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Original Article

Consideration on the Evolution of some Water Indicators in Cluj - Napoca

ODAGIU Antonia[1], Ioan OROIAN[1*], Tania MIHĂIESCU[1], Radu MIHĂIESCU[2], Claudia BALINT[1], Adriana OPINCARIU[1], Daniela BORDEA[1]

[1]University of Agricultural Sciences and Veterinary Medicine, Faculty of Agriculture, 3-5 Manastur St. 400372, Cluj-Napoca, Romania
[2]"Babeş-Bolyai" University, Faculty of Environmental Science and Engineering, 30 Fântânele Street, 400294 Cluj-Napoca, Romania

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Abstract

Water quality is expressed through a series of physical, chemical, biological and bacteriological terms of value, allowing framing of proof in a particular category, thus acquiring ownership of it to serve a particular purpose. To establish the water quality of the many physical, chemical and biological weapons as may be determined by laboratory analysis using virtually a limited number considered significant. Sampling was conducted in six locations representative neighborhoods of Cluj-Napoca (Dawn, Mărăşti, Grigorescu, Gyergyósyentmiklós Center, Mănăştur) compliance with rules in force. They were determined following indicators: pH, conductivity and turbidity of drinking water. Water samples taken from the center of Cluj - Napoca Zorilor, yielded average values of pH 5.70 and 5.90 respectively, below normal admitted, while indicating a slightly acidic pH. So conductivity yielded average values of 88.74 mS / cm center and 104.50 respectively mS / cm in Zorilor, indicating a high ionic load. Turbidity recorded normal levels in all monitoring points.

Keywords: conductiviy, measurements, pH, turbidity.

1. Introduction

Water quality can be defined as a set of conventional physical, chemical, biological and bacteriological terms of value, allowing framing of proof in a particular category, thus acquiring ownership of it to serve a particular purpose. To establish the water quality of the many physical, chemical and biological weapons as may be determined by laboratory analysis using virtually a limited number considered more significant [5, 6].

Carcaterizat quality drinking water to a number of parameters that define the quality both physically and chemically. Since the chemical characteristics of the water by direct characterization of its importance, we mention: pH, turbidity, conductivity, etc. [1, 2].

Water quality in Romania is followed according to the structure and methodological principles of Integrated Water Monitoring System in Romania (S.M.I.A.R.), restructured in accordance with the European directives [7, 8].

An important problem in interpreting and processing the data resulting from the monitoring process is linked to various factors involved in planning, harvesting, preservation, transportation, processing water samples collected for analysis. All

* Corresponding author.
Tel: +40-264-596384
Fax: ++40-264-593792
e-mail : neluoroian@gmail.com

collections and theoretical analyzes are performed after rigorous standardized methods, which theoretically should ensure consistency and comparability [3].

However, there are parameters for which no standardized methods for analysis, or for which there is equipment problems (too old or inaccurate or defective or uncalibrated etc.) or reactive (missing or impure etc.), more involved and human error, contamination of samples water, etc.

Our trial aims to emphasize the evolution of pH, conductivity, and turbidity in drinking water from the 6 districts of Cluj - Napoca.

2. Material and Method

Sampling was conducted in six locations representative neighborhoods of Cluj-Napoca (Dawn, Mărăşti, Grigorescu, Gyergyósyentmiklós Center, Mănăştur) compliance with rules in force. Determination of pH was carried out by potentiometric method with laboratory pH meter. For measuring conductivity was Conductimetry resorted to using the kit consists of conductivity cell Conductivity transducer measuring device, measuring the set of solutions of potassium chloride with known values of conductivity and glasses evidence. Quantitative determination of turbidity was performed by nephelometry, the laboratory turbidimeter, which is the main component of the kit TURB 355 IR turbidity.

3. Results and Discussions

When analyzing the evolution of indicators track to characterize the drinking water of six points monitored in Cluj - Napoca in the experimental study conducted during March-May 2016, shows that the overall performance (Figs. 1-3) gave results that demosntrează a similar pattern to them.

