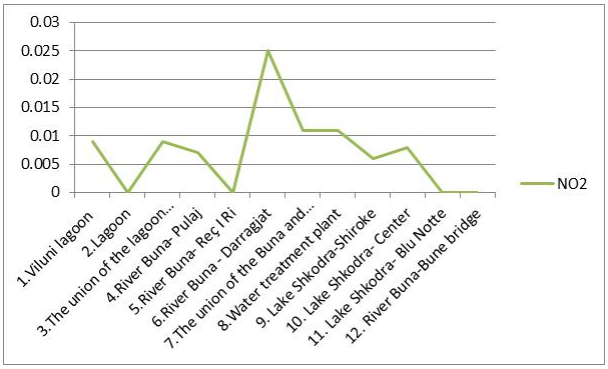

Figure 6. Distribution of nitrite values according to stations

4. CONCLUSIONS

Based on the results, *Faecal coliforms* and *Fecal streptococci* the ratio between them shows that the pollution is mainly human

The highest pollution is located in the stations Darragjat Ura e bune, the junction of the Buna River with the Drini and Shkodra lake in the center where we have high anthropogenic activity and the water is not treated before discharge

The Viluni lagoon in Velipoje and the point where the lagoon joins the sea show low levels of microbial pollution

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O 57. MICROBIC QUALITY (CF/SF) AND SOME PHYSICO-CHEMICAL PARAMETERS IN SURFACE WATERS IN THE REGION OF SHKODRA, ALBANIA

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ABSTRACT: Today, everywhere in the world, even in Albania, microbial and chemical pollution of natural surface waters remains a problem, where there are still no sewage treatment plants. This situation is also problematic for the region of Shkodra, since most of the various surface waters of this region are not treated in advance. This paper has studied the CF/Sf microbial parameters and some physico-chemical parameters such as temperature, pH, nitrites, turbidity, in 12 stations in Lake Shkodra, Buna River and Velipoja lagoon. The study provides preliminary data for the parameters analyzed during the 4 months, June-September 2023. The main source of the pollution of these waters is from human activities and measures still truncated by the lack of preliminary treatment, mainly by microorganisms. The aim was to understand the levels of pollution and the possible causes of pollution in the quality of these water resources with many uses in this region.

Keywords: Waters, River, Microbiological Parameters, Physical-Chemical Parameters

1. INTRODUCTION

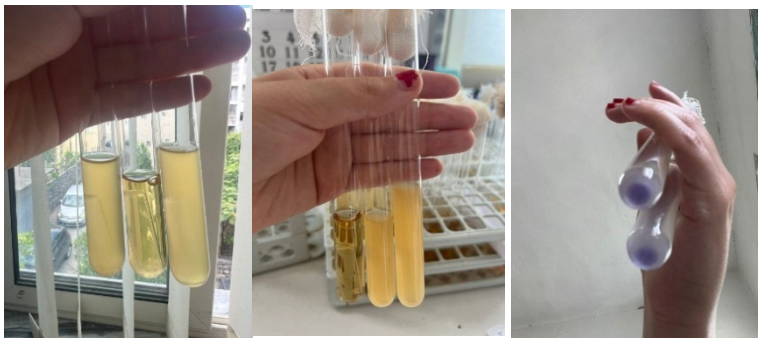
The quality of surface waters has a specific importance in the life of the regions in which they are located. These waters are connected to important economic activities, attractive to the public health of the inhabitants. The pollution of surface waters and their non-treatment constitutes today a threat to human health, the natural ecosystem and tourism in Albania. The region of Shkodra stands out for a diverse diversity of surface waters such as rivers, lakes, lagoons and the sea. Therefore, for the importance they represent both in the economy and tourism, it is important to prioritize their quality, which until now has been lacking. As for the marine waters in the north of Albania, one of the most important regions is the lagoon in Velipoja (Shkodër). Equally important are the Buna River, which flows into the Adriatic sea, whose waters are problematic because the waters of Lake Shkodra, the Drin River, etc., are polluted and untreated. The administrative center of Shkodër has recently seen an increase in economic activities and tourism, which is becoming a priority for the economy. For this reason, the quality of these waters takes on primary importance for the northern region of the country, but also beyond. Water quality is related to its physico-chemical and microbiological characteristics. Surface water pollution being one of the major environmental problems, we undertook the microbiological study based on bacterial indicators, *Faecal coliforms* and *Fecal streptococc*i as well as physico-chemical water quality indicators of Shkodër Administrative Center. Based on the EU Directives of Surface Water (2006/7/EC) and the standards approved by the Albanian government for information on surface water, the analysis of 12 stations.

