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Abstract: The aim of the paper is to analyze some drinking water samples for some companies such as: Rugova- Water, Good- Water and Water of Alps. The parameters we have focused on determining are: pH, electrical permeability, KMnO4 expense, chloride ions, dissolved oxygen in the water and oxygen saturation. Samples are taken at the sales' point and we intend to check the quality of drinking water at those retailers, where we have frequent attendance of citizens. From the results achieved we can conclude that there is no overrun of norms in accordance with World Health Organization (WHO) standards and the European Union (EU).
Practical work was carried out near the Laboratory of Food Science and Technology at UBT, applying instrumental and volumetric techniques for determination.

Key words: Water Quality, Citizens Health, Chemical-Physycal parameters.

INTRODUCTION

Drinking water is a tremendous asset for our country and the assessment of their chemical and chemical quality is of particular importance. Despite the studies so far conducted to assess the quality of drinking water in the Kosovo Markets, there are still shortcomings related mainly to the limited number of measured chemical and physical parameters.[15]
It is an integral part of the organism of every living thing. Water covers about ¾ of the land surface. In the human body on average 57-66% is found. Water in the organization of man and in all living organisms has a special physiological function. It keeps life by enabling bio-chemical functions of cells in living organisms. When decreasing the amount of water in the body, comes the disturbance of vital functions, while water loss of up to 20% causes death. In adult humans, the daily water requirement is 35 g / kg of body weight, which man receives through drinking water and restrained in food. [16]
In addition, man needs water for hygiene, food preparation, daily life. According to the degree of civilization, climatic and geological conditions, the need for this type of water is from several liters to over 1000 L/day for person.[17]

[15] Aliu Suzana: Environmental pollution of chemical nature in Lake Ohrid" Toxicological parameters in food chain. Lambert Academic Publishing. Saarbrucken Germany 2010. Amazon DistributionGmbH, Leipzig.Printed in USA and Uk.
[16] B. Hart; T. Hines; Trace Elements in rivers. in "Trace Elements in Natural Waters" ; Salbu, B. Steinnes, E. eds CRC, Press, Boca Raton, Ann Arbor, London, Tokyo. 1995. pp. 203 –221.
[17] J. Hong; W. Calmano; U. Foerstner; Interstitial Waters. In. " Trace Elements in Natural Waters, " Salbu, B., Steinnes, E. eds. CRC Press, Boca Raton, Ann Arbor,

Water is an important constituent component in other living organisms as in plants and animals, while entering into a large number of minerals. In special foodstuffs is found in large percentage and therefore they are easily broken. Water is also inevitable in the economy. Inevitable is in many technological processes, from which steam is gained as a driving force in thermal machines, is needed as a raw material for the production of many products in different types of industry. In the hydropower plant, the mechanical energy of the water mass is transformed into electricity, which is used in the industry, in the hydrosystem[18]
In different foods, the percentage of water is different, as shown in Table 1

Table 1. Water content in some food products

Name	Water (%)	Name	Water (%)
Green Salad	91-95	Boiled potatoes	76
Cucumber	91-95	Kumbulla	77
Tomatoes	98	Boiled Egg	72
Watermelon	90	Boiled Rice	75
Spinach	90	liver	72
Peach	86	Mish viçi	71
Apple	82	Mish delje	54

MATERIAL AND METHODS

Company water samples such as: Rugove Water, Good Water and Alps Water have been taken to those sale points with greater attendance of citizens.
For sampling, they received 2 dm3 of water and were sent to the Laboratory of UBT-Lipjan. Analyzing parameters were: water temperature, pH value, electrical conductivity, permanganate chemical consumption, chloride ions, dissolved oxygen in the water and oxygen saturation. During the experiment were used pure chemicals f.a. from "Merck" and "Kemika" manufacturers. Practical work was carried out near the Laboratory of Food Science and Technology, near UBT, Lipjan, applying instrumental and volumetric techniques for designation.[19] [20]

[18] Božo Dalmacija (redactor), Kontrola kvaliteta voda, Univerzitet u Novom Sadu, Institut za Hemiju, Kadetra za hemijsku tehnologiju i zashtitu životne sredine, 15-17, 253. (2001).

[19] Çullaj Allqi , Kimia e Mjedisit, Fakulteti i Shkencave Natyrore, Universiteti i Tiranës, SHB ,,Libri Universitar" , Tiranë, (2003).

