

Analysis of genetic variation of inducible nitric oxide synthase and natural resistance-associated macrophage protein 1 loci in Malaysian native chickens

Abstract

The genetic diversity of 100 Malaysian native chickens was investigated using polymerase chain reaction-restriction fragment polymorphism (PCR-RFLP) for two candidate genes: inducible nitric oxide synthase (INOS) and natural resistance-associated macrophage protein 1 (NRAMP1). The two genes were selected because of their important role in chicken's immune system. INOS and NRAMP1 PCR products were digested by AluI and SacI restriction enzymes, respectively. The restriction digests produced fragment sizes of 322 and 173 bp for INOS and 722 and 79 bp for NRAMP1 as one allele and an undigested PCR product as the other allele. Both loci were polymorph, however only INOS gene showed Hardy-Weinberg equilibrium. Average heterozygosity and the Shannon information index (I) was 0.43 and 0.62 for INOS and 0.48 and 0.68 for NRAMP1 genes, respectively. The observed polymorphism in this study shows the ability of these candidate genes in marker assisted selection and introgression programs to increase resistance to diseases in both Malaysian native and commercial chickens.

Keyword: Malaysian native chickens; Polymorphism; Inducible nitric oxide synthase (INOS); Natural resistance-associated macrophage protein 1 (NRAMP1)