# HAPLOTYPIC DIFFERENCES AND GENETIC VARIABILITY REVEALED BY MITOCHONDRIAL DNA IN IKAN HARUAN (*Channa striatus* BLOCH)

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# Haplotypic Differences And Genetic Variability Revealed By Mitochondrial DNA In Ikan Haruan (*Channa striatus* Bloch)

By

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AKHIR PROJEK

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Dengan ini disahkan bahawa saya telah menyemak laporan akhir projek ini dan

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Dedicated

to Him who sits on the throne.....

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## ABSTRACT

Restriction fragment length polymorphisms (RFLPs) of mitochondrial DNA (mtDNA) were performed on three populations of Ikan haruan from Penang (PPH), Kelantan (KH) and Johore (JH) in order to estimate genetic differences and variability. Five 6-base recognizing restriction endonucleases, *Hin* dIII, *Eco* RI, *Pst* I, *Kpn* I and *Bam* HI were used and the total size of the mtDNA was found to be about 20.3±1.6 kbp. A total of 12 haplotypes were observed among 41 individuals of the three populations and the population from Johore was discovered to be the most polymorphic with 9 haplotypes, second was from Kelantan with 7 haplotypes and third was from Penang with 5 haplotypes. Stock-specific haplotypes were observed from all the population, i.e one from Penang and two from both Kelantan and Johore respectively, and they can be used as genetic markers. It was also found that the haplotypic diversity ranges from 0.822 to 0.900 while the nucleotide diversity ranges from 0.01341 to 0.02126. The Kelantan's stock was the most divergent while Penang's and Johore's stock were found to be closely related. It was also estimated that Kelantan's stock originated 640,000 years earlier than Penang's stock and 600,000 years earlier from Johore's stock while Penang's and Johore's stock diverged only about 500,000 years ago. There is a clear definite difference between the east coast and west coast populations of Ikan haruan.

# ABSTRAK

Kaedah 'restriction fragment length polymorphisms' (RFLPs) ke atas DNA mitokondria (mtDNA) telah dijalankan terhadap tiga populasi ikan haruan dari Pulau Pinang (PPH), Kelantan (KH) and Johor (JH) untuk menganggarkan perbezaan dan variasi genetik. Lima jenis enzim restriksi, *Hin* dIII, *Eco* RI, *Pst* I, *Kpn* I dan *Bam* HI, yang dapat mengenalpasti 6-basa telah digunakan dan didapati bahawa jumlah saiz mtDNA adalah lebih kurang 20.3±1.6 kbp. Sejumlah 12 haplotip telah diperhatikan pada 41 individu daripada tiga populasi tersebut dan didapati bahawa populasi dari Johor adalah yang paling polimorfik dengan 9 haplotip, diikuti dengan populasi dari Kelantan dengan 7 haplotip dan akhirnya populasi dari Pulau Pinang dengan 5 haplotip. Haplotip yang spesifik bagi setiap stok populasi juga dijumpai, iaitu, satu daripada Pulau Pinang dan dua daripada Kelantan and Johor masing-masing, dan ianya boleh digunakan sebagai penanda genetik. Indeks kepelbagaian haplotipik berjulat di antara 0.822 hingga 0.900 manakala indeks kepelbagaian nukleotid berjulat di antara 0.01341 hingga 0.02126. Stok dari Kelantan didapati paling berbeza manakala stok dari Pulau Pinang dan Johor didapati mempunyai pertalian yang dekat. Stok dari Kelantan dianggarkan berasal 640,000 tahun terdahulu daripada stok dari Pulau Pinang dan 600,000 tahun terdahulu daripada stok Johor, manakala stok Pulau Pinang dan Johor terpisah hanya lebih kurang 500,000 tahun dahulu. Terdapat perbezaan yang ketara di antara populasi ikan haruan dari pantai timur dan pantai barat.