Taiwan Livestock Res. 55(1)：47-55, 2022
DOI：10.6991/JTLR.202203_55(1).0006

The development of genotyping platform on *PRLR* gene in indigenous chicken by kompetitive allele specific PCR [1]

Chai-Te Chu [2] Der-Yuh Lin [2][8] Yung-Yu Lai [2] Hsiao-Mei Liang [4] Shen-Shyuan Yang [5]
Tsung-Lin Liu [7] Hsiu-Luan Chang [6] Ming-Che Wu [3] and Jen-Wen Shiau [2]

Received: Jun. 22, 2021; Accepted: Mar. 30, 2022

Abstract

Broodiness is one of the reproductive physiological reactions of poultry due to natural selection and evolution, which involves genetics and environmental factors. Therefore, this behavior tends to result in a 10% decrease of the average annual egg production due to the degeneration of the ovary and reproductive tract. The prolactin receptor gene is significantly related to the broodiness in chickens. The objective of this study is to optimize a fluorescent primer-labeled KASP (kompetitive allele specific polymerase chain reaction) genotyping platform for SNP detection in prolactin receptor gene using six chicken breeds, including TLKT-07, TLKT-09, TLKT-11, TLKT-12, Hualien LRI, and Fighting Chicken. A total of 90 chickens were genotyped. Results with KASP, polymerase chain reaction single-strand conformation polymorphism (PCR-SSCP) and DNA sequencing analysis showed complete consistence, implying that the three techniques can be substituted with each other. However, KASP method not only showed a high accuracy as others, but also had the advantage of high efficiency for the process of identifying the genotype, and thereby is recommended as the SNP genotyping platform at a specific locus for breeding chicken.

Key words: Taiwan country chicken, Broodiness, Prolactin receptor gene, Kompetitive allele specific PCR.

(1) Contribution No. 2700 from Livestock Research Institute, Council of Agriculture, Executive Yuan.
(2) Breeding and Genetics Division, COA-LRI, Tainan 71246,Taiwan, R. O. C.
(3) Retired from Breeding and Genetics Division, COA-LRI, Tainan 71246,Taiwan, R. O. C.
(4) Kaohsiung Animal Propagation Station, COA-LRI, Pingtung 91247, Taiwan, R. O. C.
(5) Hualien Animal Propagation Station, COA-LRI, Hualien 97362, Taiwan, R. O. C.
(6) Department of Animal Science, National Pingtung University of Science and Technology. Pingtung 91201, Taiwan. R. O. C.
(7) Department of Biotechnology and Bioindustry Sciences, National Cheng Kung University, Tainan 70101, Taiwan. R. O. C.
(8) Corresponding author, E-mail: lin0429@mail.tlri.gov.tw.