UNIVERSITY OF LIFE SCIENCES ”KING MIHAI I” FROM TIMISOARA
”YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH IN APPLIED LIFE SCIENCES”

05-06 November 2026



Evaluation of Indicator Bacteria for Assessing the Degree of Pollution of Well Water

Anamaria-Elena CIOCHIA, Aurica-Breica BOROZAN*, Alina DOBREI
University of Life Sciences “King Mihai I” from Timisoara, Faculty of Horticulture, Forestry and Plant Biotechnologies
**Corresponding author: auricaborozan@usvt.ro*

Abstract: *Water from wells represents an important resource, particularly in rural areas, where it is used mainly for crop irrigation and animal watering; however, it can be vulnerable to microbiological contamination. The present study aimed to assess the microbiological quality of water collected from six wells (P1, A2, J3, C4, S5, and G6) located in the area of Băilești, Dolj County, Romania. The total number of mesophilic bacteria at 22°C and 37°C, the probable number of coliform bacteria, the number of Escherichia coli, as well as its presence on EMB culture medium were determined. In addition, the number of fecal streptococci, used as indicators of fecal contamination, was evaluated. The results highlight the need for regular microbiological monitoring of well water, as well as the implementation of sanitation and water treatment measures and the removal of pollution sources from the surrounding areas.*

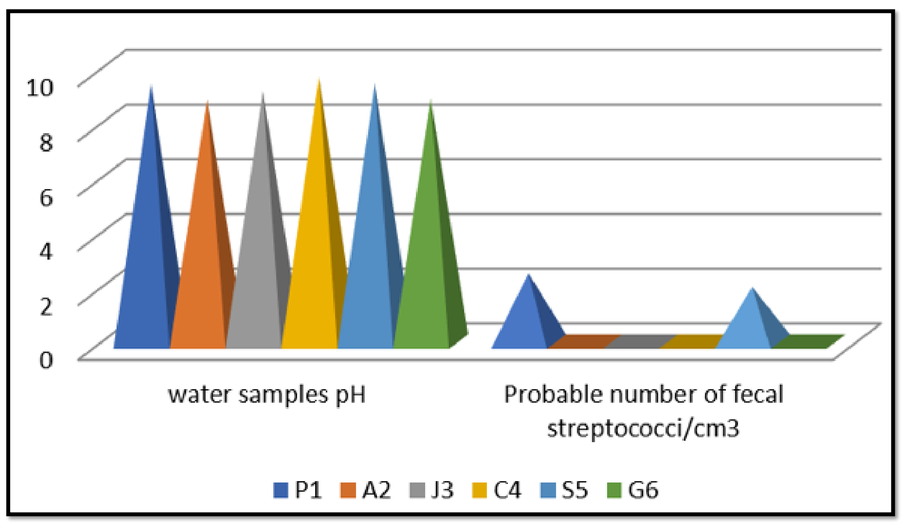
• Introduction

Microbiological contamination of groundwater represents an important issue, considering that certain pathogenic bacteria can be transmitted through the consumption of contaminated water or through contaminated food.
Considering the risks associated with microbiological water contamination, its assessment requires the investigation of microorganisms of sanitary significance.
The aim of this study is to assess the pathogenic microbiota in well water in accordance with the applicable regulations.

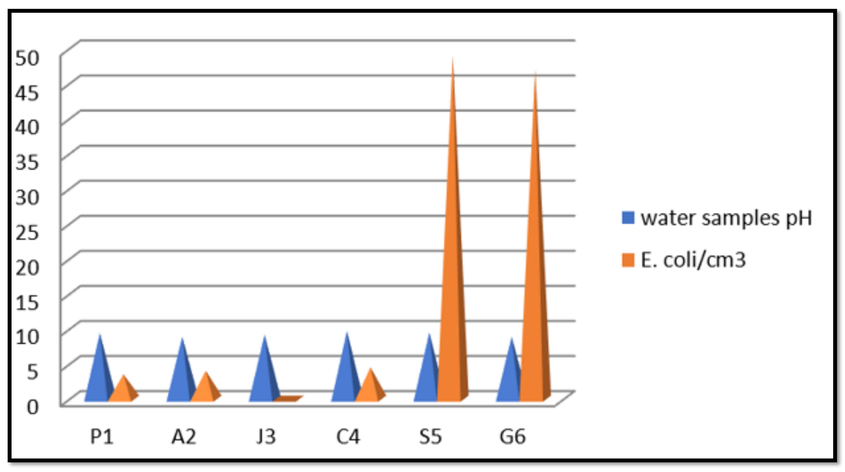
• Material and method

P1 – The well dates back to 2010 and is equipped with a bucket.
A2 – The well was drilled in 2017.
J3 – The well was drilled in 2017.
C4 – The well was drilled in 2010, is equipped with a filter.
S5 – The well dates back to 1950 and is equipped with a bucket.
G6 – The well is very old, dating from before 1900, and is equipped with a bucket.
The main microbiological analyses performed included the determination of the total number of mesophilic bacteria at 22°C; the determination of the total number of mesophilic bacteria at 37°C; the determination of coliform bacteria, into tubes containing Tryptose Lauryl Sulfate medium; the determination of fecal streptococci was determined on Bile Esculin Agar medium; the enumeration of *Escherichia coli* was determined using the pour plate technique on Tryptic Soy Agar medium at 44°C; and the identification of *E. coli* on the selective EMB (Eosin Methylene Blue) medium.

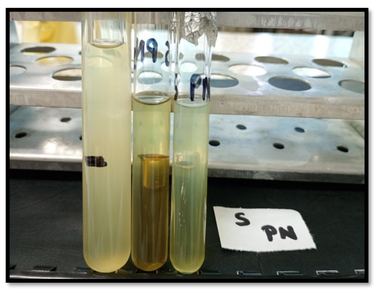
• Results and discussions



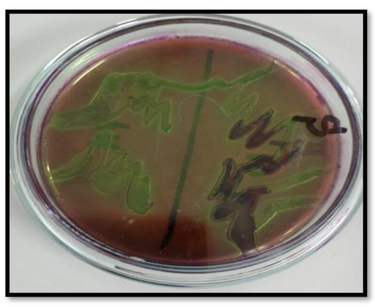
Number of fecal streptococci



Number of E. coli bacteria at alkaline pH values



Positive tubes, containing coliform bacteria



Identification of *E. coli* on EMB medium

• Conclusions

Biological contamination can lead to a deterioration in water quality and cause health problems among consumers. The level of microbial contamination in sample S5 is concerning. Water samples S5 and G6 are characterized by high numbers of coliform bacteria and E. coli. Fecal streptococci are abundant in samples S5 and P1. Mesophilic bacterial counts remain high in water sample S5, as well as in samples A2 and J3. To improve water quality, well cleaning, water treatment, and the removal of pollution sources from the surrounding areas are recommended.