

Seasonal water level fluctuation, habitat alteration and colonization of marginal benthic fauna in irrigation reservoirs in the Kala Oya River basin in Sri Lanka.

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The innumerable benthic microhabitats in freshwater ecosystems support a wide variety of fauna. These benthic fauna are sensitive to natural as well as anthropogenic disturbance events such as water level fluctuations, temperature variations, agrochemical inputs etc. The present study was carried out to investigate the effect of seasonal water level fluctuation on the distribution and colonization of benthic fauna at some irrigation reservoirs in Sri Lanka.

The study was carried at 10 reservoirs namely Angamuwa wewa, Balalu wewa, Dewahuwa wewa, Ibbankatuwa wewa, Kandalama wewa, Katiyawa wewa, Kala wewa, Siyambalangamuwa wewa, and Usgala-Siyambalangamuwa wewa in the Kala Oya river basin in Sri Lanka. The study period (September, 2014 to March 2015) included a dry season followed by a rainy season. Soil core samples ($n = 15$, volume = 0.5 dm^3 each) from within 3 random locations in the marginal zone of each reservoir at each season were collected using a soil corer. After the samples were wet sieved *in situ* through a 1 mm sieve, the macrobenthic fauna in each sample were separated, identified to the nearest possible taxonomic level and enumerated separately. Environmental parameters such as aquatic vegetation, shadiness, soil texture, soil pH and the degree of water inundation were also measured using standard methods. The Shannon-Wiener diversity index for each reservoir for the two climatic seasons were determined and were statistically compared by a t-test. The abundance of benthic species at different study sites were analyzed using cluster analysis. The importance of environmental variables on the abundance of macrobenthos for both seasons were tested by the Principal Component Analysis (PCA).

Altogether 17 taxa were recorded. *Bellamya* (Mystery snail) (62.2 ± 17.2) and *Melanoides* (Trumpet snail) (38.5 ± 11.6) were the dominant taxa during the dry season while *Bithynia* (Mud snail) (15.77 ± 6.75) and *Bellamya* (4.83 ± 1.38) dominated during the rainy season. The species richness was higher in rainy season (17 taxa) than in the dry season (11 taxa). This was due to the presence of six additional taxa i.e. Chironomidae, Oligocheata, Ephemeroptera, Trematoda, Zygoptera and *Bithynia*) during the rainy season. The species diversity of the reservoirs was significantly high during the rainy season (t – test, $P = 6.2148$, $\alpha = 0.05$, $df = 22$). PCA revealed that the degree of water inundation and aquatic vegetation to be the key factors that determine the species distribution of these reservoirs. The elevated species diversity perhaps may be due to the enhanced growth of aquatic vegetation at the shallow marginal habitats when the reservoirs were inundated by water during the rainy season. The change of this habitat alteration may have positively supported the colonization of new insect taxa such as Chironomids, Ephemeropterans and Zygopterans into these shallow marginal habitats of irrigation reservoirs in the Kala Oya River Basin in Sri Lanka.

Key words: Irrigation reservoirs, Habitat alteration, Seasonal water level fluctuation, Macrobenthic fauna, Species diversity.

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