

## Aktivitas antioksidan -mangostin terhadap biomarker stres oksidatif pada hati tikus dengan diabetes mellitus tipe 2 = Effects of -mangostin on oxidative stress biomarkers in type 2 diabetes mellitus induced rat's liver

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### Abstrak

Latar belakang: Kondisi hiperglikemi pada diabetes mellitus dapat menyebabkan stress oksidatif akibat ketidakseimbangan oksidan dan antioksidan. Pada hati, komplikasi terberat dari stres oksidatif adalah non-alcoholic fatty liver disease (NAFLD). Hingga saat ini, metformin merupakan drug of choice pengobatan diabetes mellitus tipe 2 (DMT2), namun dapat menimbulkan efek samping yang menurunkan kepatuhan berobat pasien seperti mual, muntah, dan diare. Tujuan: Penelitian ini dilakukan untuk menilai aktivitas antioksidan -mangostin terhadap kadar malondialdehid (MDA) dan glutation (GSH) hati tikus dengan DMT2 sebagai kandidat obat alternatif metformin untuk menangani stres oksidatif pada DMT2. Metode: Penelitian dilakukan terhadap tikus Wistar jantan (usia 10-12 minggu) dan dibagi menjadi enam kelompok uji: normal, normal+-mangostin 200mg/kgBB, DMT2, DMT2+metformin 200mg/kgBB, DMT2+-mangostin 100mg/kgBB, dan DMT2+-mangostin 200mg/kgBB. Kelompok DMT2 diinduksi dengan diet tinggi lemak dan glukosa, lalu diinjeksi streptozotocin. Kadar MDA dan GSH kemudian diukur dengan kit pemeriksaan pada jaringan hati yang telah disimpan dalam suhu -80°C setelah tikus-tikus di-sacrifice. Hasil: -mangostin 100 mg/kgBB memberikan hasil paling baik, yaitu selisih terbesar kadar biomarker dibandingkan keadaan DMT2, di mana terjadi penurunan kadar MDA yang signifikan ( $p=0.038$  vs DMT2) dan peningkatan kadar GSH signifikan ( $p=0.029$  vs DMT2). Kesimpulan: -mangostin mampu mempengaruhi kadar MDA dan GSH pada hati tikus dengan DMT2.

.....Background: The hyperglycaemic condition in diabetes mellitus causes oxidant and antioxidant imbalance, leading to oxidative stress. In the liver, the worst possible complication of oxidative stress is non-alcoholic fatty liver disease (NAFLD). So far, metformin is the drug of choice for treating type 2 diabetes mellitus (T2DM), but it has possibilities of causing nausea, vomiting, and diarrhoea, thereby disrupting patient compliance. Objectives: This study aims to investigate -mangostin's antioxidant activity towards malondialdehyde (MDA) and glutathione (GSH) levels in T2DM rats' liver as a candidate alternative of metformin to treat oxidative stress in T2DM. Methods: Research is conducted towards male Wistar rats (age 10-12 weeks) separated into six groups: normal, normal+-mangostin 200mg/kgBW, T2DM, T2DM+metformin 200mg/kgBW, T2DM+-mangostin 100mg/kgBW, and T2DM+-mangostin 200mg/kgBW. T2DM groups were induced with high fat-high glucose diet and streptozotocin injection. MDA and GSH levels were obtained with the appropriate assay kit of liver tissues (refrigerated at -80°C) after the rats were sacrificed. Results: 100mg/kgBW dose of -mangostin yields the best results (highest biomarker levels difference than T2DM group). It significantly decreased MDA levels ( $p=0.038$  vs T2DM) and significantly increased GSH levels ( $p=0.029$  vs T2DM). Conclusion: -mangostin is able to affect MDA and GSH levels in T2DM rats' liver.