PERAN METABOLIT SEKUNDER DAUN SUNGKAI (*Peronema canescens* Jack*)* SEBAGAI ANTIOKSIDAN DALAM MENURUNKAN FRAGMENTASI DNA PADA PREVERSASI SPERMATOZOA SAPI BALI

INTISARI

RIRIN NOVITA
22/508218/SPT/00247

Penelitian ini bertujuan untuk mengevaluasi potensi daun sungkai (*Peronema canescens* Jack) sebagai antioksidan dalam preservasi spermatozoa sapi Bali melalui tiga tahap penelitian. Tahap I bertujuan menentukan jenis pelarut ekstraksi yang menghasilkan ekstrak daun sungkai dengan aktivitas antioksidan tertinggi. Uji fitokimia, kadar fenolik, flavonoid, dan aktivitas antioksidan metode DPPH dilakukan untuk menilai potensi ekstrak. Hasil menunjukkan bahwa ekstrak etanol 70% memiliki kandungan fenolik dan flavonoid tertinggi (40,23 mg GAE/g dan 17,63 mg GAE/g) serta aktivitas antioksidan paling kuat (IC_{50} 26,24 µg/mL). Tahap II menganalisis efektivitas ekstrak daun sungkai dalam mempertahankan kualitas semen cair selama penyimpanan dingin. Empat perlakuan digunakan yaitu 0%; 0,10%; 0,15%; dan 0,20%. Parameter meliputi motilitas, viabilitas, abnormalitas, integritas membran plasma utuh. Data dianalisis menggunakan analisis variansi (ANOVA) satu arah, dilanjutkan dengan uji Tukey HSD (*Honest Significant Difference*). Analisis ragam menunjukkan bahwa level 0,15% memberikan kualitas terbaik, dengan motilitas 83,40±1,44%, viabilitas 83,95±1,08%, abnormalitas 9,82±0,47%, dan membran plasma utuh 87,50±1,07%, serta berbeda nyata dibanding kontrol. Tahap III mengevaluasi pengaruh penambahan ekstrak daun sungkai terhadap kualitas semen beku *post thawing* menggunakan komposisi perlakuan yang sama. Parameter meliputi motilitas, viabilitas, abnormalitas, integritas membran plasma dan akrosom, serta fragmentasi DNA. Data dianalisis menggunakan analisis variansi (ANOVA) satu arah, dilanjutkan dengan uji Tukey HSD (*Honest Significant Difference*). Penambahan 0,15% menghasilkan kualitas terbaik dengan motilitas 73,23±1,66%, viabilitas 78,80±1,23%, abnormalitas 10,75±0,62%, integritas membran plasma 82,60±1,85%, integritas akrosom 84,10±6,52%, dan fragmentasi DNA 17,67±5,29%, sedangkan kontrol menunjukkan hasil terendah. Secara keseluruhan, etanol 70% merupakan pelarut yang paling efektif untuk mengekstraksi antioksidan dari daun sungkai, dan konsentrasi 0,15% terbukti paling optimal mempertahankan kualitas semen cair maupun semen beku *post thawing* sapi Bali.

Kata kunci : Aktivitas antioksidan, Ekstrak daun sungkai, Sapi Bali, Kualitas semen *post thawing*, Kerusakan DNA

THE ROLE OF SECONDARY METABOLITES OF SUNGKAI LEAVES (*Peronema canescens* Jack*)* AS ANTIOXIDANTS IN REDUCING DNA FRAGMENTATION IN SPERMATOZOA PREVERSION OF BALI BULL

ABSTRACT

RIRIN NOVITA
22/508218/SPT/00247

This study aimed to evaluate the antioxidant potential of Sungkai leaves (*Peronema canescens* Jack) in the preservation of Bali bull cement through a three-stage experimental design. The first stage focused on determine the type of extraction solvent that produces sungkai leaf extract with the highest antioxidant activity. Phytochemical screening, total phenolic and flavonoid content analysis, and antioxidant activity using the DPPH method were conducted. The results revealed that the 70% ethanol extract contained the highest levels of phenolics and flavonoids (40.23 mg GAE/g and 17.63 mg GAE/g, respectively) and demonstrated the strongest antioxidant activity (IC_{50}= 26.24 µg/mL). The second stage the effectiveness of sungkai leaf extract in maintaining the quality of liquid cement during cold storage. Four treatments (0%, 0.10%, 0.15%, and 0.20%) were applied. Semen quality parameters included motility, viability, abnormality, and intact plasma membrane. Data were analyzed using one-way ANOVA followed by Tukey's HSD test. The 0.15% supplementation level produced the best semen quality, with motility of 83.40±1.44%, viability of 83.95±1.08%, abnormality of 9.82±0.47%, and intact plasma membrane of 87.50±1.07%, and was significantly superior to the control. The third stage assessed post-thaw semen quality using the same treatment composition. Parameters included motility, viability, abnormality, plasma and acrosome membrane integrity, and DNA fragmentation. Data were analyzed using one-way ANOVA followed by Tukey's HSD test. The 0.15% supplementation consistently produced the highest post-thaw quality, with motility of 73.23±1.66%, viability of 78.80±1.23%, abnormality of 10.75±0.62%, plasma membrane integrity of 82.60±1.85%, acrosome integrity of 84.10±6.52%, and DNA fragmentation of 17.67±5.29%, whereas the control showed the lowest results. In conclusion, 70% ethanol was identified as the most effective solvent for extracting antioxidant compounds from Sungkai leaves, and supplementation at 0.15% proved optimal in improving the quality of both chilled and frozen-thawed Bali bull spermatozoa.

Keywords: Antioxidant activity, Sungkai leaf extract, Bali bulls, Quality *of semen post thawing*, DNA damage