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PHYTOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITY TEST OF ARA FRUIT EXTRACT (Ficus racemosa Linn.) USING DPPH METHOD

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ABSTRACT
Ficus racemosa Linn. is a native Indonesian plant known as the ara plant in Lombok or Elo in East Java. The fruit has a fragrant aroma, soft texture, mild sweet taste and a little sour. Presence of ara (Ficus racemosa Linn.) is mostly known as one of the plants whose fruit can only be eaten and used as a medicine for diarrhea, but the compounds contained in ara are not yet known, so research is needed. The purpose of this study was to determine the secondary metabolit content of ara fruit extract and antioxidant activity using the DPPH method. Ara fruit was extracted by maceration method using methanol solvent. The results of the phytochemical screening showed that the ara fruit extract contained secondary metabolites, such as flavonoids, steroids, saponins and tannins. Antioxidant activity (IC50) extract of ara with various concentrations of 25; 50; 75; 100; and 125 ppm soul a value of 65.042 ppm. Based on the results of antioxidant activity, it can be seen that ara fruit extract is classified as a strong antioxidant.

ABSTRAK
Tumbuhan *Ficus racemosa* Linn. adalah tanaman asli Indonesia yang dikenal sebagai tumbuhan Ara di Lombok atau Elo di daerah Jawa Timur. Buahnya memiliki aroma harum, teksturnya empuk, dan rasa tidak terlalu manis serta sedikit masam. Keberadaan buah ara (*Ficus racemosa* Linn.) sebagian besar diketahui sebagai salah satu tanaman yang buahnya hanya dapat dimakan serta dijadikan sebagai obat diare, akan tetapi belum diketahui kandungan senyawa yang terdapat pada buah ara, maka perlunya dilakukan penelitian. Tujuan dari penelitian ini adalah untuk mengetahui kandungan ekstrak buah Ara (*Ficus racemosa* Linn.) berupa metabolit sekunder menggunakan metode uji tabung dengan pereaksi tetes dan aktivitas antioksidan menggunakan metode DPPH. Buah Ara (*Ficus racemosa* Linn.) diekstraksi dengan metode maserasi menggunakan pelarut metanol. Hasil skrining fitokimia menunjukkan bahwa pada ekstrak buah ara teridentifikasi mengandung senyawa metabolit sekunder yaitu flavonoid, steroid, saponin dan tanin. Aktivitas antioksidan (IC_{50}) ekstrak buah ara dengan variasi konsentrasi 25; 50; 75; 100; dan 125 ppm sebesar 65,042 ppm. Berdasarkan hasil aktivitas antioksidan dapat diketahui, bahwa ekstrak buah ara tergolong dalam antioksidan kuat.

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INTRODUCTION

Indonesia is a country that has natural wealth with various types of plants which function as medicine and are used by people who are generally far from health services (Mustariani & Hidayanti, 2021). About 26% medicinal plants has cultivated and the remaining 74% still grows wild in the forest. Indonesia's tropical Forest are estimated reached 143 million hectares as a place for medicinal plant growing. About 80% of medicinal plant found in the world grow in Indonesia tropical forests, 28,000 species plant and 1,000 species among them has used as medicinal plant. Medicinal plant believed to have it own efficacy as medication and use as material of traditional medicine in healing or disease prevention especially on natural materials that has own active compound which can be potential as antioxidants (Qamariah, *et al.*, 2018).

Antioxidants are substances with small concentrations that can significantly inhibit substrate oxidation caused by free radicals. Free radicals are atoms that are unstable and reactive because there are one or more unpaired electrons and in achieving atomic stability, free radicals will react with other atoms to get electron pairs. The reaction will continue if it is not stopped, which will cause various diseases. Therefore, antioxidant compounds are able to stabilize or neutralize free radicals by completing the lack of electrons in free radicals (Handayani, 2018). Antioxidants can be found mainly from vegetables, whole grains and fruit. There are many studies now that test antioxidant compounds from various parts found in plants such as stems, fruit, bark, flowers, leaves and roots (Inayah, 2021).

Plants have the potential as antioxidants and plants have several mechanisms to protect themselves from bacteria, one of which is by producing toxic compounds. These compounds are made by plants through a process called secondary metabolism which contains active chemical compounds such as flavonoids, alkaloids, steroids, saponins, tannins and terpenoids. These compounds have been widely studied as active compounds for treating disease, one of the plants that has the potential to have secondary metabolite compounds is the Ara Plant or fig plant (*Ficus racemosa* Linn) (Gustiana, 2022).

