ABSTRACT

This study was carried out to find diversity and density of planktonic rotifers. For the study, Safari Zoo Lake, Lahore was selected because no work has been done on this lake so far. The whole area was divided into 4 different sites. Sampling was done on monthly basis from September 2013 to June 2014. The physico-chemical parameters were determined including atmospheric temperature, pH, dissolved oxygen, water temperature, oxygen saturation, transparency, turbidity, salinity and electrical conductivity.

Plankton samples were preserved and extracted properly. Rotifer counting was done by using Sedgewick-Rafter chamber or cell at 60–100 x magnification with the help of an inverted OLYMPUS microscope. Photographs were taken by LEICA HC 50/50 microscope with 5.0 megapixel Cannon camera fixed on it. Rotifers were identified upto species level on the basis of their shape, morphological features and behaviour.

In total, 23 species were identified belonging to 8 genera. Rotifer population was highest in November and lowest in June. The dominant genera were in order *Brachionus* > *Synchaeta* > *Polyarthra*. The *Brachionus calyciflorus* was dominant species with mean population density (38.25%).

Analysis of variance (ANOVA) showed that salinity, turbidity, electrical conductivity, transparency, water temperature and air temperature were statistically significant throughout the study period. While oxygen saturation, dissolved oxygen and pH were statistically non significant.

Pearson correlation indicated that dissolved oxygen, oxygen saturation and salinity were positively correlated with rotifer density and diversity. Air temperature, water temperature, pH, turbidity, transparency and electrical conductivity were negatively correlated with rotifer density and diversity.

Shannon-Weaver index was observed high in February (1.8662) and low in June (0.6365). This showed low diversity of rotifers during the study period. These results have been supported by Simpson index of dominance, Simpson Index of diversity and Simpson reciprocal index. Species evenness was lowest in March (0.4755) and highest in April

(0.9845) showing uneven distribution of rotifers in some months but even distribution in April and some other months. Species richness ranged from 0.1188 to 0.8866 showing a smaller food chain.

Species abundance curve indicated the lowest and highest rotifer abundance throughout the study period. *Brachionus calyciflorus* had the highest peak spot in the curve. It has maximum abundance throughout the months. *Keratella cochlearis* and *Lecane luna* were present at the end of the curve with least abundance. The remaining species lie between these extremes.

Biplot of Principal Component Analysis (PCA I) reflected the relationship of rotifers with the months. In biplot, *Brachionus bidentatus*, *Brachionus quadridentatus* and *Polyarthra minor* showed strong positive relation with the months. *Brachionus calyciflorus* showed weak positive relation. *Brachionus diversicornsis, Cephalodella gibba, Keratella valga, Synchaeta stylata and Synchaeta pectinata* had strong negative relation.

PCA II was plotted between months and physico-chemical parameters. Salinity and pH were present at the upper left side. Transparency and Oxygen saturation were present at lower left side. These parameters showed strong negative correlation with months. Electrical conductivity, water temperature and air temperature, turbidity and dissolved oxygen were present on upper and lower right side, showed positive correlation.