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AKTIVITAS ANTIOKSIDAN EKSTRAK ETANOL DAUN LOAM (*Cathormion umbellatum* (Vahl) Kosterm.) PADA ORGAN HATI DAN GINJAL MENCIT (*Mus musculus* Linnaeus, 1758) JANTAN

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ABSTRAK

Antioksidan memiliki peranan penting dalam menstabilkan ROS pemicu oksidatif stres. Tumbuhan Loam (*Cathormion umbellatum* (Vahl) Kosterm.) diketahui memiliki potensi sebagai sumber antioksidan. Pada penelitian ini dilakuakan uji toksisitas dan uji manfaat daun Loam untuk mengetahui pengaruh terhadap profil kimia darah, kadar *Superoxide Dismutase* /SOD, *Melondealdehyde* /MDA, dan profil metabolit organ hati dan ginjal mencit jantan yang diinduksi karbon tetraklorida/CCl_4. Daun Loam dibuat ekstrak dengan metode maserasi dan diuji toksisitas akutnya untuk menentukan dosis uji manfaat. Pada uji toksisitas, penelitian dilakukan dengan menggunakan 25 ekor mencit jantan yang terbagi atas 5 kelompok perlakuan. Menggunakan metode OECD:420, hewan uji diberikan ekstrak dengan dosis bertahap yaitu: dosis I kelompok kontrol dosis II 5 mg/kgbb; dosis III 50 mg/kgbb; dosis IV 300 mg/kgbb; dosis V 2000 mg/kgbb. Pada uji manfaat, mencit diinduksi karbon ketraklorida/CCL_4. Perlakuan menggunakan 30 mencit jantan berusia 8 pekan strain ddy dengan dosis I CMC Na 0.5 %; dosis II ekstrak 284 mg/kgbb; dosis III CCl_4; dosis IV CCl_4+vitamin C 200 mg/kgbb; dosis V CCl_4+ekstrak 71 mg/kgbb; dosis VI CCl_4+ekstrak 284 mg/kgbb. Karbon Tetraklorida diberikan 0,5 mL/kgbb satu hari pada awal perlakuan. Mencit diberikan ekstrak etanol daun Loam dengan cara sonde (*oral gavage*) selama 7 hari. Pengambilan darah dilakukan setelah 24 jam pemberian CCl_4 dan 24 jam setelah pemberian ekstrak terakhir kemudian dilakukan uji *Aspartate aminotransferase* (ALT), *Alanine Aminotransferase* (AST) dan *Alkaline Fosfatase* (ALP). Organ hati dan ginjal mencit diambil setelah 7 hari pemberian ekstrak untuk diukur kadar SOD, MDA dan profil metabolitnya menggunakan metode ^{1}H NMR. Data yang diperoleh dianalisis menggunakan SPSS 20, ANOVA satu arah dan Duncan. Hasil penelitian ini menunjukan bahwa setiap gram daun Loam mengandung flavonoid 19,8 mg (QE)/g. Uji toksisitas akut menunjukan tidak adanya hewan mati dan mengalami keracuanan hingga dosis 2000 mg/kgbb. Ekstrak daun Loam signifikan menurunkan enzim ALT dan ALP namun tidak signifikan pada enzim AST. Enzim SOD organ hati dan ginjal tidak berpengaruh signifikan terhadap kontrol. Analisis kadar MDA menunjukan bahwa ekstrak daun loam menurunkan kadar MDA hati namun tidak berpengaruh pada ginjal. Adapun pengukuran metabolit ^{1}H NMR menunjukan bahwa ekstrak daun Loam berpengaruh terhadap perbaikan metabolit organ hati setelah induksi oksidatif stres oleh CCl_4

Kata kunci: *Cathormion umbellatum*, Karbon tetraklorida, Antioksidan, Oksidatif stres

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Antioxidant Activity of Loam Leaf (*Cathormion umbellatum* (Vahl) Kosterm.) Ethanol Extract in Liver and Kidney of Male Mice (*Mus musculus* Lin, 1758)

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ABSTRACT

Antioxidants have an important role in stabilizing ROS that trigger oxidative stress. Loam (*Cathormion umbellatum* (Vahl) Kosterm.) is known to have the potential as a source of antioxidants. In this research, a toxicity test and a benefit test of Loam leaf were carried out to determine its effects on blood profiles, *Superoxide Dismutase*/SOD levels, *Melondealdehyde* /MDA levels, and liver and kidney metabolite profiles of carbon tetrachloride/CCl_4-induced mice. Loam leaves were extracted by maceration method and tested for its acute toxicity to determine the efficacy of the test dose. This research used 25 male mice which were divided into 5 treatment groups and a control group for the toxicity test. Base on OECD:420 method, the experimental animals were given the extract in gradual doses, namely: dose I of 5 mg/kg bw; dose II of 50 mg/kg bw; dose II of 300 mg/kg bw; and dose IV of 2000 mg/kg bw. Further test male mice were given carbon tetrachloride (CCl_4) to induce oxidative stress. 0.5 mL/kg bw of CCl_4 was given once at the beginning of the treatment. This research used 30 male mice (age 8 weeks) that were grouped into 6 namely: dose I of CMC Na 0.5 %; dose II of 284 mg/kg bw extract; dose III of CCL_4; dose IV of CCl_4+ vitamin C 200 mg/kg bw; dose V CCl_4+ 71 mg/kg bw extract and dose VI CCl_4+284 mg/kg bw. Furthermore, the mice were given ethanol extract of Loam leaf by oral gavage for 7 days. Blood sampling was carried out 24 hours after the administration of CCl4 and 24 hours after the last administration of the extract for further testing of *alanine aminotransferase* (ALT), *aspartate aminotransferase* (AST), and *alkaline phosphatase* (ALP). After 7 days of administration of the extract, the mice were dissected to take their liver and kidneys, and then the levels of SOD, MDA, and their metabolomic profile were measured using the ^{1}H NMR method. The obtained data were analyzed using SPSS 21 one-way ANOVA and Duncan. Based on the results of this research showed every gram of Loam leaf contains falavonoid 19.8 mg (QE)/g. The acute toxicity test showed that there were no dead and poisoned animals up to a dose of 2000 mg/kgbw. Loam leaf extract significantly decreased ALT and ALP enzymes but did not significantly reduce AST enzymes. The liver and kidney SOD enzymes had no significant effect on the controls. Analysis MDA levels showed that Loam leaf extract reduced liver MDA levels but had no effect on the kidneys. The measurement of ^{1}H NMR metabolites showed that Loam leaf extract had an effect on the improvement of liver metabolites in CCl_4-induced mice.

Keywords: *Cathormion umbellatum*, Carbon tetrachloride, Antioxidant, Oxidative stress