Ficus racemosa Linn plant. is a native Indonesian plant known as Ara in Lombok or Elo in East Java. In the Lombok area, young Ara's can be made into sauce for side dishes, while in East Java, ripe elo fruit can be made into rujak and can be used as a medicine for diarrhea among adults and small children. The fruit has a fragrant aroma, soft texture, and the taste is not too sweet and slightly sour. In Middle Eastern countries, the Ficus species *commonly consumed* is *Ficus carica* Linn. It has been proven to have a high flavonoid content, especially in the fruit. Not only in the fruit, but the root bark content of the Ara plant (*Ficus racemosa* Linn.) also has potential as a natural antioxidant with an *Inhibition Concentration* (IC_{50}) value of 1.66 ppm and can be isolated and identified as a quercetin compound. Meanwhile, the *Ficus genus* that grows in Indonesia is *the Ficus racemosa* Linn type. has medical benefits and has been widely used empirically for the treatment of various diseases (Sudarmanto, 2015).

Degenerative disease like a heart disease, premature aging, cancer, diabetes and stroke can be caused by free radicals. Free radicals in the human body comes from two sources, from inside the body (internal) and from outside the body

(external). Internal free radicals can originate from reaction autooxidation while the external one originates from air pollution such as vehicle exhaust, radiation from electronic devices such as televisions, *cellphones*, and also from cigarette (Handayani, 2018). Therefore, the body needs substances, namely it needs antioxidants that can capture free radicals to prevent disease because antioxidant compounds are able to neutralize these free radicals (Rahman, 2022). Based on previous research conducted by Sudarmanto and Suhartati, regarding the antioxidant activity of flavonoid compounds in the root bark of Ara plants (*Ficus racemosa* Linn.), it shows that in the root part of the *Ficus plant* there is strong antioxidant activity (Sudarmanto, 2015). According to Agustina, regarding activity of antioxidant compound testing from extract Ara leaves (*Ficus carica* Linn) with water, methanol, and mixed solvents methanol-water, identified contain Powerful antioxidant in parts of leaf with a number of solvent (Agustina, 2017).

The antioxidant activity of Aras and the potential for active secondary metabolite compounds produced by Ara plants have not yet been reported. So, this research was carried out with the aim of knowing the content of secondary metabolite compounds and the antioxidant activity of Ara extracts, related to the antioxidant activity of Ara plants as a protector for the body to protect cells from damage caused by free radicals originating from natural ingredients, so researchers are interested in conducting research entitled "Phytochemical Screening and Antioxidant Activity Test of Ara Fruit Extracts (*Ficus racemosa* Linn.) Using the DPPH Method.

METHODS

The type of research used is experimental research with a qualitative approach and a quantitative approach. The qualitative approach is in the form of data from phytochemical screening results and the quantitative approach is the antioxidant test in the form of an IC_{50} value with a certain concentration.

Tools and materials

The tools used in this research include analytical scales, petri dishes , oven (*Memmert*), *stopwatch*, extract container, blender, 60 mesh sieve, UV-VIS (*Thermo Scientific, Genesis 10 UV-VIS*), drop pipette, rack test tube, test tube, *hotplate* (*Thermo Scientific*), *rotary evaporator (IKA, RV 10 Digital*), micropipette (*Eppendorf, Research plus*), cup porcelain, Erlenmeyer, beaker, spatula, stir bar, drip plate, measuring cup, flask measure, funnel, cuvette, and baking sheet.

The materials used in this research include: Ara fruit *(Ficus racemosa* Linn.*)*, methanol, $FeCl_3$ 1%, HCl, Mg, Dragendroff's reagent, Mayer's reagent, Wagner's reagent, Liebermann-Burchard's reagent, DPPH, quercetin, distilled water, and NaCl.

Research procedure

Sample preparation

Ara fruit samples were collected in the river in Langko Village, District. Janapria Regency, Central Lombok, West Nusa Tenggara. A total of 800 grams of Ara (*Ficus racemosa* Linn.) have been washed in running water and then drained. Ara's that have been cut thinly and spread in a baking dish are then dried in the oven at a temperature of 60-75°C for ± 5 hours.

Dry Simplicia and Testing Water Content

The dried Ara samples were then ground using a blender and sifted using a 60 mesh sieve, after that the water content was calculated by drying the porcelain cup using an oven at 105°C for 1 hour, then the porcelain cup was cooled in a desiccator for 15 minutes, the porcelain cup weighed with the lid on, 3 grams of sample was put into a cup and dried using an oven for 3 hours, then the cup containing the sample was cooled in a desiccator for 15 minutes and weighed, heating and weighing were repeated until a constant weight was obtained. As for determination water content can use formula (Dewi, 2023):

$$\text{water content (\%)} = \frac{(\text{initial weight} - \text{final weight})}{\text{initial weight}} \text{x } 100\% \text{ (1)}$$

Determining the % water content can be calculated using the formula (1) above, where the initial weight is the weight of the sample before heating, the final weight is the weight of the sample after heating, and the % water content is the water content contained in the sample.

Extraction

A total of 50 grams Ara simplicia was put into Erlenmeyer, then methanol solvent was added with ratio 1: 10 (50 grams simplicia of Ara fruit *(Ficus racemosa* Linn.*)*:500 mL methanol), after covering with plastic wrap and aluminum foil, left to rest for 1 x 24 hours and stirred, then repeated 3 times, and the extract was evaporated by using a vacuum rotary evaporator with a temperature of 65 °C (Srikandi, *et al*., 2020), then the extract obtained would be weighed and the % yield was calculated.

