A COMPARATIVE STUDY ON THE GENOMES OF LOCAL AND EXOTIC RABBIT BREEDS

By

HODA ADEL MOHAMED ALI

B.Sc. Agric. Sci. (Animal Production), Fac. Agric., Cairo Univ., 2006

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

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APPROVAL SHEET

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ABSRTACT

The objective of this study was to evaluate genetic characteristics of local and exotic rabbit breeds in Egypt. The local breeds were Baladi White (BW) and Baladi Red (BR) and the exotic breeds were American Rex (AR), Chinchilla (Ch) and NewZealand White (NZW). Genome scanning was applied to the genomic DNA of all populations using 14 microsatellite primers.

The microsatellite primers detected a total of 50 scorable bands in all microsatellite loci in all rabbit breeds. The band size ranged from 50 to 745 bp. The number of alleles per locus varied from one to nine and averaged 3.57. The number of detected alleles varied among rabbit breeds and averaged 2.71, 2.29, 2.64, 2.43 and 2.00 per locus in BW, BR, AR, Ch and NZW, respectively. The variability estimates in local BW and BR were in general lowly moderate and averaged 0.343 and 0.392, respectively. Low variability was shown in each of AR and Ch rabbit breeds and averaged 0.317 and 0.306, respectively. The highest variability was found in NZW rabbits and averaged 0.447. D5UTR4F showed a variability of 0.99 in BW and 0.94 in NZW. The expected heterozygosity estimates were in general low to moderate and averaged 0.414, 0.451, 0.391, 0.336 and 0.551 in BW, BR, AR, Ch and NZW, respectively. Sol33 showed a high heterozygosity estimate of 0.92 in all exotic populations and a fairly low heterozygosity estimate of 0.33 in both local populations. D19Utr4B showed a heterozygosity of 0.75 in both local populations versus no heterozygosity in all exotic populations. The genetic distance estimates between BW and BR were in general low and averaged 1.77. The farthest genetic distance indices were between NZW and AR and averaged 2.13.

The resulted genetic information reveal that the Chinchilla rabbits are more genetically closed to the local Baladi White and Baladi Red rabbits than the American Rex and NewZealand White rabbits.

Keywords: Heterozygosity, Genetic Distance, Genetic Variability, Exotic breeds, Local breeds, Microsatellites, Rabbits.

DEDICATION

I dedicate this work to my mother who, after Allah, helped me and cared and prayed for my success;

To my father; my husband who support me throughout my post-graduate studies;

And to my lovely brother and sisters especial my sister asmaa; my friends whom I acknowledge for standing by me with their trust and confidence.

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