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THE GENETIC VARIATION AND POLYMORPHISM AT MICROSATELLITE LOCI IN CHICKENS OF WARM REGIONS SELECTED FOR MEAT PRODUCTION

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ABSTRACT

In a research project aiming at the genetic improvement of warm-region originated chickens, a breeding program was practiced on naturally heat-resistant local population in Egypt and four lines have been derived. The lines were the homozygous normally-feathered selected (CE1) and control (CE2) lines, and the homozygous naked-neck selected (CE3) and control (CE4) lines. Lines CE1 and CE3 have been selected for 6-wk body weight for eight generations. The objective of this study was to assess the genetic features of the selected lines at the microsatellite loci recognized by 27 microsatellite primers in generations 6, 7 and 8.

The number of alleles detected by each primer varied from one to seven. The number of alleles per primer and generation averaged 5.72, 2.35, 5.98 and 2.57 in lines CE1, CE2, CE3 and CE4, respectively. The genetic variability was in general low among lines and ranged 0.17–0.20. Polymorphic information content (PIC) averaged 0.50, .39, 0.55 and 0.50 in lines CE1, CE2, CE3 and CE4 respectively, and line-specific alleles (LSA) formed 4.3, 0.7, 4.6 and 1.2% of total alleles in corresponding lines. The differences between each selected line and its control line in PIC and LSA were significant, except between line CE3 and line CE4 in PIC. The results denoted to the possible linkages between the detected microsatellite loci and QTL for body weight. By generation 8, the genetic distance indices between line CE1 and line CE2 averaged 0.740, and between line CE3 and line CE4 averaged 0.815. The phylogenetic dendograms revealed the genetic progress of the selected lines over subsequent generations.

Keywords: Microsatellite Alleles, Polymorphism, Selection, Variability, Warm-Region Chickens

INTRODUCTION

Despite local chicken breeds have the genetic compositions that enable them to adapt the local environments and have further significance for sustainable