Phytochemical screening

Flavonoid Test

A total of 3 mL of distilled water and 3 mL of chloroform were added into 1 mL of methanol extract of Aras *(Ficus racemosa* Linn.*)*, Then after being heated in water bath for 5 minutes it was left to stand until two phases were formed, separated between the distilled water phase and the chloroform phase into different test tubes, take sufficient distilled water phase use pipette into the tube reaction which has been provided, after that added sufficient Mg powder and 2 drops of HCl into reaction tube containing distilled water phase and then stir and observed , a positive test is indicated by the formation of a yellow, red or deep orange color in test reaction tube (Hasibuan , *et al* ., 2020).

Steroid and Terpenoid Test

1 mL of the chloroform phase is put into a test tube that has been filled with samples, the Liebermann-Burchard reagent is put into the test tube, the presence of steroids is indicated by the formation of a blue or green ring layer, while the presence of terpenoids is indicated by the presence of a purple or red color (Hasibuan, *et al.*, 2020).

Alkaloid Test

A total of 1 gram of sample was weighed, then 1 mL of 2 M HCl and 9 mL of distilled water were added, then heated over a water bath for approximately 2 minutes after which it was cooled and filtered, tested for alkaloids using the filtrate using 3 test tubes, 1 mL of filtrate into in each test tube provided, 5 drops of Mayer's reagent into the first test tube and observe and marking using label paper, 5 drops of Dragendorff's reagent into the second test tube and giving a label and observe, and 5 drops of Wagner's reagent into the third test tube, label it and observe, a positive test is indicated by the formation of a yellow precipitate in the first test tube (Mayer's reagent), the formation of an orange precipitate in the second test tube (Dragendorff's reagent), and the formation

of a brown precipitate in the third test tube (reagent Wagner) (Hasibuan, *et al*., 2020).

Saponin Test

1 mL of methanol extract of Ara (*Ficus racemosa* Linn.) into a 20 mL beaker, add 10 mL of hot water and boil for five minutes, filter and then the filtered filtrate is used as a test solution, put the filtrate into a test tube then cover and shake for ± 10 seconds and left for ± 10 minutes, 1 mL of 2 M HCl was added, and a positive test was indicated by the formation of stable foam (Gustiana, *et al*., 2022).

Tannin Test

1 mL of methanol extract of Ara (*Ficus racemosa* Linn.) was boiled with 10 ml of water then filtered, then several drops of 1% FeCl3 were added and observed, a positive test was indicated by the formation of a greenish brown or blackish green color indicating the presence of tannins (Gustiana, *et al*., 2022).

Antioxidant Test

Preparation of 100 ppm DPPH Solution

A total of 5 mg of DPPH was weighed, then a 100 ppm DPPH solution was made with 5 mg of DPPH which had been dissolved in 50 mL of methanol (Dewi, 2023), and the absorption was measured at a wavelength of 400-600 nm.

Preparation of Sample Solutions

A total of 10 mg of methanol extract sample was weighed, then a stock sample solution of 1000 ppm was made by means of 10 mg of methanol sample extract, and dissolved with methanol solvent to 10 mL (Dewi, 2023). Next, variations in the concentration of the methanol extract sample solution were made from the stock solution. with a concentration of 25; 50; 75; 100; and 125 ppm, with a volume of each 0.25; 0.5; 0.75; 1; and 1.25 mL, then filled with methanol solvent to 10 mL (Aulyawati, 2021).

Preparation of Quercetin Standard Solution (comparator)

As much as 1 mg of quercetin, then make a comparison solution of 100 ppm with 1 mg of quercetin, dissolve it and homogenize it then can be filled with methanol solvent up to 10 mL, from the comparison solution make 8 concentration variations; 10; 12; 14; and 16 ppm, with a volume of 0.8 respectively; 1; 1.2; 1.4; and 1.6 mL, then filled with methanol solvent to 10 mL (Agustin and Resmayani, 2022).

Absorption of DPPH Blank Solution

1 mL of 100 ppm DPPH solution was put into an Erlenmeyer flask, then added 3 mL of methanol and homogenized (Dewi, 2023), then incubated at room temperature for 30 minutes in a dark room (Sawiji, *et al*., 2022), and the absorbance was measured at a wavelength of 516 nm, with a UV-VIS spectrophotometer.

Measured Antioxidant Power of Sample Solution

A total of 1 mL of methanol sample solution of concentration 25; 50; 75; 100; and 125 ppm (Auliyawati, 2021) which was put into an Erlenmeyer flask, then 1 mL of DPPH solution was added to the sample solution, then 3 mL of methanol was added, incubated at room temperature for 30 minutes in the dark, after that the absorbance was measured at this wavelength. 516 nm, with a UV-VIS spectrophotometer.