The natural water pH is between 6.5 - 8 as a deviation from these values giving an indication of inorganic pollution. pH and buffering capacity thereof constitutes one of the essential properties of surface waters and groundwater, in this way ensuring a degree of affordability naturally from the impact of acid or alkali salts of Na +, K +, Ca 2+ and Mg 2+ playing an essential role in this regard [4]. 2016 was recorded consistently very low values for the pH of drinking water taken from the point situated in the center of Cluj - Napoca, since April, and the point located in Zorilor (Fig. 1).

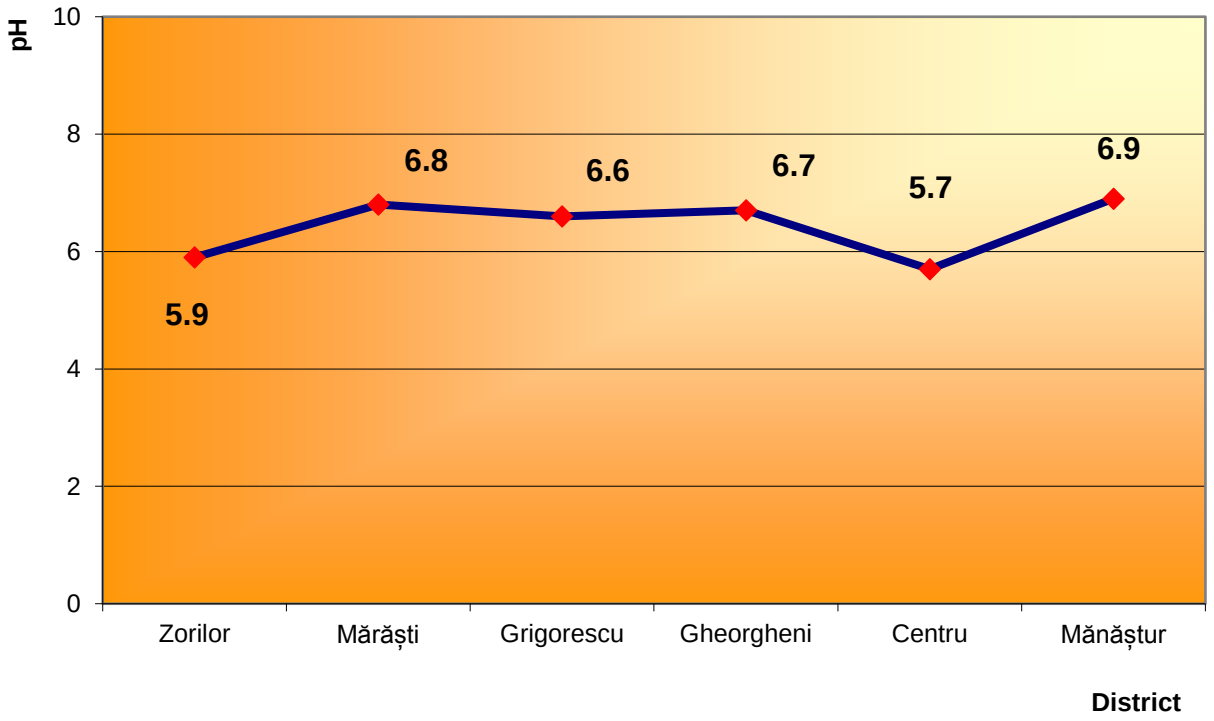

Figure 1. The average pH-ul of drinking water harvested ftrom the household network from the districts of the Cluj – Napoca Municipality, March - May 2016

Water conductivity is one of the most commonly used indicators in assessing the degree of mineralization of waters at least the following reasons: conductivity measurements (resistivity) water for determining total dissolved salts in water; have the advantage of differentiating between organic and inorganic salts (weight) on the basis of specific ion mobility; eliminates errors due to transformation of species of carbonate / bicarbonate by evaporation at 105ºC (according to the methodology of determining gravity of the fixed residue, where the losses are bicarbonates about 30%). Concerning the evolution of conductivity, in our experiment, it appears that 2016 was registered consistently high values for conductivity of drinking water taken from the point situated in the center of Cluj - Napoca, since April, and the point located in Zorilor (Fig. 2).

