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EVALUATION OF WATER QUALITY IN THE DANUBE RIVER AT KM 181 AREA CHISCANI BASED ON THE WATER QUALITY INDEX (WQI)

Daniela Ecaterina CRĂESCU[1]*, Maria Desimira STROE[1], Magdalena TENCIU[1], Floricel Maricel DIMA[1'2], Neculai PATRICHE[1]

[1]Research and Development Institute for Aquatic Ecology Fishing and Aquaculture, 54 Portului Street, Galati, Romania

[2]Faculty of Engineering and Agronomy in Braila, "Dunarea de Jos" University of Galati, 29 Calea Calarașilor Street, 810017, Braila, Romania

Abstract: In this study, the overall water quality was assessed on the basis of physico-chemical parameters of the Danube in the area of Chiscani locality at 181 km of the river. The Water Quality Index (WQI) was calculated and according to the obtained values the water quality category of the river section investigated

Keywords: Aquatic ecosystem, Spectrophotometric methods, Nitrites, Nitrates.

▶ Introduction

In the Romanian sector, the Danube River plays an essential role both ecologically and economically, fuelling irrigation networks, hydropower plants and facilitating river transport.

To assess the current state of water quality in this area, an effective tool is the Water Quality Index (WQI);

The present paper aims to analyze the current state of the Danube water quality in the area km 181 - Chiscani, with reference to relevant chemical parameters, and to identify possible traces of historical pollution.

➢ Material and method

➢Study area: The Chiscani area, located near the municipality of Brăila, is in the immediate vicinity of river kilometer 181 and was, for a long time, marked by intense industrial activities.

Study area Danube River basin Chiscani, Brăila

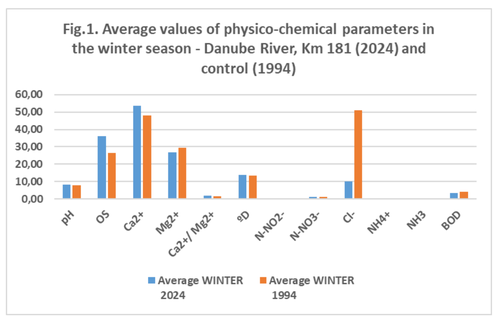
➢Physico-chemical parameters:

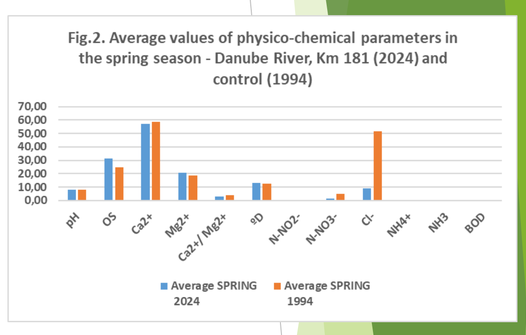
In order to determine the physico-chemical parameters of the water (pH, dissolved oxygen, organic matter, calcium, magnesium, chlorides, nitrite and nitrate concentration, ammonium and ammonia ions, nitrite, nitrate and total hardness), water samples were taken twice a month, throughout 1994 and 2024, analyzed in the chemistry laboratory of ICDEAPA Galati, according to Order no. 161 of 16/02/2006 for the approval of the Normative on the classification of surface water quality in order to establish the ecological status of water bodies

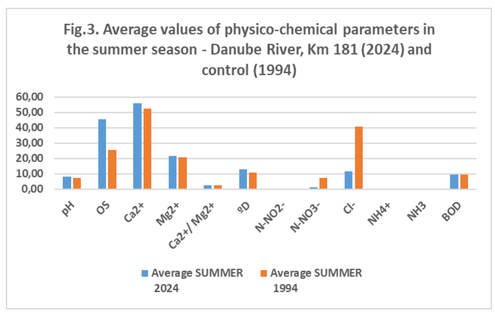
➢The Water Quality Index WQI was used to assess the level of pollution, based on the 1994 and 2024 seasonal average values of 14 representative parameters according to the formula:

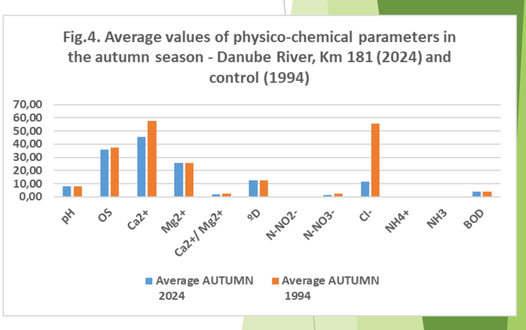
- $$WQI = \frac{\sum_{i=1}^{n}(Wi*qi)}{\sum_{i=1}^{n} Wi}$$

▶ Results and discussions









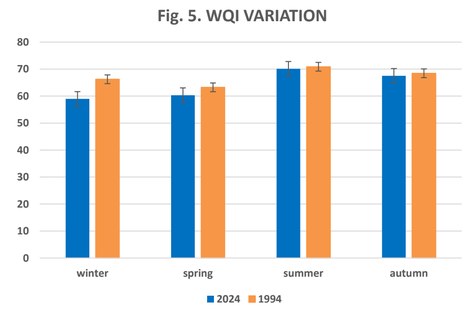


Table with reference values for the WQI categorisation of water bodies

Water quality	Excellent	Good water	Poor water	Very poor water	Water unsuitable for drinking
WQI value	0-25	26-50	51-75	75-100	>100

▶ Conclusions

The Danube water in the analyzed area (Chiscani, km 181) has shown some maintenance and improvement in quality over the last 30 years.

Final WQI calculation was 52.78 →The water quality of the Danube at km 181 indicates a moderate state, according to standard WQI classes.

Pollution reduction measures to improve ecosystem conditions are recommended.

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