ABSTRACT

PARENTAGE ANALYSIS WITH MICROSATELLITES IN KARYA TYPE SHEEP

Onur YILMAZ

Ph.D. Thesis, Department of Animal Sciences

Supervisor: Prof. Dr. Orhan KARACA

2010, 93 pages

Nowadays, the use of DNA sequences with genetic techniques and DNA polymorphism as genetic markers is increasing very rapidly. DNA testing is widely used to confirm the parentage of new registrants, and DNA verification of pedigrees is progressively replacing testing based on blood types. The aim of this study was to examine heterozygosity, calculate the power of exclusion, match probability and paternity index of the ten loci, and examine the usefulness of the involved loci in paternity tests. In the present study, 10 microsatellite loci (MAF65, OarJMP58, OarFCB193, OarFCB304, OarJMP29, BM8125, OarFCB128, OarCP34, OarVH72, DYMS1) were evaluated for their possible use to confirm paternity between 16 rams, their 101 offspring in nucleus flock of Adnan Menderes University Group Sheep Breeding Program (ADU-GKYP). DNA samples was isolated by DNA extraction kit from blood samples. Spesific genomic regions were amplified by Polymerase Chain Reaction (PCR). Fragment analysis was achieved using the automatic laser-induced fluorescence DNA sequencer Beckman Coulter CEQ 8000 Genetic Analysis System. These data obtained was analyzed by the Beckman Coulter CEQ 8000 software. A total of 105 alleles were observed in this study. The estimated observed heterozygosities (Ho) were between 0,541 and 0,841 and expected heterozygosities (He) were between 0,699 and 0,831. Probability of exclusion (P_E) for each locus and probability of exclusion for increasing combinations (CP_E) of the 10 loci were calculated. P_E for each locus were between 0,295 and 0,514, CP_E of the 10 loci were between 0,363 and 0,994. Matching probability (MP) (between 0,054 and 0,154) and power of discrimination (P_D) (between 0,85 and 0,94) were also calculated. As a result, the suitable genetic markers determined for paternity test in Karya sheep. These results could also be used as a reference for the other sheep population in Turkey.

Key words: Paternity analysis, probability of exclusion, Karya, microsatellite