

COMPARATIVE STUDY OF THE DRINKING WATER QUALITY ASSESSED FROM SEVERAL WATER SOURCES OF THE REPUBLIC OF MOLDOVA

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Introduction. Drinking water quality is a major public health issue. In the Republic of Moldova only 35% of the population uses water for drinking purposes from surface water sources, the others use water for this purpose from underground sources, having the highest share of non-compliance with sanitary-chemical and microbiological parameters.

Material and methods. The present study evaluated and analyzed the water quality service of the Prut river aqueduct, the artesian wells aqueduct and the wells, via 11 sanitary-chemical indices. The research was based on hygienic, descriptive, analytical, sanitary-chemical and statistical methods. This study was conducted under the State Program on "Estimating the risk to human health attributed to exposure to priority chemicals in the Republic of Moldova", cipher 20.8000.8007.35.

Results. The analysis of the obtained data showed that the highest values of the summary water mineralization are characteristic for the samples taken from wells constituting 1.36 ± 0.2 g/dm³, as well as for those from the aqueduct fed from the artesian well – 1.15 ± 0.18 g/dm³. Lower values were found in water from Prut River aqueducts, accounting for 0.71 ± 0.08 g/dm³. The concentration of Fe ions was higher in the water from the Prut River aqueduct, showing values of 0.028 ± 0.026 mg/dm³, followed by water from the aqueducts fed from the artesian wells – 0.023 ± 0.018 mg/dm³ and water from the wells – 0.02 ± 0.01 mg/dm³. The maximum values of copper concentrations were recorded in water from wells, which amounted to 0.04 ± 0.03 mg/dm³, followed by water from artesian well-fed aqueducts – 0.034 ± 0.05 mg/dm³ and water from the Prut River aqueducts – 0.027 ± 0.002 mg/dm³. The fluoride content in the investigated sources varied within very small limits from 0.05 ± 0.04 to 0.95 ± 0.6 mg/dm³. The average concentrations of ammonia in the water of the Prut River aqueducts and in the water from the wells showed equal values – 0.14 ± 0.1 mg/dm³, whereas the content of the estimated index was correspondingly 10 times higher in the water from the artesian wells (II 0.06-1.5; $p < 0.0001$). The same legitimacy is characteristic for the nitrogen content, the concentration in the artesian well water being of 0.004 ± 0.006 mg/dm³, corresponding to 13.3 (CI 0.02-0.07; $p = 0.0003$) and 5 (CI 0.02-0.07; $p = 0.0009$) times higher compared to the water content of the Prut River aqueducts and water assessed from the wells. The content of nitrates in the water of the Prut River the aqueducts and in the investigated artesian wells did not differ significantly, being 4.8 ± 2.4 and 4.09 ± 3.1 mg/dm³, respectively and showing low values, while the concentration of this index investigated in the wells corresponded to 13.9 (CI 59.03-75.1; $p < 0.0001$) and 17.2 (CI 59.03-75.1; $p < 0.0001$) or showing higher values compared to the aforementioned sources, thus exceeding the CMA of 50 mg/L.

Conclusions. The water from the river aqueduct is considered the safest source of drinking water supply for the population in terms of its sanitary and chemical parameters.