# DETERMINATION OF THE GENETIC DIVERSITY OF ORNAMENTAL GUPPY STRAINS (*Poeciliareticulata*) WITH SPECIAL REFERENCE TO MAJOR HISTOCOMPATIBILITY COMPLEX (MHC) CLASS IIB REGION

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# ABSTRACT

Guppies (*Poecilia reticulata*) are one of the major fresh water species that exported by Sri Lanka. Due to this high potential and demand, it is important to development of good characterizations of guppy that benefit to the industry. Major histocompatibility complex (MHC) is a group of genes that coded for cell –surface histocompatibility antigens and are the principle determinants of tissue type and transplant compatibility. MHC genes are highly polymorphic genes in vertebrate genomes and played key roles in immune function regarded immune-recognition, surveillance and host-parasite interaction. Therefore, findings of the genetic variation in MHC of ornamental guppies can be used to improve the parasitic resistance. Single Strand Conformation Polymorphism (SSCP) analysis is one such powerful genetic screening method to identify the sequence variation in Polymerase Chain Reaction (PCR) amplified products. In the present study we investigated the PCR-SSCP genetic variation in the exon 2 gene in MHC complex. Morphological characteristics regarding each strain of guppies were recorded. Whole sample was consisted with 150 guppies.10 strains of guppies purchased from Rambodagalla Ornamental fish breeding centre were taken into this study. Those were Red Blonde Tuxedo, Red Blonde, Blue Neon, Golden Tuxedo, Golden Head, Yellow Sun Set, German Sun Set, Half Black, Sun Ray and Laser Ray. Genomic DNA was extracted using Chelex ® 100 extraction protocol. The target region was amplified using forward (5'- GTG GAT TTC AGA GAA TAT GCA -3') and reverse (5'-TAG TTT ATC CAG AGC GGT TTG -3') primers. The PCR cycling protocol was at 95°C initial denaturation for 3 min, 35 cycles of 94°C for 3 min, 50°C annealing for 1 min, 72°C elongation for 1 min and final extension at 72°C for 10 min with a final hold at 4°C for ∞. According to the morphological characteristics whole guppy sample, 75% of guppies were Female and 25% were male. Upper body colour was had high variation. Highest percentage of guppies showed golden colour upper body. According to the molecular analysis, there was a genetic variation among 10 guppy strains. But within a strain there was no variation. Based on results obtained, it can be concluded that higher percentage of guppies in this study were had fan type tail. Most of male guppies had high tolerant for the stress condition, changing environmental condition which can happen in transportation. Optimized PCR protocol was effective for the amplification of the exon 2 gene in MHC class ii B region.