[20] R. Hecky; The eutrofication of Lake Victoria. Verh. Internat. Verein. Limnol. 1993. Vol. 25 pp. 39 – 48.

PRESENTING EXPERIMENTAL RESULTS

Obtained during the next experimental work the results will be presented in tabelar form.

Table 2. Determination of fisico-chemichal parameters at Good- Water.

Sample	**Locality**	**Temp. of water / ° C**	**Elelectric perfection / µs cm^{-1}**	**pH**	**Expense of $KMnO_4$ /mg dm^{-3}**	**Chlorides Cl^- mg/L**	**Satisfaction with oxygen**	**Dissolved O2 mg/L**
M_1	ETC	21.8	10	7.08	9.48	10.15	83.4	**6.76**
M_2	Intereks	21.2	13.8	6.54	7.74	9.92	84.5	**6.94**
M_3	Super Viva	21.6	15.1	7.23	10.2	8.86	89.3	**7.64**
M_4	**Viva Fresh**	**22.4**	**16.2**	**7.0**	**9.3**	**14.64**	**87.4**	**7.51**

Table 3. Determination of fisico-chemichal parameters at Water of Alps.

Sample	Locality	Temp. of water	Elelectric perfection / µs cm^{-1}	pH	Expense of $KMnO_4$ /mg dm^{-3}	Chlorides Cl^- mg/L	Satisfaction with oxygen	Dissolved O2 mg/L
K_1	ETC	21.8	27.3	7.23	13.43	12.58	83.8	**6.98**
K_2	Intereks	22	21.9	6.95	11.53	11.34	82.4	**6.74**
K_3	Super Viva	21.6	28.3	7.23	10.26	11.56	89.7	**8.13**
K_4	**Viva Fresh**	**22**	**26.1**	**7.07**	**11.9**	**26.09**	**84.2**	**7.48**

Table 4. Determination of fisico-chemichal parameters at Rugova- Water.

Sample	Locality	mp. of water / ° C	Elelectric perfection / µs cm^{-1}	pH	Expense of nO_4 /mg dm^{-3}	hlorides Cl^- mg/L	sfaction with oxygen	Dissolved O2 mg/L
R_1	ETC	21.9	17	.14	4.5	5.32	86.2	7.06
R_2	ntereks	21.8	16.4	.26	7.89	10.24	85.3	6.94
R_3	per Viva	21.7	20.2	.95	10.2	5.32	87.7	7.40
R_4	iva Fresh	21.0	19.0	.12	6.5	8.36	85.5	8.23

Table 5. Determination of fisico-chemichal parameters at Rugova- Water - UBT-Lipjan.

Sample	Locality	Temp. of water / ° C	Elelectric perfection / µs cm^{-1}	pH	Expense of $KMnO_4$ /mg dm^{-3}	Chlorides Cl- mg/L	Satisfaction with oxygen	Dissolved O2 mg/L
U_1	UBT(Kimi)	18.4	56.5	6.94	9.6	26.5	74	6.07
U_2	UBT(Kimi)	18	57.4	6.81	10.4	29.88	81.4	6.55
U_3	UBT(Kopsht)	20.8	55.9	7.10	9.7	33.67	85.8	8.12
U_4	UBT(Objekt 1)	19.1	56.9	6.85	10.6	40.51	82.1	7.8

In order to have a better visual approach, the results presented above in tabular form will also appear in figure form.

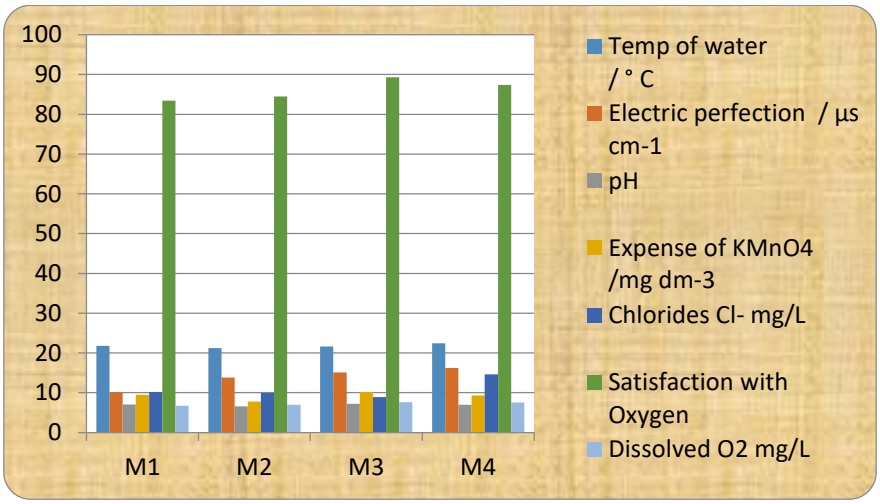

Fig 1. Determination of fisico-chemichal parameters at Good- Water .

