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Detection of MspI Polymorphism and SNP of GH Gene in Some Camel Breeds Reared in Egypt

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Abstract : Growth hormone (GH) is an anabolic hormone synthesized and secreted by the somatotroph cells of the anterior lobe of the pituitary gland in a circadian and pulsatile manner, the pattern of which plays an important role in postnatal longitudinal growth and development, tissue growth, lactation, reproduction as well as protein, lipid and carbohydrate metabolism. The aim of this study was to detect the genetic polymorphism of GH gene in five camel breeds reared in Egypt; Sudany, Somali, Mowaled, Maghrabi and Falahy, using PCR-RFLP technique. Also this work aimed to identify the single nucleotide polymorphism between different genotypes detected in these camel breeds. The amplified fragment of camel GH at 613-bp was digested with the restriction enzyme MspI and the result revealed the presence of three different genotypes; CC, CT and TT in tested breeds and significant differences were recorded in the genotype frequencies between these camel breeds. The result showed that the Maghrabi breed that is classified as a dual purpose camels had higher frequency for allele C (0.75) than those in the other tested four breeds. The sequence analysis declared the presence of a SNP (C→T) at position 264 in the amplified fragment which is responsible for the destruction of the restriction site C^CGG and consequently the appearance of two different alleles C and T. The nucleotide sequences of camel GH alleles T and C were submitted to nucleotide sequences database NCBI/Bankit/GenBank and have accession numbers: KP143517 and KP143518, respectively. It is concluded that only one SNP C→T was detected in GH gene among the five tested camel breeds reared in Egypt and this nucleotide substitution can be used as a marker for the genetic biodiversity between camel breeds reared in Egypt. Also, due to the possible association between allele C and higher growth rate, we can used it in MAS for camels and enter the camels possess this allele in breeding program as a way for enhancement of growth trait in camel breeds reared in Egypt.

Keywords : camel breeds in Egypt, GH, PCR-RFLP, SNPs
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