COMPARISON OF FISH SPECIES DIVERSITY IN TWO STREAM SEGMENTS WITHIN AN OIL PALM PLANTATION IN SOUTHERN SRI LANKA

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The rapid expansion of oil palm plantations has raised concerns about the potential ecological impact on aquatic biodiversity, particularly in tropical regions. Streams within these plantations often undergo alterations in water quality and habitat structure, which can significantly influence the composition and abundance of fish species. Understanding these impacts is essential for developing effective conservation strategies. This aims to assess the fish species diversity in the Mamana-Dola stream, situated within the Nakiyadeniya estate, amidst concerns about the impact of commercial oil palm plantations on biodiversity. The stream, situated in the lower catchment of the Gin River basin in Southern Sri Lanka, was sampled over the course of one year at 23 randomly selected locations during both the wet and dry seasons. Alongside recording fish species and their population densities, physical stream parameters were also measured at each site. A total of 32 fish species were identified, of which 50% were endemic to Sri Lanka. Based on the IUCN Red List (2020), 37.5% of the species found were categorized as threatened, including 8 Vulnerable (VU) and 4 Endangered (EN) species, with notable endangered species being Aplocheilus dayi, Laubuka ruhuna, Paracanthocobitis urophthalma, and Sicyopterus griseus. The stream was divided into two main segments: areas with oil palm cultivation and those without oil palm. Fish species density, relative abundance, and evenness were calculated using Shannon, Simpson, and Pielou's indices. The findings indicated that the oil palm segments exhibited slightly higher species diversity (H'=2.35) compared to the non-oil palm segments (H'=1.78) same was evidenced by their Simpson's Dominance Index (1-D=0.88) and Pielou's evenness index (E=0.36). This suggests a more diverse and evenly distributed fish community in oil palm segments. Additionally, stream segments with aquatic vegetation showed greater species diversity (H'=2.19) and higher Simpson's Dominance Index (1-D=0.86) than those without aquatic vegetation (H'=2.13, 1-D= 0.83). These results highlighted the positive effects of conservation efforts by plantation management, which promote sustainable agricultural practices and support existing fish diversity in the stream located within oil palm plantations. Overall, these results highlight the positive impact of such conservation efforts in plantation areas.

Keywords: Biodiversity, Conservation, Endemic Fish Species, Fish Diversity, Oil Palm Plantations.