

ABSTRACT

ANTIDIABETIC ACTIVITY TEST OF 96% ETHANOL EXTRACT OF BILAJANG BULU LEAVES (*Merremia vitifolia*) IN-VITRO WITH ALPHA-AMYLASE ENZYME INHIBITION TEST

By

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Background: Indonesia is the only country in Southeast Asia with the highest number of diabetes mellitus sufferers in 2021, ranking fifth with 19.47 million people. People in Luwu Regency, South Sulawesi Province often drink boiled water from bilajang leaves to help heal wounds in diabetes sufferers faster. *Merremia vitifolia* leaves have strong α -glucosidase inhibitory activity, so they have the potential to be antidiabetic.

Methods: This study began with sample preparation and continued with the extraction of bilajang bulu leaves using the Ultrasound-Assisted Extraction method. The resulting extract was tested for secondary metabolite compounds contained, GC-MS, total phenolic content, total flavonoid content, antioxidant activity with the DPPH method and in-vitro antidiabetic activity test of the α -amylase enzyme with the DNSA method (3, 5-dinitrosalicylic acid assay) and Starch-Iodine color assay.

Results: Secondary metabolite compounds contained in the feather hyacinth (*Merremia vitifolia*) are alkaloids, phenolics, flavonoids, saponins, tannins and steroids. The characteristics of the compounds with the GC-MS method contain 21 volatile compounds and based on the highest area percentage are patchouli alcohol, ergosta-14,22-dien-3-ol, (3.beta.,5.alpha.,22E), seychellene, phytol and Azulene,1,2,3,5,6,7,8,8a-octahydro-1,4-dimethyl7(1methylethenyl),[1S(1.alpha., 7.alpha.,8a.beta)]. The total phenolic content is 66.62 mg GAE/g and the total flavonoid content is 55.85 mg QE/g. Antioxidant activity has an IC_{50} value of 89.552 μ L/mL and ascorbic acid of 0.816 μ L/mL. The antidiabetic activity of the DNSA method (3, 5-dinitrosalicylic acid assay) has an IC_{50} value of 46.18 μ L/mL and an IC_{50} value of acarbose of 19.96 μ L/mL, while the Starch-Iodine color assay method has an IC_{50} value of 28.886 μ L/mL and an IC_{50} value of acarbose of 8,316 μ L/mL. Antioxidant activity with antidiabetic activity of DNSA (3, 5-dinitrosalicylic acid assay) and Starch-Iodine color assay methods have a perfect correlation. There was significant difference between the two methods of testing antidiabetic activity.

Conclusion: Ethanol extract of 96% bilajang bulu leaves (*Merremia vitifolia*) has very strong antidiabetic activity against the inhibition of the α -amylase enzyme using the Starch-Iodine color test method.

Keywords: Total phenolic and flavonoid content, antioxidants, antidiabetic, bilajang bulu leaves, *Merremia vitifolia*

ABSTRAK

UJI AKTIVITAS ANTIDIABETES EKSTRAK ETANOL 96% DAUN BILAJANG BULU (*Merremia vitifolia*) SECARA IN-VITRO DENGAN UJI PENGHAMBATAN ENZIM ALFA-AMILASE

Oleh

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Latar Belakang: Indonesia merupakan satu-satunya negara di Asia Tenggara dengan jumlah penderita diabetes melitus tertinggi tahun 2021 menjadi posisi kelima dengan 19,47 juta penduduk. Masyarakat di Kabupaten Luwu, Provinsi Sulawesi Selatan air rebusan daun bilajang untuk membantu penyembuhan luka pada penderita diabetes agar lebih cepat. Daun *Merremia vitifolia* memiliki aktivitas penghambatan α -glukosidase yang kuat, sehingga dapat berpotensi sebagai antidiabetes

Metode: Penelitian ini diawali dengan preparasi sampel lalu dilanjutkan dengan ekstraksi daun bilajang bulu menggunakan metode *Ultrasound-Assisted Extraction*. Ekstrak yang dihasilkan diuji senyawa metabolit sekunder yang terkandung, GC-MS, kadar total fenolik, kadar total flavonoid, aktivitas antioksidan dengan metode DPPH dan uji aktivitas antidiabetes secara in-vitro enzim α -amilase dengan metode DNSA (3, 5-dinitrosalicylic acid assay) dan *Starch-Iodine colour assay*.

Hasil: Senyawa metabolit sekunder yang terkandung dalam bilajang bulu (*Merremia vitifolia*) adalah alkaloid, fenolik, flavonoid, saponin, tanin dan steroid. Karakteristik senyawa dengan metode GC-MS mengandung 21 senyawa dan berdasarkan persentase areanya yang tertinggi adalah patchouli alcohol, ergosta-14,22-dien-3-ol, (3.beta.,5.alpha.,22E), seychellene, phytol dan Azulene, 1,2,3,5,6,7,8,8a-octahydro-1,4-dimethyl-7-(1methylethenyl),[1S(1.alpha.,7.alpha., 8a.beta)]. Kadar total fenolik 66,62 mg GAE/g dan kadar total flavonoid 55,85 mg QE/g. Aktivitas antioksidan memiliki nilai IC_{50} sebesar 89,552 μ L/mL dan asam askorbat sebesar 0,816 μ L/mL. Aktivitas antidiabetes metode DNSA (3, 5-dinitrosalicylic acid assay) memiliki nilai IC_{50} 46,18 μ L/mL dan nilai IC_{50} acarbose sebesar 19,96 μ L/mL, sedangkan pada metode *Starch-Iodine colour assay* memiliki nilai IC_{50} 28,886 μ L/mL dan nilai IC_{50} acarbose sebesar 8,315 μ L/mL. Aktivitas antioksidan dengan aktivitas antidiabetes metode DNSA (3, 5-dinitrosalicylic acid assay) dan *Starch-Iodine colour assay* memiliki korelasi yang sempurna. Kedua metode pengujian aktivitas antidiabetes terdapat perbedaan yang signifikan.

Simpulan: Ekstrak etanol 96% daun bilajang bulu (*Merremia vitifolia*) memiliki aktivitas antidiabetes yang sangat kuat terhadap penghambatan enzim α -amilase dengan metode *Starch-Iodine colour assay*.

Kata Kunci: Kadar total Fenolik dan flavonoid, antioksidan, antidiabetes, daun bilajang bulu, *Merremia vitifolia*