

Antioxidant Activity of Three Types of Medicinal Plants From Aceh

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Abstract- The province of Aceh has a crop diversity that has the potential to be developed as a medicine. The plants are the barks of *Dyera costulata*, barks of *Lannea coromandelica* and the of *Vitex pinnata* Linn leaves. Ditermine analysis antioxidant activity with 2,2 diphenyl-picrylhydrazyl (DPPH) and as a positive control used vitamin C (ascorbat acid). The result of antioxidant activity test in methanol extract showed that IC50 (Inhibition Concentration) value for barks of *Lannea coromandelica* 6.11, IC50 for *Vitex pinnata* Linn leaves 19.05 and IC50 values for barks of *Dyera costulata* 19.59. Of the three types of medicinal plants tested for their antioxidant activity, the bark of the *Lannea glandis* has the best antioxidant activity with IC50 of 6.11. IC50 vitamin C (ascorbat acid) 4,56.

Keywords: *Vitex pinnata* Linn, *Dyera costulata*, *Lannea coromandelica*, antioxidant activity

Introduction

As tropical areas, Aceh is rich with the diversity of medicinal plants spread throughout Aceh. These plants include *Dyera costulata* (biak plant), *Lannea coromandelica* (kedondong pagar plant) and *Vitex pinnata* Linn (halban plant). The barks of *Dyera costulata* in Aceh is used as an antidote drug, as well as the barks of *Lannea coromandelica*. The barks of *Lannea coromandelica* usually used to cure various diseases as dysentery and diarrhea, anti-inflammatory, hypotensi, cytotoksit and so on (Yun juan et al 2014). *Vitex pinnata* Linn is used as an anticholesterol and antidiabetic drug. The leaves are used as a medicine for fever, broken taste, and injury. Stem barks are reported to cure stomach aches, wounds, and also used as dyes. Meanwhile, root is used as an abdominal pain medication [3]. Water decoction of *V. pinnata* skin can relieve stomach pain, and its leaves are used as medicine for fever and wounds [2]. Antioxidants are compounds that can reduce oxidative damage in humans caused by free radicals and species reactive oxygen species under oxidative stress conditions [4]. By knowing the antioxidant activity of a plant then the plant can potentially be developed further as a cure for cancer or for synthetic drugs and as an antioxidant supplement in preventing free radicals. In this study will be reported antioxidant activity of methanol fraction of three types

of medicinal plants originating from Aceh namely *Dyera costulata*, *Lannea coromandelica* and *Vitex pinnata* Linn.

Materials and method

Plant materials

The leaves of *Vitex pinnata* Linn, bark of *Dyera costulata* and bark of *Lannea coromandelica* was collected in January 2016 and made into powder, then phytochemical screening test. The powdered material is then macerated with methanol for 48 hours. Then filtered and dried with a rotary evaporator until obtained thick extract. Furthermore, the viscous extract tested the antioxidant activity using radical damping with DPPH.

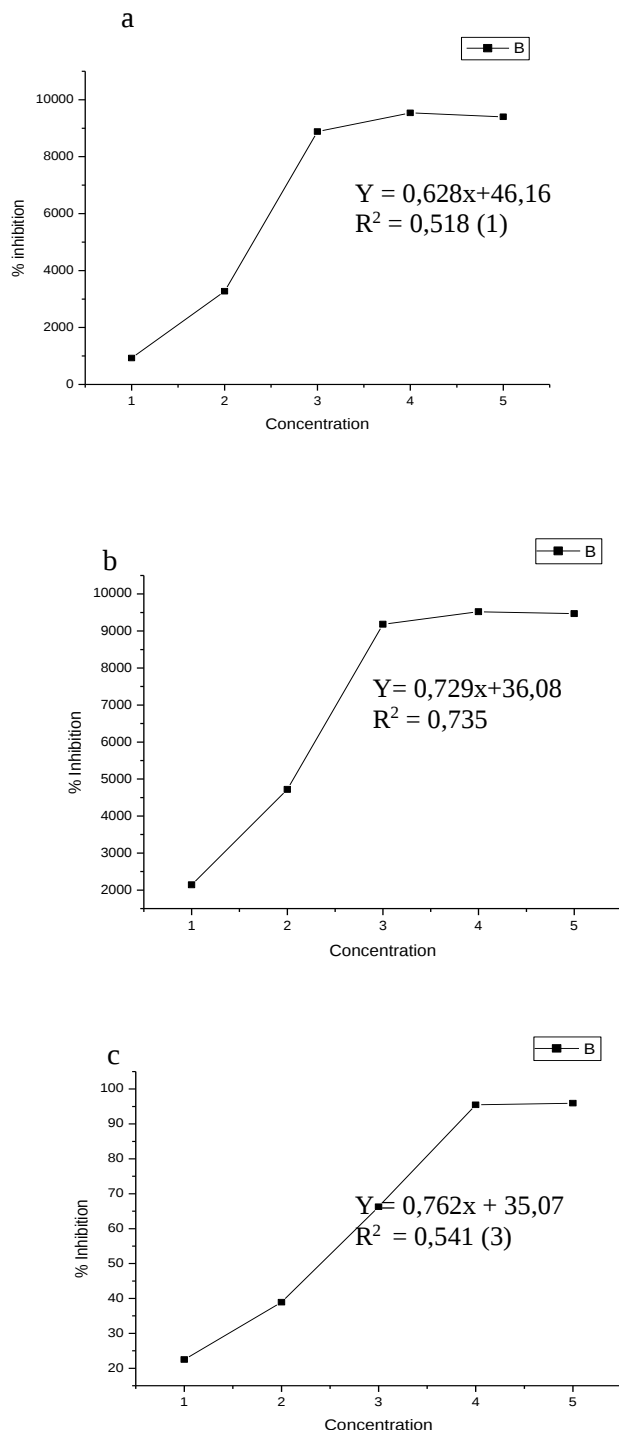
2,2 diphenyl-picrylhidrazyl (DPPH) radical scavenging assay