Measured Antioxidant Power of standard quercetin solution (Comparator)

A total of 1 mL of quercetin solution with 8 concentration variations; 10; 12; 14;

and 16 ppm, then put into an Erlenmeyer flask, then after adding 1 mL of DPPH solution to each comparison solution, 3 mL of methanol was added, after incubating at room temperature for 30 minutes in the dark, and then measuring the absorbance at this wavelength. 516 nm, with a UV-VIS spectrophotometer (Handayani, *et al*., 2014).

DATA ANALYSIS

The data analysis technique used to determine the value of antioxidant activity uses the linear regression equation y = a + bx. Calculation of the percentage of free radical inhibition of a sample against DPPH is calculated using the formula:

$$\%\ inhibition = \frac{(abs.blank - abs.sample)}{abs.blank} \text{x } 100\% \quad (2)$$

% inhibition can be determined using the formula that has been explained with the information that y is the % inhibition value (barrier), while x is the sample concentration, and a is the Intercept (intercept), and b is the Slope (slope of the linear regression line)

RESULT AND DISCUSSION

% Water content and % yield

Based on the research conducted, the % water content and % yield of Aras are presented in Table 1

Table 1. Results of measuring the water content of Ara (*Ficus racemosa* Linn.)

Sample	Water Content (%)	Yield (%)
Ara Fruit (*Ficus racemosa* Linn.)	2,042	69,1426

Phytochemical screening

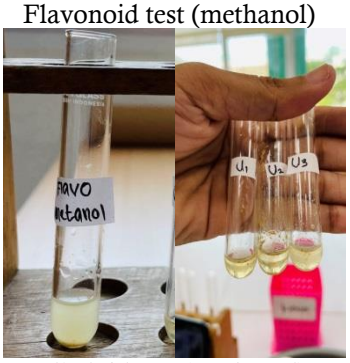
Phytochemical screening in this study aims to determine the secondary metabolite content in Ara extract (*Ficus racemosa* Linn.). The results obtained in phytochemical screening can be seen in Table 2.

Table 2. Results of phytochemical screening of Ara extract (*Ficus racemosa* Linn.)

Compound	Reactor	Literature	Discoloration	Result
Flavonoids	- Concentrated HCl + Mg metal	- Yellow	- Yellow	+
Steroids terpenoids	- Liebermann Burchard	- Green - Purple or Red	- Green - No changes	+ −
	- Mayer	- Yellow	- No changes	−
Alkaloids	- Dragendorff	- Orange	- No changes	−
	- Wagner	- Chocolate	- No changes	−
Saponin	- HCl	- Stable foam	- Stable foam	+
Tannin	- $FeCl_3$ 1%	- Brownish green or blackish green	- Brownish green	+

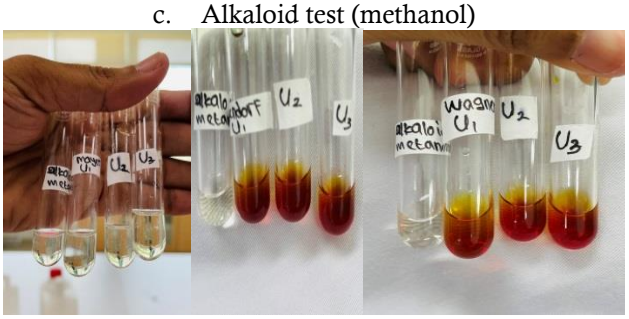
The phytochemical screening results in table 2 will be given a positive symbol (+) if they are identified as containing secondary metabolite compounds and will be given a negative symbol (-) if they do not contain secondary metabolite compounds. The following figure 1 shows the results of phytochemical screening.

a. Flavonoid test (methanol)



b. Steroid and terpenoid (methanol) test

c. Alkaloid test (methanol)



d. Saponin (methanol) test

e. Tannin (methanol) test

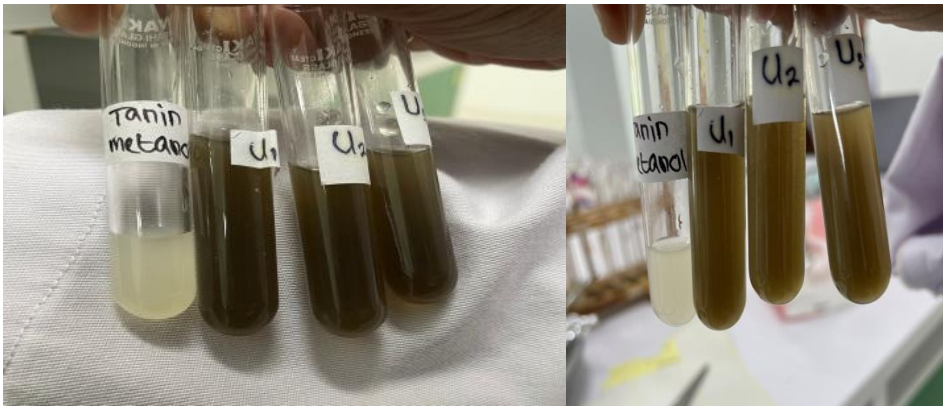


Figure 1. Screening phytochemicals extract of Ara fruit

Flavonoids

Flavonoid testing used one of the reagents, specifically concentrated HCl reagent, and positive results were obtained for Ara extract (*Ficus racemosa* Linn.). In the flavonoid test using the HCl reagent, it was proven to contain flavonoid compounds with a positive yellow test result. The process in testing flavonoids is carried out by heating which aims to dissolve the flavonoid compounds and after the heating process two phases are formed, namely the distilled water phase and the chloroform phase. The addition of Mg powder and HCl produces yellow flavilium salt (Tandi, 2020). The reaction that occurs can be seen in Figure 2.

