

**FAKULTAS KEDOKTERAN DAN ILMU KESEHATAN
UNIVERSITAS MUHAMMADIYAH MAKASSAR**

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EFEKTIVITAS FRAKSI ETIL ASETAT DAUN STEVIA (*Stevia rebaudiana* B.) SEBAGAI AGEN HOMEOSTATIS GLUKOSA : STUDI IN VIVO DAN IN SILICO

ABSTRAK

Latar Belakang: Diabetes melitus merupakan penyakit metabolik kronis yang ditandai dengan hiperglikemia akibat gangguan sekresi atau kerja insulin. Penggunaan tanaman obat sebagai terapi alternatif semakin banyak dikembangkan, salah satunya adalah tanaman stevia (*Stevia rebaudiana* B.) yang dikenal sebagai tanaman pemanis alami dengan potensi bioaktif, termasuk efek antidiabetes. Namun, studi komprehensif mengenai fraksi etil asetat daun stevia (*Stevia rebaudiana* B.) sebagai agen homeostatis glukosa masih terbatas.

Tujuan Penelitian: Penelitian ini bertujuan untuk mengevaluasi efektivitas fraksi etil asetat daun stevia (*Stevia rebaudiana* B.) dalam menurunkan kadar glukosa darah melalui pendekatan studi *in vivo* pada mencit (*Mus musculus*) yang diinduksi *streptozotocin* dan studi *in silico* terhadap reseptor GLP-1.

Metode Penelitian: Penelitian ini menggunakan model eksperimental dengan 24 ekor terbagi menjadi 6 kelompok tiap kelompok terdiri dari 4 ekor mencit jantan. Diukur kadar gula darah mencit sebelum diinduksi *streptozotocin* (STZ) 40 mg/KgBB, kemudian diukur kadar gula darah hari ke-3 setelah induksi. Fraksi etil asetat daun stevia (*Stevia rebaudiana* B.) diberikan pada dosis 100, 200, 300, dan 400 mg/KgBB. Pengukuran kadar gula darah dilakukan pada hari ke-10, 12 dan 14 pasca perlakuan. Uji *in silico* dilakukan untuk menilai afinitas ligan aktif (Rebaudioside A, C, Stevioside, dan Dulcoside A) terhadap reseptor GLP-1 menggunakan perangkat lunak *Pyrx* dan *Biovia Discovery Studio*.

Hasil Penelitian: Diperoleh fraksi etil asetat daun stevia (*Stevia rebaudiana* B.) menunjukkan penurunan glukosa darah secara dosis responsif, dengan dosis 400 mg/KgBB mencapai rata-rata persentase penurunan sebesar 42,27%, mendekati rata-rata persentase kontrol positif sebesar 45,79%. Hasil penambatan menunjukkan bahwa Rebaudioside A memiliki afinitas tertinggi terhadap GLP-1R sebesar -8,7 kkal/mol yang mengindikasikan potensinya sebagai senyawa aktif homeostatis glukosa.

Kesimpulan: Fraksi etil asetat daun stevia (*Stevia rebaudiana* B.) memiliki potensi sebagai agen penurun glukosa darah dan kandidat modulasi GLP-1 secara molekuler. Hasil ini mendukung pemanfaatan tanaman stevia sebagai terapi alternatif antidiabetes berbasis bahan alam.

Kata Kunci: Daun stevia (*Stevia rebaudiana* B.), Fraksi etil asetat, Homeostatis Glukosa, *In Vivo*, *In Silico*, GLP-1

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**EFFECTIVENESS OF ETHYL ACETATE FRACTION OF STEVIA
LEAVES (*Stevia rebaudiana* B.) AS A GLUCOSE HOMEOSTATIC AGENT:
IN VIVO AND IN SILICO STUDY**

ABSTRACT

Background: Diabetes mellitus is a chronic metabolic disease characterized by hyperglycemia due to impaired insulin secretion or action. The use of medicinal plants as alternative therapies is increasingly being developed, one of which is stevia (*Stevia rebaudiana* B.), known as a natural sweetener with potential bioactives, including antidiabetic effects. However, comprehensive studies on the ethyl acetate fraction of stevia (*Stevia rebaudiana* B.) leaves as a glucose homeostatic agent are still limited.

Research Objective: This study aims to evaluate the effectiveness of ethyl acetate fraction of stevia leaves (*Stevia rebaudiana* B.) in reducing blood glucose levels through an in vivo study approach in mice (*Mus musculus*) induced by streptozotocin and an in silico study of the GLP-1 receptor.

Research Methods: This study used an experimental model with 24 mice divided into 6 groups each consisting of 4 male mice. Blood sugar levels were measured before induction with streptozotocin (STZ) 40 mg/KgBW, then blood sugar levels were measured on the 3rd day after induction. Ethyl acetate fraction of stevia leaves (*Stevia rebaudiana* B.) was given at doses of 100, 200, 300, and 400 mg/KgBW. Blood sugar levels were measured on days 10, 12, and 14 after treatment. In silico tests were conducted to assess the affinity of active ligands (Rebaudioside A, C, Stevioside, and Dulcoside A) to the GLP-1 receptor using Pyrx and Biovia Discovery Studio software.

Results: The ethyl acetate fraction of stevia leaves (*Stevia rebaudiana* B.) showed a dose-responsive decrease in blood glucose, with a dose of 400 mg/KgBW achieving an average percentage decrease of 42.27%, approaching the average percentage of the positive control of 45.79%. The docking results showed that Rebaudioside A had the highest affinity for GLP-1R of -8.7 kcal/mol, indicating its potential as an active compound for glucose homeostasis.

Conclusion: The ethyl acetate fraction of stevia (*Stevia rebaudiana* B.) leaves has potential as a blood glucose-lowering agent and a candidate for molecular modulation of GLP-1. These results support the use of the stevia plant as an alternative, natural-based antidiabetic therapy.

Keywords: *Stevia* leaves (*Stevia rebaudiana* B.), Ethyl acetate fraction, Glucose Homeostasis, *In Vivo*, *In Silico*, GLP-1