

Diversity and Abundance of Macro-invertebrates in Relation to Water Quality in Attanagalu Oya in the Western Province of Sri Lanka

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Aquatic macro-invertebrates are considered as ideal bio-indicators as their abundance is related to water pollution. Present study was carried out from June to October 2012 in the Attanagalu Oya, one of the major rivers in the Western Province of Sri Lanka to investigate the relationship between the physicochemical parameters of river water with the abundance and diversity of macro-invertebrates. Ten sampling sites *i.e.* four from upstream and six from downstream of river, were selected for the study. River flow velocity, temperature, conductivity, pH, dissolved oxygen (DO), biological oxygen demand (BOD₅), chemical oxygen demand (COD), alkalinity, total dissolved solids (TDS) and total phosphorus were measured at each site using standard methods. Macro-invertebrates at each sampling site were collected by dragging a D-framed kick net along a 5 m stretch in both river banks at each sampling site. Animals were preserved in 70 % of ethanol and brought to the laboratory to identify up to the lowest possible taxonomic level. A total of 18 macro-invertebrate taxa belonging to two phyla, Arthropoda and Mollusca were identified. Among sites, species richness significantly varied from 3 to 14. The estimated Shannon-Wiener diversity index (SWI) ranged from 0.791 to 2.083. The BOD₅, COD, conductivity and TDS had a negative correlation ($p < 0.05$) while dissolved oxygen had a positive correlation ($p < 0.05$) with species richness and SWI. Macro-invertebrate diversity was significantly higher in the upstream (8-12 species) than downstream (3-6). Comparatively higher dissolved oxygen level (11.2-12.7 mgL⁻¹) and lower BOD₅ (2.6-3.9 mg⁻¹), COD (4.8-7.46 mg⁻¹), TDS (21-28.75 mgL⁻¹), alkalinity (28-34 mg⁻¹) and total phosphorus (0.01-0.02) levels were reported from upstream sites. Highly environmentally sensitive EPT taxa (Ephemeroptera, Plecoptera and Trichoptera) were present only in the four upstream sites. The abundance of pollution tolerant Chironomid larvae was higher in four downstream sites. The study indicated that macro-invertebrates in Attanagalu Oya could be used to monitor water quality as their diversity and abundance was found to vary with the water quality indicating the state of water pollution.

Keywords: Attanagalu Oya, macro-invertebrates, diversity indices, water quality