

Assessment of trophic status of three ecosystems in southern Iraq based on The Trophic State Index (TSI)

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Abstract

Aquatic ecosystems are under increasing pressure from direct and indirect human activities, their areas and conditions continue to deteriorate, so many of them require treatment to maintain main functions and associated ecosystem services. Good water quality paramount to supporting the life of the organism. This study aimed to assess the trophic state of some water bodies. Eastern Hammar marsh, Al-Chebiyesh marsh, and Euphrates River. Carlson's index used CTSI which collects three variables that affect the level of trophic status in the water body (chlorophyll *a*, total phosphorus, and water transparency) Sampling was carried out from six stations two stations for each water body during period extended from November 2020 to October 2021. Water temperature, depth, turbidity, light penetration, Chl-*a*, and total phosphorus are the indicators monitored. The classification of stations varied according to TSI_{chl-a}, TSI_{SD} and TSI_{TP}. The trophic status index CTSI values compared with Carlson and Simpson (1996) and shown The Eastern Hammar and Al-Chebiyesh were classified as Mesotrophic with values (46.1-45.9) respectively and the Euphrates classified as Oligotrophic with value (37.1).

Keywords: CTSI, Chlorophyll *a*, wetlands, ecosystems

Introduction

Wetlands provide important and diverse benefits to people around the world, contributing to provisioning, regulating, habitat, and cultural services. Critical regulating services include water-quality improvement while key habitat services are provided by wetland biodiversity (Clarkson *et al.*, 2017).

Eutrophication is the process of enrichment of water with plant nutrients, primarily nitrogen and phosphorus, which stimulate primary aquatic production and in its more serious manifestations, lead to visible algal blooms and phytoplankton and promote the

growth of attached algae on macrophytes (UNEP, 2003).

Carlson (1977) relied on three variables to evaluate the nutritional status of the water surface, which are generally interrelated, which are chlorophyll A, total phosphorus, and the depth of Secchi disk to estimate light penetration, which is a commonly used method that can provide quick information about the trophic status of the aquatic environment, as the index value is divided 1-100, and through it one can Giving an idea of the productivity of the water body (Lenard and Ejankowski, 2012).

The researchers paid attention to monitoring the nutritional status of water