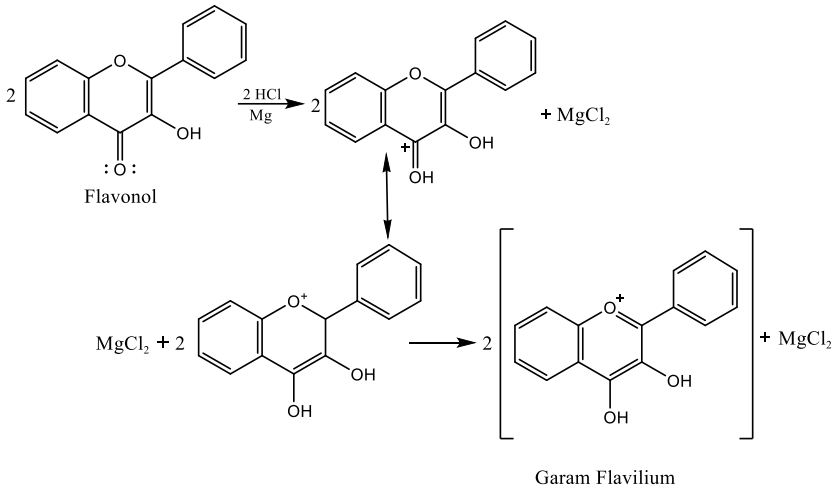


Figure 2. Reaction of flavonoids with Mg metal and concentrated HCl (Tandi, 2020).

Steroids and Terpenoids

Steroid and terpenoid test results if formed ring colored green or blue so contains steroids, meanwhile there is ring colored red or purple so positive contains terpenoids. The results of the steroid test showed positive results for Ara extract because the steroid group of compounds could be attracted by the nature of the solvent and in the steroid group there was an oxidation reaction through the formation of conjugated double bonds, while terpenoids were shown negative result (Gustiana, 2022). Steroids as primary antioxidants can reduce the formation of new free radicals. The mechanism of steroid action is by breaking the chain reaction and converting it into a stable product (Hamsidar, *et al.*, 2022). The reaction that occurs can be seen in Figure 3.

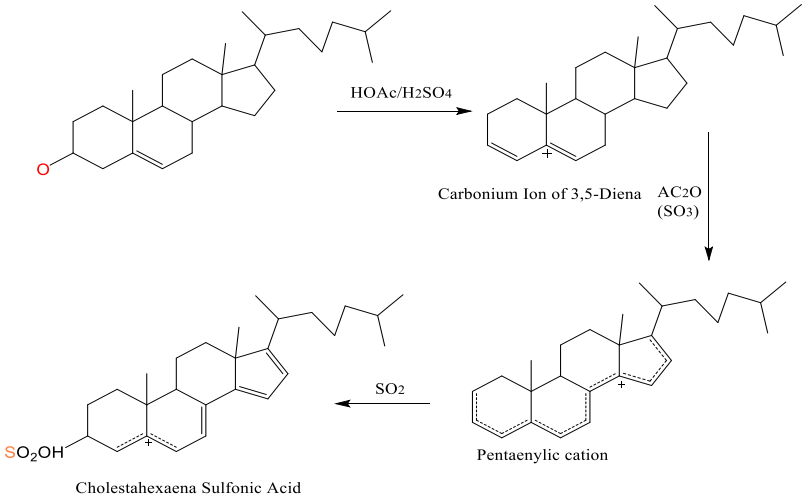


Figure 3. Reactions mechanism of steroid and terpenoid test (Habibi dkk., 2018)

Alkaloids

The alkaloid test uses three reagents, namely Mayer, Dragendorff, and Wagner. A positive test result for alkaloids in the Mayer reagent is indicated by the formation of a yellow precipitate, while in the Dragendorff reagent it is indicated by the formation of an orange precipitate, and in the Wagner reagent it is indicated by the formation of a brown precipitate. However, the Ara extract alkaloid test was declared negative, indicating that the sample did not contain alkaloids (Gustiana, *et al.*, 2022).

Saponin

Saponin positive test results are marked with formation of stable foam on the methanol extract which shows that saponin is polar so the compound can dissolve in polar solvent. The stable foam in the methanol sample shows that the saponin compound can be well extracted (Putri, *et al.*, 2023). The mechanism of action from saponins with reducing superoxide through the formation of intermediate possible hyperoxide which can prevent biomolecular damage caused by free radicals (Hamsidar, *et al.*, 2022). The saponin reaction that occurs can seen in Figure 4.

