

ABSTRAK

Penggunaan timbal yang semakin meluas di masyarakat, secara langsung meningkatkan paparan terhadap toksisitas timbal. Timbal mengakibatkan stres oksidatif dengan membentuk *reactive oxygen species* (ROS) dan menurunkan aktivitas superoxide dismutase (SOD), Lumut hati (*Marchantia polymorpha*) memiliki kandungan senyawa bioaktif yang mampu berfungsi sebagai antioksidan. Tujuan dari penelitian ini adalah untuk mengetahui efek ekstrak lumut hati terhadap fungsi hati, aktivitas SOD dan ekspresi protein stres HSP 70 pada organ hati tikus putih (*Rattus norvegicus*) setelah induksi timbal. Penelitian ini menggunakan RAL faktorial dengan variasi dosis dan waktu. Sebanyak 52 ekor tikus putih jantan galur Wistar dikelompokkan ke dalam 12 perlakuan, masing-masing 4 ulangan, 4 ekor sisanya digunakan untuk pengambilan data toksisitas timbal. Tikus perlakuan diberikan timbal 700 mg/kg BB *per oral* selama 7 hari kemudian 1 kelompok dikorbankan untuk pengambilan data toksisitas timbal. Kelompok lain diberikan perlakuan ekstrak pada hari ke-8. Variasi dosis ekstrak yang diberikan adalah 100, 200, dan 300 mg/Kg BB, sedangkan variasi waktu terminasi setelah pemberian ekstrak adalah 5 dan 10 hari. Aktivitas SOD dan kadar ALT diukur secara biokimia menggunakan kit dan pembacaan absorbansi spektrofotometer, sedangkan ekspresi protein stres HSP 70 dievaluasi menggunakan *western blot*. Data diolah dengan ANOVA dan uji lanjut DMRT. Timbal dengan dosis 700 mg/Kg BB memiliki efek nyata meningkatkan kadar ALT dan menurunkan aktivitas SOD. Ekstrak dengan dosis 100 mg/Kg BB dapat menurunkan kadar ALT dan meningkatkan aktivitas SOD. Dosis optimum yang diperoleh adalah 100 mg/Kg BB 9 hari pemberian ekstrak. Pita protein HSP 70 belum terdeteksi hingga jumlah total protein 35µg.

Kata kunci : stres oksidatif, HSP 70, SOD, ALT, lumut hati (*M. polymorpha*)

ABSTRACT

Large expansion of lead (Pb) usage in society directly increases exposure to its toxicity. Lead cause oxidative stress in which generates Reactive Oxygen Species (ROS) and decreases Superoxide dismutase (SOD) activity. Cellular oxidative stress can be indicated from increased expression of HSP 70 protein. Oxidative stress which is caused by lead toxicity stimulates damages cell thus this leads to liver malfunction that is indicated from increased ALT in blood serum. Liverwort (*Marchantia polymorpha* L.) has bioactive compound that serve as antioxidant. The purpose of this research is to study liverwort extract effect on liver oxidative damage of rat after lead exposure based on ALT level in blood, SOD activity and HSP 70 expression. This study used 52 adult male Wistar rat weighed 150-200 g which then randomly assigned into 12 groups of 4. Four animals in different group used for lead toxicity examine. Lead nitrate 700 mg/Kg body weight treated orally every day until 7 days whereas control group treated distilled water. One of lead treated group animals were sacrificed at 8th days to evaluate lead toxicity. The other treatment group were given orally by liverwort extract. Various time termination of extract treatment are 5 and 10 days with various doses are 100, 200, and 300 mg/Kg body weight. In the time termination animals were sacrificed to evaluate the liverwort extract effect on liver oxidative damage of rat after lead exposure. SOD and ALT level evaluated using biochemical assay procedure while HSP 70 expression was analyzed by western blot method. The One-way analysis of variance (ANOVA) was performed to test for significance followed by DMRT for comparisons between the groups. Result showed that lead nitrate 700 mg/Kg body weight significantly increased ALT level and decreased SOD activity. However, HSP 70 couldn't be detected within 35µg total protein. Liverwort extract 100 mg/Kg body weight in 9 days treatment significantly decreased ALT level and increased SOD activity.

Keyword: oxidative stress, HSP 70, ALT, SOD, liverwort (*M. polymorpha*)