

Brief Report

Red Dragon Fruit Extract (*Hylocereus polyrhizus*) Restores Learning Ability and Memory on Test Animals Post Lead Exposure: Experimental Study on Test Animals

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The aim of this study was to analyze whether red dragon fruit (*Hylocereus polyrhizus*) administration affect learning ability and memory after lead exposure. A randomized control-group pretest-posttest was conducted with 24 mice (*Mus musculus*), which was divided through a random assignment into four groups: G1, G2, G3, and G4. Group G1 received 1.16 mg/10 g BW lead acetate. Group G2, G3, and G4 received 1.16 mg/10 g BW lead acetate and red dragon fruit extract 250 mg/kg BW (G2), 500 mg/kg BW (G3), and 1000 mg/kg BW (G4). Results revealed that some groups that has been given red dragon fruit extract (group G2, G3, and G4) showed significant improvement of latency time, frequency, and combined scoring value of latency time and frequency in posttest by using Morris Water Maze compared to the control group ($p = .001$; $\alpha = .05$). The improvement of group G3 and G4 was better than group G2. These finding indicates that administration of red dragon fruit extract have a protective effect and improves learning ability and memory after lead exposure with 500-1000 mg/kg BW as the best dose.

Keywords: red dragon fruit extract, lead acetate, learning ability, memory

Tujuan studi ini adalah menganalisis efek pemberian ekstrak buah naga merah (*Hylocereus polyrhizus*) pada kemampuan belajar dan mengingat pasca-paparan timbal. Rancangan randomized control-group pretest-posttest dilakukan terhadap 24 ekor mencit (*Mus musculus*) yang melalui random assignment terbagi kedalam empat kelompok: kelompok K1, K2, K3, dan K4. Kelompok K1 diberikan 1.16 mg/10 g BB timbal asetat. Kelompok K2, K3, dan K4 diberikan timbal asetat 1.16 mg/10 g BB dan ekstrak buah naga merah masing-masing dengan dosis 250 mg/kgBB (K2), 500 mg/kgBB (K3), dan 1000 mg/kg BB (K4). Hasil tes ANOVA menunjukkan bahwa pada kelompok yang diberikan ekstrak buah naga merah (K2, K3, dan K4) terjadi peningkatan waktu laten, frekuensi dan angka skoring gabungan dengan menggunakan Morris Water Maze dibandingkan kelompok K1 ($p = .001$; $\alpha = .05$). Peningkatan pada kelompok K3 dan K4 lebih baik daripada kelompok K2. Simpulan penelitian ini adalah pemberian ekstrak buah naga merah memiliki efek proteksi dan dapat memperbaiki kemampuan belajar dan memori pasca-paparan timbal dan dosis 500-1000 mg/kg BB memiliki potensi lebih baik dalam memulihkan kemampuan belajar dan memori pasca-paparan timbal.

Kata kunci: ekstrak buah naga merah, timbal asetat, kemampuan belajar, ingatan

Major developments in the mining and industry sectors have caused an increased number of exploitation of earth's resources of metal, which includes lead. As

a result, humans become more susceptible to lead exposure. Lead exposure can affect humans through a number of routes such as inhalation, ingestion, and vertical transmission from mother to child through the placenta. Accumulation of lead in humans can cause oxidative stress through the production of Reactive Oxygen Species (ROS), which ultimately results in

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