RESEARCH ON SULPHUR-BACTERIA AND PHYSICAL-CHEMICAL PARAMETERS FROM SULPHUROUS WATERS OF JIBOU AREA

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AIM OF WORK

This paper aims to investigate the bacteria involved in sulphur cycle (aerobic and anaerobic bacteria) in relation to physical-chemical parameters in sulphurous waters from Jibou zone (Sălaj County).

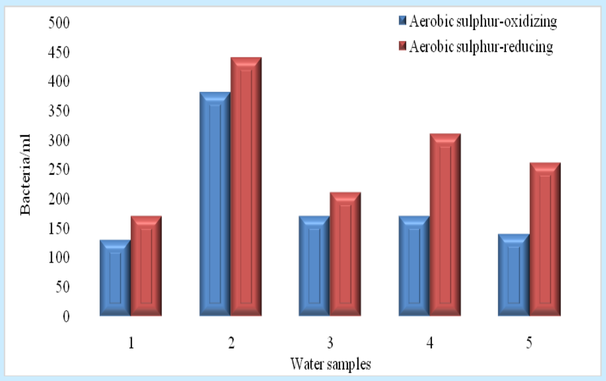
Key words: sulphurous water, Jibou, physical-chemical parameters, sulphate-reducing bacteria, sulphur-oxidation bacteria.

In order to achieve this aim the following steps have been performed:

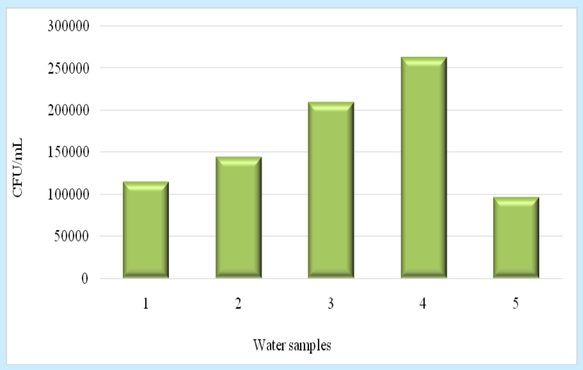
1. *PHYSICAL AND CHEMICAL PARAMETERS OF WATER SAMPLES FROM JIBOU AREA*

Samples	pH	Eh (redox potential) (mV)	Electrical conductivity (µS/cm)	Salinity (%)	Dissolved O_2 (mg/l)
1	6.73	-3	845	0.2	0.11
2	6.81	-5	858	0.2	0.25
3	6.84	-7	862	0.2	0.30
4	6.87	-9	860	0.2	0.10
5	6.88	-10	867	0.2	0.23

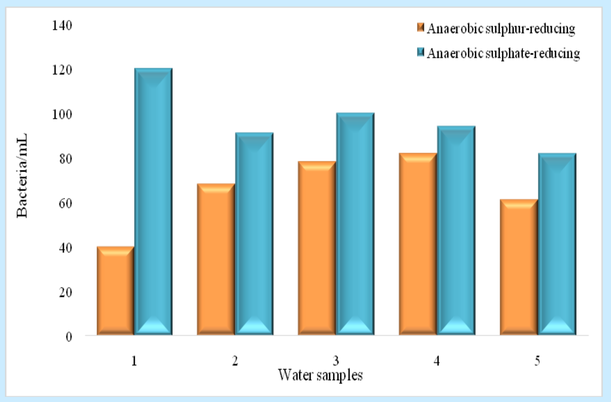
2. *MICROBIOLOGICAL ANALYSIS OF WATER SAMPLES.* **The abundance of bacteria involved in sulphurous biogeochemical cycle (aerobic heterotrophs, sulphur oxidizing aerobic, sulphur reducing aerobic, sulphur reducing anaerobic, sulphate reducing anaerobes) were determined. The bacterial indicator of water quality (BIWQ) were calculated and indicated a low intensity of these samples.**



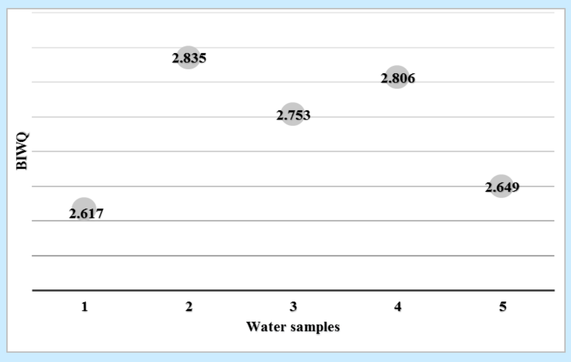
Aerobic sulphur bacteria (sulphur-oxidizing and sulphur-reducing) in water samples



The bacterial number of aerobic heterotrophic bacteria



Anaerobic sulphur bacteria (sulphur-reducing and sulphate-reducing) in water samples



Bacterial indicator of water quality (BIWQ)

CONCLUSIONS

The physical analyses showed that the sulphurous water in Jibou area fits into the very weakly acidic reaction class. The values of redox potential in water samples was very low and these values affect the affinity of the nutrients and the presence of aerobic bacteria. Values of electrical conductivity varied between 845 and 867 µS/cm. In all water samples a salinity of 0.2% was detected.
Numerical distribution of aerobic heterotrophic bacteria shows higher values in the sample 4 ($2630x10^3$ cfu/ml), followed by sample 3 ($2093x10^3$cfu/ml) and the lowest value was found in sample 5 ($965x10^3$cfu/ml).
The microbial sulphur community is not very abundant but suggests that all analysed groups were present in all water samples. Even if aerobic and anaerobic sulphur bacteria were present in the water samples, the aerobic sulphur bacteria were predominant.
The presence of all the five studied bacterial ecophysiological groups studied was noticed in all the water samples. Their number decreases in the following order: aerobic mesophilic heterotrophs ($965x10^3$ - $2630x10^3$ cfu/ml) >aerobic sulphur-reducing bacteria (170 - 440 bacteria/ml)> aerobic sulphur-oxidizing bacteria (130 – 380 bacteria/ml) > anaerobic sulphate-reducing bacteria (82-120 bacteria/ml) >anaerobic sulphur-reducing bacteria (40 - 82 bacteria/ml). The bacterial indicator of water quality (BIWQ) had very low values, which varied between 2.617 and 2.835.

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