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Comparison of some quality and safety parameters in drinking water in Pollog region

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Abstract .Water is essential for its life, without water the life on Earth would not exist. Water is the main component of the cells comprising from about 70% to about 95% of the cellular mass or organisms. This means that we are made up of about 80% of our bodies by water, and even some special organisms, such as eg, contain up to 96% water. Water contains simultaneously the environment and the outside in which live many live forms, as noted above, about 75% of our planet is covered by water. Water, thanks to some of the above-mentioned properties, has such thermal properties that disintegrate as cell stabilizers and the organism in general.

Keywords: Water, parameters, region, water network.

WORKING METHOD

The samples are taken in the Gostivar and Tetovo regions, samples were analyzed in time, day (4-8 h), within 3 days in the region, in the water supply system of Pollog region. During the review and preliminary analyzes made in the Polog region by analyzing the physical, chemical and bacteriological parameters from the Public Health Institute of the Republic of Macedonia, the center of Gostivar and Tetovo, the data were extracted and acquired.

PRESENTATION OF RESULTS

The experimental results of research in the area of the Municipality of Gostivar and Tetovo are presented in the following tables. The results obtained from the samples are compared with the Official Gazette of the Republic of Macedonia.

PRESENTATION OF RESULTS

Table 1. Results of physical and chemical analyzes of drinking water in the region of Gostivar for the period from 01.01.2015 to 31.12.2015.

Public Health Center-Tetovo				Number of tests performed					
				Physical and chemical			Bacteriological		
	Resident	Survey	Example	In gener	Non right		In gener	Non right	
Civic Settlements	49.545	4	60	38	9	23.6%	60	3	5%
City Water Supply	--	4	58	36	36	25.0%	58	3	5.2%
Local water supply	--	0	1	1	0	0	1	0	0
Individual water supply		0	1	1	0	0	1	0	0
Rural settlements	68.184	50	308	303	60	19.8%	308	58	18.8%
Key villages in the city	11575	9	43	42	10	23.8%	43	2	4.6%
The main water supply of the villages	51.789	32	205	203	40	19.7%	205	44	21.5%
Central local water supply	4.820	9	48	46	4	8.7%	48	6	12.5%
Individual water supply	--	0	12	12	6	50.0%	12	6	50.0%
Vacations hotels	--		18	17	2	11.8%	18	6	33.3%
Employer organizations	--		29	28	4	14.8%	29	0	0
Other objects		30	35	34	6	17.6%	35	4	11.4%
In general	117729	84	450	420	81	19.3%	450	71	15.8%

From the parameters listed in Table 2, which shows that in the period from 01.01.2015 to 31.12.2015, the center for general health Tetovo, the center in Gostivar as well as those of the town and those of the village has 84 field centers from where they are taken 420 samples of drinking water for physical and chemical analysis from which 81 (19.3%) were not physical and chemical rights and 450 samples of water for bacteriological analyzes from which 71 samples (15.8%) were not bacteriological. In the same period from the settlements around, 38 samples of drinking water for physical and chemical analysis were obtained from where 9 or 23.6% were unfair and 60 samples of bacteriological drinking water samples from where 3 samples or 5% were not right from the bacteriological point of view

Content of physical and chemical parameters of drinking water for the period from 01.01.2015 to 31.12.2015

Table 2. Content of physical and chemical parameters of drinking water for the period from 01.01.2015 to 31.12.2015