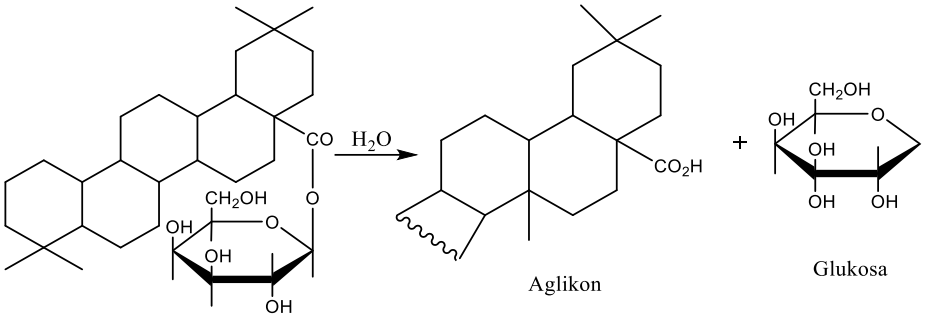


Figure 4. Saponin test reaction with water (Manongko, 2020)

Tanin

This tannin test obtained positive results using 1% $FeCl_3$ reagent. Positive results are indicated by the presence of a brownish green or blackish green color. The addition of $FeCl_3$ serves to determine the presence of phenol groups, indicated by the presence of a brownish green or blackish green color after adding 1% $FeCl_3$. After this addition, tannin will form a complex compound with Fe^{3+} ions (Illing, *et al.*, 2017). The mechanism of action of tannin as an antioxidant is by slowing down oxidation and tannin has the ability to chelate iron ions because of its function as a secondary antioxidant (Fithriani, *et al.*, 2015). The reaction of tannin with $FeCl_3$ can be seen in Figure 5.

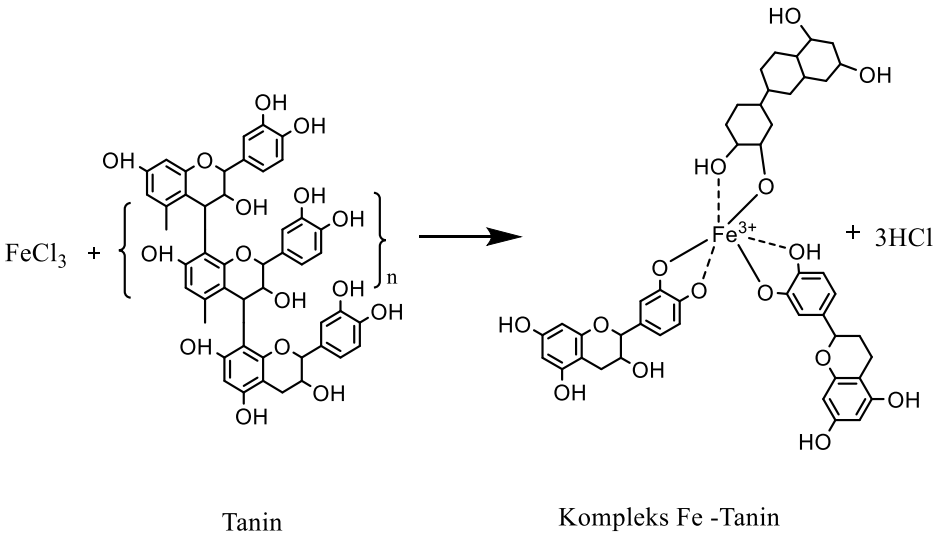


Figure 5. Tannin reaction with $FeCl_3$ 1% (Tandi, *et al.*, 2020)

Antioxidant Activity

The antioxidant activity test in this study was carried out using the DPPH (2,2-diphenyl-1-picrilhidrazyl) method. Based on research that has been carried out on antioxidant activity tests on Ara extract

(*Ficus racemosa* Linn.), the results obtained are presented in Table 3 and Table 4 shows the measuring results of the antioxidant activity of quercetin (comparison)

Table 3. Results of measuring the antioxidant activity of methanol extract of Ara (*Ficus racemosa* Linn.)

Sample	Concentration (ppm)	Average Absorbance Sample	Standard Deviation	DPPH Absorbance (nm)	% Inhibition	IC $_{50}$ (ppm)	Category
methanol	25	0,247	0,026	0,415	40,385	65,042	Strong
	50	0,221	0,038		46,746		
	75	0,189	0,044		54,409		
	100	0,177	0,032		57,301		
	125	0,158	0,024		61,783		

Table 4. Results of measuring the antioxidant activity of quercetin (comparison)

Sample	Concentration (ppm)	Average Absorbance Sample	Standard Deviation	DPPH Absorbance (nm)	% Inhibition	IC $_{50}$ (ppm)	Category
Quersetin	8	0,211	0,007	0,415	49,060	7,394	Very Strong
	10	0,144	0,013		65,301		
	12	0,061	0,012		85,204		
	14	0,024	0,009		94,072		
	16	0,021	0,009		94,795		

The linear regression curve for each methanol and quercetin extract sample can be seen in Figure 6 and Figure 7.

