Radoniqi Lake Water Monitoring of the Microbiologic Parameters

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Xhelal Këpuska[1], Luan Daija[1], Ilir Kristo[2]

[1]Regional Water Company 'Radoniq' in Gjakova, Kosovo
[2]Agricultural University of Tirana, Department of Einvironment and Ecology, Tirana, Albania.

Abstract

The aim of this study was to evaluate the microbiologic contamination level of water in Lake Radoniq, where organisms have special importance indicators of fecal contamination. Water is tested for the presence of total coliform bacteria, fecal coliform bacteria of fecal origin and mesophilic aerobic bacteria. These organisms are mainly used as indicators of water quality studies; their presence indicates that fecal material has polluted the water. Monitoring was conducted for 3 years, in 2008, 2011 and 2012 over 12 months, and the average monthly minimum and maximum are shown in the tables on monitoring the water in Lake Radoniq in Gjakovë. This study shows that water pollution is very important. In almost entire Lake area the presence of fecal coliform bacteria appears. For this numerous analyses have been made and methods through the filtration system, preparation of nutrient agar and incubation have been used. Such waters where there is interference and uncontrolled discharge of sewage, need common processing as precloration, coagulation, flocculates, sludge, filtration, final disinfection by chlorination where these processes are carried out regularly with success in the water treatment plant in RWC 'Radoniq' in order to offer consumers the best quality water.

1. Introduction

Water is a natural resource with limited and uneven distribution in time and space. All forms of life and all human activities are dependent on water. Water resources are of great importance to human life and economy and are the main source of meeting the demand for drinking water, for irrigation of lands and industries. Lack of water is considered as a limiting factor of socio-economic development of a country.

Modern industrial development and urbanization have resulted in the formation of large urban areas, industrial zones and the development of intensive agriculture. This has increased the need for water, but also the growth of urban and industrial discharges into rivers without any prior treatment, thereby reducing the possibility of self-purification (auto purification) of water.

The need for clean water, today is considered as one of the biggest problems the global environment. Currently, more than 1.2 billion people worldwide have no access to drinking water while some 3 billion people (half the world's population) do not have adequate sanitation services. More than 200 diseases are originating from contaminated water and about 6,000 people a day lose their lives just by diarrheic diseases.

According to the World Health Organization, an estimated 5 million people die each year from the consumption of contaminated water. Considering the current trend of urbanization in the world by 2025, nearly 3 billion people will need water supply and more than 4 billion for access to sanitation. In Kosovo, as in many countries, human health and meeting their needs is increasingly threatened by the poor quality or lack of clean water.

It is estimated that Kosovo has limited water resources, thus protecting, maintaining and monitoring their quality is one of the greatest environmental challenges in the society. Sustainable management of water resources, water protection and improvement of water quality require special commitment by all actors responsible.

In this study were followed bacteriological parameters as total coliforms bacteria and fecal coliform bacteria originating aerobe.The values are as the monthly average in 2008,2011 and 2012 in Lake Radoniq water and the results we draw a conclusion that:

Such waters where there is interference and uncontrolled discharge of faeces as shown in the following tables marked need for further treatment in the technological process, as paraklorim, koagolim, floculates, sludge, filtration, disinfection by chlorination final where these processes are carried out regularly with great success in water treatment plant in RWC "Radoniq." in order to offer consumers the best quality water.

2. Material and Methods

Water samples for this study were obtained in the lake and measurements were made every month in 201, 2012 and the same were tested in the bacteriological laboratory of Radoniq. Water samples were taken in 0.5 l glass bottles and initially were well cleaned and sterilized in Autokllavë at 121 ° C temperature for 20 minutes.

Transport and storage of samples was done by hand fridge while maintaining the temperature at 4-7 ° C. For analysis of total coliforms, technique of porous filter membrane filter (0.45 μm Ø) and Violet Red bile nourishing terrain - Agar, Merck product was used. For coliforms of fecal origin, technique of Membrane porosity filter (Ø 0.45 μm) and ground feeder m - Endo Agar - Less was used and for aerobic bacteria the Agar nutrient Total count agar was used. For these analyzes amount of water of 100 ml is required, and after all the work procedure they are put in an incubator at a temperature of 37 degrees for 24 hours, and after this time the number of bacteria is counted through digital counters, while aerobic bacteria is required to stay in the incubator for 48 hours.

