Abstract

Pigs on highland area are an important source of protein for the people on highland area. With lifestyle and culture of those people, black pigs are required for production. However, these pigs have a slower growth rate. Out crossing method was used to improve the growth performance traits of these pigs. However, the black spot color phenotypes were observed in these pigs and were unaccepted for the farmer on highland area. The objective of this study was to study the association of melanocortin 1 receptor (*MC1R*), agouti signaling-protein (*ASIP*) and tyrosinase (*TYR*) genes with characteristics of the pigs on highland area. Six molecular DNA markers of *MC1R*, *ASIP* and *TYR* (*MC1R727*, *MC1R370*, *ASIP-1*, *ASIP-2*, *TYR-1* and *TYR-2*) were used to genotyping in 76 black pigs and 24 non-black pigs(control group). The results showed that four molecular DNA markers were segregated in the population of pigs on highland area. Whereas, two molecular DNA markers (*ASIP-1* and *TYR-2*) were found to be unsegregated in this pig population. The *MC1R727*, *MC1R370*, *ASIP-2* and *TYR-1* markers were significantly associated with characteristics of black color of pigs ($P<0.05$). These markers (*MC1R727*, *MC1R370*, *ASIP-2* and *TYR-1*) could be identified the black pigs with 83.15, 55.78, 67.36, 74.73% accuracy. Combination of 2 (*MC1R727* + *MC1R370*), 3 (*MC1R727* + *MC1R370*+ *ASIP-2*) and 4 (*MC1R727* + *MC1R370* + *ASIP-2* + *TYR-1*) molecular DNA markers could be identified the black pigs with 71.57, 75.78 and 81.05% accuracy. The results in this study indicated that the*MC1R*727 marker was highly significantly associated with black color of pigs and this marker could be used to select the black characteristics in pigs on highland area.