A preliminary genetic analysis of some Turkish horse breeds and implications for breed management studies

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TÜRKHAYGEN-I is a recently initiated national project in Turkey, aimed at genotyping the existing livestock breeds, establishing banks (embryo, sperm, tissue and DNA) to preserve animal genetic resources and to use the knowledge in registration studies, and in developing conservation and management strategies. In context of the study, in situ conservation populations are also being formed. As a part of the study, each species included in the study is analysed by 20 microsatellite loci and mtDNA sequence diversity.

Turkish horse is one of the species included in TÜRKHAYGEN-I project. The fieldwork for sampling is an ongoing process. Among the 74 samples so far collected there are 4 populations: Hınıs'ın Kolu Kısası (n=30), Erzurum yerel atı (n=17), Kars yerel atı (n=17) and Malakan atı (n=10). A 440 bp mtDNA CR sequence analysis revealed 56 haplotypes grouped in 7 lineages, with a haplotype diversity of 0.991±0.004 and nucleotide diversity of 0.020±0.0006. The estimated average number of nucleotide difference is 8.57. The diversity analysis of the populations based on 9 microsatellite loci resulted in an average gene diversity of 0.8, an average heterozygosity of 0.7 and an average number of 6.2 alleles per locus per population. The onserved number of alleles per locus was not associated with the sample size. The estimated D_A genetic distances were low (between 0.054-0.13) but the FCA analysis revealed some clustering in relation to origin of the groups.

Horse are highly motile, horse trade is a highly dynamic sector, and there is no breeding strategy. The preliminary results have shown that these populations come from multiple maternal lineages, but they form clusters based on genotypic data which were in accordance with their origin and phenotypic grouping. These results suggest that, if genetic data is included in constructing proper breeding and management programs, the improvement of Turkish breeds can be possible.

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