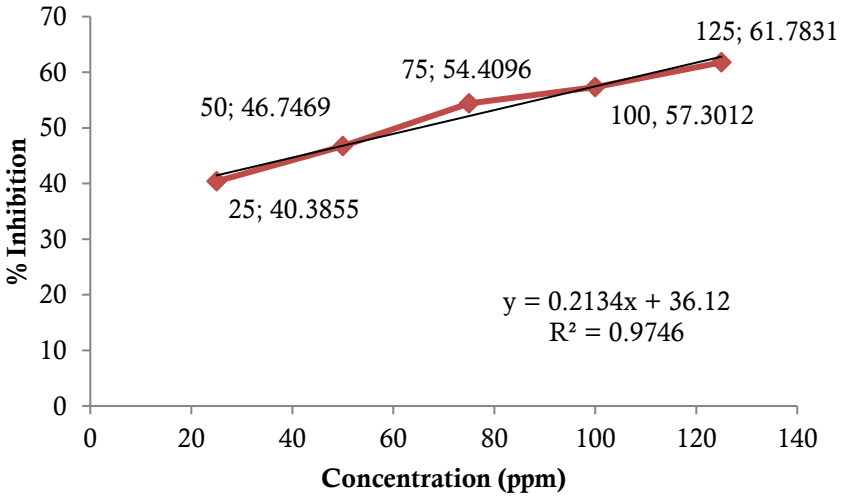


Figure 6. Equation curve Extract linear regression methanol

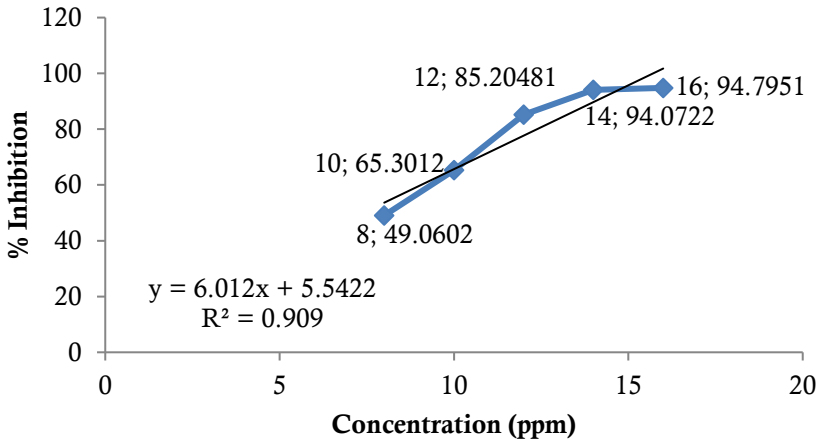


Figure 7. Equation curve Quercetin linear regression

This antioxidant activity was measured using the DPPH method, namely a UV-Vis spectrophotometer. Testing antioxidant activity using DPPH was shown by a change in color from purple to yellow. The working principle of the UV-Vis spectrophotometer is that light is passed through a monochromator and cuvette which is then passed to the detector (absorbed) to be converted into spectra (Sari, 2015). The antioxidant reaction with DPPH to become DPPH-H can be seen in Figure 8.

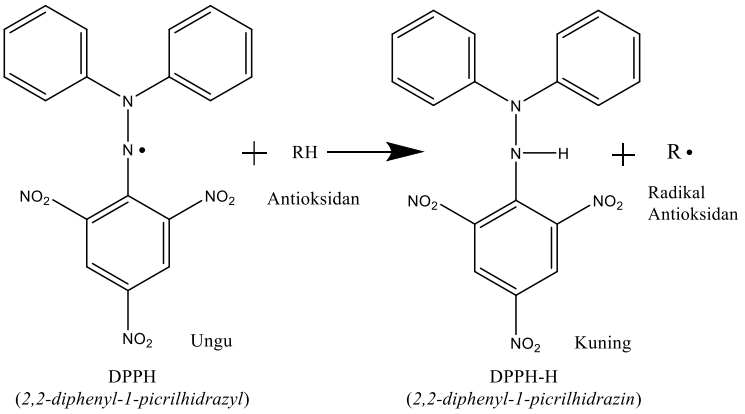


Figure 8. Antioxidant reaction with DPPH to become DPPH-H (Melina, 2022)

The use of wavelengths to measure the absorbance of methanol extracts of Aras and quercetin with varying concentrations is at a wavelength of 516 nm. The wavelength of 516 nm used is in accordance with measurements previously carried out by researchers and the reason for using quercetin as a comparison or positive control is because it has very strong antioxidant activity in capturing free radicals. Where quercetin has OH groups at 3', 4', 3, 5 and 7 in the structure of the quercetin compound (Salamah and Widyasari, 2015). The structure of quercetin can be seen in Figure 9.