Physical and chemical analysis	In general	Non Right		Turbidity		Consumption of KMnO ₄		NH ₄		NO ₂	NO ₃		Fe		Color		
		Nr.	(%)	Nr.	NTU	Nr	%	Nr	%	Nr.	%	Nr	%	Nr	(%)	Nr	%
Civic Settlements	38	9	23.6	9	23.6	0	0	0	0	0	0	0	0	0	0	0	0
City Water Supply	36	9	25	9	25	0	0	0	0	0	0	0	0	0	0	0	0
Local water supply	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Individual water supply	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rural settlements	303	60	19.8	56	18.5	6	2	2	0	0	0	1	0.3	11	3.6	0	0
Key villages in the city	42	10	23.8	10	23.8	0	0	0	0	0	0	0	0	1	2.4	0	0
The main water supply of the villages	203	40	18.2	37	18.2	3	1.5	1	0	0	0	0	0	7	3.4	0	0
Central local water supply	46	4	8.7	4	8.7	0	0	0	0	0	0	0	0	1	2.2	0	0
Individual water supply	12	6	41.6	5	41.6	3	25	1	0	0	0	1	8.3	2	16	0	0
Vacations hotels	17	2	11.8	2	11.8	0	0	0	0	0	0	0	0	0	0	0	0
Employer organizations	28	4	14.3	4	14.3	0	0	0	0	0	0	0	0	1	3.6	0	0
Other objects	34	6	17.6	6	17.6	0	0	0	0	0	0	0	0	1	2.9	0	0
In general	420	81	19.3	77	18.3	6	1.4	2	0	0	0	1	0.2	13	3.1	0	0

Table 2 shows that from January 1, 2015 to December 31, 2015, the physical and chemical parameters higher than those with non-right waters are turbidity (18.3%), followed by iron content (3.1%), consumption potassium permanganate (1.4%), ammonia (0.5%) and nitrates (0.2%).

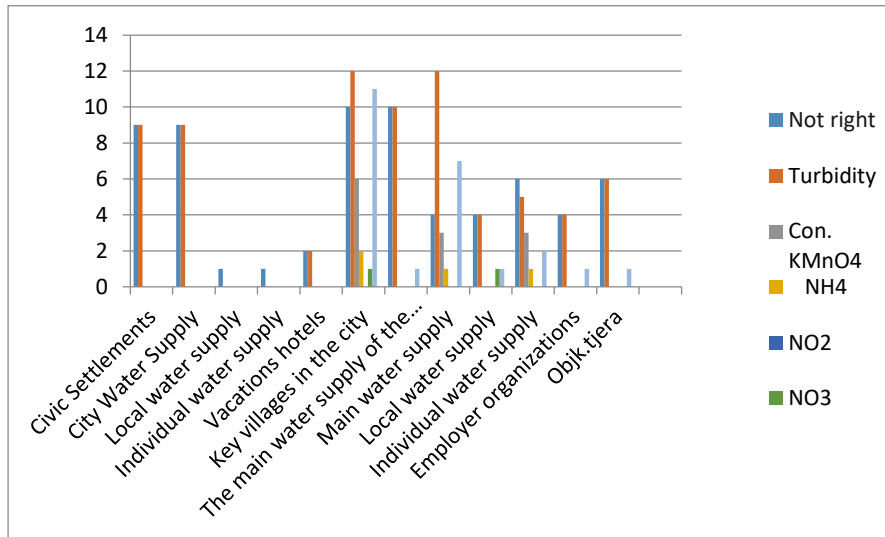


Fig 1-Content of physical and chemical parameters of drinking water from 01.01-31.12.2015

