

ABSTRACT

ORAL ACUTE TOXICITY TEST OF ETHANOL EXTRACT OF OIL MANGROVE (*Rhizophora apiculata*) BARK TOWARDS KIDNEY HISTOPATHOLOGY OF MALE WHITE RATS (*Rattus norvegicus*) Sprague-Dawley STRAIN WITH FIXED DOSE METHOD

By

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Background: *Rhizophora apiculata* is a type of mangrove plant that was previously identified to contain active components such as steroids, triterpenes, saponins, flavonoids, alkaloids, and tannins. The source of the active ingredients in mangrove plant extracts has been used as a traditional medicine in anticancer, antitumor, antidiabetic, and antimicrobial healing.

Methods: This study was designed to determine the acute toxicity effect of ethanol extract of mangrove oil bark against the kidneys of male white rats (*Rattus norvegicus*) Sprague Dawley strain using a fixed-dose method through preliminary and main tests. Ethanol extract from Mangrove oil bark was given to 4 treatment groups at doses of 5, 50, 300, and 2000 mg/kg BW (body weight) compared to the control group. These animals were observed continuously for 14 days to see whether there were signs of acute toxicity. On the 15th day, they were terminated for kidney organ harvesting. Data were analyzed using Kruskal-Wallis and continued with the Mann Whitney Post Hoc test.

Results: The results of this study suggested that there were no toxic symptoms such as seizures and death. The results of the average damage assessment of the microscopic appearance of the kidney, at doses of 5, 50, 300 and 2000 mg/kg BW, were 0.4; 0.6; 1.4; 2.4 and in the control group, the average damage was 0. The results of the Kruskal-Wallis test found $P < 0.05$, namely, there was a difference in the level of kidney damage between groups, while the results of the Mann Whitney Post Hoc test showed a significant difference between the control group and the treatment group 3 and 4.

Conclusion: In conclusion, administration of *Rhizophora apiculata* extract did not cause symptoms of acute toxicity clinically in white rats, however, histopathological examination of the kidneys at a dose of 300 mg/kg BW found inflammatory cells and a dose of 2000 mg/kg BW resulted in significant damage in the form of tubular thyroidization and inflammatory cells.

Keywords: Kidney histology, *Rhizophora apiculata*, Fixed dose method, Acute toxicity.

ABSTRAK

UJI TOKSISITAS AKUT ORAL EKSTRAK ETANOL KULIT BATANG BAKAU MINYAK (*Rhizophora apiculata*) TERHADAP HISTOPATOLOGI GINJAL TIKUS PUTIH (*Rattus norvegicus*) JANTAN GALUR *Sprague-Dawley* DENGAN METODE *FIXED DOSE*

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Latar Belakang: *Rhizophora apiculata* merupakan salah satu jenis tanaman bakau yang sebelumnya teridentifikasi mengandung komponen aktif seperti steroid, triterpene, saponin, flavonoid, alkaloid, dan tannin. Sumber bahan aktif dalam ekstrak tanaman bakau telah dimanfaatkan sebagai obat tradisional dalam penyembuhan antikanker, antitumor, antidiabetes, dan antimikroba.

Metode: Penelitian ini dirancang untuk menentukan efek toksisitas akut ekstrak etanol kulit batang tanaman bakau terhadap ginjal tikus putih (*Rattus norvegicus*) jantan Sprague Dawley dengan metode dosis tetap melalui uji pendahuluan dan uji utama. Ekstrak kulit batang bakau diberikan ke 4 kelompok perlakuan dengan dosis bertingkat 5, 50, 300, dan 2000 mg/kgBB yang dibandingkan dengan kelompok kontrol. Hewan-hewan tersebut diamati selama 14 hari terus menerus untuk melihat ada atau tidaknya tanda-tanda toksisitas akut dan pada hari ke 15 di terminasi untuk pengambilan organ ginjal. Data di analisis menggunakan *Kruskal-Wallis* dan dilanjutkan uji *Post Hoc Mann Whitney*.

Hasil: Hasil dari penelitian ini menunjukkan bahwa tidak ada gejala toksik seperti kejang hingga kematian. Hasil penilaian rata-rata kerusakan gambaran mikroskopis ginjal, pada dosis 5,50,300, dan 2000 mg/kgBB yaitu 0,4; 0,6; 1,4; 2,4 dan pada kelompok kontrol rerata kerusakan 0. Hasil dari uji *Kruskal-Wallis* didapatkan $P < 0,05$ yaitu terdapat perbedaan tingkatan kerusakan ginjal antar kelompok, sedangkan hasil uji *Post Hoc Mann Whitney* terdapat perbedaan yang bermakna antara kelompok kontrol dan kelompok perlakuan 3 dan 4.

Kesimpulan: Pemberian ekstrak *Rhizophora apiculata* tidak menyebabkan gejala toksisitas akut secara klinis pada tikus putih, namun pada pemeriksaan histopatologi ginjal dengan dosis 300mg/kgBB ditemukan sel radang dan dosis 2000 mg/kgBB mengakibatkan rusak secara signifikan berupa tiroidisasi tubulus, dan sel radang.

Kata kunci: Histologi ginjal, *Rhizophora apiculata*, Metode *fixed dose*, Toksisitas akut.