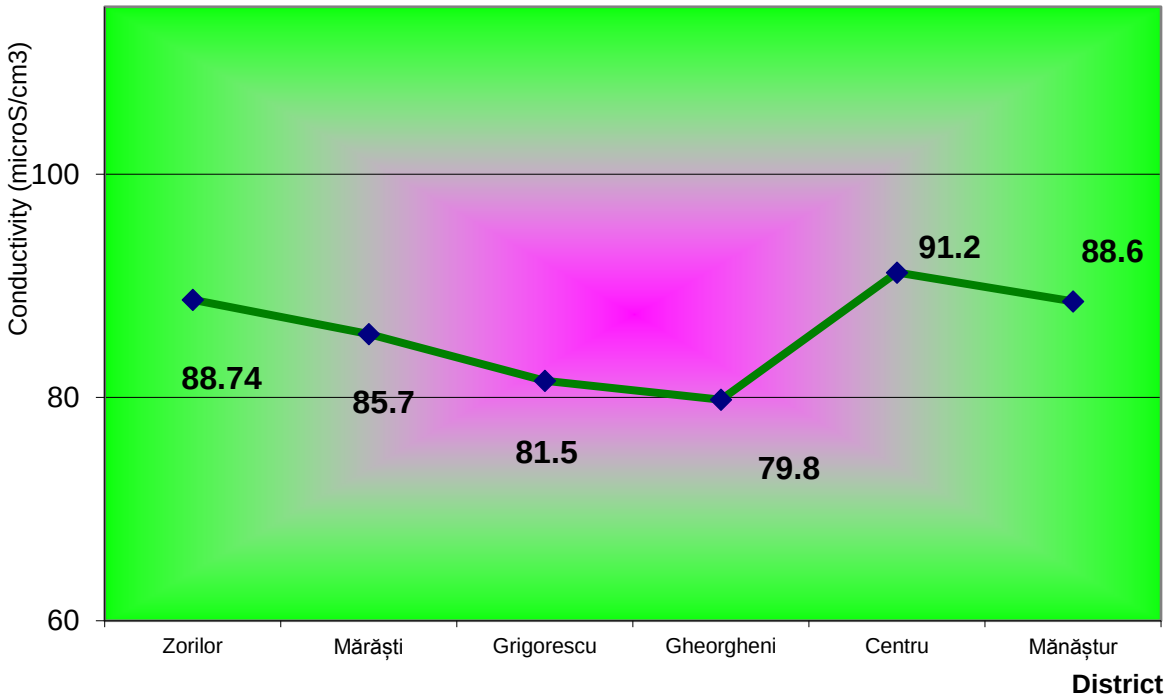

Figure 2. The average conductvity of drinking water harvested ftrom the household network from the districts of the Cluj – Napoca Municipality, March - May 2016

The evolution of pH and conductivity, meaning the low values recorded for pH and conductivity of water taken from the point situated in the center of Cluj - Napoca, since April of 2016 and section located in Zorilor assume that datoriează state of the drinking water distribution network.

The turbidity is due to the solid particles or colloidal suspensions. In a general definition is deemed total suspension assembly components insoluble solids are present in a quantity of water which can be separated by laboratory methods (filtration, centrifugation, sedimentation). Weight is expressed in mg / l and the volume in ml /L. The value of total suspensions is particularly important for water naturale.În characterization by size and specific gravity, particles are separated in the form of deposits (sediment) or float on the water surface (floating). Suspensions gravimetric represents all insoluble solids that can settle naturally in a certain limited period of time [4]. For turbidity is found, but similar developments in current experimental respectively in 2016 (Fig. 3).

