CAIRO UNIVERSITY

Faculty of Veterinary Medicine
Department of Theriogenology

Oocyte Competence and In Vitro Produced Embryos in Camels (Camelus dromedarius) with Emphasis on Gene Expression

Thesis presented by

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Abstract

"Oocyte Competence and In Vitro Produced Embryos in Camels (Camelus dromedarius) with Emphasis on Gene Expression"

Ahmed A. M. Abd-Elfattah, Faculty of Veterinary Medicine, Cairo University
Master Degree Thesis in Theriogenology, 2016

Six experiments were conducted on dromedary camels during the breeding (November to April) and non-breeding (May to October) seasons for two successive years (2013/2014 and 2014/2015) in order to investigate factors affecting oocyte in vitro developmental competence and to investigate gene expression of matured oocytes. Selected (excellent and good quality) oocytes were cultured in TCM-199 and CR1aa media at 38.5 ºC, 5% CO_2 for 40 hrs, without or with EGF. Higher ($P<0.05$) oocyte yield rate of excellent and good quality was observed during the breeding versus the non-breeding season. Camel oocytes cultured in TCM-199 showed better cytoplasmic maturation rate than CR1aa as expressed by increased percentage of GIII cumulus expansion. TCM-199 medium supplemented with EGF increased nuclear maturation rate versus its effect in CR1aa. Moreover, addition of EGF to TCM-199 and CR1aa improved cytoplasmic maturation rate. Cleavage rate of IVF oocytes increased in maturation medium TCM-199 + EGF when compared with TCM-199 without EGF. Natural parthinod camel embryos were higher during the breeding season in zygote (2^{nd} pb), 2-cell, 4-cell and 8-cell stages and embryo like structure when compared with the non-breeding season. Significantly ($p<0.05$) higher CX43, IGF1, ATP5A1 were found in matured oocytes of TCM-199+EGF group than immature and TCM-199 groups. BCL2 (apoptosis gene) was significantly ($P<0.05$) higher in TCM-199 camel oocytes group than that observed in TCM-199+EGF immature oocytes group.

In conclusion, breeding season was characterized by excellent and good oocyte yield.TCM-199 and CR1aa media were suitable for in vitro maturation of camel oocytes. IVF of matured camel oocytes can be done using epididymal sperm. Addition of EGF to culture media improved developmental competence of camel oocytes and embryos due to its effect on gene expression of matured oocytes. Natural parthinogenesis phenomenon was higher during the breeding season.

Keywords: Dromedary camel, Oocyte competence, In vitro maturation, Gene expression.

DEDICATION

Where would I be without my family? I would like to share my appreciation and gratitude to both of my parents, my brother and my sisters. Many times they have expressed their love and desire to see me succeed through prayers. Words fail me to express my appreciation to my Mother. I love you and give thanks for everything you have done for me and our family.

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benching and facilities, in-vitro embryo production and molecular biology experimentation with enough patience and excellent pedagogy. Dr. Kandil expertise, advice, recommendations and valuable guidance were instrumental in the completion of this study, I never forget your mother heart of taking me with you to most of your scientific projects all over Egypt and see by my eye your tireless efforts, working day and night to get first embryo transferred bufflo ((Emy)). Dear teacher ((THANK YOU)).

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Ahmed A. M. Abdelfattah

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