

INTISARI

Latar Belakang. Diabetes mellitus merupakan gangguan metabolik yang dicirikan dengan hiperglikemia karena defek sekresi insulin, kerja insulin atau keduanya. Ada banyak bukti bahwa senyawa aktif dari tanaman obat dapat digunakan untuk mengobati diabetes. Tujuh hidroksi-2- (4-hidroksi-3-metoksi-fenil) -kroman-4-one merupakan senyawa flavonoid yang diisolasi dari biji *Swietenia macrophylla* King. Tujuan penelitian ini adalah untuk mengkaji efek 7- hidroksi-2- (4-hidroksi-3-metoksi-fenil) -kroman-4-one terhadap kadar glukosa darah, Insulin serum, nilai *Homeostatic Model Assessment of Insulin Resistance* (HOMA-IR), ekspresi gen *Glucagon Like Peptide-1* (GLP-1) intestinal, ekspresi gen *Retinol Binding Protein 4* (RBP4) dan *phosphoenol pyruvate Carboxykinase* (PEPCK,) di hepar pada tikus Diabetes mellitus (DM) tipe 2. **Metode.** Tiga puluh ekor tikus jantan (*rattus norvegicus*) yang digunakan dalam penelitian ini dibagi menjadi 6 kelompok dengan 5 ekor tikus tiap kelompok. 1) kontrol normal, 2) kontrol DM, 3) tikus DM diberi metformin, 4) 5) dan 6) tikus DM yang mendapat 7- hidroksi-2- (4-hidroksi-3-metoksi-fenil) -kroman-4-one berturut-turut 10mg, 30mg dan 90mg/200g berat badan (BB)/hari. **Analisis.** Sampel darah dianalisis terhadap kadar glukosa darah, insulin serum dan HOMA IR sebelum dan setelah pemberian 7- hidroksi-2- (4-hidroksi-3-metoksi-fenil) -kroman-4-one selama 4 minggu. Pada akhir penelitian sampel jaringan intestinal diambil untuk pemeriksaan ekspresi gen GLP-1 sedangkan heparnya untuk dianalisis ekspresi gen PEPCK dan RBP-4 menggunakan q-Polimerase Chain Reaction (q-PCR). **Hasil.** Kadar glukosa darah berkurang secara signifikan ($p < 0,05$) pada kelompok 3, 4, 5 dan 6. Kadar insulin serum meningkat pada kelompok 3 dan 4 ($p < 0,05$). Nilai HOMA IR berkurang secara signifikan ($p < 0,05$) pada kelompok 3, 4, 5 dan 6. Ekspresi gen PEPCK mengalami penurunan pada dosis 90mg/200gBB ($p < 0,05$). Ekspresi gen RBP-4 mengalami penurunan tidak bermakna ($p > 0,05$) dan ekspresi gen GLP-1 mengalami peningkatan secara tidak bermakna ($p > 0,05$). **Kesimpulan.** Hasil tersebut menunjukkan bahwa 7- hidroksi-2- (4-hidroksi-3-metoksi-fenil) -kroman-4-one dosis 90mg/200gBB menurunkan kadar glukosa darah, menurunkan resistensi insulin dan menurunkan ekspresi gen PEPCK, sedangkan kadar 10mg/200gBB meningkatkan kadar insulin serum secara signifikan, meningkatkan ekspresi gen GLP-1 intestinal dan menurunkan ekspresi gen RBP-4 hepar tikus secara tidak bermakna.

Key words : Diabetes melitus, Flavonoid., Hiperglikemia, Insulin, PEPCK, RBP-4, GLP-1, *Swietenia macrophylla* King seed.

ABSTRACT

Background and aims. Diabetes mellitus is a metabolic disorder characterized by hyperglycemia due to defect of insulin secretion, insulin action, or both. There are increase evidence that active compounds of medicinal plants may be used to treat diabetes. Seven- hydroxy-2-(4-hydroxy-3-methoxy-phenyl)-chroman-4-one is a flavonoid compound from *Swietenia macrophylla* King seed. The aim of this study is to investigate the effect of a 7-hydroxy-2-(4-hydroxy-3-methoxy-phenly)-chroman-4-one compound of the *Swietenia macrophylla* King seed on blood glucose level, insulin level, Homeostatic Model Assessment of Insulin Resistance (HOMA-IR) value, Glucagon like peptide -1 (GLP-1) intestinal, Retinol binding protein-4 (RBP-4) and Phosphoenolpyruvate Carboxykinase (PEPCK) gene expression in type 2 diabetes rats. **Methods.** Thirty adult rats (*rattus norvegicus*) were used divided into 6 groups with 5 in each groups as follows:1)normal control rats, 2) diabetic rats,3) diabetic rats with metformin, 4), 5) and 6) diabetic rats with a 7-hydroxy-2-(4-hydroxy-3-methoxy-phenly)-chroman-4-one 10mg, 30mg and 90mg/200gbody weigh (bw) respectively. **Analysis.** Blood samples were analyzed for blood glucose, insulin levels and HOMA IR before and after 4 weeks of administration. At the end of the study, the liver tissue and intestine were removed for quantitative PCR (qPCR) analyses. Liver tissue for RBP4 and PEPCK gene expression and intestine for GLP-1 gene expression. **Results.** Blood glucose levels decreased significantly ($p < 0.05$) in group 3, 4, 5 and 6. Serum insulin levels increased in group 3 and 4 ($p < 0.05$). HOMA IR value was significantly reduced ($p < 0.05$) in group 3, 4, 5 and 6. GLP-1 gene expression is not significantly increased ($p > 0.05$), RBP-4 gene expression was not significantly decreased ($p > 0.05$) and PEPCK gene expression was decreased significantly at dose 90mg / 200gbw ($p < 0.05$). **Conclusion.** These results indicate that the 7-hydroxy-2- (4-hydroxy-3-methoxy-phenly) -chroman-4-one dose of 90mg / 200gbw lowering blood glucose levels, insulin resistance and PEPCK gene expression, whereas the levels of 10mg / 200gbw increasing insulin levels significantly, increasing intestinal GLP-1 gene expression and lowering RBP-4 gene expression in rat hepatic not significantly.

Key words : Diabetes mellitus, Flavonoid., Hyperglycemia, Insulin, GLP-1, RBP4, PEPCK, *Swietenia macrophylla* King seed