MONITORING OF PHYSICAL INDICATORS IN WATER SAMPLES

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Abstract: *In this paper, are monitored following indicators physics of water in Eforie Nord, Herastrau Mogosoaia Moeciu, Bordei: turbidity, pH, oxygen, conductivity, such variation is made and physical indicators of temperature.*

To measure this quality indicator of water, we used: turbidimeter portable microprocessor type HI 93 703, oxigenometer portable microprocessor type HI 9146, pH meter type HI 9214.

Natural water quality is determined, in general, all mineral and organic substances, dissolved gases, particulate matter and living organisms present.

Conductivity of water is one of the most used indicators to assess the degree of mineralization, water conductivity measurements allow determination of total dissolved salts in water.

The concentration of hydrogen ions in water (pH), is an important factor determining the reactivity of water capacity, its aggressiveness, ability to provide water for development of various media organizations. Turbidity is due to solid particles or in the form of colloidal suspensions. It is therefore very important to monitor physical indicators of water.

Keywords: pH, turbidity, conductivity, oxygen in water

1. Introduction

Water quality is defined by three parameters: basic parameters: temperature, pH, conductivity, dissolved oxygen, parameters indicative of persistent pollution cadmium, mercury, organo - halogenated and mineral oils optional parameters: total organic carbon, biochemical oxygen demand anionic detergents, heavy metals, arsenic, boron, sodium, cyanide, total oil.

To characterize the quality and degree of pollution of water are used as indicators. They can be classified according to their nature and by the nature and the effects they have on water as: classification by nature quality indicators:

Indicators organoleptic (taste, smell);

- Physical indicators (pH, electrical conductivity, color, turbidity);
- Chemical indicators.
- In this paper, we monitored physical indicators in waters: Herastrau, Eforie, Moeciu, Mogosoaia

2. Materials and methods

To highlight the portable turbidimeter turbidity we used the Hanna firm. Turbidity was designed in accordance with standard ISO 7027 International, so the unit of measurement of turbidity is the FTU (Formazin turbidity unit). FTU is the same as other internationally recognized unit: NTU (nephelometric turbidity units)

Picture conversion between these units is shown in Table 1.

Table 1
Picture the conversion

	JTU	FTU/NTU	SiO_2 mg/l
JTU	1	19	2.5
FTU/NTU	0.053	1	0.13
SiO_2 mg/l	0.4	7.5	1

The tool works by passing a beam of infrared light through a cuvette containing the sample:

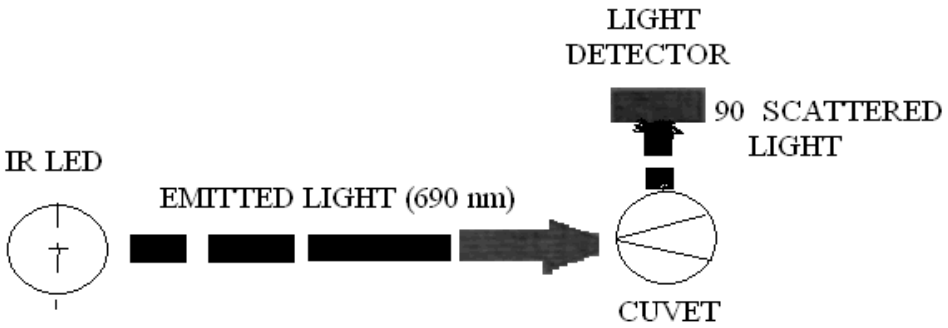

Figure 1 Switching the light beam through the cuvette [1]

A sensor placed perpendicular to the direction of light, measure the amount of light scattered by particles in the sample of existing undissolved. The microprocessor converts the readings into FTU values. Water turbidity is characterized by its lack of transparency due to the existence of particles in suspension.

Total suspension means all components insoluble solids present in a quantity of water and can be separated by laboratory methods (filtration, centrifugation, sedimentation). Gravimetric expressed in mg / l or volume in ml / l.