2. MATERIALS AND METHODS

Water sampling, storage, transport and analyzing was done according the Standard Methods of Water Examination (APHA, AWWA, WEF, 1998: APHA, AWWA, WEF, 2005)

Two parallel samples were taken for each point. One sample was taken for the determination of microbiological parameters and the other sample was taken for the determination of parameters physical – chemical. Water samples were taken at a depth of 30-50 cm from the surface of the water (WHO, 1995, APHA 1998, ISO 5667–2:1991). Microbiological quality was determined by the standard method most probable number (MPN) for *Faecal coliforms* and *Fecal streptococci* (APHA, 1970, APHA 1985). The samples were taken from June to September 2023, in 12 different stations. Preliminary test for *Faecal coliforms* the medium used is Lactose broth was incubated in incubate 35°C (LB) (APHA 1985). For the confirmation test it is used EC Broth. For all test tubes where turbidity is observed after 24 hours, a confirmation test is performed. It is incubated at a temperature of 44° ± 0.2°C for 24 ± 2 hours, (Wilrich P.2010). The detection and enumeration of *Faecal streptococci* was carried out using the MPN method

(WHO 1982; USEPA 1986; APHA 1998). In the preliminary test the medium used is Azide Dextrose Broth (ADB).(APHA 1998) Incubation was done at 37°C for 24 hours. The presence of turbidity was observed in the tubes, which is an indicator of the presence of *Faecal sterptoccoci*, (Mallmann and Seligmann 1950, Rothe, 1948). For the confirmation test it is used (Ethyl violet azide broth) EVAB. Incubate at a temperature of 37°C for 24-48 hours. The formation of a purple stamp (bruise) at the end of the test tube or in any case the formation of a dense turbidity indicates the presence of *Faecal streptococci* (APHA 1998, Edwards S.J., 1933, Hartman G., 1937).



A) B) C)

Figure 1. A, B The result of the samples (ECB) : C) The result of the samples(EVA)

3. RESULTS AND DISCUSSIONS

Referring to figure 2, it turns out that the Buna River in 3 stations, Darragjat Ura e bune, the junction of the Buna River with the Drini turns out to be polluted. The pollution happens in advance in these points, for example the bridge of Bune and Darragjat discharge the untreated sewage of the city of Shkodra and the village of Pulaj-Velipoje. Also, the place where the drin river joins the bunen shows a pollution beyond the norms, the water that collects all the water that is discharged from the surroundings of the region untreated in Shkoder. Also the lake of Shkodra in the center has a lot of pollution as the sewage of the restaurants located around it is discharged.

Based on the figure 2 and 3 it results that *Faecal coliforms* and *Fecal streptococci* the ratio between them shows that the pollution is mainly human

