Abundance and diversity of freshwater molluscs in some selected reservoirs of the Kala Oya river basin, Sri Lanka

S.N. Weerakoon*, W. U. Chandrasekara and U. S. Amarasinghe

Department of Zoology & Environmental Management, Faculty of Science, University of Kelaniya 11600, Sri Lanka.

*Corresponding Author (email: snweerkn@gmail.com)

Benthic macroinvertebrates such as molluscs are known to be possible bioindicators of aquatic ecosystems. We carried out a study to investigate how the abiotic factors affect the abundance and diversity of molluscan fauna at 10 irrigation reservoirs in the Kala Oya river basin during the dry season from August to November 2014. In each reservoir, three sampling sites were selected where at each site, a 50 m long perpendicular line transect was established running from its maximum water supply level towards the center of the reservoir. Three soil samples were collected at 10 m intervals each along each transect using a 0.5 dm^3 soil corer. These samples were sieved *in situ* through a 1 mm sieve and the remains were preserved in 10% formalin solution containing Rose Bengal. Later the molluscs and other associated macrofauna were identified to the nearest possible taxonomic category using standard taxonomic keys and the fauna belonging to each taxon were enumerated separately. In addition, data related to vegetation cover, intensity of human disturbances, intensity of pollution, agrochemical inputs, soil texture and human settlements based on a modified scoring system were also collected. Altogether 4328 molluscs belonging to 11 genera were recorded. Molluscan genera such as *Bellamya* (45.9%), *Melanoides* (26.7 %) and *Thiara* (16.9 %) dominated the samples while the remainder (10.5%) belonged to less dominant genera consisting of *Planorbis*, *Gyraulus*, *Indoplanorbis*, *Lamellidans*, *Planorbella*, *Lymnaea* and *Pila*. The abundance of the molluscan genera varied significantly between the reservoirs (MANOVA; $F_{(99, 899)}$ = 4.300, P = 0.000; Wilk's λ = 0.06515) and along the transect distances (MANOVA; $F_{(44, 483)}$ = 0.901, P = 0.654; Wilk's λ = 0.73988). High diversity measures of molluscs were observed at Angamuwa wewa, Katiyawa wewa, Rajanganaya reservoir and Usgala-siyambalangamuwa wewa. Principal Component Analysis (PCA) for the mollusc abundance and the relationship between PC1 scores and Shannon–Wiener diversity index endorsed that *Bellamya*, *Melanoides* and *Thiara* were the highly contributing genera to the high diversity of the molluscs in the above reservoirs. Results of the PCA for abiotic factors revealed that both the abundance and species diversities were high at moderately sandy bottoms with high vegetation cover and agrochemical inputs. In contrast, the intensity of human disturbances, pollution, human settlement and shadiness showed a negative effect on the abundance and diversity of these molluscs. This study was carried out as part of a comprehensive study which investigates how the aspects related to biotic integrity and multiple uses of reservoirs could be used to develop effective management options for reservoir fisheries in Sri Lanka.

Keywords: Abiotic factors, anthropogenic disturbances, benthic molluscs, Irrigation reservoirs, Shannon – Wiener diversity index.