DNA barcoding analysis of larval fishes in Peninsular Malaysia

ABSTRACT

Aim: To identify fish larvae to species level by DNA barcoding method using the mitochondrial Cytochrome c Oxidase I (COI) gene. The lack of species identification work on fish larvae in Peninsular Malaysia has warrant this study to be conducted. Methodology: Identification of fish larvae species from mangrove areas of Pendas Johor, Matang Perak, Pekan Pahang and Setiu Terengganu was conducted. Samples were collected from April 2015 to September 2015 using a bongo net, towed at a depth of about 0.5 m from the surface for 5 min against the tidal flow. From the total of 354 fish larvae collected, a representative of 177 fish larvae was selected and sequenced using COI gene Results: Results from BLAST and BOLDSYSTEM search showed all sequences had high percentage identity index and similarity (90% to 100%). Fish larvae were identified through phylogenetics analysis showing monophyletic status between query sequences with reference sequences obtained from own collection and GenBank. The Sillago vittata and Sillago sihama sequences was found to be in separate clusters despite their similar genus. A few strong match of specimens from different genus was found with high bootstrap value (n>90%) through Neighbour-Joining (NJ) and Maximum likelihood (ML) analysis e.g the Paramugil parmatus with Liza melinoptera (NJ =100%, ML = 99%) and Pseudogobius oligactis with Eugnathogobius oligactis (NJ = 92%, ML 94%). Interpretation: Identification of fish larvae were best conducted with the aid of molecular method, DNA barcoding in particular rather than comparative taxonomical studiesalone that able to identify fish larvae sample to genus level at best.

Keyword: Cyctochrome c Oxidase I (COI) gene; DNA barcoding; Fish larvae; Mangroves; Peninsular Malaysia; Phylogenetic