The value of total suspension is particularly important for the characterization of natural waters. Depending on the size and specific gravity, particles are separated in the form of deposits (sediment) or floating on the water surface (floating). Gravimetric suspensions are all insoluble solids that can settle, naturally in a limited period of time.

The conductivity of water is one of the indicators used in assessing the degree of mineralization of waters at least the following reasons:

- Measurements of the conductivity (resistivity) allow determination of the total content of water of dissolved salts in the water;
- Have the advantage of differentiation between inorganic and organic salts (weight) based on specific ion mobility;
- Eliminate errors due to transformation of species of carbonate / bicarbonate by evaporation at 105 ^{0} C (according to the methodology of determining the gravity fixed residue, where the losses are bicarbonates 30%).

Conductivity type of firm Hanna HI 99300 is a portable measurement EC/TDS/0C/0F with Enhanced

The concentration of hydrogen ions

HI 9214 is a compact device pH/0C thin, microprocessor designs to be easily transported.

PH electrode has a temperature sensor included for quick and accurate temperature measurements and automatic temperature compensation natural water pH is between 6.5 - 8 as a deviation from these values giving an indication of inorganic pollution.

The concentration of hydrogen ions in water, is an important factor that determines the reactivity of water, aggression its ability to be water environments for the development of various organisms, etc..

Between the pH of the water and its acidity or alkalinity are not identical. Increased alkalinity or acidity are not accompanied by corresponding changes in pH due to the buffering capacity of natural waters that have particular. The main natural buffer system is the system of water dissolved carbonic acid / carbonate, the pH of the water is between 6.5-8.5.

Indicators of the oxygen

Oxygen gas is soluble and is dissolved in water in the form of O_2 molecules, the presence of oxygen in the water conditioning the existence of a large majority of aquatic organisms. All waters which are in contact with atmospheric air containing dissolved oxygen while groundwater containing very little oxygen. The solubility of oxygen in water depends on the pressure, air temperature, water temperature and salinity.

Dissolved oxygen, the most important parameter of water quality in rivers and lakes is the content of dissolved oxygen because oxygen is vital to aquatic ecosystems. The content of oxygen in natural waters must be at least 2 mg / l, while the paint, in particular those operating in the fish farms, the dissolved oxygen content should be 8-15 mg / l.

3. Results and discussion

In figure 2 -5, we present the results of measurements of five water samples.

From Figure 2-5 it is observed that at low temperatures Herăstrău waters, Eforie North Mogoşoaia are acidic. Waters Moeciu board are alkaline. At higher temperatures than water is alkaline Bran. Lower pH leads to immune disorders.

