

ABSTRACT

Nanda Indarwati. NIM.24020122130066. Analysis of Freshwater Species Diversity in The Downstream Area of Padang Bulia Waterfall, Bali Using eDNA Approach. Ecology and Biosystematic Laboratory, Undergraduate Biology, Department of Biology, Faculty of Science and Mathematics, Diponegoro University. Under the supervisions of Karyadi Baskoro and Ni Kadek Dita Cahyani.

Freshwater ecosystems play an essential role in maintaining biodiversity, regulating regional climate, purifying water sources, and facilitating the natural circulation of materials across ecological systems. Fish are important components of freshwater biodiversity and are highly sensitive to environmental health. This study employed a Third Generation Sequencing (TGS) approach based on Oxford Nanopore Technologies (ONT) using MiFish-U primers targeting the mitochondrial 12S gene, supplemented by comprehensive bioinformatics processing and alpha diversity ecological analysis. The results showed that the eDNA approach successfully identified 27 freshwater species, including 9 native species of Indonesia. The Shannon-Wiener diversity index and Simpson diversity index for samples were 3.1 and 0.953, 6.2 and 0.974, and 4.4 and 0.967. These findings indicate that the ecosystem is in good condition, as reflected by the high diversity of fish communities and low species dominance. Since fish communities serve as bioindicators of aquatic environmental health, this suggest that the fish communities in the downstream area of Padang Bulia Waterfall are relatively balanced and reflects a stable ecosystem.

Keywords: eDNA, Metabarcoding, ONT, Alpha diversity, Padang Bulia Waterfall