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Microbial indicators of coastal water in Velipoja beach, Albania

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Abstract

The Albanian coastline is about 450 km long, with wide access to the Adriatic and Ionian seas. It has become popular in recent years for its many unexplored rocky and sandy beaches, crystal waters, curative sand rich in iodine, which has given a great impact in tourism and economy. Velipoja beach is located on the northwest of Adriatic Sea. Coastal waters of Velipoja are used for bathing, fishing and tourism, but in recent years these waters are exposed to various sources of pollution, which are related to restaurants and agricultural activities, wastewater discharge, etc. The quality of coastal water in Albania is particularly analysed by the Public Health Institution. It was considered reasonable to monitor the microbiological quality of coastal waters on Velipoja beach through microbiological parameters during summer season. Evaluations of the results were done based on Directive 2006/7/EC for inland waters, coastal and transitional waters. Seawater samples were tested mainly for *E. coli*, *E. faecalis*, *S. faecalis*, *heterotrophs* in accordance with European Standards using the membrane filtration method. Water samples were taken monthly from May-September 2023.

Based on the data received, during the monitoring period the bacterial concentration for *E. faecalis* varied from 0 CFU /100 ml to 228 CFU/100 ml. The concentration for *S. faecalis* varied from 0 CFU /100 ml to 128 CFU/100 ml. The concentration for *E. coli* varied from 0 CFU /100 ml to 134 CFU/100ml. Velipoja Center has the highest concentration of *E. coli*, *E. faecalis*. The concentration of bacteria increases during the months of July and August, probably due to the large number of tourists visiting Velipoja beach during this period. According to Directive 2006/7/EC of the European Parliament, the quality of coastal waters of Velipoja during the period of investigation for *E. coli* is in the category "Excellent quality".

Monitoring for the presence of pathogen bacteria are essential water quality assessment, which directly or indirectly leads to serious problems to human health. Enterococcus faecalis is an

indicator of an old faecal pollution (EN ISO 7899-2, 2000). The European Community (2006) recommended the following parameters: *Escherichia coli*/100 ml (500/1.000), and Intestinal enterococci/100 ml (200/400) categorized in the class A and B. Urban wastewaters are major sources for surface and groundwater pollution in the Shkodra lake basin.

Monitoring for the presence of pathogen bacteria are essential water quality assessment, which directly or indirectly leads to serious problems to human health. *Enterococcus faecalis* is an indicator of an old faecal pollution (EN ISO 7899-2, 2000). The European Community (2006) recommended the following parameters: *Escherichia coli*/100 ml (500/1.000), and Intestinal enterococci/100 ml (200/400) categorized in the class A and B. Urban wastewaters are major sources for surface and groundwater pollution in the Shkodra lake basin.

Keywords: coastal waters, indicator bacteria, *E. faecalis*, waterborne diseases.

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