

PENGARUH PEMBERIAN PROTEIN SEL TUNGGAL *Bacillus* sp. TERHADAP KUALITAS SPERMATOZOA PADA MENCIT JANTAN

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ABSTRAK

Kualitas spermatozoa merupakan salah satu determinan utama fertilitas pria yang sangat dipengaruhi oleh kecukupan nutrisi. Protein, sebagai komponen esensial dalam proses spermatogenesis dan pematangan spermatozoa, berperan penting dalam mempertahankan motilitas, viabilitas, konsentrasi, serta morfologi normal spermatozoa. Salah satu sumber protein alternatif yang berpotensi dimanfaatkan adalah protein sel tunggal (PST) yang dihasilkan oleh mikroorganisme, seperti *Bacillus* sp. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian PST *Bacillus* sp. terhadap kualitas spermatozoa mencit jantan. Metode yang digunakan dalam penelitian ini adalah metode eksperimen dengan Rancangan Acak Lengkap (RAL) menggunakan 24 ekor mencit jantan galur Swiss Webster berusia 8 minggu dengan berat badan 30 gram yang dibagi ke dalam 4 kelompok perlakuan yaitu P0 (kontrol), P1 (50 mg/kgBB), P2 (100 mg/kgBB), dan P3 (150 mg/kgBB). Parameter yang diamati meliputi berat testis, motilitas, viabilitas, konsentrasi, morfologi normal, dan morfologi abnormal spermatozoa. Data dianalisis menggunakan uji *One Way ANOVA* dilanjutkan *Post Hoc Duncan*. Hasil penelitian menunjukkan bahwa pemberian PST *Bacillus* sp. Perlakuan P3 (150mg/kgBB) berpengaruh nyata ($p < 0,05$) terhadap peningkatan berat testis ($0,439 \pm 0,041$ gram), motilitas spermatozoa ($64 \pm 8,98\%$), viabilitas spermatozoa ($66 \pm 1,91\%$), morfologi normal spermatozoa ($65 \pm 3,82\%$), dan konsentrasi spermatozoa ($180,27 \pm 7,78$) $\times 10^6/\text{mL}$, serta penurunan morfologi abnormal spermatozoa ($35 \pm 3,82\%$) dibandingkan kelompok perlakuan lainnya. Berdasarkan hasil penelitian dapat disimpulkan bahwa PST *Bacillus* sp. berpotensi meningkatkan kualitas spermatozoa dan berat testis mencit jantan pada dosis 150mg/kgBB.

Kata Kunci : *Bacillus* sp., kualitas spermatozoa, protein sel tunggal, spermatogenesis

THE EFFECT OF PROVIDING SINGLE CELL PROTEIN FROM *Bacillus* sp. ON SPERMATOZOA QUALITY IN MALE MICE

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ABSTRACT

Spermatozoa quality is one of the main determinants of male fertility and is strongly influenced by nutritional adequacy. Protein, as an essential component in the process of spermatogenesis and spermatozoa maturation, plays an important role in maintaining spermatozoa motility, viability, concentration, and normal morphology. One alternative protein source with potential for utilization is single cell protein (SCP) produced by microorganisms, such as *Bacillus* sp. This study aimed to determine the effect of *Bacillus* sp. SCP administration on the spermatozoa quality of male mice. The method used in this study was an experimental method with a Completely Randomized Design (CRD), involving 24 male Swiss Webster mice aged 8 weeks with an average body weight of 30 g, divided into four treatment groups: P0 (control), P1 (50 mg/kg BW), P2 (100 mg/kg BW), and P3 (150 mg/kg BW). The observed parameters included testicular weight, spermatozoa motility, viability, concentration, normal morphology, and abnormal morphology. The data were analyzed using One-Way ANOVA followed by Duncan's post hoc test. The results showed that *Bacillus* sp. SCP administration in the P3 treatment group (150 mg/kg BW) had a significant effect ($p < 0.05$) on increasing testicular weight (0.439 ± 0.041 g), spermatozoa motility ($64 \pm 8.98\%$), spermatozoa viability ($66 \pm 1.91\%$), normal spermatozoa morphology ($65 \pm 3.82\%$), and spermatozoa concentration ($180.27 \pm 7.78 \times 10^6/\text{mL}$), as well as reducing abnormal spermatozoa morphology ($35 \pm 3.82\%$) compared with the other treatment groups. Based on these findings, it can be concluded that *Bacillus* sp. SCP has the potential to improve spermatozoa quality and testicular weight in male mice at a dose of 150 mg/kg BW.

Keywords: *Bacillus* sp., spermatozoa quality, single cell protein, spermatogenesis