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Research Article

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Phytochemical screening and antioxidant activity from fruit and leaf extracts of *Ficus aurata* (Miq.) Miq.

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ABSTRACT

Phytochemical screening and antioxidant activity from the extracts of leaves and fruit of Ficus aurata (Miq.)Miq. have never been reported yet. Antioxidant activity test used 2.2-difenil-1-pikrilhidrazil (DDPH)method. Extraction process was gradually held with eluents n-hexane, ethyl acetate, and methanol. Phytochemical screening showed the existence of flavonoids, terpenoids, steroids, and phenolics in fruit and leaves. Antioxidant potentials were found 39.105 µg/mL, 84.419 µg/mL, 171.192 µg/mL, 188.160µg/mL for ethyl acetate extract of leaves and fruit, n-hexane extract of leaves, and methanol extract of fruit respectively. n-hexane extract of fruit was found to be inactive.

Keywords: *Ficus aurata* (Miq.) Miq,phytochemical screening, antioxidant, DPPH

INTRODUCTION

Ficus known as “ara”, is a genus grown in tropic and sub-tropic region. *Ficus* contains of 750 species [1,2,3,4], 800 species [5], and 1000 species [6,7]. This plant grows as a tree, bushes, and creeper that stand toward any conditions. *Ficus* can be found in South Asian and South East Asian countries like India, Nepal, Vietnam, Thailand, Myanmar, South China, Sumatra, Java and Taiwan [8], and many more countries in South West Asia and East Mediterranean, from East Turkey to Spain and West Portugal, and also in America, Chile, Saudi Arabia, Persia, India, China, and Japan [9].

Ficus has been used as traditional medicine for many diseases. *Ficus* species is a strong antioxidant in healing and therapy for many oxidative diseases due to the presence of polyphenols and flavonoids [10,11,12,13]. The advantages of this plant are for diabetes, skin diseases, antiulcer, dysentery, stomachache, jaundice, heart disease, and goiter. *Ficus* species are cultivated for its beauty and demand like bonsai[5,7,12,14-17].

EXPERIMENTAL SECTION

Plant

Fruit and leaves were taken from Limau Manis environment, Andalas University, Padang, Indonesia. This plant was identified in Herbarium of Andalas University (ANDA) of Biology Department, Andalas University with identification number of 204/K-ID/ANDA/VI/2014. Based on identification, this plant belongs toMoraceae family with one of its species *Ficus aurata* (Miq.) Miq.

Figure 1. *Ficus aurata* (Miq.) Miq.species

Chemicals

All reagents used in the study were analytical grade.Methanol, ethyl acetate, n-hexane, chloride acid, Mg metal, ferry chloride, Meyer reagent, Liebermann-Burchard reagent, DPPH (2,2-diphenyl-1-picrylhidrazyl) from Sigma-Aldrich company, and ascorbic acid.

Phytochemical Screening

Phytochemical screening of fruit and leaves used Meyer reagent for alkaloids, cyanide reagent for flavonoids, Liebermann-Burchard reagent for terpenoids and steroids, and ferry chloride for phenolic compounds.

Extraction

Air-dried fruit and leaves of *Ficus aurata* (Miq.)Miq. were grounded and macerated with increasing order of polarity solvents starting from n-hexane, ethyl acetate, and methanol for 5 times, respectively and successively. All extracts were filtrated and evaporated using a rotary evaporator at 40^{o}C to yield crude extract.