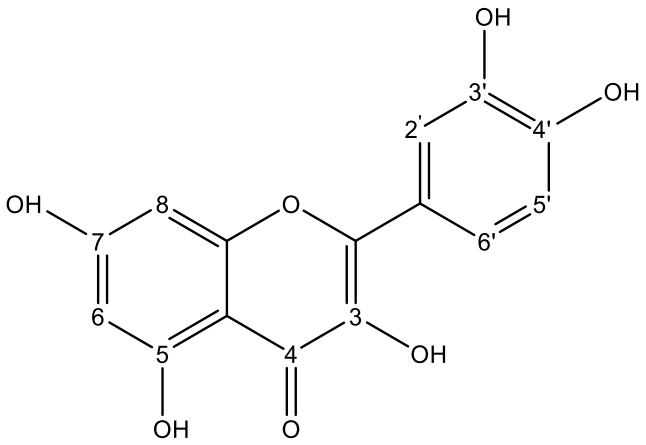


Figure 9. Structure of quercetin (Aulyawati, 2021)

The steps that researchers took before carrying out the UV-Vis test, quercetin and Ara extract which had been added to the blank solution (DPPH) were incubated for 30 minutes so that DPPH could react optimally with quercetin or methanol. The reaction of DPPH with antioxidant compounds from quercetin and the sample during the incubation process was characterized by a change in the solution from purple to yellow. This change is identified when all the electrons in DPPH already have a partner (Neti, *et al.*, 2018).

The antioxidant activity of Ara extract samples can be seen from the % inhibition. The IC_{50} respectively obtained by quercetin and methanol samples were 7.394 and 65.042 ppm which can be seen in Tables 3 and 4. The results of the antioxidant activity test show that the methanol extract has a strong level of antioxidant activity because the methanol solvent is polar which can dissolve polar compounds and quercetin has a high level of antioxidant activity. The antioxidant activity is very strong because quercetin is a flavonoid derivative which has been proven to contain the best antioxidants. It can be said that methanol extract has strong potential in reducing free radicals (Kasminah, 2016). In accordance with research conducted by Eva Agustina on testing the activity of antioxidant compounds from Ara leaf extract (*Ficus carica* Linn) with water, methanol and methanol-water mixtures, it was identified as containing strong antioxidants in the leaves with several solvents (Agustina, 2017).

The ability of Ara extract to prevent free radicals is because the methanol extract contains active secondary metabolite compounds in the form of flavonoids and other compounds such as steroids, saponins and tannins which are phenolic compounds with potential as antioxidants. The antioxidant abilities found in flavonoids are due to the presence of phenolic hydroxy groups in their molecular structure. When flavonoids react with free radicals, new and stable radicals will be formed due to the aromatic nuclear resonance effect (anti-radical scavenging) (Widyasari, 2019).

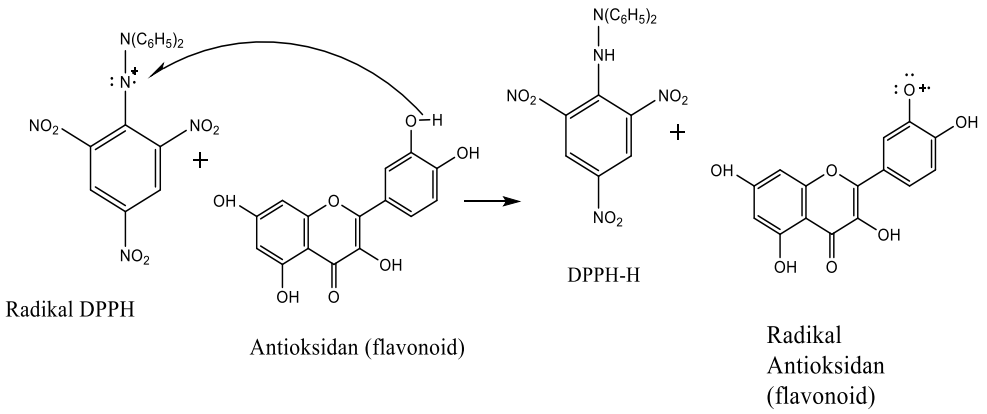


Figure 10. Mechanism of antioxidants reaction (flavonoids) with DPPH radicals (Salamah & Widyasari, 2015)

The antioxidant activity level of Ara extract was obtained from the results of a linear regression equation by creating a curve between concentration (x) and % resistance (y). The antioxidant activity value can be expressed by IC_{50}. Where there is a relationship between concentration and % inhibition, namely a linear relationship. So the higher the concentration of a sample, the higher the % inhibition produced and the lower the IC_{50} value of a sample, the stronger the antioxidant activity.

CONCLUSION

Based on the research that has been carried out, it can be concluded that the methanol extract has been identified as containing secondary metabolites in the form of flavonoids, steroids, saponins and tannins. Meanwhile, the antioxidant activity value shows a strong antioxidant with an IC_{50} value of 65.042%. Quercetin as a comparison has very strong antioxidant activity with an IC_{50} of 7.394%.

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