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FLAVONOID CONTENT OF MANGROVE Rhizhopora mucronata IN LANGGE VILLAGE, DISTRICT ANGGREK, North Gorontalo

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Abstract

Flavonoids are one of the antioxidant biocative compounds that are often found in plants and their utilization has often been used by the public for natural medicine. Most of the natural antioxidant compounds are phenolic compounds and the most important group of natural antioxidant compounds are tocopherols, flavonoids and phenolic acids. Mangroves are one of the beneficial plants that have direct contact with human life, especially coastal communities. The purpose of this study was to identify the presence of bioactive compounds and the flavonoid content of*Rhizophora mucronata* obtained from Langge Village, Anggrek District, North Gorontalo Regency. The research method used is descriptive research method. To get the extract using maceration method with ethanol solvent. The test results showed that the total flavonoid content was 19.5095 mg/ml on average, while the results of phytochemical screening were identified as containing alkaloids, flavonoids, tannins, saponins, and phenolic compounds.

INTRODUCTION

Mangroves are fertile plants and dominate the coastal areas. Mangrove forests are better known as mangrove forests. Mangrove is the local name of the species Rhizophora mucronata. Mangroves dominate mangrove forests in Indonesian waters (Podungge et al., 2015).

The coastal area of Gorontalo Province, especially Langge Village, Anggrek District, North Gorontalo Regency there is an area known as the "mangrove tracking" area where there is a variety of mangrove vegetation. According to Baderan and Kumaji (2017) that true mangrove plant species found in mangrove areas in Langge Village, Anggrek District, North Gorontalo Regency at the tree, sapling and seedling levels are *Soneratia alba, Soneratia ovata, Avicennia alba, Avicennia marina, Ceriops tagal, Ceriops decandra, Rhizophora mucronata, Rhizopora apiculata, Rhizophora stylosa, Xylocarpus granatum, Burgueira gymnorhiza and Burgueira parviflora.*

Mangrove fruit has an important role in food and nutrition of the rural poor in general and coastal communities. Mangrove fruit is rich in nutrients and provides additional nutritional supplements for forest dwellers and many rural coastal communities. Considering the problem of the ever-increasing human population and depleting natural resources, edible mangrove fruit has a very important role to be utilized as much as possible (Rout et al., 2015)

EXPERIMENTAL

Materials and Methods

Rhizophora mucronata were collected from mangrove forest in Langge Village , Gorontalo. The fruit used is ripe and aerated until the water content is reduced to make powder.

General Procedure

The extraction process of *Rhizophora mucronata* was performed following the maceration technique of Baehaki (2017.). The dried fruit were grounded to obtain powder formed. About 20 g of simplisia was macerated using 80 mL of 95% ethanol for 24 h while shaking in a shaker. The mixture was filtered using Whatman No. 42. The obtained filtrate was then evaporated using a rotary evaporator until the concentrated extract was obtained. This extract was characterized for phytochemical screening, total flavonoid content

Detection Method Phytochemical Screening

The qualitative phytochemical screening of *Rhizophora mucronata* extract was performed using Harborne (1973) method.

Total Flavonoid Content

The total flavonoid content (TFC) was determined by the aluminum chloride colorimetric method and measured by UV-Vis spectrophotometer at a wavelength of 511 nm (Rebaya *et. al.*, 2015)

RESULTS AND DISCUSSION

Phytochemical Screening

The phytochemical screening showed *Rhizophora mucronata* fruit that extracted using ethanol consists of several secondary metabolites, ie alkaloids, flavonoids, tannins, saponins and phenolics. Phytochemical content in plants has a significant role in the antibacterial activity.[9] Apart from that, plants that are composed of

bioactive compounds such as flavonoids, alkaloids, saponins, phenolic vitamins, etc. also has biochemical activity.[10]The screening result of *Rhizophora mucronata* fruit extract was shown in Table-1.

Table-1: Phytochemical Screening of *Rhizophora Mucronata*

Secondary metabolite	**Result**	**Result of color change**
Alkaloids (Dragendorf, wagner, meyer)	+ + +	Dragendorph : Orange Wagner : Chocolate Meyer : sediment white
Flavonoids	+	Red
Tannins	+	Green
Saponins	+	Bubbles/foam
Steroids	-	No changes color
Triterpenoids	-	No changes color
Phenolic	+	Orange chocolate

The presence of those metabolites can indicate a potential of *Rhizophora mucronata* as a new potential medicine. In the previous study, those metabolics can be used as an antibacterial agent that works in different ways. Alkaloids were identified can act as an interfere to disturb the formation of the cell wall and induced the dead cell. Flavonoid is a lipophilic compound that can easily interact with the phospholipid that can be found in the bacterial cell wall, as a result, the flavonoid can act as antibacterial (Kumar et al, 2013).

Tannin has potency as a chelating agent with plasmolytic affect and disturbs the cell permeability. Tannin can as an antibacterial agent through protein precipitation, interact with the cell membrane, enzyme inactivation, destruction or inactivation of bacterial genetic material. The antimutagenic activity of plants is due to the presence of total phenols and flavonoid content. (Kumar et al, 2018).

According to Mukhriani (2016) that extraction is the process of separating materials from the mixture using an appropriate solvent. The extraction process is stopped when an equilibrium is reached between the concentration of the compound in the solvent and the concentration in the plant cell

Total Flavonoid Content

The screening result of *Rhizophora mucronata* fruit extract ethanol was shown in Table-2.

Table 2. Result of total flavonoid content *R. mucronata*

No.	Flavonoids	Average mg/ml
1. 1	19.5571	19.5095
2. 2	19.4143	
3 3	19.5571	

The total flavonoid content from the results of the colorimetric method using aluminum chloride showed that the total fruit flavonoids on average was 19.5085 mg/ml. The content of secondary metabolites in plants can vary depending on environmental factors and factors within the plant itself. According to Siswanto (2004) and Handoyo (2011) explained that the level of age and maturity of plants affects the maximum active content of secondary metabolites in plants. The content of secondary metabolites in plants is closely related to natural antioxidant compounds. Flavonoids are one of the bioactive compounds that can act as antioxidants. According to Purwaningsih et al., (2013) that one of the fruits that contain high antioxidants from mangrove plants is black mangrove fruit.*(R. mucronata*). Furthermore, according to Kumar et al., (2009) flavonoids can act as antioxidants because of their properties as good acceptors of free radicals, namely a species that has one or more unpaired electrons in its orbital such as hydroxy radicals and superoxide which are commonly referred to as ROS. Reactive Oxygen Species). Apart from being a source of antioxidants, flavonoids also have biological activities such as anti-bacterial, anti-cholesterol, anti-hyperlipidemia, anti-virus, anti-diabetic, anti-inflammatory, anti-cancer (Neldawati et al., 2013).

CONCLUSION

The phytochemical screening of ethanolic extract of*Rhizophora mucronata*identified the presence of alkaloids, flavonoids, tannins, saponins and phenolics. Total flavonoid content by colorimeter method is 19.5095 mg/ml

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