



Preserving Boar Semen Quality Parameters with Propolis Extracts During Long-term Storage

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INTRODUCTION

Propolis is a natural resinous mixture used by honeybees with a variety of biological effects, including antioxidant and anti-inflammatory properties. In animal reproduction studies, propolis has exhibited the potential to protect spermatozoa during storage. The aim of this study was to evaluate the effects of aqueous and ethanolic propolis extracts on boar semen quality parameters during 72-hour liquid storage at 17°C.

METHODOLOGY

Eleven semen samples were collected from boars at an artificial insemination (AI) station and subsequently diluted with a long-term extender. The samples were then divided into separate parts and supplemented with 5% and 10% aqueous (5AP, 10AP) or ethanolic (5EP, 10EP) propolis extracts (Figure 1). For extract preparation, crude propolis was ground into powder and macerated in water or 70% ethanol at room temperature (5 h, occasional shaking). Extracts were prepared at concentrations of 5% and 10% (w/v), filtered, and stored at 4°C until use. One part of each semen sample was designated as the control group, receiving no addition of propolis extracts. Assessment of sperm viability and motility was conducted prior to dilution and after a 72-hour storage period using a sperm class analyzer (SCA). A total of 66 sperm motility and viability tests were performed.

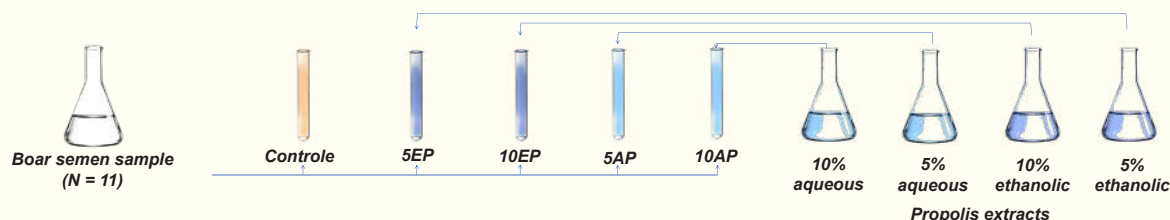


Figure 1. Schematic overview of semen sample dilution with propolis extracts.

RESULTS

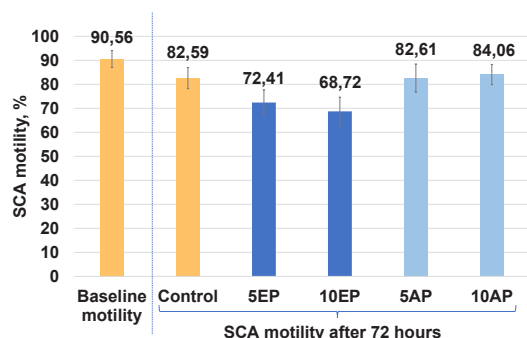


Figure 2. Sperm motility assessed by SCA before and after 72 h storage with different propolis extracts.

At the beginning of the experiment, the mean motility of the semen samples measured by SCA was 90.56 (SD (standard deviation) = 6.990) %. After 72 hours, the results demonstrated that aqueous propolis extracts (5AP, 10AP) in boar semen helped to maintain sperm motility in comparison with control group and ethanolic propolis dilution ($P < 0.05$). In aqueous groups, SCA motility was reduced by 7.95 (SD = 13.142) % in 5AP and 6.50 (SD = 8.302) % in 10AP, while in control group it was reduced by 7.97 (SD = 10.435) % (Figure 2). Conversely, ethanolic propolis extracts (5EP, 10EP) had a detrimental effect on semen SCA motility. Furthermore, the viability of semen samples diluted with aqueous propolis extracts was more than 10% higher compared to the control group ($P < 0.05$), further supporting the beneficial effects of propolis.

CONCLUSION

In conclusion, the present study indicates that aqueous propolis extracts provide protective benefits for boar sperm during storage, while ethanolic extracts may have a cytotoxic effect. Further research is necessary to understand the mechanisms underlying these effects.

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