

ABSTRACT

Scerina Hana Pertiwi. 24020122130090. Fish Species Diversity in Lake Buyan, Bali Based on Environmental DNA (eDNA) Metabarcoding Analysis. Ecology and Biosystematics Laboratory, Department of Biology, Faculty of Science and Mathematics, Universitas Diponegoro. Under the supervision of Jafron Wasiq Hidayat and Ni Kadek Dita Cahyani.

Lake Buyan is a tropical lake ecosystem in Bali that is currently experiencing ecological pressure due to anthropogenic activities such as land-use change, intensive agriculture, tourism, and the introduction of non-native invasive fish species that threaten native biodiversity. This study aimed to analyze fish species diversity and detect the presence of invasive species, including the potential occurrence of new invasive species in Lake Buyan using *environmental DNA (eDNA) metabarcoding* based on *Oxford Nanopore Technology (ONT)*. Water samples were collected from 10 sampling sites, followed by DNA extraction, amplification of the mitochondrial 12S rRNA gene using PCR, and sequencing using the MinION platform. The results showed that the initial dataset consisted of 1 Kingdom, 3 Classes, 34 Orders, 50 Families, 129 Genera, and 232 Species. After the filtering process, 1 Phylum, 1 Class, 9 Orders, 11 Families, 24 Genera, and 34 Freshwater fish species were obtained. Fish diversity was dominated by the orders Cichliformes and Cypriniformes. The eDNA metabarcoding successfully identified native species such as *Barbodes binotatus*, *Channa striata*, and *Oryzias javanicus*, as well as invasive species such as *Amatitlania nigrofasciata*, and two potential new invasive species, namely *Carassius cuvieri*, and *Carassius langsdorfii*. Both species exhibit relatively rapid reproduction rates and have the potential to compete with native planktivorous fish. However, predatory fish act as natural enemies to these potentially invasive species, thereby helping to control their populations within the aquatic ecosystem. Overall, this method provides a comprehensive overview for monitoring fish biodiversity and detecting invasive species in Lake Buyan, and can serve as a strong scientific basis for conservation policy formulation in the Lake Buyan area.

Keywords: *Lake Buyan, Freshwater Fish, Oxford Nanopore Technology, Biodiversity*