

The Study of Coat Color Gene Polymorphisms in Jeju Horses by Routine Genotyping of MC1R, ASIP and MATP Genes

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Purpose: Coat color in mammals depends on the relative amount of eumelanin(black-brown) and pheomelanin(red-yellow), which are controlled, by the melanocortin-1 receptor(MC1R) gene and the Agouti-signaling peptide(ASIP) gene. Dilution of coat color also have relation to the membrane-associated transporter protein(MATP) gene. This study was performed to understand relationships between genotype and phenotype in Jeju Horse, and to classify and systematize Jeju Horse coat color polymorphisms in comparison with Thoroughbred.

Materials and Methods: Blood samples were collected from 35 Jeju horses and 28 Thoroughbred horses by jugular vein. We extracted the genomic DNA from blood and performed PCR. ASIP gene was analyzed by a Simple PCR amplification and electrophoresis on a 4% agarose gel. MC1R gene and MATP gene was analyzed by a PCR-RFLP and electrophoresis on a 2% agarose gel. PCR-RFLP was carried out using Taq 1 in MC1R gene, Tsp 509 1 in MATP gene.

Results: Genotype assembly is Jeju horses 15 and Thoroughbred 12. When compare Allele of ASIP gene A with a, Both Jeju horse and Thoroughbred had aa have black coat color regardless of MC1R genotype except grey color. When compare Allele of ASIP gene E with e, Both Jeju horse and Thoroughbred had ee have chestnut coat color regardless of MC1R genotype except grey color. When compare Allele of MATP gene C with Ccr, Individuals expressed CC frequently and coat color was darker except grey and pinto.

Conclusion: In bay, chestnut and black with indefinitely coat color will be able to classify by routine genotyping, and it will be able to systematize Jeju Horse coat color polymorphisms. In case of Grey and pinto with various genotypes may be concerned in different gene except MC1R, ASIP, MATP gene.

Key words: jeju horse, coat color, MC1R, ASIP, MATP

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