GENETIC DRIFT OF LUSITANO HORSES IN BRAZIL

DERIVA GENÉTICA DA RAÇA PURO SANGUE LUSITANO NO BRASIL

VICTORIA RIZZATO PASCHOAL[2]; RICARDO ANTÓNIO DA SILVA FARIA*[1];; LUIZ EDUARDO CORREIA OLIVEIRA[1]; BEATRIZ PRESSI MOLINA DA SILVA[1]; PABLO CASTAÑO DOMINGUEZ[1]; CAMILLA DE SOUZA OLIVEIRA[1]; JOSINEUDSON AUGUSTO II VASCONCELOS SILVA[2]

[1]Faculdade de Ciências Agrárias e Veterinária (FCAV), Unesp, Jaboticabal, SP, Brazil..
[2]Faculdade de Medicina Veterinária e Zootecnia (FMVZ), Unesp, Botucatu, SP, Brazil.
*e-mail: fariasky@gmail.com

Genetic drift means alteration of the allelic frequencies of a given population, due solely to chance. It occurs with greater intensity when the population suffers a drastic reduction of effective size. The objective of this study was to evaluate if the values of genetic drift suggest a bottleneck effect and absence of genetic stability in the population of animals that compose the Lusitano pedigree (PSL) in Brazil. The information used came from the Brazilian Association of PSL Breeders (ABPSL), involving 16,511 horses born between 1967 and 2012. Of the total animal population (TP), we composed a reference population (RP), including 8,329 animals born in the last 10 years (2003-2012). The creation of RP was to characterize the active population and the current generation of the animals, considering the value of 10 years as generation interval. The values of the effective size of the founders (f), effective size of the ancestors (fa) and effective size of population (Ne) were ascertained and the genetic drift was determined by calculating the ratio of fe/fa, where a value greater than one means the presence of the bottleneck effect. In turn, a fe/Ne ratio greater than 0.5 indicates the occurrence of changes due to genetic drift. The stability of the genetic drift in the population can be observed by fe approximated to Ne/2. The results suggested strong representation of founders in the present generations. The results obtained from the values of the ratio fe/Ne were equal to 0.74 for TP and 0.59 for RP, indicating the existence of genetic drift. The bottleneck effect was small, since the fe/fa ratio presented values equal to 1.16 (TP) and 1.11 (RP). The values fe≈(Ne/2) were equal to 43≈29 for TP and 40≈34 for RP, indicating the use of reproducers with a large number of founders at their origin. Genetic drift of the PSL in Brazil approaches stability, progressively increasing the representation of the founders in the RP, indicated by the values of the ratio that were close to the ideal. The fe/fa ratio confirmed the absence of important bottleneck effects in the populations, with values near one in RP. These values of stability and absence of bottleneck effect suggest a relation with the increase of Ne, that is, there was an increase in the number of animals, provoking greater genetic stability. We can conclude that the PSL in Brazil has permanent founding lineages in the animals, presenting reduced genetic alterations in RP, possibly caused by random segregation of alleles and genetic variability in the population evaluated.

Keywords: bottleneck effect, funder, equine.

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