Genetic variation in BoLA microsatellite loci in Portuguese cattle breeds

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ABSTRACT
Major histocompatibility complex (MHC) typing based on microsatellites can be a valuable approach to understanding the selective processes occurring at linked or physically close MHC genes and can provide important information on variability and relationships of populations. Using microsatellites within or in close proximity with bovine lymphocyte antigen (BoLA) genes, we investigated the polymorphisms in the bovine MHC, known as the BoLA, in eight Portuguese cattle breeds. Additional data from non-BoLA microsatellite loci were also used to compare the variability between these regions. Diversity was higher in BoLA than in non-BoLA microsatellites, as could be observed by the number of alleles, allelic richness and observed heterozygosity. Brava de Lide, a breed selected for aggressiveness and nobility, presented the lowest values of observed heterozygosity and allelic richness. Results from neutrality tests showed few statistically significant differences between the observed Hardy–Weinberg homozygosity ($F$) and the expected homozygosity ($F_E$), indicating the apparent neutrality of the BoLA microsatellites within the analysed breeds. Nevertheless, we detected a trend of lower values of observed homozygosity compared with the expected one. We also detected some differences in the levels of allelic variability among the four BoLA microsatellites. Our data showed a higher number of alleles at the BoLA-DRB3 locus than at the BoLA-DRBP1 locus. These differences could be related to their physical position in the chromosome and may reflect functional requirements for diversity.

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