DVSC Dissertation Summary No. 12328, Faculty of Veterinary Medicine, Urmia University
The academic year: 2022-2023.
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Title of thesis: Evaluation of the effects of taxifolin hydrate and crocin supplements on dog semen during storage at refrigerator

Abstract:

Artificial insemination using cold semen is one of the available techniques for raising domestic animals. Still, the cooling process causes a significant decrease in sperm quality due to increased oxidative stress. The present study aims to investigate crocin and taxifolin hydrate for preserving dog semen at 4°C during a period of 72 hours. In this study, 25 ejaculates were collected from 5 terrier dogs and diluted in a Tris-based diluent. Then, they were divided into 10 parts in control groups, sham control (containing antioxidant solvent, dimethyl sulfoxide) and treated with 0.5 and 1 mM crocin, 5 and 10 µM taxifolin hydrate, 0.5 mM crocin + M µ . 5 taxifolins, 0.5 mM crocin + 10 mM taxifolin, 1 mM crocin + 5 mM taxifolin and 1 mM crocin + 10 mM taxifolin were divided. Sperm collections, including general and progressive motility, motility indices and sperm viability were evaluated for 72 hours. Also, for a more accurate measurement, the level of malondialdehyde (MDA), examination of DNA integrity of sperms, assessment of oxidative stress factors and examination of sperm plasma membrane integrity were performed. The obtained results showed that the progressive motility in cru during 72 hours of storage in the groups of 1 mM crocin + 5 µM taxifolin and mM crocin + 10 mM taxifolin and overall motility in the 1 mM taxifolin + 1 mM taxifolin group compared to the control group and other treatment groups were significantly higher. Also, the examination of the mobility indicators except for smoothness (straight path) shows that 1 mM crocin and 10 mM taxifolin, as well as the combination of 1 mM crocin + 1 mM taxifolin (the highest percentage) significantly improve the indicators compared to the control group. Investigating sperm viability showed that the addition of 1 mM crocin + 10 mM taxifolin and 1 mM crocin + 5 mM taxifolin significantly improves sperm viability. Also, these two groups have more plasma membrane continuity and less DNA damage. The lowest amount of malondialdehyde and the highest amount of total antioxidants were related to the 1 mM crocin + 10 mM taxifolin group. According to the positive results of crocin and taxifolin and adding them to the diluent, the present study showed that the addition of crocin and taxifolin could improve dog semen from liquid storage.

Key words: Antioxidant, dog sperm, oxidative stress, crocin, taxifolin hydrate