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The Impact of Aquatic Invasive Plant, *Pontederia crassipes,* on Zooplankton Abundance and Diversity in Muthun Ela Stream, Gampaha, Sri Lanka.

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Abstract

The proliferation of aquatic invasive plants can profoundly alter freshwater ecosystems by modifying water quality. *Pontederia crassipes,* commonly known as water hyacinth, is one of the aggressive aquatic invaders, native to tropical and subtropical South America. This study assesses the impact of *P. crassipes* on zooplankton abundance and diversity in Muthun Ela stream, Gampaha, by comparing three infested and three non-infested sites. Water samples were collected in triplicate from three infested and three open-water sites over six months. A 300 µm zooplankton net was used for zooplankton sampling. Infested sites had lower dissolved oxygen (4.61±0.14 mg/L), temperature (27.13±0.33 °C), phosphate (0.88±0.09 mg/L) and nitrate (0.72±0.09 mg/L), chlorophyll-a concentrations (0.35±0.04 µg/L) and higher turbidity (5.55±0.14 mg/L), likely affecting primary productivity. The study recorded 24 zooplankton species belonging to the orders Cyclopoida, Cladocera, Ploima, Anomopoda, Podocopida, Oikopleurida, and Appendicularia. Cladocera and Cyclopoida were dominant in both environments, contributing 23.33% and 16.67% in infested areas and 21.35% and 16.39% in open waters, respectively. Families such as Moinidae, Sididae, Lepadellidae, and Cypridídae were evenly distributed between the two habitats, with Lepadellidae and Cypridídae showing slightly higher representation in open-water sites, while rotifers of Lecaneidae and Lepadellidae were also widespread. In contrast, Conochilidae (1.07%) and Appendicularia (0.18%) were recorded only in open-water sites, indicating their preference for less vegetated habitats. Non-infested sites consistently support higher zooplankton abundance (180.00±12.76 ind./L) compared to the infested sites (126.11±7.63 ind./L, $p<0.001$), especially for families such as Daphniidae and Cyclopidae. In contrast, the infested areas showed comparatively higher richness, suggesting that *P. crassipes* alters community composition by creating microhabitats while limiting overall population size. Diversity indices analysis revealed higher species diversity in open water (Shannon Wiener mean=1.73±0.01), but greater species richness in infested areas (Margalef's mean=3.17±0.49). Collectively, non-infested sites supported higher abundance, while infested sites exhibited more variable and microhabitat-driven species richness. The findings suggest that *P. crassipes* alters habitat conditions, reducing zooplankton abundance and diversity, which may have cascading effects on the aquatic food web.

Keywords: *Invasive, Abundance, Diversity, P. crassipes, Zooplankton*