EFFECT OF SOME PRODUCTS OF HONEY BEE ON AGE AT PUBERTY AND FERTILTY OF MALE RABBITS

By

AHMED HAMDY KHADR MOHAMED

B. Sc. Agric. Sc. (Animal and poultry Production), Ain Shams University. 2012

A thesis submitted in partial fulfillment
of
The requirements for the degree of

MASTER OF SCIENCE
In
Agricultural Science
(Animal Physiology)

Department of Animal Production
Faculty of Agriculture
Ain Shams University

2016

Approval Sheet

EFFECT OF SOME PRODUCTS OF HONEY BEE ON AGE AT PUBERTY AND FERTILTY OF MALE RABBITS

By

AHMED HAMDY KHADR MOHAMED

B. Sc. Agric. Sc. (Animal and poultry Production), Ain Shams University. 2012

This thesis for M. Sc. degree has been approved by:

Dr. Abd El-Karim Ibrahim Mohamed El-Sayed ……..……
Prof. Emeritus of Animal Physiology, Faculty of Agriculture, Benha University

Dr. Farouk Abd-Allah Khalil ……..……
Prof. Emeritus of Animal Physiology, Faculty of Agriculture, Ain Shams University

Dr. Ahmed Mohamed El-Sherbiny ……..……
Prof. of Animal Physiology, Faculty of Agriculture, Ain Shams University

Date of Examination: / / 2016

EFFECT OF SOME PRODUCTS OF HONEY BEE ON AGE AT PUBERTY AND FERTILTY OF MALE RABBITS

By

AHMED HAMDY KHADR MOHAMED

B. Sc. Agric. Sc. (Animal and poultry Production), Ain Shams University.

2012

Under the supervision of:

Dr. Ahmed Mohamed El-Sherbiny

Prof. of Animal Physiology, Animal Production Department, Faculty of Agriculture, Ain Shams University (Principal Supervisor)

Dr. Assem Abdo Ramadan

Lecturer of Animal Physiology, Animal Production Department, Faculty of Agriculture, Ain Shams University

ABSTRACT

Ahmed Hamdy Khadr Mohamed: Effect of Some Products of Hony Bee on Age at Puberty and Fertility of Male Rabbits. Unpublished Master of Science Thesis, Animal Production Department, Faculty of Agriculture, Ain Shams University, 2016.

The present work was carried out at Intensive Rabbit Production Unit, belonging to Consulting and Research Center, Faculty of Agriculture, Ain Shams University. The work was designed to investigate the effects of royal jelly (RJ) or/ and bee honey (H) on age of sexual puberty, semen quality and fertility of male New Zealand White (NZW) rabbits. Eighty pre-pubertal male NZW rabbits and 80 hybrid nonparous female rabbits were used in the present study. Male rabbits were randomly divided into 4 groups (20 bucks per group); bucks were administered orally with 0.5 mL of a solution/ kg body weight (b. w.), 3 times weekly for 6 weeks; which contained: 1) water for control (1st group), 2) 0.25 mL bee honey + 0.25 mL water (2nd group), 3) 200 mg royal jelly + 0.5 mL water (3rd group) and 4) 200 mg royal jelly + 0.25 mL honey + 0.25 mL water (4th group). All rabbit males were weighed weekly from the age of 60 up to 179 days old. The ages, at descending of testes into scrotum, at the beginning of fighting, at separation of penis from sheath, and at the first ejaculation were observed. At ages of 60, 90, 120 and 150 days old, 3 males from each group were sacrificed for anatomical and histological measurements. Blood samples were collected from the marginal ear vein of the experimental male rabbits using heparinized tubes. Blood plasma was separated by centrifugation at 700 G for 20 min and stored at -20ºC until analysis. Semen was collected artificially from each buck once weekly. Two successive ejaculates were collected and evaluated. Two unreceptive females were used as teaser for semen collection purpose. Eighty hybrid nonparous females were used for fertility test (20 females were inseminated artificially for each experimental group). The results of the present study showed that pre-pubertal NZW rabbits received RJ or/ and bee honey showed significant ($P<0.05$) earlier puberty age (earlier ages at

testes descending into scrotum, separation of penis from sheath, fighting, first ejaculated sperm, appearance of secondary spermatocytes in testis, appearance of spermatid in testis, appearance of sperm in testis and epididymis); significant ($P<0.05$) increase of male reproductive system weight, accessory sexual gland weight, mean of testes weights, mean of testes index, mean of epididymis weights, mean diameter of seminiferous tubules, thickness of spermatogenic epithelium layer, mean diameter of epididymal duct and thickness of epididymal epithelium layer ; significant ($P<0.05$) increase of libido, ejaculate volume, mass motility, percentage of sperm progressive motility, motility index, sperm-cell concentration, seminal plasma fructose concentration, total sperm output, motile sperm concentration and functional sperm concentration compared to control group. On the other hand, percentages of dead and abnormal spermatozoa increased significantly ($P<0.05$) for control group compared to the other three groups. Blood plasma concentrations of testosterone and cholesterol increased significantly ($P<0.05$) for royal jelly or/ and bee honey groups compared with control. Otherwise, plasma concentrations of aspartate amino transferase (AST) and alanine amino transferase (ALT) differed non-significantly among groups. Rabbit bucks treated with royal jelly or/ and bee honey showed better fertility (higher conception rate and litter size) than control bucks.

It is of importance to mention that better results were obtained from the fourth group which received both if royal jelly and bee honey, as compared to the other groups.

In conclusion, the results of the present study showed that oral administration of royal jelly or/ and bee honey could be used beneficially to have earlier puberty age, improve semen quality and fertility of male NZW rabbits. This improvement was also mirrored on better liver functions as observed with normal concentrations of AST and ALT.

ACKNOWLEDGMENT

Praise be to ALLAH, the master of the world most gracious, most merciful, all words of different language are unable to express my deepest thanks to ALLAH who gave me everything I have and gave the ability and patience to finish this work.

Special thanks, indebtedness are extended and deep gratitude to **Dr. Ahmed Mohamed El-Sherbiny,** Professor of Animal Physiology, Department of Animal production, Faculty of Agriculture, Ain Shams University, for suggesting the title, idea and plan of this study, kind supervision, valuable guidance, kind encouragements and his valuable efforts in reading and correcting the manuscript.

Sincere thanks and deepest gratitude to **Dr. Assem Abdo Ramadan**, Lecturer of Animal Physiology, Department of Animal production, Faculty of Agriculture, Ain Shams University, for his guidance, his kind advice and valuable revision of the manuscript.

The author likes to express his deep profound gratitude and sincere appreciation to late Professor **Dr. Hanafy Embaby El-Sobhy** (God's mercy), Professor Emeritus of Animal Physiology, Department of Animal production, Faculty of Agriculture, Ain Shams University, for his kind supervision, valuable guidance, kind encouragements

The author likes to express his deep thanks **Dr. Manal El-sayed** Professor of Animal Breeding, Department of Animal production, Faculty of Agriculture, Ain Shams University, for his guidance in statistical analysis.

The author likes to express his deep thanks **Dr. Ahmed lotfy Hashem** Professor of Animal Physiology, Department of Animal production, desert center research, for his helping in testosterone analysis.

Finally the author appreciate his great thanks to the intensive rabbit production unit , belonging to agriculture studies and

consultation center, Faculty of Agriculture, Ain Shams University, for providing him with animals, labors and equipments during the experimental period.

Special thanks to my mother, my father, my sisters, my friends especially **Ahmed said** and **Mohamed Khaled**, and my big family.

CONTENTS

LIST OF TABLES