# Identification of morphologically similar reef fishes (Perciformes, Lutjanidae) using a molecular approach

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Reef associated fish species can be commonly found in coral reef ecosystems. In Sri Lanka, reef fishes are a popular source of food in local and export markets. Close characters among some reef fish species cause difficulty in distinguishing the correct species only by looking at their morphology. For instance, *Lutjanus quinquelineatus* and *Lutjanus notatus* are very similar in morphology. Mis-identification of fishes at their species level will cause mis-predictions which will affect fisheries management decisions. Hence, it is very important to identify fish to their correct species level for sustainable conservation and management. It has been proved that biotechnological applications can be used to identify fish up to their correct species level accurately by using species-specific molecular tags. This preliminary study was carried out to study the DNA barcodes of *Lutjanus quinquelineatus* and *Lutjanus fulviflamma*, two economically important reef fish species of Sri Lanka. Muscle samples were preserved in 100% ethanol and DNA was extracted from twelve samples (six from each species) using Qiagen's DNeasy Blood and Tissue Kit. Polymerase chain reaction was carried out for the common fish "barcode" region of mitochondrial COI gene using Fish F1 and R1 primers. PCR products were bi-directionally sequenced and sequencing results were analyzed by using BioEdit and bioinformatic tools in NCBI BLAST. Sequence alignment with NCBI BLAST search resulted in more than 99% identity. The results implied that many species were mis-identified such as, *Lutjanus quinquelineatus* (Five-lined snapper) as *Lutjanus notatus* (Blue-striped snapper), *Lutjanus fulviflamma* (Black-spot Snapper) as *Lutjanus johnii* (John's snapper). Multiple sequence alignment of the *Lutjanus notatus* resulted in Single Nucleotide Polymorphisms in the 135$^{th}$ (G/T) and 249$^{th}$ (C/T) bp positions, showing that there are a few nucleotide level variations among the individuals of the same species. The study showed that there have been mis-identifications in some reef fish during field data and sample collection, which emphasize the fact that it is very important to upgrade the current reef fish guide in Sri Lanka and identification of correct morphological features to discriminate reef fish species accurately to prevent such errors in future.

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