

Phylogenetic Studies of Six Egyptian Sheep Breeds Using Cytochrome B

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Abstract : Recently, the control (D-loop) and cytochrome b (Cyt b) regions of mtDNA have received more attention due to their role in the genetic diversity and phylogenetic studies in different livestock which give important knowledge towards the genetic resource conservation. Studies based on sequencing of sheep mitochondrial DNA showed that there are five maternal lineages in the world for domestic sheep breeds; A, B, C, D and E. By using cytochrome B sequencing, we aimed to clarify the genetic affinities and phylogeny of six Egyptian sheep breeds. Blood samples were collected from 111 animals belonging to six Egyptian sheep breeds; Barki, Rahmani, Ossimi, Saidi, Sohagi and Fallahi. The total DNA was extracted and the specific primers were used for conventional PCR amplification of the cytochrome B region of mtDNA. PCR amplified products were purified and sequenced. The alignment of sequences was done using BioEdit software and DnaSP 5.00 software was used to identify the sequence variation and polymorphic sites in the aligned sequences. The result showed that the presence of 39 polymorphic sites leading to the formation of 29 haplotypes. The haplotype diversity in six tested breeds ranged from 0.643 in Rahmani breed to 0.871 in Barki breed. The lowest genetic distance was observed between Rahmani and Saidi (D: 1.436 and Dxy: 0.00127) while the highest distance was observed between Ossimi and Sohagi (D: 6.050 and Dxy: 0.00534). Neighbour-joining (Phylogeny) tree was constructed using Mega 5.0 software. The sequences of 111 analyzed samples were aligned with references sequences of different haplogroups; A, B, C, D and E. The phylogeny result showed the presence of four haplogroups; HapA, HapB, HapC and HapE in the examined samples whereas the haplogroup D was not found. The result showed that 88 out of 111 tested animals cluster with haplogroup B (79.28%), whereas 12 tested animals cluster with haplogroup A (10.81%), 10 animals cluster with haplogroup C (9.01%) and one animal belongs to haplogroup E (0.90%).

Keywords : phylogeny, genetic biodiversity, MtDNA, cytochrome B, Egyptian sheep

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