

THE EVALUATION OF BACTERIOLOGICAL INDICATORS OF THE WATER FROM SIBIU'S WATER SUPPLIES DURING 2001 – 2004

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Abstract: Sibiu's main water supplies, that used for obtain drinking water, are Cîbin watery source (the barrier lake Gura Râului) which assure the main volume of water supply and Sadu water source.

In order to establish the level of bacteriological pollution and to determine the potential risk for health we brought the next bacteriological parameters: total bacteria growing at 37⁰ C (mesophilic) number, total bacteria growing at 22⁰ C (mesophilic) number, the most probable number of coliform bacteria, the most probable number of thermotolerant coliform bacteria (faecal coliforms), the most probable number of enterococci.

INTRODUCTION

Water is the most important nutriment. It cannot be replaced. These assertions are not figure of speech, but quotation from the watery standards applied in developed countries. Man can spare himself for a long time of water, used in different purposed, but he cannot live without drinking water. He may resist longer without food, but very little without water. He is able to find water in different sorts of food, but he needs liquid water. That is why drinking water was, is and it will be the most important sort of water.

The permanent delivery of drinking water enforces the obedience of some rules that guarantees good microbiological quality of water such as: the use of a best quality supply, the use of all available methods and devices in order to insure the protection of catchments and to assure the permanent water's disinfection.

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The theme of this study can be register in the current preoccupation of specialists in achieving, as careful as possible, an monitoring of the supplies intended to be drinkable in order to apply a proper treatment of these for preventing hidric epidemics.

Sibiu's main water supplies that are permanently controlled are Cibin watery source (the barrier lake Gura Râului) which assure the main volume of water supply and Sadu water source.

MATERIALS AND METHODS

The bacteriological analysis of water has as a purpose the evaluation of water's quality and of the bacteriological pollution level. The results of water's bacteriological analysis is correlated with the results of organoleptic, chemical, physical and biological determination for a complete evaluation of its quality.

The determination of bacteriological indicators is done according to the methods settled in STAS 3001/ 1991 Water. Bacteriological analysis.

In order to establish the level of bacteriological pollution and to determine the potential risk for health we brought about the next bacteriological parameters: total bacteria growing at 37°C (mesophilic) number, total bacteria growing at 22⁰ C (mesophilic) number, the most probable number of coliform bacteria, the most probable number of thermotolerant coliform bacteria (faecal coliforms), the most probable number of enterococci.

RESULTS AND DISCUSSION

A. Water's evaluation of bacteriological indicators from Cibin water supply (the barrier lake Gura Râului) during 2001 – 2004

The evaluation of bacteriological level of Sibiu's main watery source which is Cibin during 2001 – 2004 reflects the following facts:

- the highest months' values of coliform bacteria (2072.25 / 100 ml) were obtained in September – October 2003, and the slightest value in May 2002 (26,9 / 100 ml) according to figure 1;
- the highest months' values of thermotolerant coliform bacteria (659.15 / 100 ml) were obtained in the periods September - October 2001 August – September 2002; the smallest value was 0 / 100 ml, as figure 2 presents;
- the number of enterococci is very small during the whole year, the highest value was obtained in September 2003 (12.4 / 100 ml), according to figure 3.

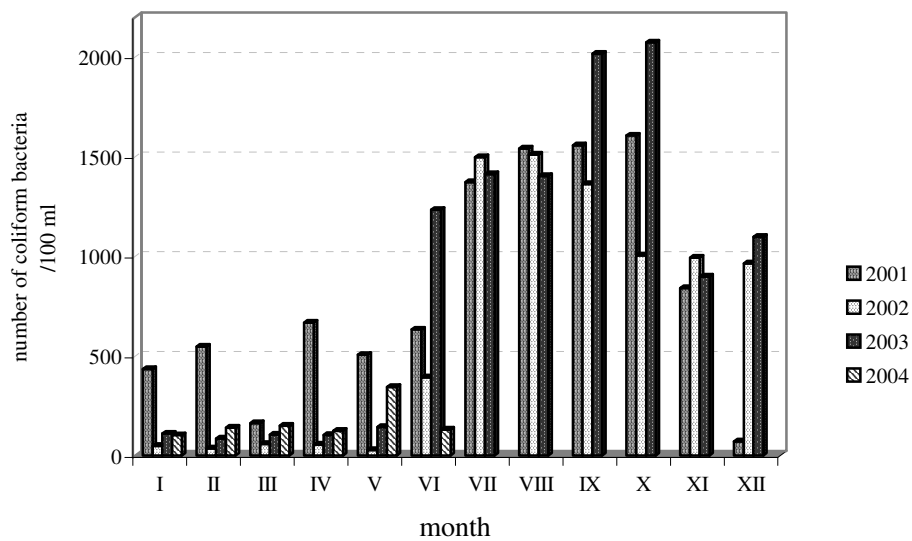


Figure 1. Variation of most probable number of coliform bacteria in Cibin's water during 2001 – 2004

