

ABSTRAK

OPTIMALISASI DOSIS EKSTRAK DAUN SALAM (*Syzygium polyanthum*) TERHADAP PENURUNAN GLUKOSA DARAH DAN KERUSAKAN HISTOPATOLOGI HATI MENCIT (*Mus musculus* L.) YANG DIINDUKSI ALOKSAN

Oleh
Dedi Perangin Angin

Hiperglikemia merupakan kondisi meningkatnya kadar glukosa darah yang berlangsung kronis dan dapat menimbulkan kerusakan pada organ penting, termasuk hati. Aloksan merupakan agen diabetogenik yang bekerja dengan merusak sel β pankreas melalui mekanisme stres oksidatif dan sering digunakan untuk membentuk model diabetes pada hewan uji. Daun salam (*Syzygium polyanthum*) mengandung senyawa bioaktif berupa flavonoid, tanin, saponin, dan alkaloid yang diketahui memiliki aktivitas antioksidan, antihiperglikemik, serta hepatoprotektif. Penelitian ini bertujuan untuk mengetahui pengaruh serta menentukan dosis optimal ekstrak etanol daun salam terhadap penurunan kadar glukosa darah dan perbaikan gambaran histopatologi hati mencit yang diinduksi aloksan. Penelitian ini merupakan penelitian eksperimental menggunakan mencit jantan yang dibagi ke dalam lima kelompok perlakuan. Induksi hiperglikemia dilakukan dengan pemberian aloksan dosis 150 mg/gBB secara intraperitoneal. Ekstrak etanol daun salam diberikan secara oral selama 14 hari dengan dosis 150 mg/gBB, 250 mg/gBB, dan 350 mg/gBB. Parameter yang diamati meliputi kadar glukosa darah serta gambaran histopatologi hati menggunakan pewarnaan *hematoksilin-eosin* (HE). Data dianalisis menggunakan Repeated Measures ANOVA, uji Kruskal–Wallis, dan Mann–Whitney. Hasil penelitian menunjukkan bahwa kelompok kontrol aloksan mengalami peningkatan kadar glukosa darah yang signifikan disertai kerusakan jaringan hati berupa degenerasi sel, nekrosis sel, dan sel radang. Pemberian ekstrak etanol daun salam menunjukkan perbaikan pada semua dosis. Dosis 150 mg/gBB menurunkan kadar glukosa darah dengan perbaikan histopatologi yang masih terbatas, sedangkan dosis 250 mg/gBB menunjukkan penurunan kadar glukosa darah yang lebih besar disertai perbaikan struktur hepatosit yang lebih jelas. Dosis 350 mg/gBB memberikan efek paling optimal, ditandai dengan penurunan kadar glukosa darah yang paling signifikan ($p < 0,05$) serta struktur jaringan hati yang mendekati normal dengan minimal degenerasi sel, sel radang, dan nekrosis sel, sehingga berpotensi dikembangkan sebagai agen antihiperglikemik dan hepatoprotektif berbasis bahan alam.

Kata kunci: Daun salam, glukosa darah, histopatologi hati, *Mus musculus*.

ABSTRACT

OPTIMIZATION OF BAY LEAF EXTRACT (*Syzygium polyanthum*) DOSAGE ON THE REDUCTION OF BLOOD GLUCOSE AND HISTOPATHOLOGICAL LIVER DAMAGE IN MICE (*Mus musculus* L.) INDUCED BY ALLOXAN

By

Dedi Perangin Angin

Hyperglycemia is a condition characterized by chronically elevated blood glucose levels that can lead to damage to vital organs, including the liver. Alloxan is a diabetogenic agent that induces diabetes by damaging pancreatic β cells through oxidative stress mechanisms and is widely used to establish experimental diabetes models in laboratory animals. Bay leaves (*Syzygium polyanthum*) contain bioactive compounds such as flavonoids, tannins, saponins, and alkaloids, which are known to possess antioxidant, antihyperglycemic, and hepatoprotective activities. This study aimed to evaluate the effects and determine the optimal dose of ethanol extract of bay leaves on the reduction of blood glucose levels and the improvement of liver histopathological features in alloxan-induced mice. This experimental study used male mice divided into five treatment groups. Hyperglycemia was induced by intraperitoneal administration of alloxan at a dose of 150 mg/kg body weight. The ethanol extract of bay leaves was administered orally for 14 days at doses of 150 mg/kg body weight, 250 mg/kg body weight, and 350 mg/kg body weight. The observed parameters included blood glucose levels and liver histopathological features using hematoxylin–eosin (HE) staining. Data were analyzed using Repeated Measures ANOVA, Kruskal–Wallis test, and Mann–Whitney test. The results showed that the alloxan control group experienced a significant increase in blood glucose levels accompanied by liver tissue damage, characterized by cellular degeneration, cellular necrosis, and inflammatory cell infiltration. Administration of the ethanol extract of bay leaves resulted in improvement at all tested doses. A dose of 150 mg/kg body weight reduced blood glucose levels with limited histopathological improvement, while a dose of 250 mg/kg body weight produced a greater reduction in blood glucose levels accompanied by more distinct improvement in hepatocyte structure. The dose of 350 mg/kg body weight demonstrated the most optimal effect, indicated by the most significant reduction in blood glucose levels ($p < 0.05$) and liver tissue structure approaching normal, with minimal cellular degeneration, inflammatory cells, and necrosis. These findings suggest that bay leaf ethanol extract has potential to be developed as a natural antihyperglycemic and hepatoprotective agent.

Keywords: Bay leaf, blood glucose, liver histopathology, *Mus musculus*.