ABSTRACT

TOTAL PHENOLIC CONTENT, ANTIOXIDANT, AND ANTIBACTERIAL TEST ETHYL ACETATE FRACTION OF RAMBUTAN LEAVES (*Nephelium lappaceum* L.) USING THE *Ultrasound-Assisted Extraction METHOD*

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Background: In most cases, secondary metabolite compounds produced by plants are used as targets for compound isolation in experiments to obtain certain pharmacological effects. Rambutan leaves (*Nephelium lappaceum* L.) have various pharmacological properties, including antibacterial and antioxidant properties. The pharmacological properties of plants have been proven to be influenced by the secondary metabolite compounds contained. Phenolic compounds and flavonoids are compounds known to have antibacterial and antioxidant activity. Many factors influence the type and amount of compounds in the extract, such as method, solvent, temperature and extraction time. The *Ultrasound-Assisted Extraction* method is used as a means of increasing the efficiency of extracting desired compounds and is often used in the extraction of thermolabile natural materials.
Method: This research began with extraction of rambutan leaves using the *Ultrasound-Assisted Extraction* method and then continued with multilevel fractionation to obtain the ethyl acetate fraction. The resulting ethyl acetate fraction was tested for the secondary metabolite compounds contained, total phenolic content, total flavonoid content, antioxidant activity using the DPPH method, and antibacterial inhibitory power against the bacteria *Staphylococcus aureus* and *Pseudomonas aeruginosa* using the cylindrical diffusion method.
Result: The secondary metabolite compounds contained in rambutan leaves are saponins, alkaloids, phenolics, flavonoids, tannins and triterpenoids. Total phenolic content 324,41 mg GAE/g. Total flavonoid content 145,82 mg QE/g. Effective consentration (IC_{50}) value 19,056 mg/L. The diameter of the inhibition zone against Staphylococcus aureus bacteria at concentrations of 20%, 10%, 5%, and 2.5% were 16.33 mm, 11.33 mm, 8 mm, and 4.16 mm, respectively. The diameter of the inhibition zone against Pseudomonas aeruginosa bacteria starts at a concentration of 20%, diameter of inhibition 7 mm.
Conclusion: The ethyl acetate fraction of rambutan leaves has good antioxidant and antibacterial activity.

Keywords: Phenolic, flavonoid, antioxidant, antibacterial, rambutan leaves

ABSTRAK

PENGUJIAN TOTAL FENOLIK, ANTIOKSIDAN, DAN ANTIBAKTERI, FRAKSI ETIL ASETAT DAUN RAMBUTAN (*Nephelium lappaceum* L.) MENGGUNAKAN METODE *Ultrasound-Assisted Extraction*

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Latar Belakang: Senyawa metabolit sekunder yang dihasilkan tanaman pada sebagian besar kasus dijadikan target isolasi senyawa pada suatu percobaan untuk mendapatkan efek farmakologis tertentu. Daun rambutan (*Nephelium lappaceum* L.) memiliki berbagai sifat farmakologis di antaranya sebagai antibakteri dan antioksidan. Sifat farmakologis tanaman telah terbukti dipengaruhi oleh senyawa metabolit sekunder yang terkandung. Senyawa fenolik dan flavonoid merupakan senyawa yang dikenal memiliki aktivitas antibakteri dan antioksidan. Banyak faktor yang mempengaruhi jenis dan jumlah kandungan senyawa dalam ekstrak seperti metode, pelarut, suhu, dan waktu ekstraksi. Metode *Ultrasound-Assisted Extraction* digunakan sebagai sarana meningkatkan efisiensi ekstrak senyawa yang diinginkan dan sering digunakan dalam ekstraksi bahan alam yang *thermolabile.*
Metode: Penelitian ini diawali dengan ekstraksi daun rambutan menggunakan metode *Ultrasound-Assisted Extraction* lalu dilanjutkan dengan fraksinasi bertingkat untuk mendapatkan fraksi etil asetat. Fraksi etil asetat yang dihasilkan diuji senyawa metabolit sekunder yang terkandung, kadar total fenolik, kadar total flavonoid, aktivitas antioksidan metode DPPH, dan daya hambat antibakteri terhadap bakteri *Staphylococcus aureus* dan *Pseudomonas aeruginosa* metode difusi silinder.
Hasil: Senyawa metabolit sekunder yang terkandung dalam daun rambutan adalah saponin, alkaloid, fenolik, flavonoid, tanin, dan triterpenoid. Kadar total fenolik 324,41 mg GAE/g. Kadar total flavonoid 145,82 mg QE/g. Nilai IC_{50}19,056 mg/L. Diameter zona hambat terhadap bakteri *Staphylococcus aureus* pada konsentrasi 20%, 10%, 5%, dan 2,5% berturut-turut 16,33 mm, 11,33 mm, 8 mm, dan 4,16 mm. Diameter zona hambat terhadap bakteri *Pseudomonas aeruginosa* dimulai pada konsentrasi 20% yaitu 7 mm.
Simpulan: Fraksi etil asetat daun rambutan memiliki aktivitas antioksidan dan antibakteri yang baik.

Kata kunci: Fenolik, flavonoid, antioksidan, antibakteri, daun rambutan