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Association of Major Histocompatibility Complex Alleles with Antibody Response to Newcastle Vaccine in Chicken

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Abstract : The major histocompatibility complex (MHC) is the best-characterized genetic region associated with susceptibility and/or resistance to a wide range of infectious diseases, autoimmune diseases and immune responses to vaccines. It has been demonstrated that there is an association between the MHC and resistance to Marek disease, Newcastle disease, Rous sarcoma tumor, Avian leucosis, Fowl cholera, Salmonellosis and Pasteurellosis in chicken. The present study evaluated the MHC polymorphism and its association with antibody response to Newcastle (ND) vaccine in Iranian native chickens. The MHC polymorphism was investigated using LEI0258 microsatellite locus by PCR-based fragment analysis. LEI0258 microsatellite marker is a genetic indicator for MHC, which is located on microchromosome 16 and strongly associated with serologically defined MHC haplotypes. Antibody titer against ND vaccine was measured by Haemaglutination Inhibition (HI) assay. Statistical analysis was performed using SPSS software (version 21). Total of 13 LEI0258 microsatellite alleles were identified in 72 samples which indicated a high genetic diversity in the population. The association study revealed a significant influence of MHC alleles on immune responses to Newcastle vaccine. 311 and 313 bp alleles were significantly associated with elevated immune responses to Newcastle vaccine ($p<0.05$). These results would be applicable in designing and improving the populations under selective breeding.

Keywords : chicken, LEI0258, MHC, Newcastle vaccine
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