

DNA Barcoding of Selected Fin Fishes from New Calabar River in Rivers State, South-South Nigeria Using Cytochrome C Oxidase Subunit 1 Gene

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Abstract : The major environmental crisis is the loss of biodiversity and the decline is predominant in the fish population. Although taxonomic history began 250 years ago, there are still undiscovered members of species and new species are waiting to be uncovered. The failure of the traditional taxonomic method to address this issue has resulted to the adoption of a molecular approach-DNA barcoding. It was proposed that DNA barcoding using the mitochondrion cytochrome oxidase subunit I (COI) gene has the capability to serve as a barcode for fish. The aim of this study was to use DNA barcoding in the identification of fish species in the New Calabar River, Rivers State. BLAST result showed the correlation between the sequence queried and the biological sequences with the NCBI database. The names of the samples, percentage ID, predicted organisms, and GenBank Accession numbers were clearly identified. A total of 18 sequences (all > 600bp) belonging to 8 species, 7 genera, 7 families, and 5 orders were validated and submitted to the NCBI database. Each nucleotide peak was represented by a single colour with various percentage occurrences. Two (22%) out of the 9 original samples analyzed corresponded with the predicted organisms from the BLAST result.) There were a total of 712 positions in the final dataset. Evolutionary analyses were conducted in MEGA11. Pairwise sequence alignment showed different consensus positions and a total of 30 mutations. There was one insertion from *Polynemus dubius* and 29 substitutions (transition-15 and transversion-14) mutations. No deletion and nonsense codons were detected in all the amplified sequences. This work will facilitate more research in other keys areas such as the identification of mislabeled fish products, illegal trading of endangered species, and effective tracking of fish biodiversity.

Keywords : DNA barcoding, Imo river, phylogenetic tree, mutation.

Conference Title : ICTB 2025 : International Conference on Taxonomy and Biodiversity

Conference Location : New York, United States

Conference Dates : May 29-30, 2025