

**Homogeneous nature of Malaysian Marine fish *Epinephelus fuscoguttatus*  
(Perciformes; Serranidae): Evidence based on molecular markers,  
morphology and fourier transform infrared analysis**

**Abstract**

Taxonomic confusion exists within the genus *Epinephelus* due to the lack of morphological specializations and the overwhelming number of species reported in several studies. The homogenous nature of the morphology has created confusion in the Malaysian Marine fish species *Epinephelus fuscoguttatus* and *Epinephelus hexagonatus*. In this study, the partial DNA sequence of the 16S gene and mitochondrial nucleotide sequences of two gene regions, Cytochrome Oxidase Subunit I and III were used to investigate the phylogenetic relationship between them. In the phylogenetic trees, *E. fuscoguttatus* was monophyletic with *E. hexagonatus* species and morphology examination shows that no significant differences were found in the morphometric features between these two taxa. This suggests that *E. fuscoguttatus* is not distinguishable from *E. hexagonatus* species, and that *E. fuscoguttatus* have been identified to be *E. hexagonatus* species is likely attributed to differences in environment and ability to camouflage themselves under certain conditions. Interestingly, this finding was also supported by Principal Component Analysis on Attenuated Total Reflectance–Fourier-transform Infrared (ATR-FTIR) data analysis. Molecular, morphological and meristic characteristics were combined with ATR-FTIR analysis used in this study offer new perspectives in fish species identification. To our knowledge, this is the first report of an extensive genetic population study of *E. fuscoguttatus* in Malaysia and this understanding will play an important role in informing genetic stock-specific strategies for the management and conservation of this highly valued fish.