POPULATION STRUCTURE OF BRAZILIAN QUARTER HORSE EQUINES BY USE OF GENOMIC INFORMATION

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The cutting line Quarter Horse has the purpose of functional competitions, which explores the agility of horses, while the racing lines explores the velocity on short distances. The aim of this study was to point the population structure and genomic relationship of Quarter Horse equines from different lines (cutting or racing). Were used 408 (61 cutting horses; 347 racing horses) equines of both sexes and registered on the study book of Brazilian Horse Breeders Quarter Horse Association (ABQM). Animals were collected on Jockey Club of Sorocaba (Sorocaba/SP) an in a dozen of properties across São Paulo state. A set of 177 animals (61 cutting horses; 116 racing horses) was genotyped on 2011 in a density panel of 54K, and remaining animals (N = 231) were genotyped on 2015 in a panel of 65K markers. Principal component analysis was performed at PLINK 1.9 to visualize the basis of genetic structure of the population. Considering the complete data-basis, were used on analysis only the SNPs that are common between the two lines (33,944 SNPs). The results were interpreted on graphical form at ggplot2, and by discriminant analysis at adegenet on R software. Results point to severe distinction between lines on this breed. In racing animals were also verified subpopulations, which could be related to the formation of families descending from important sires.

Keywords: DNA polymorphisms, horse, molecular markers, SNP array