the raw curve of gallicacid.Data analysis using the standard curve equationy = 0.0119x + 0.0416.The results obtained where the content of polyphenols in ethanol extract of dengen leaves were 39,793 mgGAE/g or 3.97% b/b while those in stem bark were 444.8 mgGAE /g or 44.8% b/b.

Keywords : Total Polyphenol, Ethanol Extract, Leaves of Dengen, Stem Bark of Dengen (Dilleniaserrata), Gallat Acid, Spectrophotometer UV VIS

INTRODUCTION

Plant contain metabolite Secondary various kind of type . Product waste from plant this on the principle could made into to be medicine . Metabolites secondary that is including alkaloids, flavonoids, polyphenols , oil volatile and others (Mource A, 2001)

Development era also make a disease more and more increase . In the urban era now this , more degenerative diseases suffered by society . Diseases that including diabetes, disease heart , cancer and aging early. Diseases this caused by the presence of ROS (reactive Oxygen Species) or usually called free radical. Free radical is a cell reactive which is not have partner , so binding normal cell inside body as the host and on finally grow to be cancer (Nathan R, 2009)

Compound polyphenols is a organic compounds that can function as antioxidant for against free radical. One of them mechanism polyphenols as antioxidant is ability of polyphenols for prevent damage caused by ROS (Reactive Oxygen Species) with way binding between polyphenols with compound iron (Nathan R, 2009).

One of thendemic plants owned by Sulawesi-Indonesia island is Dengen*(Dilleniaserrate*). This plant is a wild plants , which are usually grow in the forest and like small tree . This plant have fruit with characteristic of acidifytaste .The fruit similar with orange fruit. Because of the sense of belonging , then society local often make this is used to acidify taste for cook an fish , substitute acid Java and can be consumed directly. Based on research NurIlma (2012), this fruit contains vitamin C more than 84%. Utilization of this plant is still limited to the fruit, which has been made besides juice, has also been developed into dodol (NurIlma, 2012). In addition, the ethanol extract of Dengen fruit contains tannin, saponins and flavonoids, with a routine equivalent level of flavonoids of 3.05% and weak antioxidant activity (Syahruni R et al.). In another study the ethanol extract of Dengen Fruit (*Dilleniaserrata*) contained alkaloid compounds, flavonoids, saponins, polyphenols and triterpenoids (Illing I et al, 2017).

Another bodypart of Dengen potentially contain metabolite secondary polyphenols is stem bark. Utilization stem bark in the community, usually cooked with water is used orallyto treat blood vomiting (Jalil , J., 2015) .

Seeing the use of Dengen is still limited in fruit, the researchers wanted to examine other plant body parts, are leaves and stem bark about the content of polyphenols in this part. Based on the background of the problem above, the problem statement is how much is the total polyphenol content of ethanol extract of

leaves and stem bark of Dengen (*Dilleniaserrata*) from the MalangkeCity of LuwuDistrict?. The aim of this research was to determine the total polyphenols in ethanol extract of leaves and stem bark of Dengen(*Dilleniaserrata*) from the MalangkeCity of LuwuDistrict.

MATERIAL AND METHOD

The placeandTime

The research was held in January - June 2019 at the Chemistry Laboratory, Department of Pharmacy, PoltekkesKemenkes Makassar.

Toolandmaterial

The tools used are maceration vessels , analytical scales, rotary evaporators, glass tools, spectrophotometers UV-Vis. While the ingredients used are leaves and stem bark Dengen, ethanol 70%, ethanol 96% ,Folin-Ciocalteau, Na_2CO_3 and Gallic acid .

Sample Processing

Selected parts of the plant were leaves a bit old, and stem bark were clean. Then wash it with water. After wet sorting, the parts are cut into small pieces, then dried it by aerating. After drying, the simplicia is ready to be extracted.

Extraction

Leaf and stem bark of Dengen (*Dilleniaserrata*) that has been pollinated weighedand entered to in container maceration, then added ethanol70% up to submerged all of them. The container maceration closed and saved in a sheltered place from sun for 3-4 day while stirred occasionally. Then filtered , separated between pulp and filtrate . Pulp that is extracted back with ethanol 70% of the new one in the same amount. It do to solvent last one already clear .Ethanol Extract then collected and the ethanol was evaporated to obtained ethanol extract was thick.