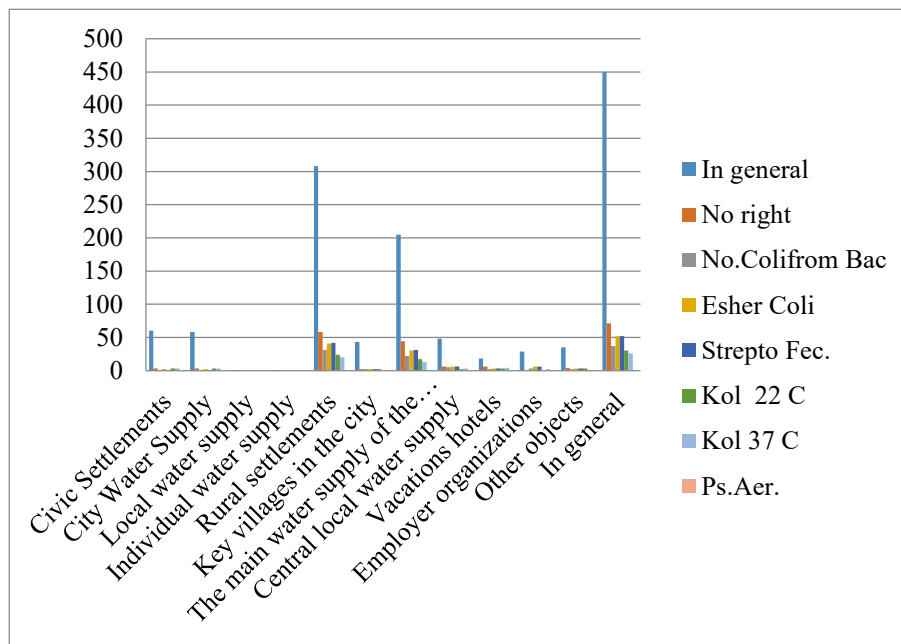


Fig. 2- Bacteriological parameters of drinking water for the period from 01.01-31.12.2015

From bacteriological parameters (Table 3), 52 examples of drinking water (11.5%) are not accurate for E-coli and Streptococcus facial parameters, 37 examples (8.2%) in coliform bacteria, 30 examples (6.7%) from columns at 220C and 26 examples (5.8%) are not fair from the number of columns at 37°C.

Content of incorrect bacteriological parameters examples of drinking water for the period from 01.01.2015 to 31.12.2015.

Table 3. Bacteriological parameters of drinking water for the period from 01.01.2015 to 31.12.2015.

Bacteriological analysis	General	Not right		Nr. total coliform bacteria		Escherichia Coli		Streptococcus Fekalis		Number of colonies in 22°C		Number of colonies at 37°C		Pseudomonas Aeruginosa	
		Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
Civic Settlements	60	3	5	1	1.7	2	3.3	1	1.7	3	5	3	5	0	0
City Water Supply	58	3	5.2	1	1.7	2	3.4	1	1.7	3	5.2	3	5.2	0	0
Local water supply	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Individual water supply	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rural settlements	308	58	18.8	31	10	41	13.3	42	13.6	24	7.8	20	6.5	0	0
Key villages in the city	43	2	4.6	2	4.6	2	4.6	2	4.6	2	4.6	0	0	0	0
The main water supply of the villages	205	44	21.5	22	10.7	30	14.6	31	15.1	17	8.3	13	6.3	0	0
Central local water supply	48	6	12.5	5	10.4	6	12.5	6	12.5	2	4.2	3	6.3	0	0
Individual water supply	12	6	50	2	16.6	3	25	3	25	3	25	4	33.3	0	0
Vacations hotels	18	6	33.3	3	16.6	6	33.3	6	33.3	0	0	2	11.1	0	0
Employer organizations	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other objects	35	4	11.4	2	5.7	3	8.6	3	8.6	3	8.6	1	2.9	0	0
In general	450	71	15.8	37	8.2	52	11.5	52	11.5	30	6.7	26	5.8	0	0

CONCLUSION

1. Based on the physical and chemical results obtained in the drinking water in the region of Gostivar, for the period from 01.01.2015 to 31.12.2015, as water of the highest quality based on the turbidity parameter results local water supply samples, individual water supply with 0 NTU score whereas with the highest score of NTU 41.6 result, samples from individual water supply from village network;
2. Based on the results obtained from the bacteriological point of view, 52 samples of drinking water (11.5%) were not regular according to the Escherichia coli and streptococcus fecalis parameters, 37 samples (8.2%) were not regular based on the colon parameter at 22 ° C and 26 samples (5.8%) are irregular for the number parameter in colonies at 37 ° C. As evidenced by the safer bacteriological aspect, the samples were sampled in local and individual waterworks as well as samples as employers' organizations.
3. As a final conclusion we can conclude that both the physical and the microbiological aspects the analyzed waters are safe and show no signs of danger, so they are allowed to drink.

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