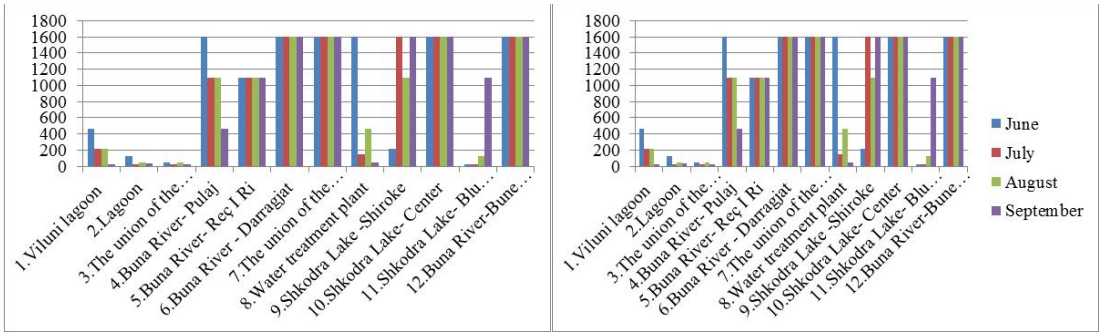


Figure 2. Level of microbial contamination of *Faecal Coliforms* according to the stations and months.

Based on the values suggested by the European standards (new Directive 2006/7/EC for surface water) for the content of *Faecal streptococci* it is classified˝Excellent quality˝ in all analyzed stations

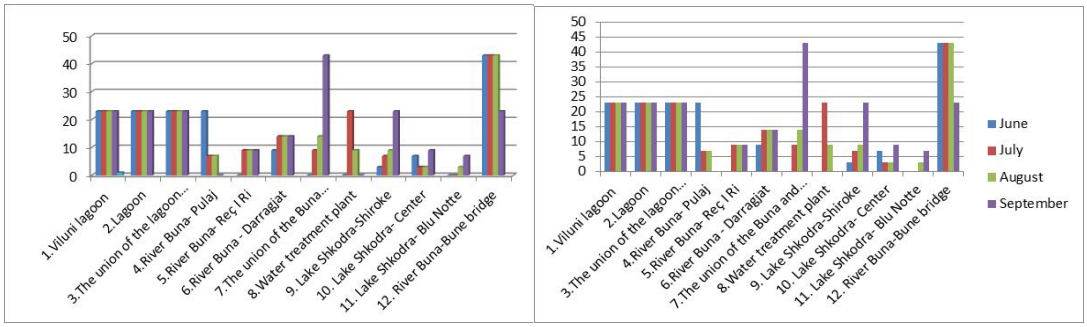


Figure 3. Level of microbial contamination of *Faecal streptococci* according to the stations and months.

From the analysis of the physico-chemical parameters, it results that the average temperature of the lake stations is about 24.4°C, in the Buna River it is about 23.4°C

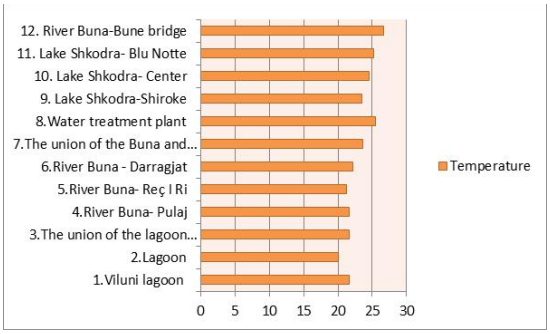


Figure 4. Distribution of temperature values according to stations

Also, the analysis of turbidity shows a high value at the point of the station where the sea joins the lagoon, unlike other stations where the values are low

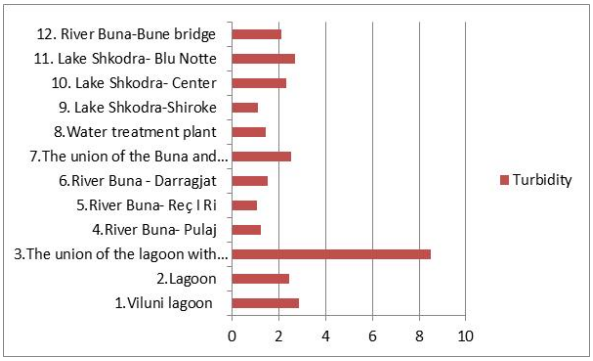


Figure 5. Distribution of turbidity values according to stations

High values of nitrites are found in the Buna-Darragjat River, while low values are found in the lagoon and Reç i Ri, which have a zero value.