COMPARATIVE INVESTIGATIONS OF MALLARD DUCK (ANAS PLATYRHYNCHOS) GENOMIC DNA USING CHICKEN AND DUCK SPECIFIC MICROSATELLITE PRIMERS

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Summary. Microsatellites provide an excellent opportunity for developing genetic markers of high utility because the number of repeats is highly polymorphic. In addition, the assay to score microsatellite polymorphism is quick and reliable and the procedure is based on polymerase chain reaction (PCR). In Lithuania, domestic duck is an economically important poultry species, however, developing microsatellite primers for domestic duck is technically demanding and expensive. Since such microsatellites are very common in the chicken genome, we have previously performed microsatellite – PCR analysis of genomic DNA of Mallard duck (Anas platyrhynchos) using chicken specific microsatellite primers. In addition, microsatellite loci have gained widespread use in genome mapping, phylogenetic and conservation genetics due to their abundance in eukaryotic organisms. Therefore, another goal of our work was to use duck specific microsatelite primers in order to detect polymophism in Mallard duck (Anas platyrhynchos).

Individual blood samples were collected from 61 Mallard ducks from various regions of Lithuania (Babtai, Kretuona, Bukiskis, and Vilnius).. This was followed by phenol – chloroform – isoamyl alcohol extraction of DNA from each sample. The PCR was carried out in a final volume of 25 µl consisting of 50 mM KCL, 10 mM Tris-HCL (pH 8.3), 1.5 mM $MgCl_2$, 0.1 % Triton X-100, 200µM of each deoxynucleoside triphosphate (dNTP), 1U Taq polymerase, 100nM each primer and 25 ng genomic DNA. In the polymerase chain reaction three chicken specific primers of microsatellite marker (ADL-115, ADL-209, ADL-231) and two duck specific primers of microsatellite marker (APH-23, APH-24) were used. Ten microliters of the PCR mixture were loaded onto a 5 % polyacrylamide gel, stained in 0.5 µg/ml ethidium bromide. After PCR products were visualised in a UV transilluminator, photographed and evaluated. In our study PCR products of appropriate size were resolved, suggesting that chicken specific markers may be useful for examining population structure and gene flow in a range of Anatidae. Although thegenetic markers detected may have unknown functions and perhaps do not influence trait variation, they can be used in combining information from a number of samples and provide a good characterisation of breeds. The increasing number of available markers provide an elementary and powerful tool for better understanding of the genetic variance and population architecture related to different duck species and breeds.

Keywords: duck, microsatellites, genetic markers, polymerase chain reaction, DNA, chicken.