

RESEARCH ARTICLE

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Monitoring the water microbial parameters of some lakes of Lura ParkANDREJEVA GOLLOSHI^{1*}; ARTA LIKA²; MARGARITA HYSKO¹¹Department of Biology, Natural Sciences Faculty, University of Tirana, Albania²Department of Biology and Chemistry, Natural Sciences Faculty, University of Shkodra, Albania

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Abstract

Lura Park with surface of 1,280 hectares is located in northern Albania, in the eastern part of the massive mountain Lura Crown. This park has 14 glacial lakes, located at the height of 1350-1720 meters that create a colorful and attractive environment. In winter these lakes are covered by ice. The largest lake is the Great Lake with an area of 32 hectares. But in almost all the lakes the natural balance is broken, as a result of demographic changes of region and usage without any criteria of the vegetation around the lakes. Disposal of inert materials and solid waste, as well as those of liquid in many water environments of Lura, has damaged their appearance and quality. It is appreciated the quality of some lakes of Lura in different points, with microbial parameters in determining the total number of microorganisms (HET) and the presence of coliforms and by comparing them with international norms allowed for surface waters. The results obtained, showed low levels of coliforms in the water lakes, which is within the limits allowed. The greater this contamination was observed during summer, and less in the winter.

Keywords: Lura Park, Lura's lake, HET, total coliforms, Water fecal contamination.

1. Introduction

Lura is one of the most Albanian natural attractions. Albania lakes stretching from sea level (Lake Butrint) of up to 2360 m in height where the glacial lake Gramozi most High in Albania. In height between 0 – 200 m above sea level are 101 lakes, or 40 % of the overall number of lakes [1, 7].

Lura Park has an area of 1,280 hectares and is located in the eastern part of the mountain massif called " crown Lura ". With its 14 glacial lakes created a picturesque and attractive environment at an altitude of 1350-1720 m. Among these are the biggest Lakes: Great Lake 32 hectares, Lake of Pines 13 hectares, Black Lake 8 hectares and Lake of Flowers 4 hectares. In winter these lakes are covered by ice. Lawn hill after hill after Lura beautiful meadow below. These lakes constitute the special hydrological ecosystems [1, 7].

Lura was once true gem, the beauty of the lakes, their vegetation and forests, but today is corrupt, polluted, with the dumping of solid waste and liquid waste in the waters of lakes and rivers, by an increase the level of various organic waste inorganic in them [3, 8, 9].

Therefore intervention is needed by the whole society, especially by residents of the area, prohibiting slaughter of forests and natural beauty of this area.

Lake's and river's water is very important for many traditional uses, such as irrigation, fisheries, tourism and industry. The study of microbial parameters in addition to those physico-chemical of the lake water is of great importance to determine the water pollution. This is important for the Lura Park and it's beautiful lakes as well. We think to give our modest contribution for the study and prevention of water pollution of Lura Park.

2. Materials and methods

We monitored microbial water pollution during spring 2013. Analyses were performed in the laboratory of Microbiology. Samples were taken from three lakes in Lura: Cow Lake, Great Lake and Bruci Lake.

Samples collection was done fortnightly and taken at depths 15 to 30 cm and 50 cm to 1 m to the shore. Samples transport is done in thermoboxes to the laboratory within 24 hours and [4, 5]. For heterotrophs is used YEA (Yeast Extract Agar) and plating method. LB (Lactose Broth) and EC for the coliforms and MPN (Most Probable Number) method. All procedure is done according to European and international standards ISO 7899-1.1998 [2, 4, 6, 10].

3. Results and discussion

3.1 Heterotrophs and coliform in Cow Lake

Three stations were tested for heterotrophs and coliforms in spring in the Cow Lake: one in the west, one in the east and one in the place called spill. All data are shown in the graphs below.

