Water Chemistry of the Nilambe Oya, a Tributary in the Central Mahaweli Valley of Sri Lanka 1. Some Physicochemical Characteristics

E.I.L. SILVA

Institute of Fundamental Studies
Hantana Road, Kandy
Sri Lanka

Abstract

Monthly and spatial variations of temperature, pH, electric conductivity, suspended solids, major cations (Na^+, K^+, Ca^{++} & Mg^{++}) and anions (HCO_3^-, SO_4^{--} & Cl^-) of the Nilambe Oya, draining a sub-catchment (6127 ha) of the Mahaweli basin were determined from Sep. 1989 to Aug. 1990 using standard methods. Temperature ranged from 18.0 °C to 32.2 °C with a significant seasonal variation. The pH varied from 5.40 to 8.10 with significant seasonal and spatial variations. Electric conductivity changed from 9 μ S to 110 μ S with only a significant inter-site variability. The stream water carried suspended solids ranging from 0.9 mg l^{-1} to 31.7 mg l^{-1} during the study period with significant seasonal and spatial variations.

Na^+ and K^+ concentrations ranged from 1.07 mg l^{-1} to 4.24 mg l^{-1} and from 0.25 mg l^{-1} to 1.77 mg l^{-1} respectively with significant inter-site variations. Ca^{++} and Mg^{++} concentrations ranged between 0.11 mg l^{-1} and 7.16 mg l^{-1} and between 0.11 mg l^{-1} and 4.43 mg l^{-1} respectively also with significant spatial variations. The ranges of HCO_3^- (1.8 - 61.5 mg l^{-1}) and Cl^- (1.50 - 9.5 mg l^{-1}) also showed significant monthly variations whereas the SO_4^{--} concentration ranged from 0.25 mgl^{-1} and 4.98 mg l^{-1}, also with a significant monthly variation.

Concentrations of major ion species and ranges of temperature, electric conductivity, suspended solids and pH of the Nilambe Oya result due to a cumulative product of the geographical location, weather and climate, geochemical processes and anthropogenic activities of the watershed. Land use patterns play a significant role with respect to inter-site variability in physicochemical characteristics of the Nilambe Oya resulting in marked deviations from pristine values so far reported for tropical headwater streams.