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Molecular Marker-Based Genetic Diversity Assessment of Thai Native Chicken and Broiler Chicken

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Abstract

The World chicken meat market is characterised by numerous quality marks: “Label de Qualite Wallon” in Belgium and “Label Rouge” in France, denominations of geographical origin, organic agriculture, etc. Most of those certified productions have specifications requiring the use of slow-growing chicken strains. Such as Thai native chickens have tough and strong muscles, low fat contain and free of antibiotic. The objectives of this research were to employ Amplified fragment length polymorphism (AFLP) to assess the genetic diversity between Thai native chickens and fast-growing broilers. Two restriction enzymes (EcoRI/TaqI) were used for double digestion and 50 selective primer combinations with two and three selective nucleotides were tested on individual DNA samples from chicken products essentially in carcass form that were ascribed as belonging to either slow (Thai native chicken) or fast-growing strains (Broiler). Within the resulting of AFLP fingerprint profiles were analysed on polyacrylamide gel electrophoresis and visualised by silver staining, each combination of primer generally produced 102–220 bands. The AFLP fragments ranged from 50 to 700 bp in length. Two AFLP fragments were identified as type-strains specific markers. The E-ACT / T-CAT primer combination gives a band (270 bp) that is specific for slow-growing chickens, and another AFLP fragment generates a band (250 bp) that was found to be characteristic of fast-growing chickens. The two specific AFLP markers will be isolated, re-amplified, cloned, and sequenced. The effectiveness and the specificity of the two interesting determinants were assessed further on another individuals of both strains. Moreover, genetic diversity of Thai native chicken and broiler chicken will be discussed.

Keywords: Amplified fragment length polymorphism, broiler, genetic marker, Thai native chicken