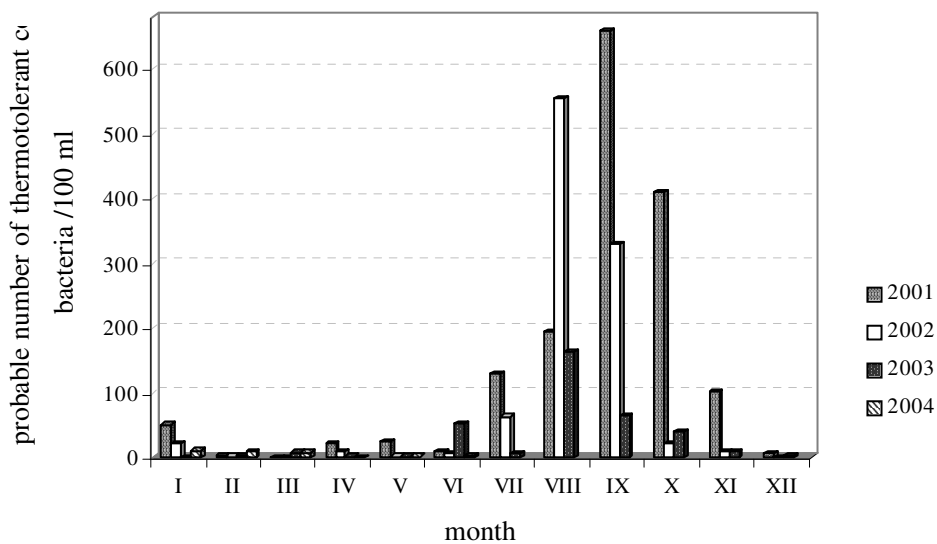


Figure 2. Variation of most probable number of thermotolerant coliform bacteria in Cibin's water during 2001 - 2004

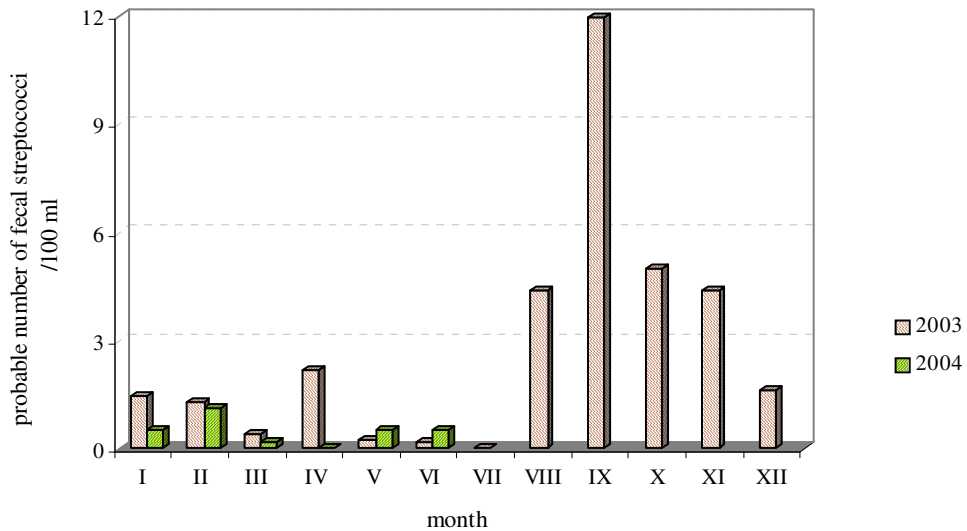


Figure 3. Variation of most probable number of fecal streptococci in Cibin's water during 2003 - 2004

B. The evaluation of bacteriological indicators of water from Sadu's watery source during 2001 – 2004

The evaluation of bacteriological charge of Sadu's watery source during 2001-2004 reflects that:

- the highest months' value of coliform bacteria was obtained in July 2003 (8469,7 / 100 ml) and the smallest value obtained in March 2002 (358.46 / 100 ml), as observed in figure 4;
- the highest value of thermotolerant coliform bacteria was in September 2003 (6719.2 / 100 ml) and the smallest value was obtained in March 2004 (100 / 100 ml), according to figure 5;
- the number of fecal streptococci is between the highest month's value 1558 / 100 ml (July 2003) and the smallest one 10,4 / 100 ml (May 2004), as figure 6 shows.

