

Use of large ecological indices of macro-invertebrate to assess water quality in Kordan River

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Abstract

The use of macroinvertebrates and ecological indices are valuable tools for evaluating the health or unhealthy conditions of rivers. The aim of this study was to measure and evaluate the water quality of Kordan River using the benthic macroinvertebrates and ecological indices namely, BMWP, ASPT, H', λ and Welch model. In order to investigate the water quality of Kordan River, ten stations were sampled within 4 seasons (Autumn 2017 to Summer 2018) using Surber sampler 144 inch area to collect benthic invertebrates. At the same time environmental variables were measured using Horiba U10 analyzer. The results showed that despite the seasonal fluctuations, the values of environmental variables were in the range of standards. The riverbed was dominated by pebble (2 to 4 mm) and granules (1 to 2 mm). During this study, 26 species, genus and insect larvae belonging to 16 families were identified. The most abundant taxa in 4 seasons were *Ephemeropterae*, *Dipterae*, *Trichopterae* and Isopoda, respectively. The BMWP index values showed a good conditions of water quality for all seasons but ASPT index values showed a bad condition in spring and summer. The H' index values showed a moderate condition of pollution in the study area according to Welch model. Exception was station 2 in autumn with H'=4.24 as unpolluted area. Significant correlations were recorded between macroinvertebrates density and 2 mm sediment particles. There was also a significant correlation between temperature-salinity ($P<0.01$), temperature-Do ($P<0.01$ - r value= -0.97**), and salinity-Do ($P<0.01$ - r value=-0.90**). according to research finding, the shallowness and depletion of inflow of water in Kordan River during spring and summer as well as rural sewage discharges could be important sources of water quality depletion and decreasing of macroinvertebrates diversity in the study area.

Keywords: Macroinvertebrates, Ecological indices, Water quality, Kordan River.