3. Results and Discussion

The data from this study for the three bacterial indicators are shown in the tables below. Based on data compiled from the tables, indicates that the water samples analyzed in this study result in contamination from the presence of bacteria with fecal origin and total Coliform with high average index, and this is particularly noticeable in the April to June due to runoff of high water that Lumbardh of Deçani brings as main supply of lake Radoniq, and in July - August when water temperatures are higher and create favorable conditions for the development of bacteria, while during December, January and February there's a fall in presence of bacteria due to the lower water temperature.

Such waters need further treatment in the technological process and special attention to be paid to the chlorination process to eliminate the bacteria that are present in the lake water of Radoniq. These processes are implemented promptly and with great success in water treatment Plant in RWC 'Radoniq' in order to offer consumers the best quality water.

Tabelle 1. Bacteriological parameters to test the water of Lake 'Radoniq'

2008	**Total coliform bacteria**		**Coliform bacteria of faecal origin**		**Total number aerobic mesophyl bacteria**	
	min	max	min	max	min	max
Jan	45	55	55	62	58	68
Feb	38	42	57	73	62	75
Mar	45	50	62	75	60	70
Apr	50	70	60	> 100	70	> 200
Maj	58	45	70	> 100	75	> 250
Jun	65	78	75	>100	100	> 250
Jul	60	66	67	85	95	> 250
Aug	65	70	72	77	88	150
Sep	62	68	72	65	75	100
Oct	58	64	89	68	72	87
Nov	50	55	70	75	66	82
Dec	48	53	66	72	64	76

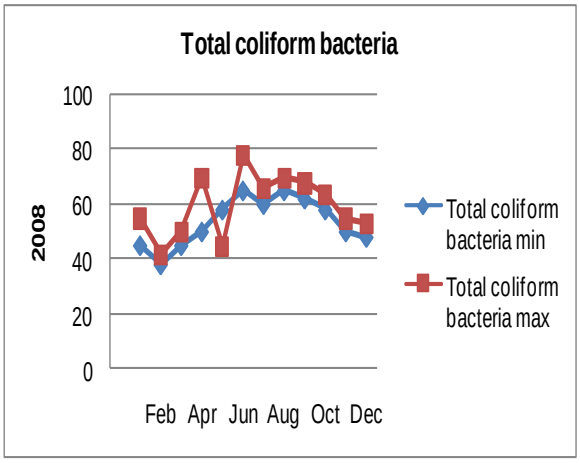

Figure 1.Total coliform bacteria

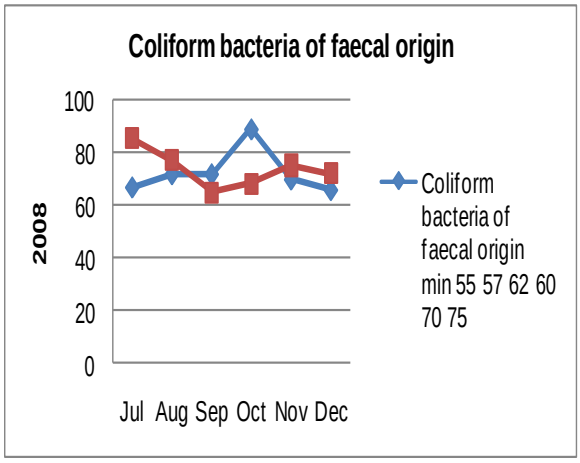

Figure 2.Coliform bacteria of faecal origin

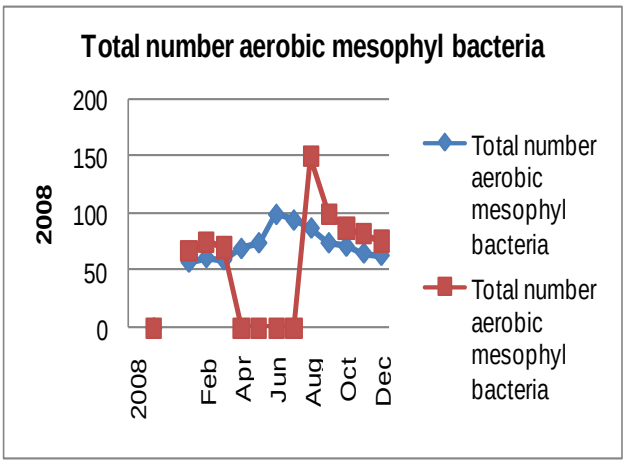

Figure 3. total number aerobic mesophyl bacteria

Table 3. Bacteriological parameters to test the water of Lake 'Radoniq'