Sample Measurement

1. **Standard Gallic Acid Standard Curves**
   Made series dilution 10 , 20, 30, 40, 50 and 60 µg/ml of gallic acid.A series of diluted gallic acid solutions thenpipedeachseriesdilutionas much300µl toinvial andadded1,5 ml*Folin-Ciocalteau* (1: 10) then left for 3 minutes.After 3 minutes, 1.2 ml of $Na_2CO_3$7.5% wasadded and the mixture was incubated for 30 minutes .The absorbanwas measured at a wavelength of 400-800 nm.The maximum wave length obtained at 745 nm (Murtidjaya& Lim, 2007)
2. **Determination Total Polyphenols from Extract Ethanol Dengen (***Dilleniaserrata)*
   Ethanol extract of leaf was made in concentration of 500 µg / ml and for stem barkwas madeconcentration of 100 µg/ml inethanol 96%. Taken 300µl from dilution extract , and entered to in vial, then added 1,5 ml *Folin-Ciocalteau*(1: 10) and left for 3 minutes.After 3 minutes, 1.2 ml of $Na_2CO_3$7,5% was added and the mixture was incubated for 30 minutes . The mixture then measured its absorbance at a wavelength of 745 nm (Murtidjaya& Lim, 2007).

Data Analysis

Data on total polyphenol levels were obtained using the spectrophotometer UV-Vis method at the maximum wavelength, sample absorbance values will be obtained and calculated with straight line equations (*linear* regression) based on the standard curves produced and then the levels (concentrations of substances) can be determined using the formula below this

$$Y = a + bx$$

RESULTS AND DISCUSSION

Results obtained from research this could seen on table the following :

Table 1
Total polyphenols (equivalent acid gallat) Ethanol Extract of Dengen

Part of Plant	Total Polyphenols (mgGAE/g)
Leaf	39.79
Stem Bark	444,8

In this study, the determination of total polyphenol in leaf and stem bark of Dengen *(Dilleniaserrata)* come from Malangke City, Luwu District using uv-vis spectrophotometer UV-Vis. Dengen is a endemic plants , which only growing in the Sulawesi islands . This plant many contain compounds metabolite secondary . Based on utilization of stem barkas treat blood vomiting,the content of polyphenol in the leaves and stem bark was examined

(Windadri, 2006)

Polyphenol compounds are complex compounds derived from plants that have the same characteristic are aromatic rings containing one or two hydroxyl distillates. Polyphenol compounds are useful for human health because they have antioxidant, antiradical and anticarogenic properties, so they can inhibit pathogens in food, antiproliferation and antimutagenic, can inhibit oxidation of low density cholesterol (LDL) compounds in endhothelial cells, can increase high density cholesterol (HDL)), and can reduce triglyceride content.

In this study, leaves and stem bark were made simplicia first. Then macerated using ethanol 70%. This solvent has semipolar properties so that it can attract polyphenol compounds to the fullest. In addition, ethanol solvents have a high level of safety compared to methanol solvents which have toxic properties.

The total measurement of polyphenols is based on measuring the absorbance of colored solutions in a UV Vis spectrophotometer at a wavelength of 745 nm. This measurement uses the FolinCiocalteau method. FolinCiocalteau is a mixture of phosphotungstic ($H_3PW_{12}O_{40}$) with phosphomoybdat acid ($H_3PMo_{12}O_{40}$) which is reduced to blue (W_8O_{23}) and molybdenum (Mo_8O_{23}) during phenol oxidation. This reaction occurs under the conditions of bases produced by sodium carbonate (Conforti F, 2006)

The results obtained where the content of polyphenols in ethanol extract of dengen leaves were 39,793 mgGAE/g or 3.97% b/b while those in stem bark were 444.8 mgGAE /g or 44.8% b/b. This shows that the stem bark contains high polyphenol compounds than the leaves, so it can be used as a source of antioxidant compounds. It can also be seen, that the ethanol extract from the stem bark is red. This red color indicates the type of anthocyanin compound.

CONCLUSION

From the results of the study, the total polyphenol contained in the ethanol extract of dengen leaves was 39.79 mgGAE/g or 3.979% while in stem bark dengen (*Dilleniaserrata*) which was 444.8 mg GAE/g or 44.48% .

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