

ABSTRACT

The present study was carried out to determine the species composition, abundance and distribution of fish species in the Kala Oya River Basin (KOB), Sri Lanka and to investigate how the fish species assemblage structure of KOB is affected by the environmental factors and resource use patterns of the area. Samples were collected from August 2018 to January 2019 in monthly intervals from 8 selected sampling sites in KOB representing lentic and lotic waters giving attention to human disturbances. Both fish samples and physio-chemical environment factors were observed and statistically analyzed to measure correlations in aspects of spatial, temporal, environment factors and species composition. Morphometric and genetic analysis of *Puntius dorsalis* were conducted to determine the effect of environmental factors on local adaptations of species.

Study indicate high fish species diversity in Kala Oya River Basin with recorded 45 taxa belonging to 18 families. Fish community was rich with indigenous species (n=27), where only 10 endemic species was recorded. Fish species diversity was significantly different in wet and dry season, and lentic and lotic habitat conditions. *Rasbora microcephalus*, *Dawkinsia singhala*, *Puntius dorsalis*, *Puntius thermalis*, *Mystus vittatus*, *Amblypharyngodon grandisquamis*, *Devario malabaricus* and *Glossogobius giuris* were the most common species among all the sampling sites. Correlations of environmental factors shows species diversity in lentic habitats are correlated with temperature, pH, turbidity, Total dissolved solids, electrical conductivity alkalinity, chlorinity and sand content. Species diversity in lotic habitats significantly correlate with stream velocity, canopy cover, silt and cobble content. Correspondence analysis further exhibits each species variations in relation to environmental factors in spatial-temporal aspects. Although morphometric analysis of *Puntius dorsalis* indicate significant variations of populations along the river gradient, the genetic analysis did not show significant differences along the river gradient.

Some fish species that were not recorded in earlier studies in the KOB were also recorded during the present study. Results of this study further indicates that the fish species composition and diversity in spatial-temporal scale, and their relations to dynamic environment conditions provide insight for the necessity of conservation and management of river basin community.