2012	**Total coliform bacteria**		**Coliform bacteria of faecal origin**		**Total number aerobic mesophyl bacteria**	
	min	max	min	max	min	max
Jan	50	65	54	68	50	65
Feb	55	72	53	62	52	63
Mar	60	77	60	75	48	70
Apr	71	85	67	82	85	> 150
Maj	74	78	70	88	80	> 200
Jun	80	100	75	85	100	> 300
Jul	72	79	70	82	85	230
Aug	69	76	73	85	80	150
Sep	64	88	65	72	75	95
Oct	59	82	55	60	70	85
Nov	62	76	50	58	72	82
Dec	59	73	45	52	66	75

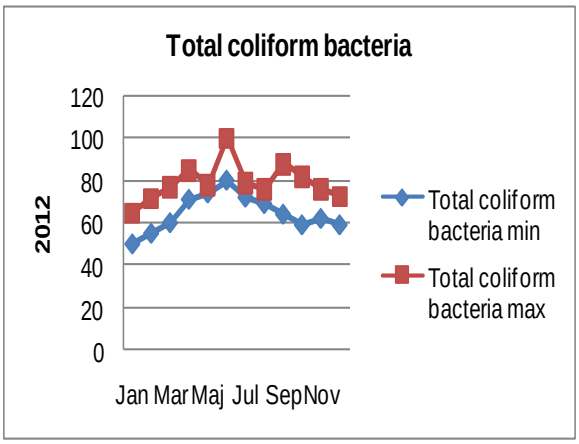

Figure 7.Total coliform bacteria

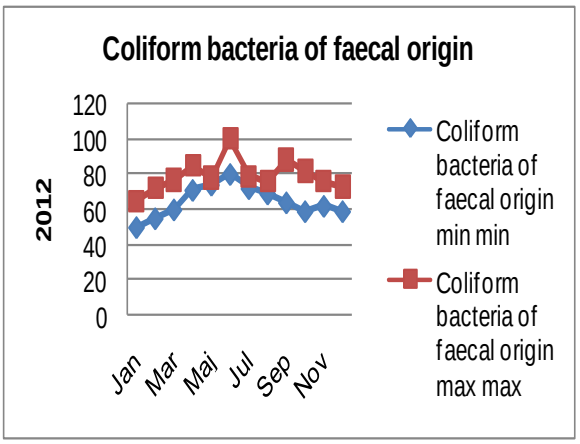

Figure 8.Coliform bacteria of faecal origin

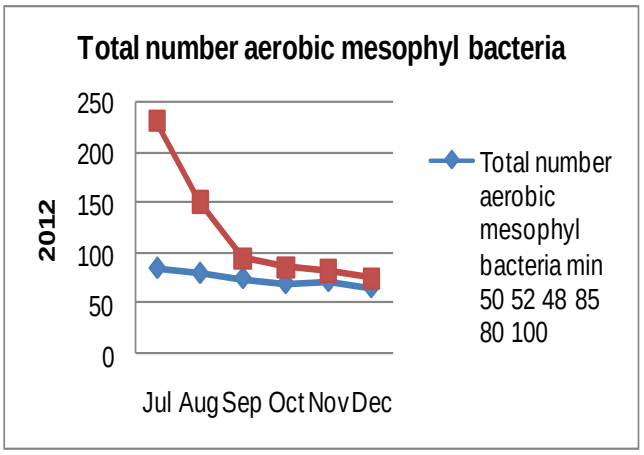

Figure 9. Total number aerobic mesophyl bacteria

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5. Refernces

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