



Assessing Integrity of Aquatic Ecosystem in the Southern Part of the Euphrates River Using Fish as Bio-Indicators

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ABSTRACT

The state of the world's rivers is increasingly disturbed and requires a comprehensive understanding and appropriate conservation measures, and hence assessing the river health provides essential information for conservation. A set of metrics based on biomes was designed to evaluate the southern part of the Euphrates River; the fish community consisted of twenty-three species, with the highest abundance recorded for the endemic, invasive, and migratory species, respectively. The fish composition was divided into three groups; the species richness group was distinguished by the correlation of the region's richness index with the number of endemic fish species and marine migratory species. Fish community composition showed a close relationship with the final index value through its positive correlation with the percentage of the sensitive species ($r=0.683$, $P=0.01$) and the inverse correlation with *Planiliza abu* ($r= -0.629$, $P=0.02$). The nutritional composition group was characterized by the dominance of the herbivores species, and the final index value was correlated to the proportion of the carnivorous species ($r=0.803$, $P=0.002$). The value of the evidence was 56.53%, which is within the classification of moderate environments. The study in this paper demonstrated that the selected measures were strongly associated with the direction of each measure's effect and the flexibility of the response of the final value of the evidence to it. The multivariate statistical techniques approach was also used to evaluate the effectiveness of these measures. The technique showed that out of twelve units in the index, nine were efficient, and three were less efficient in sensitivity to the surrounding environmental changes. Biomonitoring is essential to determining organisms' responses to the environmental degradation factors. It provides results and descriptions of the river health that affect water quality, enabling reliable management of water resources and the development of plans to measure environmental risks.

INTRODUCTION

Biomonitoring is generally defined as the systematic use of living organisms or their responses to determine the state or changes of the environment. It is also known as a method of monitoring the impact of external factors on ecosystems and their development over time or verifying the difference between different sites (Rosenberg, 1998; Markert *et al.*, 1999). Bodies of water are subject to environmental pressures that act on different