CAIRO UNIVERSITY

Faculty of Veterinary Medicine
Department of Theriogenology

Sire Evaluation through Genetic Characterization of Some Important Genes in Buffalo (Bubalus bubalis)

A thesis presented by

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(B.V.Sc., Menofyia University, Sadat branch, 2011)

For The Degree of M. V. Sc.

(Theriogenology)

Under supervision of

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(2016)

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ABSTRACT

This study aimed to evaluate semen characteristics in buffalo bulls and to detect the genetic polymorphisms in pituitary-specific transcription factor (PIT-1) and prolactin (PRL) genes as bases for selection of bulls with good breeding value. A total number of 60 buffalo bulls aged 2-8 years was used in the study. The animals were divided into three groups according to the age. The first group aged between 2 to <3 years (n= 35). The second group aged between 3 to <5 years (n= 14). The third group aged between 5 to <8 years (n= 11). Also, the animals were divided according to body condition score into two groups. The first group scores were between 2 to <3 (n= 33). The second group scores were between 3 to <4 (n= 27). Three collections were obtained from each animal and evaluated for volume, individual motility, live sperm percentage and chromatin integrity. DNA was extracted from semen and blood samples for genotyping of PIT-1 gene using *HinfI*-RFLP and PRL gene using *XbaI* RFLP. Ejaculate volume, individual motility and live sperm percentage were significantly lower in old than adult and young buffalo bulls. While chromatin damage percentage had no significant differences among age groups. Body condition score had no significant effect on semen characteristics except live sperm percentage that was significantly higher ($p>0.05$) in animals having body condition score between 2 to < 3 than in animals having body condition score between 3 to <4. All buffalo bulls were genotyped as BB with the predominance of B allele for PIT-1 gene without genetic variation where PCR 451 bp fragment were digested into two fragments 244 and 207 bp. *XbaI* RFLP of PRL gene recorded genetic polymorphism in 678 bp PCR fragment with presence of AA genotype of undigested fragment in high frequencies (91.67%) while BB genotype of digested fragments into 231 and 447 bp in low frequencies (8.33%).

It could be concluded that, age had adverse effect on semen quality. Monomorphic pattern of the amplicon 451 bp in PIT-1 HinfI locus in exon 6 in Egyptian buffalo (Bubalus bubalis) while presence of genetic polymorphism in PRL XbaI locus in regulatory region which acts as a genetic marker in buffalo bulls.

Key words: Buffalo, Semen, PIT-1 (POU1F1), PRL, PCR, RFLP.

DEDICATION

To

My Mother,

My Father,

My sisters,

And My brothers.

ACKNOWLEDGEMENTS

*First of all, I thank **ALLAH**, who gives me the capability to proceed this research successfully.*

*I wish to express my deepest gratitude to my supervisor **Prof. Dr. Afify A. EL-Menoufy,** Professor of Theriogenology, Faculty of Veterinary, Cairo University, for his scientific supervision of this thesis, guidance, advice, teaching, encouragements, constructive criticisms and suggestion throughout the research as well as his help revising my thesis. I feel honored to have the opportunity to be supervised by such prominent scientist in artificial insemination.*

*I want to express my thanks to my supervisor **Prof. Dr. Youssef F. Ahmed,** Professor of Animal Reproduction and AI, National Research Center, for his excessive wisdom and patience, providing excellent guidance, insight, close supervision and continuous encouragement throughout the course of this thesis. I feel honored to have worked with such helpful scientist.*

*I have to give the greatest thanks to **Prof. Dr. Karima Gh. Mahmoud** , Professor of Reproductive Genetics, National Research Center, for her practical learning, continuous help, constant friendship, enormous effort, statistical analysis as well as her help revising my thesis and above all for providing necessary lab. facilities during the whole span of this research work. Without her efforts we could not complete this work.*

*I have to give the greatest thanks to **Prof. Dr. Mahmoud Fathi Nawito,** Professor of Animal Reproduction and A.I., National Research Center, for his continuous encouragement and financial support funded by a project he was the P.I. of it.*

*I wish to thank sincerely **Prof. Dr. Othman E. Othman,** Professor of Animal Genetics and Biotechnology, Cell Biology Department, National Research Center, for his guidance in practical part in the beginning of the course of this thesis.*

*I want to express my thanks to **Dr.Abd elazeez Sakr**, a researcher in Animal Production Research Institute, Agriculture Research Center, for his greatest role in providing different samples and*

necessary lab. facilities in the breeding station of animals and his help in learning practical trials of semen evaluation.

Also I cannot forget the continuous support from all staff members of Reproductive Genetics Lab., Animal Reproduction and AI Department, National Research Center, especially ***Prof.Dr. Khaled Abdel hameed*** *and* ***Dr. Hazem El-debeky*** *for their help in learning practical trials.*

Finally, I wish to appreciate and express my deepest sense of gratitude to my mother, my father, my sisters, my fiancée and my brothers for their moral support, encouragement and prayers throughout the period of this thesis. Honestly, I couldn't have completed this thesis without their support.

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