



A comparative analysis on diel vertical migration of zooplankton in littoral and limnetic zones of a reservoir in Sri Lanka

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Diel Vertical Migration (DVM) is a behavior displayed by many zooplankton in freshwater and marine habitats to avoid the visual predation risk. Usually, they perform a behavior pattern of ascending to the upper pelagic region during the nighttime and descending to deeper water layers during the daytime. The present study aimed to investigate the DVM of zooplankton in a tropical reservoir and compare the differences if any in limnetic and littoral zones. The research was conducted in Hambegamuwa reservoir in Monaragala District, Sri Lanka. Zooplankton samples and abiotic data were collected at four-hour intervals throughout 24 hours in each sampling day. Three sampling days from dry season to rainy season (August 2023 to November 2023) were considered. All data were collected at fixed depths i.e. surface and 3 ft in the littoral zone and surface, 3 ft and 6 ft in the limnetic zone. Three main zooplankton phyla were identified as Rotifera, Arthropoda and Sarcomastigophora, and were quantified as individuals L⁻¹. They included seven genera of Rotifera and two genera of Arthropods. Canopy cover, aquatic vegetation and other hydrological parameters were different between the littoral and limnetic zones. In the limnetic zone, the DO had a significant negative correlation with depth ($r = -0.828$) and turbidity had a significant positive correlation with depth ($r = 0.626$). In the limnetic zone, the bottom layer exhibited the highest percentage abundance values of zooplankton in the morning, while the topmost layer has higher values during the darker hours. The results exhibited that only the limnetic zone possessed a DVM pattern of zooplankton. Same taxonomic group exhibited different DVM patterns at limnetic and littoral zones. In littoral zone, only the phylum Sarcomastigophora exhibited DVM. Abundant food availability and shelter from vegetation reducing predation risk might be the reasons for the absence of the DVM pattern in the littoral zone.

Keywords

Diel vertical migration, zooplankton, littoral zone, limnetic zone, reservoir