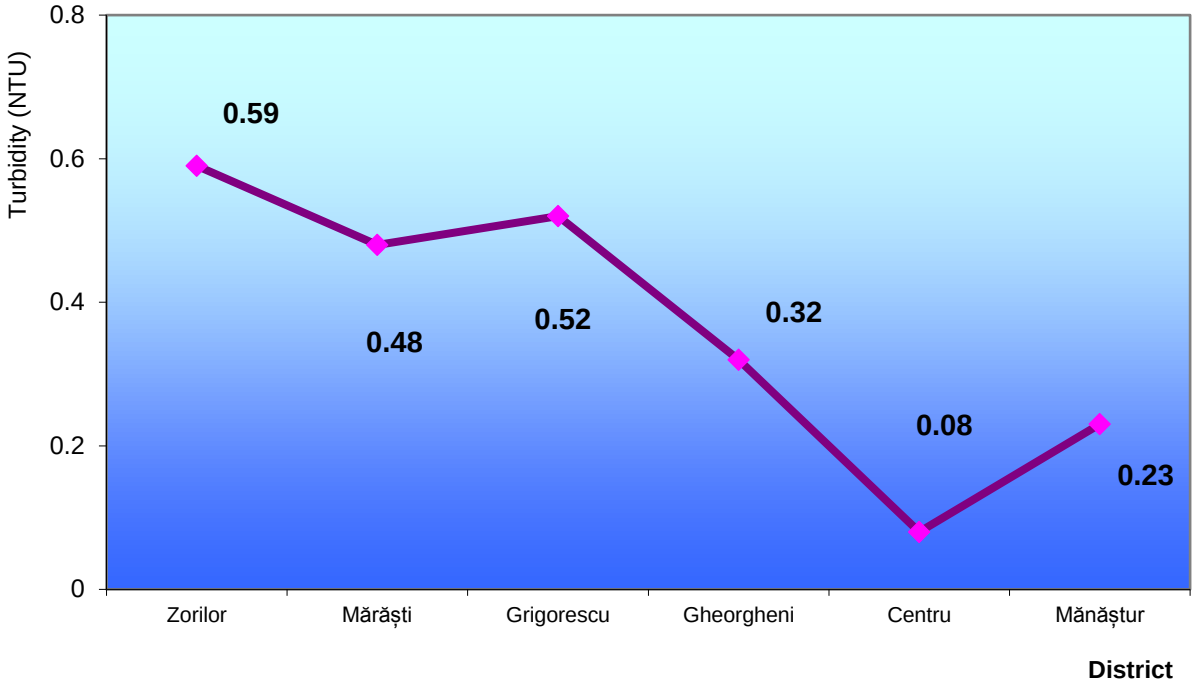

Figure 3. The average turbidity of drinking water harvested ftrom the household network from the districts of the Cluj – Napoca Municipality, March - May 2016

4. Conclusion

The pH monitoring has yielded average values of 6.80 for Mărăşti district, 6.60 for Grigorescu district, 6.70 for the Gheorgheni neighborhood, 6.90 for Mănăştur, values that are within normal limits. Instead, water samples taken from the center of Cluj - Napoca and those harvested from the point of prelevre located in Zorilor, yielded average values of 5.70 and 5.90 respectively, below normal admitted, indicating while a slightly acidic pH.

Monitoring conductivity yielded average values of 85.70 mS/cm for Mărăşti district, 81.50 mS /cm for Grigorescu district, 79.80 mS/cm and 88.10 mS/cm for Gheorgheni district, and for Mănăştur district, respective.

These values frame within normal limits. Instead, water samples taken from the center of Cluj - Napoca and those harvested from the point of prelevre located in Zorilor, yielded average values of 88.74 mS / cm and 104.50 respectively mS /cm showing high ionic load.

Monitoring water turbidity yielded average values of 0.59 NTU for Zorilor, 0.48 NTU for Mărăşti district, district Grigorescu 0.52 NTU to 0.32 NTU to 0.15 NTU Gheorgheni district for water samples harvested from the center of Cluj - Napoca and 0.23 NTU for those taken from the monitoring point located in the district Mănăştur values within normal limits.

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