Faculty of Agriculture

MICROSATELLITES AS A TOOL IN RUMINANTS BREEDING

BY

RASHA ABD EL-HAMEED MAHMOUD SOMIDA

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B.Sc. Agric. Sci. (Anim. Prod.), Fac. Agric. Fayoum, Cairo University, 2003

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of M. Sc.

In
Agricultural Sciences (Animal Breeding)
Animal Production Department
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ABSTRACT

The present study was conducted to genetically analyze two Egyptian native breeds: Baladi and Zaraibi using three microsatellite markers: INRA005; ILSTS005 and ILSTS087. The results showed that all the microsatellite studied were polymorphic and gave more than one allele. The microsatellite INRA005 gave six alleles; the microsatellite ILSTS005 gave five and finally the microsatellite ILSTS087 gave 8 alleles. Due to that, these three microsatellites could be fruitfully used in paternity tests. Moreover, they could be employed for further researches on mapping quantitative trait loci detection and subsequently marker assisted selection breeding programs. The overall heterozygosity and PIC values were 0.9 and 0.7545 indicating high gene diversity. The highest observed heterozygosity were found in Zaraibi and Baladi breeds **(**1.000**)** and minimum in Zaraibi goat breed (0.650**)**. In the two breeds studied, low inbreeding rates was indicated (mean FIS= -0.1139) within the breeds. Genetic differentiation between breeds was moderate with a mean FST value of 4.593.

The clusters obtained on phylogenetic tree generated from Nei's genetic distance matrix agreed with the geographic origin of the breed. Deviations from Hardy-Weinberg equilibrium were noted for most of the locus. The time of divergence in Zaraibi and Baladi breeds was estimated to be 71 generations (284 years).

The two breeds showed high degree of admixture. The study analyzed the population structure of these two breeds and contributed to the knowledge and genetic characterization of two different breeds of Egyptian native goat (Baladi and Zaraibi). In addition, the microsatellites recommended by ISAG proved to be useful for the biodiversity studies in Egyptian goat breeds.

Keywords: Genetic variation; Goat; Microsatellites; breed structure; INRA005; ILSTS005; ILSTS087, markers and Egyptian

goat