CHAPTER VI

CONCLUSION

The present study demonstrated the advantages and drawbacks of microsatellite and mtDNA analysis. Microsatellite analysis is a powerful approach to monitor genetic variations within and between arowana strains. The results revealed pronounced genetic differentiation between each strain of arowana, except the wild and hatchery strains of Malaysian yellow-tail gold. Losses of microsatellite alleles, signs of inbreeding and recent bottleneck events in arowana were probably caused by low numbers of the initial broodstock and breeding and selection. Since arowana has high economic value, it is essential to minimize the impacts of the narrowing gene pool. Genetic management practices should be implemented to monitor the genetic variability of the wild and hatchery strains. Microsatellite analysis is ideal for this apporach.

There are disagreements between the microsatellite and mtDNA results. Microsatellite and mtDNA data produced different topologies for the gene trees. MtDNA data showed correlation with colour traits but not with microsatellites. The phylogenetic structures derived from microsatellite and mtDNA data are not associated with geographical distance. Microsatellite analysis is efficient for estimating short term genetic distances at the population level, but mtDNA analysis is more suitable for resolving long term divergence.

The divergence time estimated based on mtDNA sequences agreed with the paleogeographical records of South East Asia. The formation of Sundaland during the Pleistocene allowed faunal exchange and the fluctuation of the sea level eventually led to the divergence of arowana. Their migration route within Sundaland has yet to be known. The long-term divergence only caused morphological and molecular differences but speciation did not occur. At present, the divergence time was estimated based on only two genes and ten haplotypes, hence, further investigations are needed to verify the results.