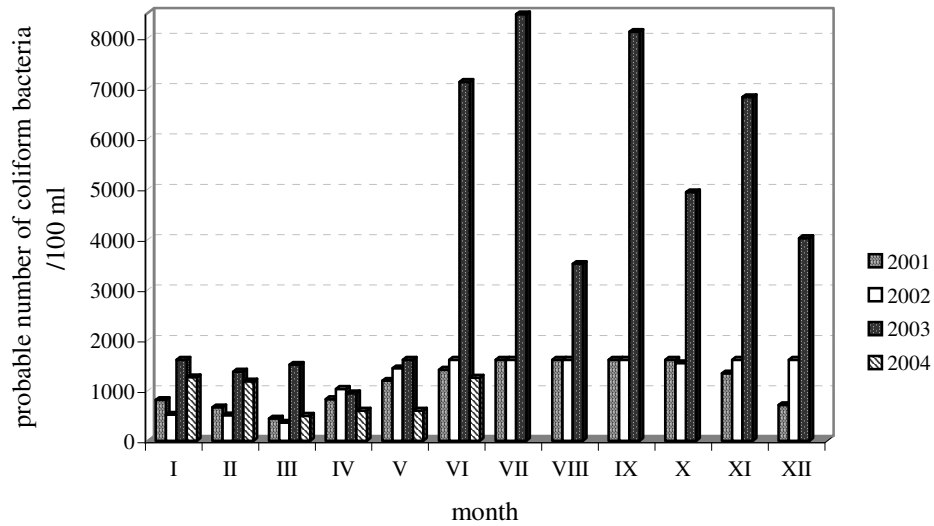


Figure 4. Variation of most probable number of coliform bacteria in Sadu's water during 2001 - 2004

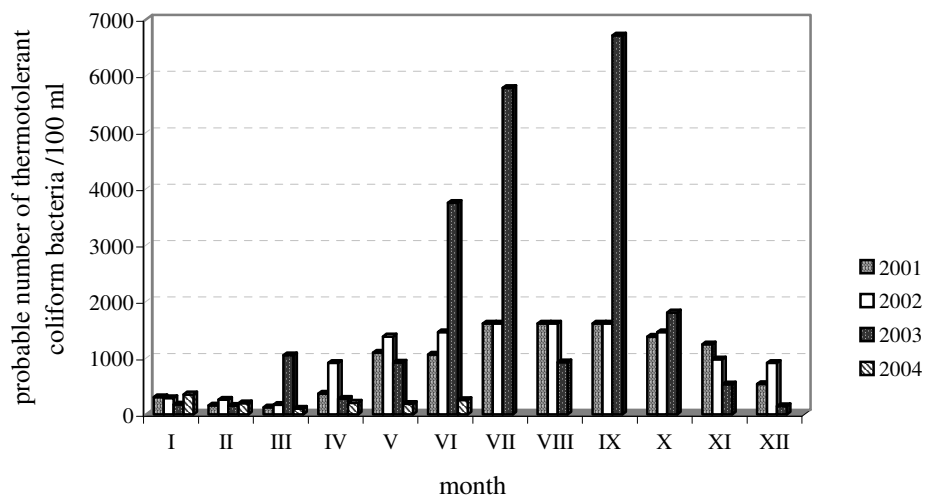


Figure 5. Variation of most probable number of thermotolerant coliform bacteria in Sadu's water during 2001 – 2004

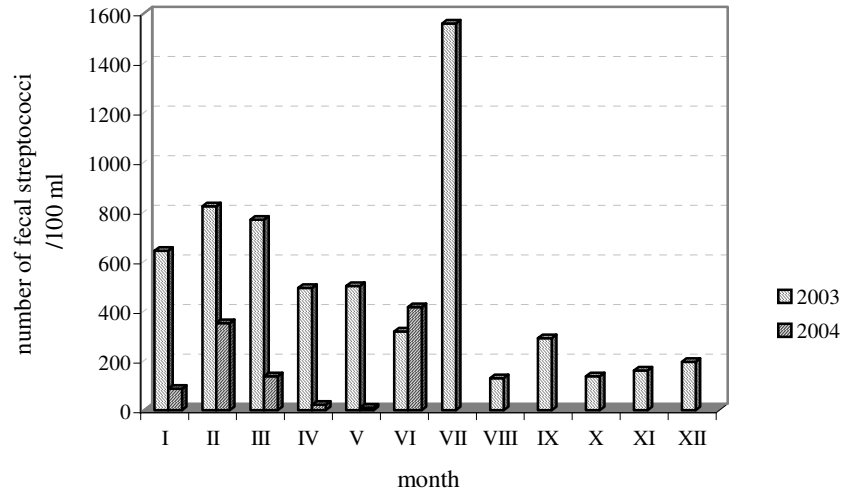


Figure 6. Variation of most probable number of fecal streptococci in Sadu's water during 2003 – 2004

CONCLUSIONS

After bacteriological monitoring of water from Cibin and Sadu sources during 2001 – 2004 we can see that:

- water from Sadu supply has extremely high values of bacteriological parameters, this shows a prominent impurity of this source. That is why this source needs to be closely monitorise and it should be use cautionly by applying some proper methodsin order to treat it for drinking.
- the analysis of water from Sibiu's main watery source (Cibin) reflected the fact that the values of all parameters do not create treatment problems. By imposing some clascal treatment and disinfection methods the water come from this source it can be assured the suppling with drinking water of high quality according to the current regulations.

During a year the variation of bacteria's number, no matter the source, we can see:

- highest value of bacteriological parameters during spring and autumn due to water circulation, the change in lake's stratification, but also due to abundant rains that wipe the versants and carries suspensions and nutrients that promote the development of phytoplanktonic organisms and of bacterian biota;

- in warm season water's high temperature is good for the development of algae and the appearance of decomposition process registering bacteriological maxims;
- the overtaking of normal average bacteriological values characteristic to every source due to accidental situations of pollution in case of overfalls or infiltration.

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