

PENGARUH NANOEMULSI PURWOCENG TERHADAP KADAR TESTOSTERON SERUM, VOLUME TESTIS DAN HISTOPATOLOGI TESTIS TIKUS PUTIH WISTAR JANTAN PASCA INDUKSI STRES MODEL *PARADOXICAL SLEEP DEPRIVATION*

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ABSTRAK

Latar belakang: Pengurangan durasi tidur dapat menimbulkan kerusakan multi organ yang berkaitan dengan mekanisme stres oksidatif. Stres oksidatif berkontribusi pada stress kronis menyebabkan perubahan pada testis seperti penurunan jumlah dan diameter tubulus seminiferus, serta penurunan jumlah ukuran sel leydig dan sel spermatogenik. Purwoceng (*Pimpinella pruatjan* Molk.) adalah tanaman herbal asli Indonesia yang diketahui memiliki aktivitas antioksidan. Nanoemulsi dikembangkan dari ekstrak etanol Purwoceng sebagai peningkatan kualitas sediaan. **Tujuan :** Penelitian ini bertujuan untuk mengetahui pengaruh nanoemulsi purwoceng terhadap kadar testosterone serum, volume testis dan histopatologi testis tikus putih Wistar jantan pasca induksi stres Paradoxical Sleep Deprivation. **Metode:** Penelitian berupa eksperimental dengan desain post-test only with control group. Sebanyak 24 ekor tikus dibagi menjadi 6 kelompok perlakuan. Kelompok A diberi PSD, kelompok B diberi PSD dan sleep recovery, kelompok C diberi PSD dan ekstrak purwoceng 25 mg/300 gBB/hari, kelompok D diberi PSD dan nanoemulsi purwoceng 25 mg/300 gBB/hari, kelompok E diberi PSD dan nanoemulsi purwoceng 50 mg/300 gBB/hari, dan kelompok F diberi PSD dan nanoemulsi purwoceng 75 mg/300 gBB/hari. Kadar testosterone serum diukur dengan metode ELISA. Organ testis diambil untuk mengukur volume dan histopatologi testis yang ditentukan menggunakan software Image J. Data dianalisis dengan uji One Way ANOVA dan dilanjutkan uji Post Hoc Bonferroni. **Hasil:** Terdapat perbedaan bermakna pada kadar testosterone serum, volume testis dan histopatologi testis ($p < 0,005$). **Kesimpulan:** Pemberian nanoemulsi purwoceng menunjukkan perbedaan yang bermakna pada kadar testosterone serum, volume testis, dan histopatologi testis pasca induksi PSD.

Kata kunci: nanoemulsi purwoceng, sleep deprivation, kadar testosterone serum, volumetestis, histopatologi

**THE EFFECT OF PURWOCENG NANOEMULSION ON SERUM
TESTOSTERONE LEVELS, TESTICULAR VOLUME AND TESTICULAR
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MODEL**

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ABSTRACT

Background: Stress is a non-specific response of the body to all threats. The body's response is in the form of a gradual adaptation process and causes physiological to maladaptive changes. Reducing sleep duration can cause multi-organ damage related to oxidative stress mechanisms. Oxidative stress contributes to chronic stress causing changes in the testes such as a decrease in the number and diameter of the seminiferous tubules, as well as a decrease in the number of Leydig cells and spermatogenic cells. Purwoceng (*Pimpinella pruatjan* Molck.) is a native Indonesian herbal plant which is known to have antioxidant activity. Nanoemulsion was developed from Purwoceng ethanol extract as a preparation quality improvement. **Purpose :** This study aims to determine the effect of purwoceng nanoemulsion on serum testosterone levels, testicular volume and testicular histopathology of male Wistar rats after stress induction of Paradoxical Sleep Deprivation for 96 hours. **Methods:** This research is an experimental study with a post-test only design with a control group. A total of 24 rats were divided into 6 treatment groups. Group A was given PSD, group B was given PSD and sleep recovery, group C was given PSD and purwoceng extract 25 mg/300 gBW/day, group D was given PSD and purwoceng nanoemulsion 25 mg/300 gBW/day, group E was given PSD and purwoceng nanoemulsion 50 mg/300 gBW/day, and group F was given PSD and purwoceng nanoemulsion 75 mg/300 gBW/day. Serum testosterone levels were measured by the ELISA method. Testicular organs were taken to measure testicular volume and histopathology determined using Image J software. Data were analyzed by One Way ANOVA test and followed by Bonferroni Post Hoc test. **Results:** There were significant differences in serum testosterone levels, testicular volume and testicular histopathology ($p < 0.005$). **Conclusion:** Administration of purwoceng nanoemulsion affected serum testosterone levels, testicular volume, and testicular histopathology after PSD induction.

Keywords: purwoceng nanoemulsion, sleep deprivation, serum testosterone levels, testicular volume, histopathologist