

ARTICLE / INVESTIGACIÓN

The influence of some ecological factors on fish diversity and abundance in Al-Huwyzah marsh / South of Iraq

Abdul Hussein Jaafer Abdullah^{1*}, Audai M. Qasim¹, and Sajad A. Adullah²

DOI. 10.21931/RB/2023.08.02.53

¹Department of Marine Vertebrate, Marine Science Center, University of Basrah, Iraq.²Department of Biology, College of Education-Qurna, University of Basrah, Iraq.Corresponding author: abdulhassain.abdulah@uobasrah.edu.iq

Abstract: From January to December 2019, the composition of fish assemblages in Al-Huwyzah marsh was studied in various ways based on the nature of their life-history strategies. In order to assess the impact of hydrological variations on fish assemblage composition, diversity, and abundance. Water temperature fluctuated from 12°C in January to 33°C in July. Salinity varied from 1.38 g/l in March to 3.87 g/l in November. Hydrogen ion fluctuated from 7.37 in November to 8.18 in December. Monthly fluctuations in water depth were monitored for flat sections and low-lying areas of the marsh. Fish assemblages in Al-Huwyzah marsh were studied to determine the impact of hydrological and environmental changes on the pattern, abundance, diversity, and richness of fish assemblages. Fixed, drift, and cast gillnets were used to catch the fish. Nine thousand eight hundred fifty-three fish specimens belonging to 18 species, 17 genera, ten families, and six orders were caught from the three selected stations. All of which belonged to the Osteichthyes class. Ten fish species were native, and eight were exotic species. The Abu mullet *Planiliza abu* was the most abundant species comprising 35.74% of the total number of species, *Prussian carp Carassius gibelio* 19.74% of the total caught, and blue tilapia *Oreochromis aureus* 19.23%. The dominance index (D3) ratio is 74.71% of the upper abundance of three fish species in the present area. The equilibrium strategists that prefer stable habitats with a long time breeding season include abundant exotic species, and opportunistic strategists comprise one species of present fish assemblage.

Key words: Assemblage of fish, Huwyzah marsh, Hydrological variations.

Introduction

The Mesopotamian marshes in southern Iraq represent some wonderful and unique habitats with no counterpart in Asia, with various species inhabiting those marshes^{1,2}. Marshes are the largest wetland with a diverse aquatic ecosystem in southwest Asia, covering an area of about 15,000 km² and accounting for approximately 44 percent of Iraq's inland freshwater. The habitats of marshes vary depending on various definitive factors such as hydrology, water temperature, salinity, primary production, and nutrients^{3,4}. The marshes are considered one of the most biodiverse areas, with many different types of life, such as aquatic plants, fish, and birds. They provide a permanent habitat for many species of waterfowl and a flyway for migrating birds between Asia, Africa, and Siberia⁵. In addition to being a significant economic resource for human communities, marsh residents typically build their homes out of the plants that grow in the marsh and engage in fishing and animal husbandry; they are also popular tourist destinations for recreational and sport fishing^{6,7}. The marshes dried up during the 1990s, and these processes altered the hydrological system of this wetland, causing a habitat catastrophe and the death of aquatic organisms and the destruction of biodiversity and the displacement of its inhabitants. The Al-Huwyzah marsh, which covers around 90691 hectares in Iraq, was one of the first freshwater wetlands designated as a Ramsar World Heritage site⁸. After 2003, the Huwyzah marsh was inundated with water like the other marshes. Still, it pointed out that hydrological modification in marshes can affect biodiversity

due to the impact on the ecosystem in the marshes⁹. The problem is that in the recent decade, many dams have been built in the head sources of the Tigris and Euphrates Rivers basin, causing to reduction the amount of incoming water¹⁰. This situation drove hard hydrological variations, which relatively became longer, sharper, and more effective, and they have caused a significant impact on the biota in these wetlands. The fish populations suffer from extermination in flat-lying areas in the dry season¹⁻⁶. In contrast, the immersion period has become shorter, with lower water levels.

No previous works dealt with fish biodiversity and the impacts of hydrological variations in Al-Huwaizah marsh before and after the drainage, which has a critical role in biodiversity. But there were, several investigations were done after the restoration of marshes in April 2003; most of them discussed fish diversity in Al-Huwaizah marsh, southern Iraq, investigated species composition and ecological indices of fishes in the restored marshes of southern Mesopotamia collected 17 fish species from Al-Huwayzah marsh¹¹. Discussed fish assemblage in Al-Huwyzah marsh recorded 15 species and found *P. abu* the most abundant species forming 37.1% of total caught¹². We studied the composition structure of fish assemblage in Um Alnaaj, Al-Huwyzah marsh, which caught 13 fish species and dominant Cyprinidae, represented by eight species¹³. Evaluating fish assemblage composition in Al-Huwayzah marsh in southern Iraq recorded 19 fish species². This paper aims to assess the impact of hydrological variations on the composition, diver-

Citation: Abdullah, A.H.J.; Qasim, A.M.; Adullah, S.A. The influence of some ecological factors on fish diversity and abundance in Al-Huwyzah marsh / South of Iraq. *Revis Bionatura* 2023;8 (2) 53. <http://dx.doi.org/10.21931/RB/2023.08.02.53>

Received: 15 May 2023 / **Accepted:** 10 June 2023 / **Published:** 15 June 2023

Publisher's Note: Bionatura stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: © 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

