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Habitat Characterization of *Pethia nigrofasciata* Inhabiting Wak Oya Stream at the Kelani River Basin, Sri Lanka

Nanayakkara, P.S.S.[1]*, Perera, P.K.P.[2], Karawita, H.[2]

[1]*Post Graduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka*
[2]*Department of Forestry and Environmental Science, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*
*nanayakkara.pss@gmail.com

Abstract

The habitat characterization of the endemic fish species *Pethia nigrofasciata*, belonging to the family Cyprinidae found in wet-zone basins of Sri Lanka, was examined in the present study. The species is at risk due to anthropogenic activities that may degrade its habitat and collection for ornamental fisheries. The study was conducted from August 2022 to January 2023 in the Wak Oya Stream at the Kelani River basin. The relationship between the abundance of *P. nigrofasciata* and various habitat and environmental parameters, such as dissolved oxygen, temperature, biological oxygen demand, total dissolved solids, conductivity, stream width, and depth, flow rate, stream edge and, bed conditions, and associated flora and fauna species, were studied in 20 sampling sites along the Wak Oya Stream. Data were collected monthly against the species abundance of *P. nigrofasciata*. According to the results, there is a significant variation in the mean abundance of *P. nigrofasciata* across the sample sites. The mean abundance of *P. nigrofasciata* in the stream edge conditions with Soil (26.45±16.75) is significantly higher (α=0.05) than that of Rocky edges (13.71±07.91). Additionally, there is a significant difference (α=0.05) in the abundance of the species among Sandy, Rocky, and Silty bed conditions. The mean abundance of *P. nigrofasciata* is highest in Sandy bed conditions (22.53±12.58), followed by Rocky bed conditions (10.33±2.43), and lowest in Silty bed conditions (5.25 ±02.30). According to the study the species was found in shallow tributaries with a mean stream depth of 0.43±0.15 meters and a mean width of 5.35±2.01 meters and it prefers moderate canopy cover of 31-40%. *P. nigrofasciata* exhibited a preference for habitats with considerably higher mean Dissolved Oxygen (DO) of 6.81±0.62 ppm, low mean Biological Oxygen Demand (BOD) 0.43±0.30 ppm, and low mean Total Dissolve Solids (TDS) 0.018±0.004 ppm, indicative of a minimal preference for organic pollution. Also, the average temperature of 26.8±0.6° C and low mean electrical conductivity of 0.037±0.007 mS further characterized the species' preference for cool and low-polluted habitats. *P. nigrofasciata* preferred slightly acidic and stable pH 6.41±0.21 and slow-moving habitats, with an average flow rate of 0.10±0.11 ms^{-1}. Moreover, the prominent edge-associated plant species were identified as *Glyceria maxima*, *Ochlandra stridula*, and *Lagenandra praetermissa*. Furthermore, prominent riparian habitat types were identified as Rubber cultivation, Forest Covers, and Marshy land in the sampling area. Overall, this research provides comprehensive insights into the environmental characteristics shaping the habitat of *P. nigrofasciata*, offering valuable information for conservation efforts.

Keywords: *Pethia nigrofasciata,* Habitat, Abundance, Environmental parameters, Wak Oya