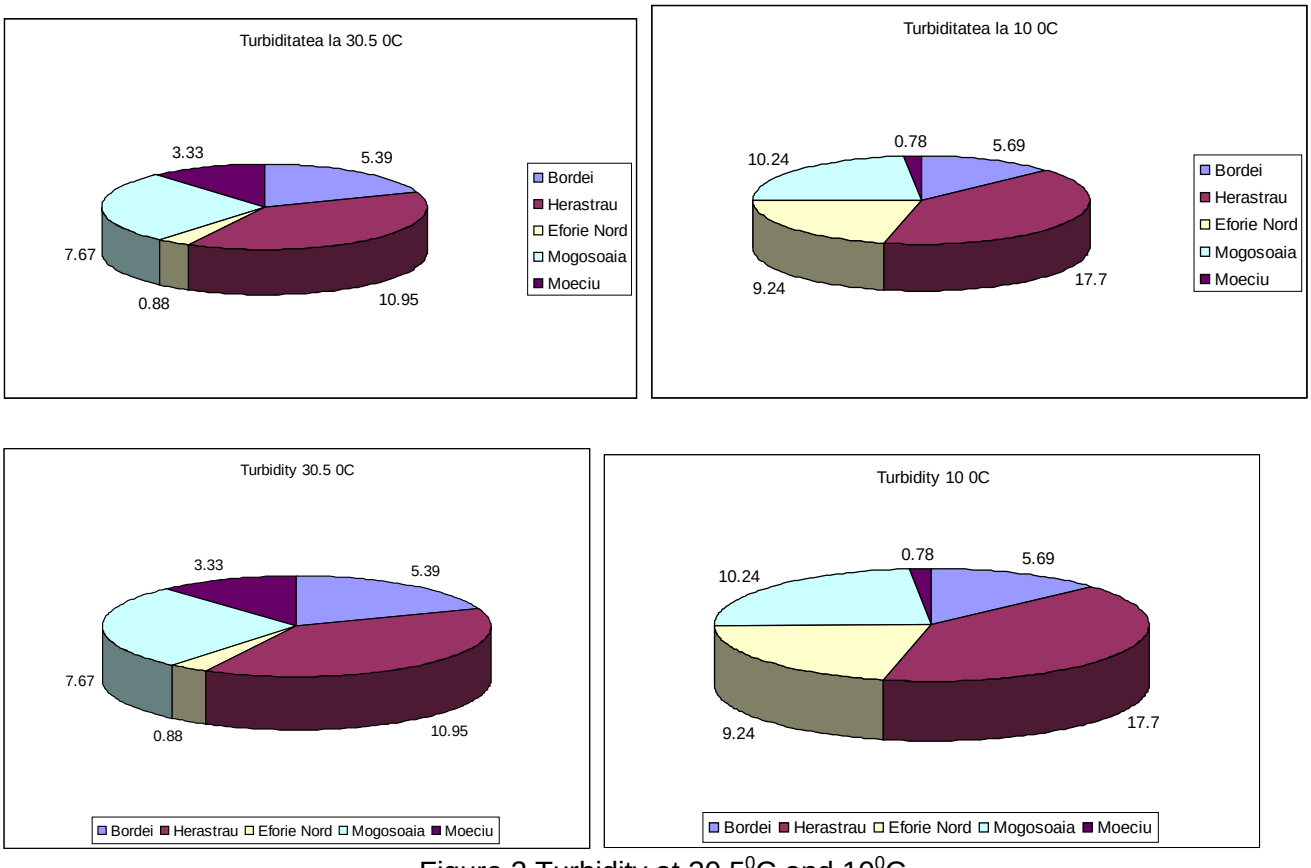

Figure 2 Turbidity at 30,5^{0}C and 10^{0}C

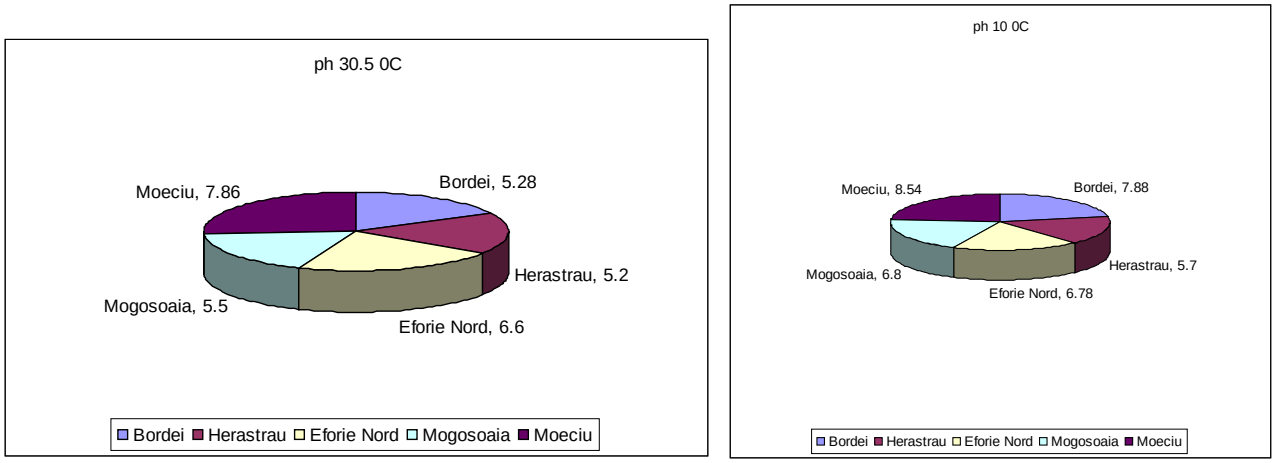

Figure 3a pH at 30,5^{0}C and 10^{0}C

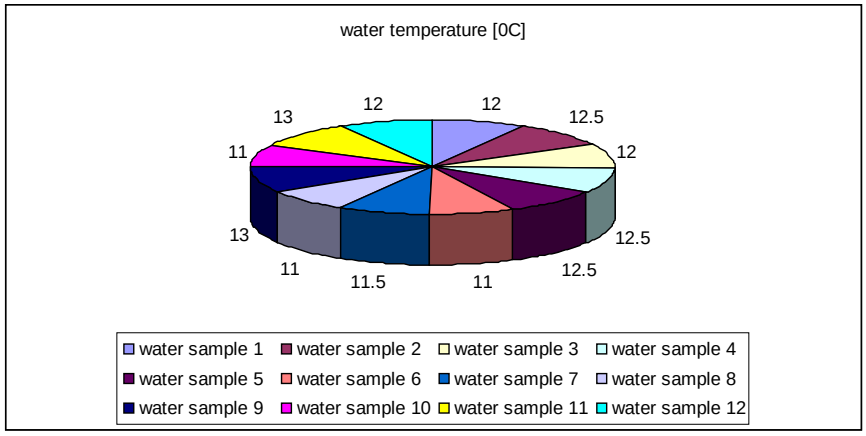

Figure 3 bThe pH of the samples at different temperatures Herastrau water

In Figure 3 b we monitored water samples at temperatures between Herastrau [11-13 ^{0}C]. Note that the 1-4 water samples had pH values below 7 and from 5 to 12 water samples had pH values above.

Table 2 Value pH

	water sample 1	water sample 2	water sample 3	water sample 4	water sample 5	water sample 6	water sample 7	water sample 8	water sample 9	water sample 10	water sample 11	water sample 12
water temperature [0C]	12	12.5	12	12.5	12.5	11	12	11	13	11	13	12
pH [ph unit]	6.63	6.48	7.25	6.75	7.4	8	7.6	7.2	7.5	7.29	7.4	7.6

