

ABSTRAK

PERBANDINGAN METODE EKSTRAKSI TERHADAP AKTIVITAS ANTIOKSIDAN DAN ANTIINFLAMASI EKSTRAK ETANOL 96% DAUN DEWANDARU (*Eugenia uniflora* L.) SECARA *IN-VITRO*

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Latar Belakang: Inflamasi merupakan reaksi imunitas tubuh terhadap suatu rangsangan yang disebabkan oleh zat asing yang masuk ke dalam tubuh. Inflamasi kronis dapat memicu berbagai penyakit degeneratif. Penggunaan obat antiinflamasi sintetik berisiko menimbulkan efek samping, sehingga diperlukan alternatif berbasis bahan alam. *Eugenia uniflora* L. mengandung senyawa metabolit sekunder, khususnya fenolik dan flavonoid, yang berpotensi sebagai antioksidan dan antiinflamasi. Metode ekstraksi berperan penting dalam menentukan kandungan dan aktivitas ekstrak biologis.

Metode: Penelitian ini bertujuan membandingkan metode maserasi dan *Ultrasound-Assisted Extraction* terhadap aktivitas antioksidan dan antiinflamasi ekstrak etanol 96% daun dewandaru secara *in vitro*. Aktivitas antioksidan diuji menggunakan metode DPPH (2,2-diphenyl-1-picrylhydrazyl), sedangkan aktivitas antiinflamasi diuji melalui metode penghambatan denaturasi protein bovine serum albumin (BSA). Serta dilakukan penetapan kadar total fenolik dan flavonoid menggunakan spektrofotometri UV-Vis.

Hasil: Metode maserasi menunjukkan aktivitas antioksidan lebih tinggi dibandingkan metode UAE, dengan nilai IC_{50} sebesar 25,942 ppm dan 75,636 ppm. Sebaliknya, aktivitas antiinflamasi ekstrak lebih optimal pada metode UAE dibandingkan maserasi, dengan nilai IC_{50} sebesar 80,657 ppm dan 111,680 ppm. Metode UAE juga menghasilkan kadar total flavonoid dan fenolik yang lebih tinggi, masing-masing sebesar 80,68 mgQE/g dan 20,50 mgGAE/g, dibandingkan metode maserasi yang menghasilkan 50,78 mgQE/g dan 19,11 mgGAE/g.

Kesimpulan: Metode ekstraksi berpengaruh terhadap aktivitas antioksidan dan antiinflamasi ekstrak etanol 96% daun dewandaru. Metode maserasi menghasilkan aktivitas antioksidan yang lebih kuat, sedangkan metode UAE lebih efektif dalam meningkatkan kadar total flavonoid, fenolik dan aktivitas antiinflamasi dan kadar total flavonoid dan fenolik yang lebih tinggi.

Kata Kunci: antioksidan, antiinflamasi, daun dewandaru, *Eugenia uniflora* L., maserasi, *Ultrasound-Assisted extraction*

ABSTRACT

COMPARISON OF EXTRACTION METHODS ON ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITY OF 96% ETHANOL EXTRACT OF DEWANDARU LEAVES (*Eugenia uniflora* L.) *IN-VITRO*

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Background: Inflammation is an immune response of the body to stimuli caused by foreign substances entering the body. Chronic inflammation can trigger various degenerative diseases. The use of synthetic anti-inflammatory drugs poses a risk of adverse side effects; therefore, natural-based alternatives are required. *Eugenia uniflora* L. contains secondary metabolites, particularly phenolic and flavonoid compounds, which have potential antioxidant and anti-inflammatory activities. The extraction method plays an important role in determining the chemical composition and biological activity of plant extracts.

Method: This study aimed to compare maceration and Ultrasound-Assisted Extraction (UAE) methods on the antioxidant and anti-inflammatory activities of 96% ethanol extracts of *Eugenia uniflora* L. leaves in vitro. Antioxidant activity was evaluated using the DPPH (2,2-diphenyl-1-picrylhydrazyl) assay, while anti-inflammatory activity was assessed by the inhibition of bovine serum albumin (BSA) protein denaturation. Total phenolic and flavonoid contents were determined using UV–Vis spectrophotometry.

Result: The maceration method exhibited higher antioxidant activity than the UAE method, with IC_{50} values of 25.942 ppm and 75.636 ppm, respectively. In contrast, the anti-inflammatory activity of the extract was more pronounced in the UAE method than in maceration, with IC_{50} values of 80.657 ppm and 111.680 ppm, respectively. Furthermore, the UAE method produced higher total flavonoid and phenolic contents, amounting to 80.68 mg QE/g and 20.50 mg GAE/g, compared to the maceration method, which yielded 50.78 mg QE/g and 19.11 mg GAE/g.

Conclusion: The extraction method significantly influences the antioxidant and anti-inflammatory activities of the 96% ethanol extract of *Eugenia uniflora* L. leaves. The maceration method resulted in stronger antioxidant activity, whereas the UAE method was more effective in increasing total flavonoid and phenolic contents as well as enhancing anti-inflammatory activity.

Keywords: antioxidant, anti-inflammatory, dewandaru leaves, *Eugenia uniflora* L., maceration, Ultrasound-assisted extraction