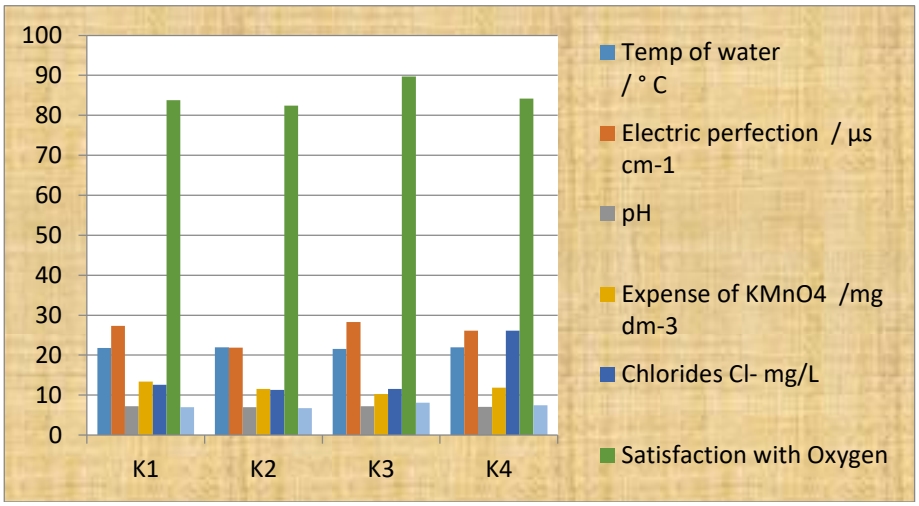

Fig 2. Determination of fisico-chemichal parameters at Water of Alps.

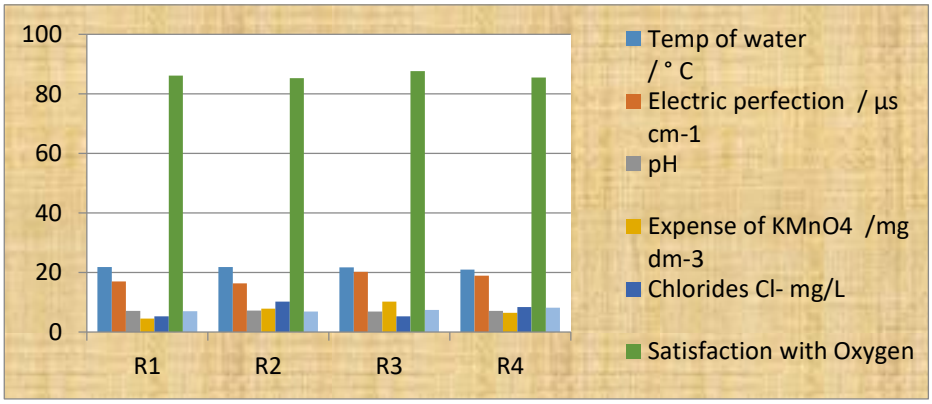

Fig. 3 - *Determination of fisico-chemichal parameters at Rugova- Water.*

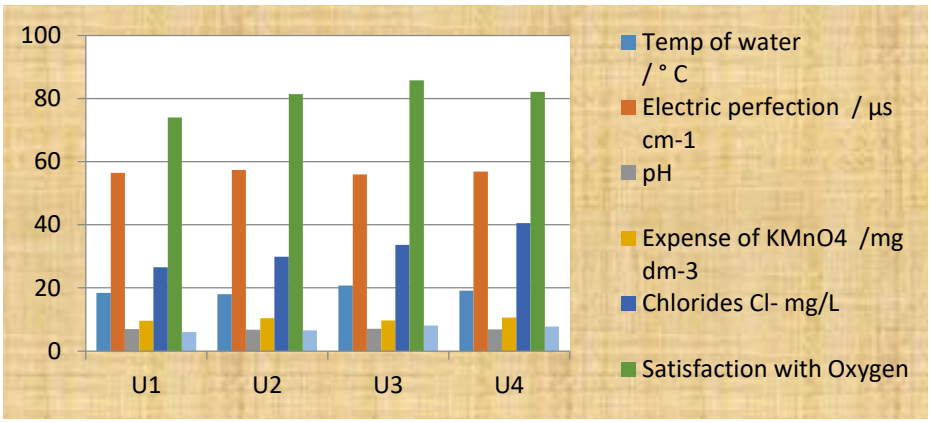

Fig. 4 -Determination of fisico-chemichal parameters at Rugova- Water - UBT-Lipjan

