

# Pengaruh Ekstrak Etanol Buah Mahkota Dewa (*Phaleria macrocarpa*) Terhadap Kadar Malondialdehid (MDA) pada Ginjal Tikus Sprague-Dawley yang Diberi Besi Berlebih = Effect of Ethanol Extract of *Phaleria macrocarpa* Fruits on Kidney Malondialdehyde (MDA) Level in Sprague-Dawley Rats Induced by Iron Overload

Kelvin Kohar, author

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## Abstrak

Latar belakang: Besi berlebih dalam tubuh manusia dapat memicu stress oksidatif dan menyebabkan kerusakan ginjal. Malondialdehid (MDA) merupakan produk samping peroksidasi lipid akibat stres oksidatif. Penelitian menunjukkan bahwa senyawa mangiferin yang terkandung dalam buah *Phaleria macrocarpa* bermanfaat sebagai pengkelat besi. Penelitian ini bertujuan untuk menganalisis efektivitas ekstrak etanol buah *Phaleria macrocarpa* dalam menurunkan kadar MDA pada ginjal tikus yang diberi besi berlebih. Metode: 30 tikus Sprague-Dawley dibagi dalam 6 kelompok, yaitu normal, kontrol negatif, Deferiprone 462,5 mg/kgBB, Mangiferin 50 mg/kgBB, ekstrak etanol *Phaleria macrocarpa* 100 mg/kgBB, dan 200 mg/kgBB. Kelompok perlakuan diinjeksikan besi sukrosa intraperitoneal (15 mg/kali) dua kali seminggu selama tiga minggu, dilanjutkan perlakuan sesuai kelompok. Pada minggu ke-7, organ ginjal diambil untuk dibuat homogenat yang selanjutnya diukur kadar proteinnya menggunakan metode Bradford. Kadar MDA diukur dengan Thiobarbituric Acid menggunakan spektrofotometer 530 nm, kemudian hasilnya dibagi kadar protein (nmol/mg protein). Uji statistik yang digunakan berupa perbandingan rerata >2 kelompok menggunakan One-Way ANOVA. Hasil: Semua kelompok induksi besi mengalami peningkatan MDA secara signifikan dibandingkan kelompok tanpa perlakuan. Pemberian mangiferin dan ekstrak etanol *Phaleria macrocarpa* 100 mg/kgBB berhasil menurunkan kadar MDA secara signifikan dibandingkan kelompok kontrol negatif. Selain itu, dosis 100 mg/kgBB juga memiliki hasil yang paling mendekati nilai normal ( $3,876 \pm 0,248$  vs  $2,890 \pm 0,497$ ). Namun, pemberian dosis 200 mg/kgBB menunjukkan hasil kadar MDA yang paling tinggi ( $4,868 \pm 0,774$  nmol/mg protein). Kesimpulan: Pemberian ekstrak etanol buah *Phaleria macrocarpa* 100 mg/kgBB dapat menurunkan kadar MDA ginjal tikus Sprague-Dawley yang paling baik dibandingkan dosis 200 mg/kgBB maupun kontrol positif.

.....Introduction: Iron overload in human body may induce oxidative stress and kidney failure.

Malondialdehyde (MDA) is byproduct of oxidative stress induced lipid peroxidation. Studies shown that Mangiferin in *Phaleria macrocarpa* fruit also useful as chelator agent. This study aims to analyze the effectivity of *Phaleria macrocarpa* fruits ethanol extract on reducing kidney Malondialdehyde (MDA) levels in rats induced by iron overload. Method: Thirty Sprague-Dawley rats were divided into six groups: normal, negative control, Deferiprone 462.5 mg/kgBW, Mangiferin 50 mg/kgBW, Ethanol extract of *Phaleria macrocarpa* 100 mg/kgBW, and 200 mg/kgBW. Intervention groups received iron sucrose intraperitoneally (15 mg/times) biweekly for three weeks, followed by corresponding group intervention. At week 7, kidneys were taken to make homogenate. Each sample homogenate was measured its protein using Bradford and MDA level using Thiobarbituric Acid method by spectrophotometer 530 nm (nmol/mg protein). Statistical test used was mean difference among >2 groups using One-Way ANOVA. Result: Iron overload induction groups were associated with significantly higher MDA levels than normal. The administration of mangiferin

and ethanol extract 100 mg/kgBW successfully reduced MDA level significantly compared to negative control. Besides, 100 mg/kgBW dose group had the closest MDA to normal ( $3.876 \pm 0.248$  vs.  $2.890 \pm 0.497$ ). However, dose of 200 mg/kgBW showed the highest MDA ( $4,868 \pm 0,774$  nmol/mg protein). Conclusion: The administration of 100 mg/kgBW Phaleria macrocarpa fruits ethanol extract was associated with the best reduction of kidney MDA level in Sprague-Dawley rats induced by iron overload compared to either 200 mg/kgBW dose or positive control.