ABSTRACT

The melanocortin-4 receptor (MC4R) gene is a key factor in the regulation of energy homeostasis and feed intake. In this study, the polymorphisms of chicken MC4R gene were identified. The associations between MC4R and performance traits in indigenous chickens were studied. Six single nucleotide polymorphisms (SNPs) were found in the chicken MC4R gene. Four SNPs were found in coding region at position 82(G>A), 315(G>T), 336(C>T) and 871(T>C). The others were located in 5'- and 3'-flanking regions at position -163(T>C) and 1228(A>G), respectively. Out of these polymorphic sites, 3 SNPs at position -163, 315 and 336 were developed as simple protocols for genotyping 220 Pradhuangdum indigenous chickens. Restriction enzyme AluI was used to detect SNPs at position -163 and SSCP technique was used to genotype SNPs at position 315 and 336, respectively. The AluI and SSCP markers were associated with body weight and average daily gain (p<0.05). However, no association between AluI and SSCP markers and breast wide and Shank length traits were found in this study. The results indicate that the MC4R markers are associated with growth traits in indigenous chickens. Furthermore, the MC4R markers might be used as a molecular marker in a selection program of the indigenous chickens to improve growth traits.