DISCUSSION OF RESULTS

From the analyzed results for the water companies Rugove Water, Good Water and Alveo Water, it is seen that the registered pH varies from 6.54 to 7.23, for Good Water, while electrical permeability varies from 10 to 16.2 µS / cm, while the Potassium permanganate ranges from 7.74 to 10.2 mg dm-3, chlorine ions 8.86 to 14.64 mg dm-3 and oxygen saturation from 83.4 to 89.3, dissolved oxygen in the water 6.71 to 7.64.
For alpine water, the maximum pH value was recorded 7.26, while the potassium permanganate expended 13.43 mg dm-3, where it is the highest recorded value. Other parameters have also resulted within standards.

CONCLUSIONS

Based on the results obtained during our work and by comparing them with the table below we can conclude that:
Tab. 6 *- Classification of quality aquatic ecosystems UNECE (content, mg / l)*

Category	P_{total}	NO_3^-	Dissolved O_2	BOD_5	**COD**	NH_4^+
Quality I	<10	<5	>7	<3	<3	<0.1
Quality II	10-25	5-25	7-6	3-5	3-10	0.1-0.5
Quality III	25-50	25-50	6-4	5-9	10-20	0.5-2
Quality IV	50-125	50-80	4-3	9-15	20-30	2-8
Quality V	>125	>80	<3	>15	>30	>8

- Based on the analyzed samples of the above results : Good water, Alps and Rugova water, these waters may be traded and used as drinking water because they belong to the first class and do not

exceed the norms of the Union European and Republic of Kosovo standards for drinking water.[21] [22]

- Based on the fact that water is of special importance for the life of the population, it is necessary that the analysis of the samples of water of good water, water of the Alps, Rugove Water, including all the other waters traded in Kosovo, should be fulfilled with additional analyzes such as:
- radiological parameters,
- parasitological parameters and those parameters to be determined by accredited methods by relevant institutions.

REFERENCES

1. Aliu Suzana: Environmental pollution of chemical nature in Lake Ohrid" Toxicological parameters in food chain. Lambert Academic Publishing. Saarbrucken Germany 2010. Amazon DistributionGmbH, Leipzig.Printed in USA and Uk.
2. B. Hart; T. Hines; Trace Elements in rivers. in "Trace Elements in Natural Waters" ; Salbu, B. Steinnes, E. eds CRC, Press, Boca Raton, Ann Arbor, London, Tokyo. 1995. pp. 203 –221.
3. J. Hong; W. Calmano; U. Foerstner; Interstitial Waters. In. " Trace Elements in Natural Waters, " Salbu, B., Steinnes, E. eds. CRC Press, Boca Raton, Ann Arbor,
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5. Çullaj Allqi , Kimia e Mjedisit, Fakulteti i Shkencave Natyrore, Universiteti i Tiranës, SHB ,,Libri Universitar" , Tiranë, (2003).
6. R. Hecky; The eutrofication of Lake Victoria. Verh. Internat. Verein. Limnol. 1993. Vol. 25 pp. 39 – 48.
7. R. Beckett; Surface and Colloid Chemistry in Natural Waters and Water treatment, Plenum Press, Melbourne. 1990.
8. Srudato, R.J. Pagano. Landfill Leachate and Groundëater Contamination. In: Grondëater Contamination and Control, Zoller, U. (Eds.). Marcel Dekker, Inc., Neë york, pp:712. (1994).

[21] R. Beckett; Surface and Colloid Chemistry in Natural Waters and Water treatment, Plenum Press, Melbourne. 1990.

[22] Srudato, R.J. Pagano. Landfill Leachate and Groundëater Contamination. In: Grondëater Contamination and Control, Zoller, U. (Eds.). Marcel Dekker, Inc., Neë york, pp:712. (1994).