

Pengaruh Hibiscus sabdariffa Linn. terhadap Stres Oksidatif Jantung Tikus pada Kondisi Overtraining: Kajian terhadap Malondialdehid (MDA), Superoxide Dismutase (SOD), Glutathione (GSH), dan NADPH Oxidase (Nox2) = Effect of Hibiscus sabdariffa Linn. on Oxidative Stress in heart of Overtrained Rat: Study on Malondialdehyde (MDA), Superoxide Dismutase, Glutathione (GSH) and NADPH Oxidase 2 (Nox2)

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Abstrak

Latar belakang: Akumulasi volume latihan fisik yang berlebihan (overtraining/OT), dalam jangka panjang dapat menimbulkan penurunan performa yang disebut overtraining syndrome (OTS). Patofisiologi OTS banyak dihubungkan dengan stress oksidatif, kondisi ketidakseimbangan antara radikal bebas dan antioksidan endogen, yang dapat berujung pada gangguan kardiovaskular. Beberapa penelitian menunjukkan bahwa stres oksidatif dapat dihambat melalui suplementasi antioksidan. Hibiscus Sabdariffa Linn. (*H. sabdariffa*) adalah tanaman yang mengandung antioksidan tinggi.

Tujuan: Melihat efek OT terhadap tingkat stress oksidatif jantung tikus dan efek pemberian *H. sabdariffa* terhadap stress oksidatif jantung tikus OT.

Metode: Studi eksperimental menggunakan 25 tikus Wistar dewasa, 8-10 minggu, 300-350 gr, diacak menjadi lima kelompok: Kontrol (C), Kontrol+Hibiscus (C-Hib), Latihan Aerobik (A), Overtraining (OT) dan Overtraining+Hibiscus (OT-Hib). Dosis *H. sabdariffa* yang diberikan: 500 mg/kgBB/hari. Latihan fisik (A dan OT) dilakukan 5x/minggu selama 11 minggu. Dihitung kadar MDA, SOD dan GSH pada jantung tikus menggunakan spektrofotometri dan Nox2 pada jantung tikus menggunakan ELISA pada akhir Minggu 11.

Hasil: Pada kelompok OT-Hib kadar MDA secara bermakna mengalami penurunan, kadar GSH secara bermakna mengalami peningkatan, didukung dengan kadar SOD yang cenderung meningkat, namun tidak signifikan, dan Nox2 mengalami peningkatan yang tidak signifikan.

Kesimpulan: Overtraining menyebabkan kondisi stres oksidatif pada jaringan jantung tikus dan pemberian suplementasi *H. sabdariffa* memiliki potensi menangani stres oksidatif pada jantung tikus overtraining

*Background: Accumulation of overtraining/OT volume, in the long run can lead to decreased performance called overtraining syndrome (OTS). Pathophysiology of OTS is associated with oxidative stress, a condition of imbalance between free radicals and endogenous antioxidants, which can lead to cardiovascular disorders. Some research shows that oxidative stress can be inhibited through antioxidant supplementation. Hibiscus Sabdariffa Linn. (H. sabdariffa) is a plant that contains high antioxidants.*

*Objective: This study was to look at the effect of OT on rat heart oxidative stress levels and the effect of giving H. sabdariffa to oxidative stress in OT rats.*

*Methods: The study was an experimental study using 25 adult Wistar rats, 8-10 weeks, 300-350 gr, randomized into five groups: Control (C), Control + Hibiscus (C-Hib), Aerobic Exercise (A), Overtraining (OT) and Overtraining + Hibiscus (OT-Hib). Dosage of H. sabdariffa given: 500 mg/kg/day. Physical exercise (A and OT) is given 5x/week for 11 weeks. Calculated levels of MDA, SOD and GSH using*

spectrophotometry and Nox2 using ELISA at the end of Week 11.

Results: In the OT-Hib group, MDA levels significantly decreased, GSH levels significantly increased, supported by SOD levels which tended to increase, but were not significant, and Nox2 experienced an insignificant increase.

Conclusion: Overtraining can causes oxidative stress conditions in rat heart tissue, and supplementation of Hibiscus sabdariffa Linn. can handle oxidative stress in overtraining rat's heart.</i>