

## ABSTRACT

Mitochondrial DNA (mtDNA) markers has been widely used to better resolve the taxonomic identification as well as display the genetic relatedness of different species and closely related fish. The highly cost ornamental fish, Asian arowana (*Scleropages formosus*) of family *Osteoglossidae* has different colored strains that are geographically distributed in different regions around Southeast Asia. The taxonomic classification of these different strains still remains unclear and disputable. The partial sequences of the cytochrome b and the DNA barcoding gene, cytochrome C oxidase were analyzed and assessed for molecular identification; to differentiate the colored varieties of this species. The results of this study indicated that there was lack of both COI and cytochrome mtDNA differentiation among the red and golden main varieties that it did not indicate emergence of new species. However, the partial sequences of the genes are sufficient to identify the species when compared to its closely related species as well as the green strains compared to other strains of the Asian arowana. In the future, more markers will be used to obtain a more concrete evidence to support the existence of a relationship among Arowana starians.

## ABSTRAK

Penanda (marker) DNA mitokondria (mtDNA) digunakan secara meluas untuk pengenalan taksonomi dengan lebih jitu. Selain daripada itu, ia juga boleh digunakan untuk mencari pertalian genetik antara ikan dari spesis lain dan juga spesis yang terdekat dengan ikan. Arowana Asia yang tergolong dalam famili *Osteoglossidae* dimana ia terdapat di kawasan sekeliling selatan-timur Asia mempunyai strain untuk warna yang berbeza. Pengklasifikasi taksonomi bagi strain untuk warna berbeza ini belum dikaji dengan jelas dan masih dipersoalkan. Separuh jujukan dari cytokrome b dan gen untuk barkoding DNA iaitu Cytochrome C oksidasi telah dianalisis untuk membezakan keupayaan warna berbeza bagi spesis ini melalui identifikasi secara molekular. Kajian ini menunjukkan bahawa pembezaan oleh kedua-dua COI dan cytokrome mtDNA antara warna merah dan emas yang merupakan spesis utama tidak menunjukkan kewujudan spesis baru. Walaubagaimana pun jujukan dari separuh gen adalah mencukupi untuk mengenal pasti spesis apabila dibandingkan dengan spesis yang terdekat dan juga apabila strain untuk warna hijau dibandingkan dengan strain untuk warna lain bagi Arowana Asia. Dalam jangka masa panjang, lebih penanda harus diperolehi bagi membuktikan kaitan antara strain untuk warna lain bagi Arowana spesis dengan lebih kukuh dan jitu.

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## LIST OF ABBREVIATIONS

µg	Microgram
µl	Microlitre
°C	degree Celsius
10X	ten times
1X	one time
5X	five times
AMOVA	Analysis of molecular variance
BLAST	Basic local alignment search tool
CITES	Convention on International Trade in Endangered Species
COI,II,III	Cytochrome c oxidase subunit 1,II,III
Cyt b	Cytochrome b
D-loop	Displacement loop
dATP	deoxyadenosine triphosphate
dCTP	deoxycytidine triphosphate
dGTP	deoxyguanosine triphosphate
dNTP	deoxyribonucleotide triphosphate
dTTP	deoxythymidine triphosphate
ddH <sub>2</sub> O	Double distilled water
D <sub>N</sub>	genetic distance
DNA	Deoxyribonucleic acid
EtBr	ethidium Bromide
EDTA	ethlendiamine tetraacetic acid
et al.	others
F <sub>st</sub>	Fixation index
g(s)	Gram(s)
h or hr	Hour
IUCN	International union for conservation of nature
K	Kilo
LD	Linkage disequilibrium
m	Meters
NCBI	National Center for Biotechnology Information
NJ	Neghbor joining
numts	Nuclear copies of mitochondrial sequences
OD	Optical density
p	Pico
PCR	Polymerase Chain Reaction
T <sub>A</sub>	Annealing temperature

TBE	Tris-borate-EDTA buffer
tRNA	Transfer Ribonucleic acid
s	Second
UV	Ultra violet
v	Volt