

UJI AKTIVITAS ANTIKARDIOTOKSISITAS EKSTRAK SAMBILOTO (*Andrographis paniculata*) PADA TIKUS WISTAR YANG DIINDUKSI DOKSORUBISIN

Angelina Zelima Br Napitupulu¹, Indah Saraswati², Desy Armalina³, Nani Maharani⁴

¹Fakultas Kedokteran, Universitas Diponegoro

²Departemen Biologi dan Biokimia, Fakultas Kedokteran, Universitas Diponegoro

³Departemen Anatomi dan Histologi, Fakultas Kedokteran, Universitas Diponegoro

⁴Departemen Farmakologi dan Terapi, Fakultas Kedokteran, Universitas Diponegoro

ABSTRAK

Latar Belakang: Doksorubisin dapat menyebabkan efek samping pada jantung yang berkaitan dengan peningkatan efek radikal bebas. Ekstrak sambiloto mengandung berbagai senyawa yang memiliki aktivitas antioksidan yang tinggi seperti flavonoid dan andrografolid yang mampu mengurangi efek radikal bebas.

Tujuan: Mengetahui aktivitas antikardiotoksitas ekstrak sambiloto melalui gambaran histopatologi jantung tikus Wistar yang diinduksi doksorubisin.

Metode: Penelitian ini merupakan penelitian eksperimental dengan desain *posttest only control group*. Sebanyak 25 ekor tikus Wistar jantan dibagi secara acak menjadi 5 kelompok. Kelompok kontrol sehat (KS) dan kontrol doksorubisin (K-) diberi pakan standar selama 14 hari. Kelompok perlakuan 1 (P1), perlakuan 2 (P2), dan perlakuan 3 (P3) diberi pakan standar dan ekstrak sambiloto dengan dosis berurutan yaitu 250, 500, dan 1000 mg/kgBB secara oral selama 14 hari. Kelompok K(-), P1, P2, dan P3 diinduksi doksorubisin 5 mg/kgBB pada hari ke-12, -13, dan -14 secara intraperitoneal. Pada hari ke-15, dilakukan terminasi dan dilakukan pembuatan preparat organ jantung. Dilakukan penghitungan rata-rata jumlah infiltrasi sel inflamasi dan diuji statistik.

Hasil: Jumlah rata-rata infiltrasi sel inflamasi pada kelompok KS = $0,00 \pm 0,00$; kelompok K(-) = $3,72 \pm 1,89$; kelompok P1 = $0,64 \pm 0,38$; kelompok P2 = $0,40 \pm 0,40$; dan kelompok P3 = $0,24 \pm 0,26$. Uji statistik menunjukkan tidak ada perbedaan bermakna jumlah rata-rata infiltrasi sel inflamasi antarkelompok ($p > 0,05$).

Kesimpulan: Ekstrak sambiloto memiliki aktivitas antikardiotoksitas melalui gambaran histopatologi jantung tikus Wistar yang diinduksi doksorubisin meskipun tidak berbeda bermakna secara statistik.

Kata Kunci: *Andrographis paniculata*, kardiotoksistas, doksorubisin

ABSTRACT

Background: Doxorubicin can cause side effects on the heart that are related to the increased free radical effects. Sambiloto extract contains various compounds that have high antioxidant activity such as flavonoids and andrographolide that can reduce the effects of free radicals.

Aim: To determine the anti-cardiotoxic activity of sambiloto extract through cardiac histopathology of doxorubicin-induced Wistar rats.

Method: This study is an experimental study with posttest only control group design. Twenty-five male Wistar rats were randomly divided into 5 groups. Healthy control (KS) and doxorubicin control (K-) groups were given standard feed for 14 days. Treatment group 1 (P1), treatment group 2 (P2), and treatment group 3 (P3)

were given standard feed and sambiloto extract with sequential doses of 250, 500, and 1000 mg/kgBB orally for 14 days. Group K(-), P1, P2, and P3 were induced doxorubicin 5 mg/kgBB on day -12, -13, -14 intraperitoneally. On day 15, termination was performed and heart organ preparations were made. The average number of inflammatory cell infiltration was calculated and statistically tested.

Result: The average number of inflammatory cell infiltration in group KS = $0,00 \pm 0,00$; group K(-) = $3,72 \pm 1,89$; group P1 = $0,64 \pm 0,38$; group P2 = $0,04 \pm 0,40$; and group P3 = $0,24 \pm 0,26$. Statistical tests showed no significant difference in the average number of inflammatory cell infiltration between groups ($p > 0,05$)

Conclusion: In doxorubicin-induced Wistar rats, sambiloto extract has anticardiototoxicity activity via cardiac histopathology, though the differences are not statistically significant.

Keyword: *Andrographis paniculata*, cardiototoxicity, doxorubicin

ANTICARDIOTOXICITY ACTIVITY OF SAMBILOTO EXTRACT IN DOXORUBICIN-INDUCED WISTAR RATS (Studi Antikardiotoksitas Ekstrak Sambiloto pada Wistar yang Diberi Doxorubicin)

Sambiloto extract (*Andrographis paniculata*) contains several active elements such as diterpenoids, flavonoids, and glycosides. These active elements have been reported to have anti-inflammatory, antidiabetic, and antioxidant properties. Doxorubicin is a cytotoxic agent that can cause cardiotoxicity. Doxorubicin-induced cardiotoxicity is characterized by myocarditis, pericarditis, and fibrosis. This study aims to determine the effect of sambiloto extract on doxorubicin-induced cardiotoxicity in Wistar rats. The study design used was a completely randomized design with four treatment groups. The first group (K-) did not receive doxorubicin, while the second group (KS) received doxorubicin only. The third group (P1) received sambiloto extract at a dose of 250 mg/kg body weight, and the fourth group (P2) received sambiloto extract at a dose of 500 mg/kg body weight. The fifth group (P3) received sambiloto extract at a dose of 1000 mg/kg body weight. The experiment was conducted for 14 days. On day 15, the experiment was terminated and heart organ preparations were made. The average number of inflammatory cell infiltration was calculated and statistically tested. The results showed that the average number of inflammatory cell infiltration in group KS = $0,00 \pm 0,00$; group K(-) = $3,72 \pm 1,89$; group P1 = $0,64 \pm 0,38$; group P2 = $0,04 \pm 0,40$; and group P3 = $0,24 \pm 0,26$. Statistical tests showed no significant difference in the average number of inflammatory cell infiltration between groups ($p > 0,05$). The conclusion is that sambiloto extract has anticardiototoxicity activity via cardiac histopathology, though the differences are not statistically significant.