

ABSTRACT

Muhammad Bintang Yanuar. 24020122120007. Environmental DNA (eDNA) Metabarcoding Analysis in Revealing Freshwater Fish Diversity in Lake Batur, Bali. Ecology and Biosystematics Laboratory, Department of Biology, Faculty of Science and Mathematics, Diponegoro University. Under the supervisions of Karyadi Baskoro and Ni Kadek Dita Cahyani.

*Lake Batur is the largest freshwater ecosystem in Bali, which is currently facing severe ecological pressure due to massive Floating Net Cage activities and the unregulated release of ornamental fish. This study aims to uncover the diversity of freshwater fish species and identify introduced taxa in Lake Batur using environmental DNA (eDNA) metabarcoding techniques. Water sampling was conducted at ten observation stations representing variations in the lake's zones. The amplification of environmental genetic material targeted the MiFish 12S rRNA marker gene, followed by sequencing using MinION Nanopore technology. Bioinformatics analysis successfully detected 20 fish taxa that were unevenly distributed. The results indicated that, based on genetic material traces, the fish community in Lake Batur is dominated by introduced species, particularly from the Cichlidae family (*Oreochromis niloticus*). Conversely, native fish groups such as Nilem (*Osteochilus* sp.), Snakehead (*Channa striata*), Wader (*Rasbora arundinata*), and Gourami (*Trichopodus trichopterus*) have experienced ecological niche shrinkage and were detected with only very minimal traces of genetic material. Furthermore, the detection of non-native taxa triggering high false-positive rates confirms indications of genetic pollution from hybrid aquaculture strains originating from KJA facilities, as well as the incompleteness of the global genetic reference database. The dominance of these introduced taxa has disrupted the balance of the lake's ecosystem; therefore, an evaluation of KJA zoning governance and the enrichment of the local freshwater fish genetic database are urgently needed to support native species conservation efforts.*

Keywords: *Lake, eDNA Metabarcoding, Freshwater.*