Antioxidant activity

Antioxidant activity assay was carried out using a *96-well microplate reader* (Berthold LB-941) measured with DPPH method [18] at wavelength 520 nm. Sample (2 mg) was dissolved in MeOH (2 mL) and diluted to afford concentrations 1000, 500, 250, 125, 62.5 and 31.25 µg/mL (two fold dilution method). DPPH (80 µL, 80µgmL) was added to each concentration (absorption stability range 0.2-0.8) and incubated for 30 minutes in the dark zone. The lower absorbance of the reaction mixture indicated the higher free radical activity. The percent DPPH radical scavenging activity was designed with percent inhibition calculated by using following equation:

$$\%\ Inhibition = \frac{(Absorbance\ of\ control\ -\ Absorbance\ of\ Sample)}{Absorbance\ of\ Control}\ X\ 100$$

The IC_{50} value of the sample is the concentration of the sample required to inhibit 50% of the DPPH free radicals. The IC_{50} value can be calculated by making linier regression equation as follows:

$Y = b \cdot X + a$

$Y = 50$

Where Y was percent inhibition and X was concentration of the sample.

RESULT AND DISCUSSION

Phytochemical Screening

Phytochemical screening of metabolite secondary (alkaloids, flavonoids, steroids, triterpenoids, and phenolics) from fruit and leaves of *Ficus aurata* (Miq.) Miq. is presented in Table 1 below:

Table 1 : Phytochemical screening of fruit and leaves of *Ficus aurata* (Miq.) Miq.

No	Chemical constituent	Test	Result of Fruit	Result of Leaf
1	Alkaloid	Mayer test	Negative	Negative
2	Flavonoid	Sianida test	Positive	Positive
3	Steroid	Liebermann Burchard test	Positive	Positive
4	Triterpenoid	Liebermann Burchard test	Positive	Positive
5	Phenolic	Ferric Chlorida test	Positive	Positive

Antioxidant activity

Antioxidant activity assay from fruit and leaves of *Ficus aurata* (Miq.) Miq.possessed good antioxidant potential except for n-hexane extract based on previously reported [19]. This is supported by phytochemical screening of fruit and leaves that contain phenolics and flavonoidswhich are active as antioxidant. Antioxidant activity from many extracts of fruit and leaves can be seen in figures below:

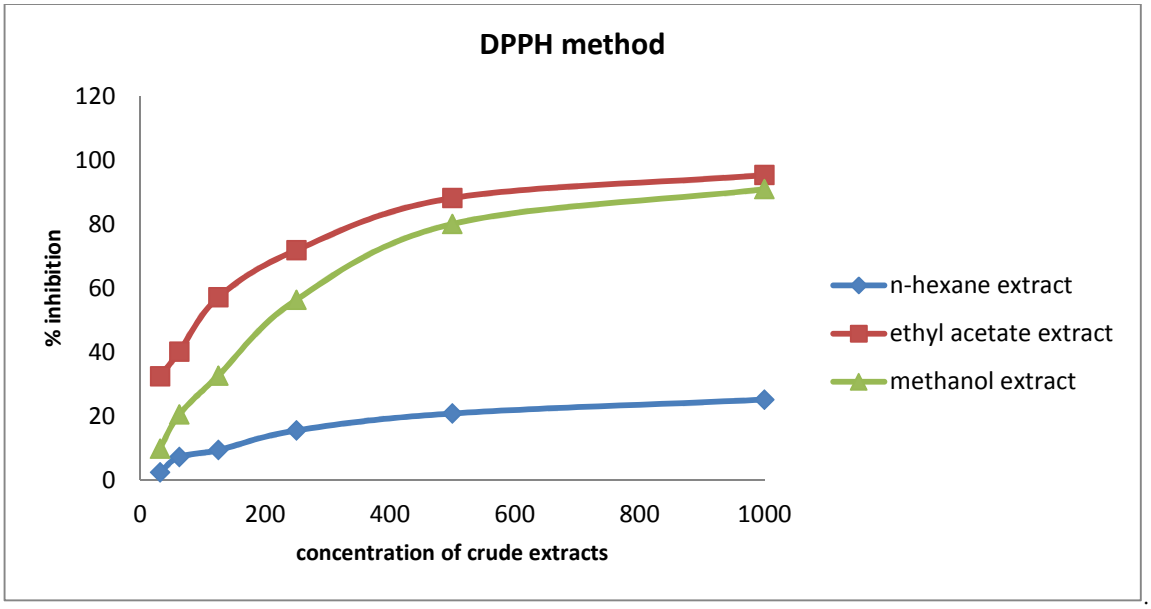

Figure 2.Percent Inhibition of *Ficus aurata* (Miq.) Miq. . fruit extracts

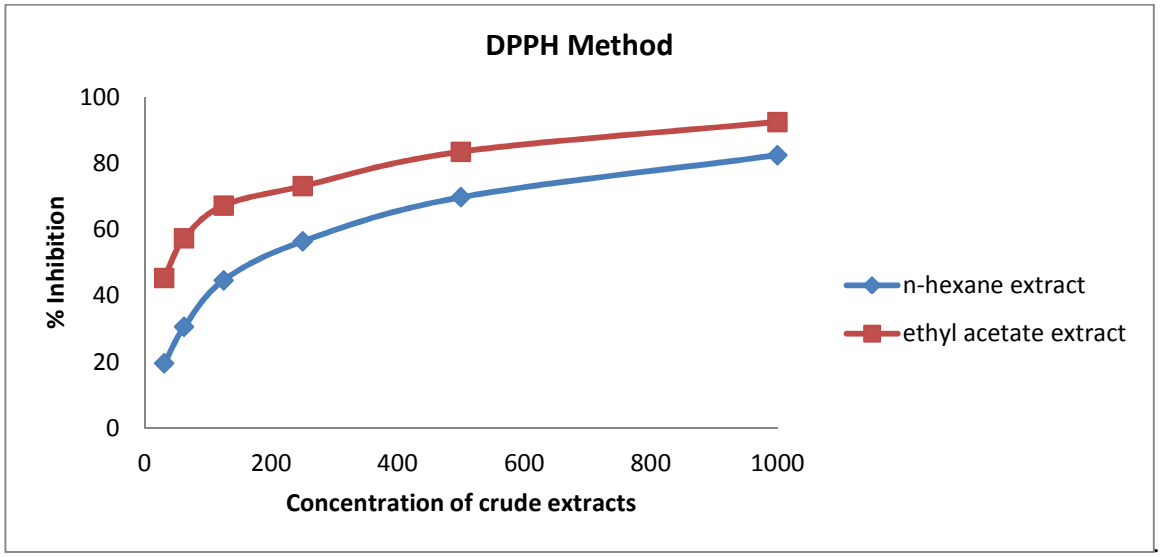

Figure 3.Percent Inhibition of *Ficus aurata* (Miq.) Miq. leaf extracts

The IC_{50}value of fruit and leaf extracts of *Ficus aurata* (Miq.) Miq. exhibited lower antioxidant potential compared to ascorbic acid (IC_{50}= 7.12±0.06) as shown in Table 2 below.

Table 2. IC_{50} value of fruit and leaf extracts of *Ficus aurata* (Miq.) Miq.

Sample	Extract	IC50 (µg/mL)	Criteria
Fruit	Methanol	188.16 ± 0.55	Intermediate
	Ethyl acetate	84.42 ± 0.14	Strong
	Hexana	43,839.15 ± 573.30	Inactive
Leaves	Ethyl acetate	39.11 ± 0.10	Very strong
	Hexana	171.19 ± 0.06	Intermediate

CONCLUSION

Phytochemical screening of *Ficus aurata* (Miq.) Miq. showed the presence of terpenoid, steroid, flavonoid, and phenolic compounds in fruit and leaves. This study determined that ethanol extract of *Ficus aurata* (Miq.) Miq. has strong antioxidant potential where IC_{50}value was found to be IC_{50} 39.105 µg/mL and 84.419 µg/mL for leaves and fruit respectively. Intermediate antioxidant potential was found for n-hexane extract of leaves and methanol extract of fruit as IC_{50} 171.192 µg/mL and 188.160 µg/mL respectively. Meanwhile, n-hexane extract of fruit was found inactive.

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