

ABSTRAK

PENGARUH EKSTRAK DAUN DUWET (*Syzygium cumini* L.) TERHADAP TEKANAN INTRAOKULAR, KADAR *MALONDIALDEHYDE*, DAN AKTIVITAS *SUPEROXIDE DISMUTASE* TIKUS MODEL GLAUKOMA

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Glaukoma merupakan penyakit mata progresif yang ditandai oleh peningkatan tekanan intraokular (*intraocular pressure*/IOP) dan kerusakan saraf optik yang dapat menyebabkan kebutaan permanen. Terapi glaukoma masih berfokus pada penurunan IOP dan belum sepenuhnya menargetkan stres oksidatif yang berperan dalam progresivitas penyakit. Daun duwet (*Syzygium cumini* L.) mengandung senyawa antioksidan yang berpotensi dalam terapi glaukoma. Penelitian ini bertujuan untuk mengetahui potensi pengaruh ekstrak daun duwet terhadap tekanan intraokular, kadar *malondialdehyde* (MDA), dan aktivitas *superoxide dismutase* (SOD) pada tikus model glaukoma. Dua belas ekor tikus jantan galur Wistar dibagi menjadi empat kelompok, yaitu kontrol sehat, kontrol sakit, serta kelompok perlakuan ekstrak daun duwet dosis 250 dan 500 mg/kgBB secara oral selama 14 hari. Induksi glaukoma menggunakan injeksi deksametason subkonjungtiva. Pengukuran tekanan intraokular dilakukan pada hari ke-0, 7, 14, 21, dan 28 menggunakan tonometer iCare® TONOLAB, sedangkan kadar MDA dan aktivitas SOD diperiksa pada akhir penelitian. Analisis data menggunakan uji ANOVA. Hasil penelitian menunjukkan bahwa induksi deksametason meningkatkan nilai tekanan intraokular sebagai penanda glaukoma. Terapi ekstrak daun duwet menurunkan peningkatan IOP mata tikus glaukoma secara signifikan. Kadar MDA tikus model glaukoma sebesar $12,3 \pm 0,16$ nmol/mL. Terapi ekstrak biji duwet baik dosis 250 dan 500 mg/kg BB secara signifikan menurunkan kadar MDA pada tikus glaukoma, berturut-turut sebesar $3,27 \pm 0,29$ dan $1,84 \pm 0,16$ nmol/mL. Induksi deksametason menurunkan aktivitas SOD secara signifikan sebesar $33,9 \pm 4,12\%$, lebih rendah dibandingkan kelompok perlakuan dosis 250 mg/kgBB sebesar $63,0 \pm 2,78\%$ dan dosis 500 mg/kgBB sebesar $72,1 \pm 4,58\%$. Perbedaan kadar MDA dan aktivitas SOD antar kelompok menunjukkan hasil yang signifikan ($p < 0,05$). Pemberian ekstrak daun duwet (*Syzygium cumini* L.) efektif menurunkan peningkatan tekanan intraokular, kadar MDA, serta meningkatkan aktivitas SOD pada tikus model glaukoma.

Kata kunci: ekstrak daun duwet, glaukoma, stres oksidatif, *Syzygium cumini*, tekanan intraokular

ABSTRACT

THE EFFECT OF DUWET (*Syzygium cumini* L.) LEAF EXTRACT ON INTRAOCULAR PRESSURE, MALONDIALDEHYDE LEVELS, AND SUPEROXIDE DISMUTASE ACTIVITY IN A GLAUCOMA RAT MODEL

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Glaucoma is a progressive ocular disease characterized by increased intraocular pressure (IOP) and optic nerve damage that can lead to permanent blindness. Current glaucoma therapy primarily focuses on lowering IOP and does not fully target oxidative stress, which contributes to disease progression. Duwet (*Syzygium cumini* L.) leaves contain antioxidant compounds with potential therapeutic benefits in glaucoma management. This study aimed to evaluate the effects of duwet leaf extract on intraocular pressure, malondialdehyde (MDA) levels, and superoxide dismutase (SOD) activity in a rat model of glaucoma. Twelve male Wistar rats were divided into four groups: healthy control, glaucoma control, and treatment groups receiving oral duwet leaf extract at doses of 250 and 500 mg/kg body weight for 14 days. Glaucoma was induced by subconjunctival dexamethasone injection. Intraocular pressure was measured on days 0, 7, 14, 21, and 28 using an iCare® TONOLAB tonometer, whereas MDA levels and SOD activity were evaluated at the end of the study. Data were analyzed using analysis of variance (ANOVA). The results showed that dexamethasone induction increased intraocular pressure, indicating successful glaucoma induction. Administration of duwet leaf extract significantly reduced the elevated IOP in glaucomatous rats. Malondialdehyde levels in the glaucoma control group reached 12.3 ± 0.16 nmol/mL. Treatment with duwet leaf extract at doses of 250 and 500 mg/kg body weight significantly reduced MDA levels to 3.27 ± 0.29 and 1.84 ± 0.16 nmol/mL, respectively. Dexamethasone induction significantly decreased SOD activity to $33.9 \pm 4.12\%$, whereas SOD activity increased to $63.0 \pm 2.78\%$ and $72.1 \pm 4.58\%$ in the 250 and 500 mg/kg body weight treatment groups, respectively. Differences in MDA levels and SOD activity among groups were significant ($p < 0.05$). Administration of duwet leaf extract (*Syzygium cumini* L.) effectively reduced intraocular pressure and MDA levels while increasing SOD activity in a rat model of glaucoma.

Key words: duwet leaf extract, glaucoma, intraocular pressure, oxidative stress, *Syzygium cumini*