



## General and comparative data on water ecology in Shkumbin River, Elbasan

Selma Myslihaka\*<sup>1</sup> 

<sup>1</sup>Faculty of Natural Sciences, University "A. Xhuvani", Elbasan, Albania, selma.myslihaka@yahoo.com

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### Keywords

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Water  
E. coli

### Abstract

It is essential importance the assessment and maintenance of the aquatic ecosystems for the well-being of the society since they are closely related to the human and environmental systems. In this study we have taken a part of Vidhas- Shkumbin river, Elbasan region in Albania, as a case study because it is an area massively affected by industrial pollution. From the general hydrobiological data, in this paper we give a full study on the comparative features of water ecology from physical-chemical, bacteriological data. Various analyzes have been performed based on some standard methodologies for the examination of water performed in the laboratory in terms of water quality determination of the chemical need for oxygen, dissolved oxygen, determination of nitrates, phosphates, ph, hardness and bacteriology. From the study of water in Vidhas-Shkumbin river, we came to the following conclusions: Water resources are of the phreatic type, the level of phreatic water varies depending on atmospheric precipitation, with general temperatures of 16 degrees Celsius, with a strength of 28 degrees German, mineralization occurs too high 160mg / l and from the bacteriological content the water appears mostly high because of presence of bacteria E.coli, Pseudomonas aeruginosa, Enterococci intestinal.

### Introduction

In this study we have taken as a case of study Vidhas-Shkumbin river in Elbasan region in Albania. From the general hydrobiological data, the region consists on quaternary water-bearing complexes which mainly form the water-bearing basin of the middle part of Shkumbini Valley. The main importance of this study consists in the identification of ecological thresholds, how a pollutant input or the maintenance of a certain species can have a drastic reaction in the ecosystem. The transition from a clean aquatic ecosystem to a turbid aquatic ecosystem. The results determined by this study will be of help to environmental managers who need information about these point of river aquatic ecosystems.

### Material and Method

This study is realized through a method divided in two main stages:

#### The preparatory stage

The data in this field are realized in the laboratory of the hydrological enterprise in Tirana. These physical-chemical and bacteriological data on these water sources were carried out in December 2020

#### Field work phase

At this stage, water sample was carried out in the period December 2020- May 2023. Their analysis is made by me, near a private environmental laboratory in Elbasan according to the methods:

Determination of nitrates, determination of dissolved oxygen - iodometric method, Alkalinity. Water quality - Enumeration of culturable micro-organisms - Colony count by inoculation in a nutrient agar culture.

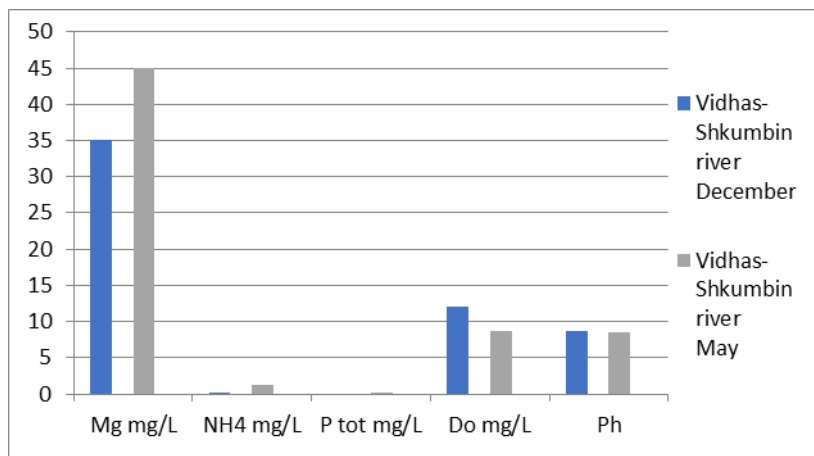
**Results and Discussion**

In our study according to the physical-chemical analysis data: Water resources are of the phreatic type, with general temperatures of 16.3 degrees Celsius. The water is without cooler, small and taste. The valoris of anion NO<sub>3</sub> and phosphorus appears very low. Ph 8.3. With a strength of 28 degrees German, mineralization is too high 160mg/l.

The current physical-chemical data are presented in this comparative Table 1.

**Table 1.** The current physical-chemical data are presented in the comparative graphic

Station name	Sampled period	Mg (mg/L)	NH4 (mg/L)	P tot (mg/L)	Do (mg/L)	Ph	Strength G Degrees	The value of quality
Vidhas-Shkumbin River Elbasan	December 2020	35	0.1	-	12	8.6	23	1
Vidhas-Shkumbin River Elbasan	May 2023	45	1.2	0.11	8.7	8.5	28	2.2



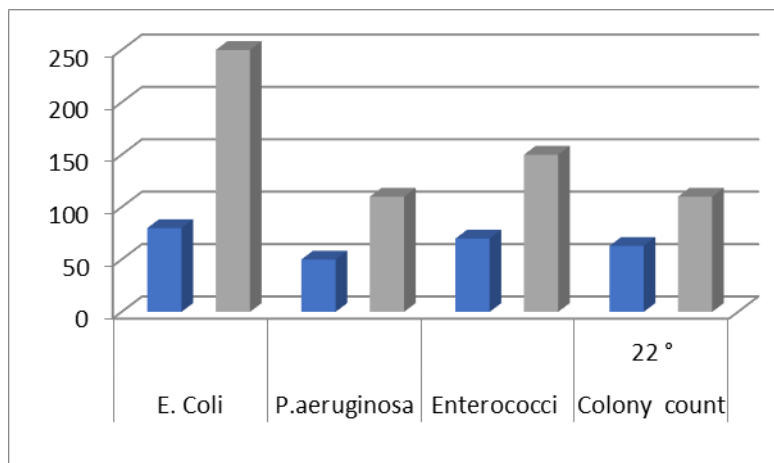
**Figure 1.** Physical-chemical Data (2020-2023)

Based on the presence of bacteria E.coli, Pseudomonas aeruginosa, Enterococci intestinal. The bacteriological content the water appears mostly high.

The current physical-chemical data are presented in this comparative Table 2.

**Table 2.** Physical-chemical data

Station name	Sampled period	E. Coli	Pseudomonas aeruginosa	Enterococci intestinal	Colony count at 22 Degrees	Allowed rate
Vidhas-Shkumbin River Elbasan	December 2020	80	50	70	63	100 ml
Vidhas-Shkumbin	May 2023	250	110	150	110	100 ml



**Figure 2.** Comparative graphic of Bacteriological Data (2020-2023)

## Conclusion

Compared to the 2020 data study, we see a decrease of 0.5 in water quality. As point of the threshold ecology will be the presence of the E.coli and Pseudomonas aeruginosa. That's a sign of a high presence pollution of black waters. According to Italian law and analysis: These Water resources are classified as a Type 1. To prevent the transition from a clean aquatic ecosystem to a turbid aquatic ecosystem. These water resource need a simple processing, filtration and disinfection.

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