

Allochthonus inputs into seasonal reservoirs: "Ornithological eutrophication" as a source of nutrient enrichment

A.M. Gunaratne¹, S. Jayakody^{1*} and U.S. Amarasinghe²

¹Wayamba University of Sri Lanka, Makandura, Gonawila.

²University of Kelaniya, Kelaniya.

*Corresponding Author (Email: sevvandi_jayakody@yahoo.com)

The current study evaluates a lesser known allochthonus nutrient input into water sources, i.e. accumulation of bird faecal matter. Asian Openbill (*Anastomus oscitans*) population is increasing in Sri Lanka and due to mass breeding within reservoirs and higher population densities. Faecal matter could be a potential input of nutrients. Field investigations were carried out in Anavilundawa Ramsar sanctuary during 2007/08, where the reservoir was divided into four strata; inlet, breeding ground, centre and outlet. Surface and bottom water samples were analyzed for NO_3^- , NH_4^+ , PO_4^{3-} , K^+ , hardness and dissolved oxygen (DO). Total depth, Secchi depth, temperature, turbidity and water pH were also recorded.

In surface layers, the highest amount of NO_3^- was recorded for breeding ground (0.55 mg l^{-1}) followed by reservoir centre. The highest levels of PO_4^{3-} (0.93 mg l^{-1}), alkalinity (142 mg l^{-1}) and NH_4^+ (1.9 mg l^{-1}) were also recorded in breeding grounds. In the bottom layers, the highest level of NO_3^- was recorded in breeding ground (0.49 mg l^{-1}) followed by reservoir centre. Similarly, the highest levels of PO_4^{3-} (0.83 mg l^{-1}), alkalinity (147 mg l^{-1}) and NH_4^+ (2.16 mg l^{-1}) were recorded from the breeding ground. The lowest level of DO was recorded for breeding grounds both in surface layers (2.03 mg l^{-1}) and bottom layers (0.84 mg l^{-1}). The lowest levels of pH were recorded for breeding grounds in surface layers (5.90) and bottom layers (5.93). The highest level of turbidity was recorded at the centre of reservoir for both surface water (30.95 NTU) and bottom water (2.76 NTU). Canonical variate analysis indicated the influence of ornithological eutrophication in water with four strata being significantly distinct for surface layer whilst, similarities in water quality in inlet and outlet for bottom layer. Hence bird faecal matter could be a constraint for maintaining water quality; however the results also suggest evidence for self regulation of water quality within the system, a character which needs to be retained.