Measurement of antioxidant activity was performed by radical damping using DPPH and ascorbic acid is used as a standard. Samples for testing were prepared by dissolving in methanol. The concentrations of the tested samples were 50, 100, 200 and 400 µg/ml. To each concentration of sample was added 1 mL of solution of DPPH 0.4 mM (in methanol p.a) and then added methanol until mark 5 mL. mouth tube covered with aluminum foil. Homogenized and incubated at 37 °C for 30 min after being cultivated. The absorbance was read a 517 nm with UV-Vis spectrophotometer. Each concentration was tested in triplicate. Percent inhibition is calculated based on the formula [1].

$$\% \text{ of scavenging} = \frac{\text{Abs (control)} - \text{Abs sample}}{\text{Abs (control)}} \times 100 \quad (1)$$

Result and Disscusion

The results of testing of antioxidant activity for methanol fraction showed that three types of medicinal plants from Aceh have antioxidant activity. The antioxidant activity of *Lannea coromandelica* bark, *Dyera costulata* bark and *Vitex pinnata* Linn leaf can be seen in Figure 1 below.



Picture 1. Antioxidant activity (a) The barks *Lannea coromandelica* (b) The barks of *Dyera costulata* (c) The leaves of *Vitex pinnata* Linn

The graphs are showing the best antioxidant activity (a) with an IC₅₀ value of 6.11 close to IC₅₀ from a positive control (ascorbic acid/vitamin C) of 4.56. The value of IC₅₀ (Inhibition Concentration 50) is the concentration of antioxidants (µg / mL) that can inhibit 50% free radicals. The value of IC₅₀ is obtained from the intersection of the line between 50% barrier power with the concentration axis, then put into the equation $Y = a + bx$ where $Y = 50$ and the X value indicates IC₅₀. The extract is declared active when the IC₅₀ value is less than 100 µg / mL. The high antioxidant activity of skin of *Lannea coromandelica* stem because it contains chemical compounds as reported by (Yum juan et al, 2014) is bark of *Lannea coromandelica* contains thirteen chemical compounds such as quercetin, p-hydroxybenzoic acidethyl ester. This compound is known to have antioxidant activity. the best. The second sequence is the *Vitex pinnata* Linn leaf graph (b) with an IC₅₀ value of 19.05. The presence of antioxidant activity on the leaves of *Vitex pinnata* Linn because the leaf contains chemical compounds such as phenol and terpen groups. The results reported that *Vitex pinnata* Linn leaves contain Iridoid compounds (terpenoid groups) and p-hydroxy benzoate (phenol groups) [6]. Third order graph (c) bark *Dyera costulata* with IC₅₀ value of 19.59. The presence of antioxidant activity on *Dyera costulata* stem bark because *Dyera costulata* contains phenolic secondary metabolites, saponins, terpenoids and flavonoids [5]. As a positive control use ascorbic acid. IC₅₀ ascorbic acid value of 4.56. Of the three types of medicinal plants tested for antioxidant activity, *Lannea coromandelica* stem bark has the highest antioxidant activity with IC₅₀ value of 6.11 and close to antioxidant activity of positive control with IC₅₀ 4.56.

Conclusion

Based on the results of the research can be concluded that the antioxidant activity of three types of medicinal plants from Aceh all have antioxidant activity with IC₅₀ value of each of which is *Lannea coromandelica* bark is 6.11. The value of IC₅₀ bark of *Dyera costulata* stem is 19,59 and IC₅₀ value for *Vitex pinnata* Linn leaves is 19,05. IC₅₀'s most closely approximated IC₅₀ positive control is *Lannea coromandelica* bark.

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