

Genetic Variations Between Horse Breeds Using RAPD Markers

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Abstract :

Abstract: Genetic diversity is the basis for present day diversified living systems and future genetic improvement needs. Within the framework of breed conservation, genetic characterization is important in guarding breeds and is a prerequisite for managing genetic resources. The objective of the present study is to estimate the genetic diversity and phylogenetic relationships among Egyptian horse breeds (Native and Arabian) and an exotic breed (Thoroughbred) using Random Amplified Polymorphic DNA – Polymerase Chain Reaction (RAPD) technique. Initially, 25 primers were screened among all the breeds of which 14 primers amplified the genomic DNA. Four primers generated reproducible and distinct RAPD profiles and were used for further analysis. A total of 40 loci were amplified, of which 37 were found polymorphic (92.5%), useful for genetic variation study between breeds. The genetic diversity had the highest value (0.2048) in Arabian and the lowest value (0.0116) in Native breed. The genetic distance was found highest between Arabian and Thoroughbred ($D=0.5442$) and lowest between Native and Arabian ($D=0.3280$). However, genetic identity was highest ($I=0.7204$) between Native and Arabian and lowest ($I=0.5803$) between Arabian and Thoroughbred. UPGMA dendrogram based on Nei's genetic distance grouped the investigated horse breeds genotypes into two clusters. The first cluster includes Egyptian breeds (Native and Arabian) where as the second cluster include Thoroughbred which appeared to be most distant from the other breeds. In conclusion, these results indicated the effectiveness of RAPD in detecting polymorphism between horse populations and their applicability in population studies and establishing genetic relationships among the horse populations. [Nature and Science. 2010;8(5):90-99]. (ISSN: 1545-0740).

Key Word :

Genetic diversity, Horse breeds, RAPD-PCR.

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