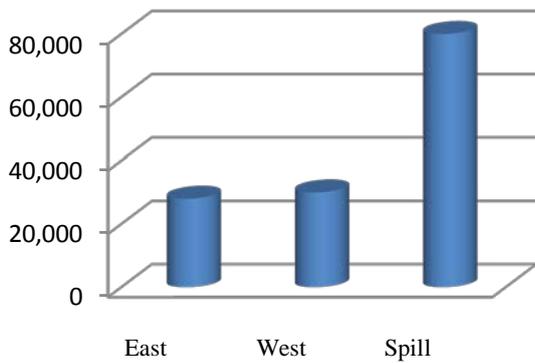


Figure 1. Heterotrophs in the Cow Lake (CFU/100ml)

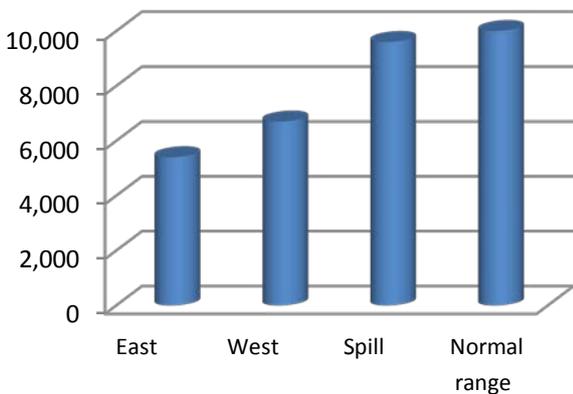


Figure 2. Coliforms in the Cow Lake (CFU/100ml)

In the third station of the Cow Lake the concentration of heterotrophs was the highest, while in the other two, the amount was almost the same.

From these data it appears that the amount of both groups, heterotrophs and coliforms, increase from the east to west and spill. Although the rise in the coliforms concentration is considerable, it is still within the normal range (Figure2). In the place 3 of sampling there is a populated area and the pollution is higher than in two others. Such a data about the impact of the human in water lake pollution is given by other researcher for the other lakes [3, 8, 9].

3.2 Heterotrophs and coliforms in three lakes.

In spring 2013, three other lakes were tested for coliforms and heterotrophs levels: Great Lake, Bruci Lake and Cow Lake and the result is given in Figure 3 and 4.

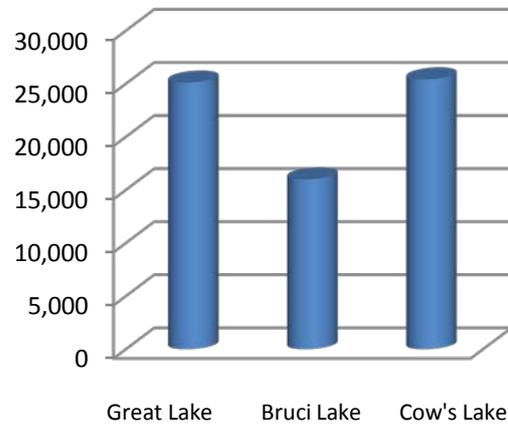


Figure 3. Level of heterotrophs in three lakes (CFU/100ml)

Heterotrophs level were higher in the Great Lake and Cow Lake, while the Bruci Lake was poor in microorganisms. This lake is far from the villages, there is not fecal pollution and water quality is good.

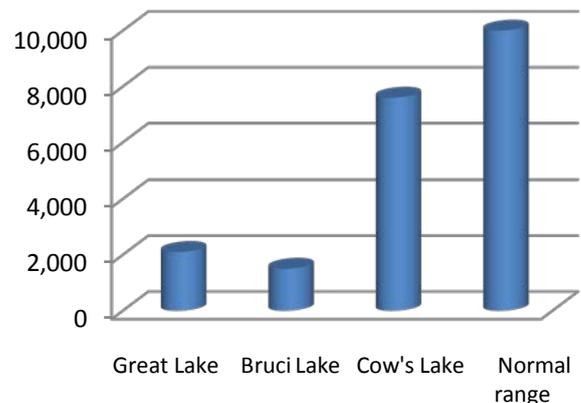


Figure 4. Level of coliforms in three lakes and comparison with the normal range (CFU/100ml)

Coliforms show the highest concentration in the Cow Lake and the lowest in Bruci Lake. The Great Lake showed a relatively low level of coliforms. All three lakes, are not significantly polluted because the concentration of coliforms was lower than the normal range.

4. References

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