Use of Fish Assemblage as Environmental Indicators for the Shatt Al-Arab, Dora Area, Basrah, Iraq

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Abstract

Environmental indicators and fish species composition at the Shatt al-Arab, Dora Station were investigated using four types of fishing gear, through which a total of 17,789 fish specimens were collected. These specimens represented 15 orders, 35 families, 50 genera, and 59 species. All species belong to the class Osteichthyes, except for four species classified under Chondrichthyes. The ichthyofaunal composition included 51 marine species (86.44%) and 8 freshwater species (13.56%). Based on their occurrence, species were categorized into 12 common, 10 seasonal, and 36 occasional species. The Mugilidae family was the most dominant, accounting for 27.74% of the total catch, followed by the Engraulidae family at 20.69%. Among the individual species, *Planiliza klunzingeri* ranked first in relative abundance (21.24%), followed by *Thryssa whiteheadi* (18.05%). The highest numerical abundance was recorded in September with 2,587 individuals, while the lowest occurred in January with 364 individuals. The Shannon-Wiener diversity index peaked at 2.69 in September and dropped to 1.69 in February. The evenness index reached its highest value in November (0.79) and the lowest in March (0.59). Species richness (Margalef index) was at its highest in September (4.33) and lowest in January (2.03). The dominance index was recorded with the highest value in January (0.77) and the lowest in September (0.44). Among the environmental factors studied, salinity and water temperature were the most influential, accounting for 47.69% of the total effect on fish abundance and diversity. These two parameters significantly shaped the observed environmental indicators, with strong correlations between their fluctuations and the biological responses of fish communities.

Keywords

Ecological indicators; Fish.assemblages; Freshwater; Multivariate analysis