Study Concerning the Quality Indices of Flowing Waters. A Case Study: Iara River
Antonia ODAGIU, Ioan Gh. OROIAN*, Ilie COVRIG, Tania MIHĂIESCU

Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Manastur St., 400372 Cluj-Napoca, Romania; neluoroian@gmail.com

Abstract. The water pollution is first of all a consequence of the lack of prevention and also inertia of public interest initiatives, often being claimed technical and economical difficulties. The aim of this paper is to present the results of monitoring the water quality from a mountain river. The analysis was carried on within the Laboratory of the Monitoring of Environmental Quality from the Faculty of Agriculture of the University of Agricultural Sciences and Veterinary Medicine Cluj – Napoca, during April - June 2013. Temperature recorded values between 16 –21°C pH, 6.5 – 6.9, conductivity 70.2 µS/cm - 72.8 µS/cm, turbidity 0.05 - 0.16 NTU, dissolved oxygen 10.01 –9.10 mg/L. All monitored parameters that are the basis of identification of the water quality indices, during monitored time interval, April 1st - June 26th 2013 framed within normal admitted limits, which demonstrate the lack of pollution of this river segment.

Keywords: pollution, indices of water quality, monitoring.

Introduction. Due to the increasing concern related to the pollution phenomenon, both vegetal and animal world do not cope enough rapidly to the new harmful conditions and for this reason lot of species disappeared. Some rivers and lakes are so polluted that fish and completely disappeared, the total number of hydrobionts dramatically decreased, except pathogen microorganisms. The water pollution is first of all a consequence of the lack of prevention and also inertia of public interest initiatives, often being claimed technical and economical difficulties (2001http://www.oregon.gov/OWEB/docs/pubs/wq_mon_guide.pdf). Water does not belong to a single individual, but to entire world, that has to organize water resources use and protection.

Aims. The aim of this study is to present the results of monitoring the water quality from a mountain river, Iara River, respectively, upstream and downstream, meaning pH, turbidity, conductivity, dissolved oxygen. The samples were harvested upstream and downstream of the Valea ierii village, from Iara affluent of Arieş River.

Materials and methods. The analysis was carried on within the Laboratory of the Monitoring of Environmental Quality from the Faculty of Agriculture of the University of Agricultural Sciences and Veterinary Medicine Cluj – Napoca, during April - June 2013.

Results and Discussions. Concerning temperature, there were recorded normal values for the studied time interval, both upstream and downstream. In the first part, (April 1st – April 28th 2013), it was among 16 –18°C upstream, and among 16 –17°C downstream. During the second part of the interval (April 29th – June 2nd 2013), temperature varied from 13°C (5th week), to 17°C (9th week), and from 14°C (6th week), to 19°C (9th week), downstream. During the last part of the studied time interval, among June 2nd - June 23rd, 2013, upstream temperature varied between 16°C (10th week), to 17°C (during the last weeks of the experimental interval, 11th and 12th weeks, respectively), and downstream, temperature varied between 18°C (10th week), and 21°C (12th week).

Both downstream and upstream, during the first part of the monitoring period, (April 1st – April 28th 2013), pH framed within normal values of this period. Upstream it was among
the limits 6.5 – 6.9, and downstream among 6.7 – 6.8. During the second part of the time interval (April 29th – June 2nd 2013), pH varied from 6.5 (8th and 9th week), la 6.8 (5th week), and downstream, the pH varied from 6.5 (5th week), to 6.9 (6th week and 8th week). During the last part of the time interval, weeks 10 – 12, respectively, upstream the pH varied between 6.5 (12th week) and 6.8 (10th week), and downstream between 6.6 (12th week), and 6.7 (10th and 11th weeks).

The conductivity recorded upstream during April 1st – April 28th 2013 values situated among the interval 70.2 µS/cm during the first experimental week and 72.2 µS/cm during the 2nd and 4th weeks, downstream. Both upstream and downstream, during all 4 weeks of monitoring (April 1st – April 28th 2013), conductivity framed within normal limits. During the second time interval, it varied among 70.2 µS/cm upstream and 71.1 µS/cm downstream. The maximum conductivity value was recorded only downstream, during the 7th experimental week - 72.6 µS/cm. During the last part of the time interval, weeks 10 – 12, respectively, conductivity varied upstream between 71.9 µS/cm (12th week) and 72.3 µS/cm (10th week), and downstream, among 72.1 µS/cm (12th week) and 72.8 µS/cm (11th week).

The values recorded for turbidity within April 1st – April 28th 2013 both upstream and downstream, for turbidity, demonstrate that it framed within normal values for that period. Upstream it varied among limits 0.05 – 0.06 NTU, and downstream, among 0.09 – 0.10 NTU. During the second part of the studied time interval (April 29th – June 2nd 2013), turbidity varied among 0.05 NTU (5th week) and 0.07 NTU (8th and 9th weeks), and upstream, among 0.07 NTU (6th and 7th weeks) and 0.11 NTU (9th week). In the last part of the studied time interval, namely weeks 10 – 12, upstream, turbidity varied between 0.07 NTU (10th week) and 0.08 NTU (11th and 12th weeks, respectively), and downstream, turbidity varied between 0.09 NTU (10th week) and 0.16 NTU (12th week).

The concentration of dissolved oxygen monitored during April 1st – April 28th 2013, framed, upstream and downstream, within normal limits for this time interval. Upstream, it oscillated among the limits 10.01 – 10.03 mg/L, and 9.90 – 9.80 mg/L, downstream. During the second part of the studied time interval (April 29th – June 2nd 2013), the minimum value recorded for the dissolved oxygen was of 10.14 mg/L (5th week) and 9.40 mg/L (9th week), while downstream, the concentration of dissolved oxygen varied among 9.70 mg/L (6th week) and 9.10 mg/L (9th week). During the last part of the studied time interval, the 10th - 12th weeks, respectively, upstream, the concentration of dissolved oxygen varied among 9.50 mg/L (10th week) and 9.40 mg/L (11th and 12th weeks, respectively), and downstream, the concentration of dissolved oxygen varied among 9.30 mg/L (10th week) and 9.10 mg/L (12th week), which also was the minimum concentration recorded during the entire experimental period.

Temperature recorded values between16 – 21°C pH, while values framing within the limits 6.5 – 6.9. The conductivity frames in normal values and had a minimum of 70.2 µS/cm and a maximum of 72.8 µS/cm. Turbidity was low and framed between 0.05 and 0.16 NTU. Dissolved oxygen recorded satisfactory values between 10.01 – 9.10 mg/L.

**Conclusion.** All monitored parameters that are the basis of identification of the water quality indices, during monitored time interval, April 1st - June 26th 2013 (temperature, pH, turbidity, conductivity, dissolved oxygen) framed within normal admitted limits, which demonstrates the lack of pollution of this river segment.

**REFERENCES**