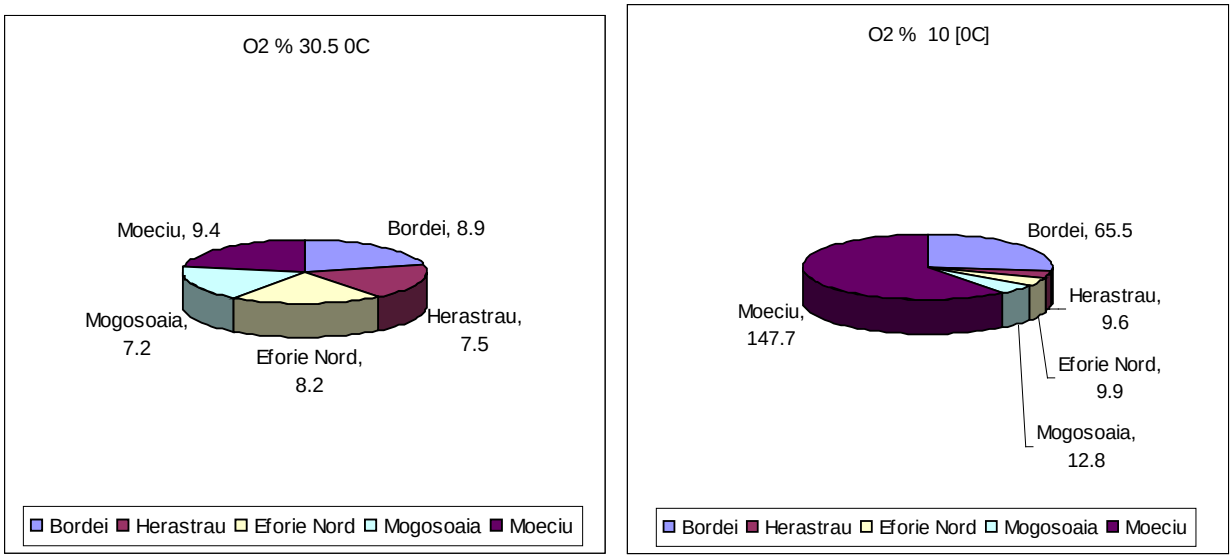

Figure 4 Oxygen content 30,5^{0}C and 10^{0}C

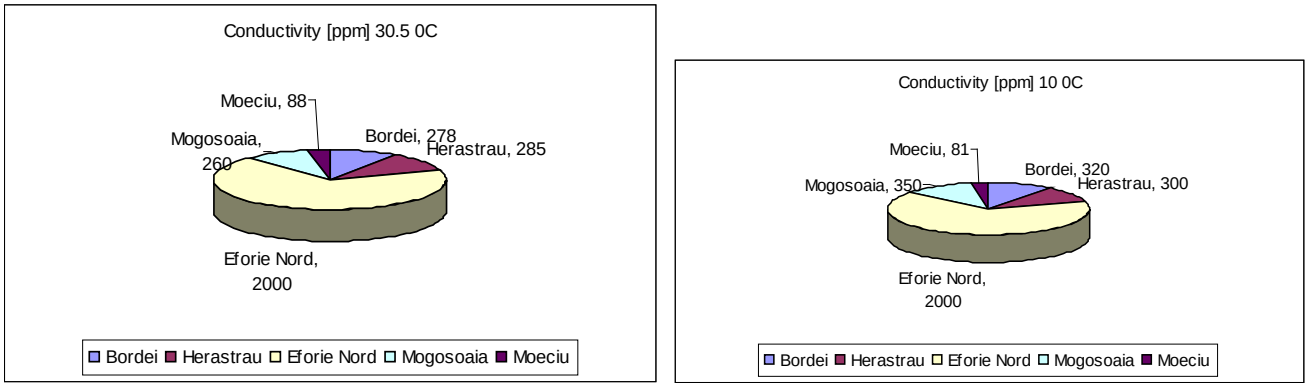

Figure 5 Conductivity at 30,5^{0}C and 10^{0}C

Conclusions

Following research, we found that at low temperatures (10^{0}C) were the only alkaline water board and Bran these waters with a pH of 7.87 and 8.54. Other water had a pH of less than 7 which are acidic.

At higher temperatures (24^{0}C), only alkaline water was Bran water with a pH of 7.86, the other four water samples were acid value (below 7). We know that to live a long and healthy life, you have to remove acidic wastes in our body. The best and easiest way to get rid of these acidic wastes is to liquefy them and neutralize them with alkaline water. By removing acidic waste particles in the blood, eliminate the risk of disease.

Alkaline water has the ability to neutralize acid and liquefy waste to be eliminated from the body, keeping its alkalinity - so healthy and well.

And if turbidity best value (lowest value) was recorded at both temperatures Bran and at low temperatures.

Reduction of oxygen below the smooth breathing of fish is one of the common causes of death responsible fish. Just like humans, and fish need oxygen to breathe. Most fish are not able to extract this gas and direct vital air, and instead manage to procure it from the water that surrounds them. If water, however, is low in oxygen, the fish die.

Water is indispensable for human body. Under natural conditions, the water is never pure, the it is always a certain amount of chemicals dissolved or suspended.

Through contact with the environment pollute water reaching to contain a number of substances dissolved or suspended water which prints the physical, chemical, biological and bacteriological.

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