CORAL-MINE
(CORAL-MINE)

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1. INTRODUCTION

One of the areas of research carried out at the Bion Institute is the measurement of the effects of (ultra) weak radiation from various sources. This radiation cannot be measured with conventional measuring instruments.

Many less traditional devices are not yet capable of measuring this kind of radiation (physical or chemical effects) with sufficient reliability - but technologies are constantly developing in this direction. Most often, this kind of radiation, together with its effects (physicochemical and biological), cannot be explained by generally accepted theories, although some scientists have proposed possible explanations.

The Bion Institute specializes in measuring the biological effects of low emission of various products for which manufacturers cannot confirm their claims in the usual way. Over years of research, the Bion Institute has developed a series of tests that make it possible to use the human body or water to detect such weak emissions – and thus determine their general effects. A Coral Club client ordered testing of their Coral-Mine product and its effect on water. An experimental study was carried out using the BionEvapo® method on the influence of Coral-Mine, ordinary sand, and as a control - an empty sachet-bag, i.e. standard water.

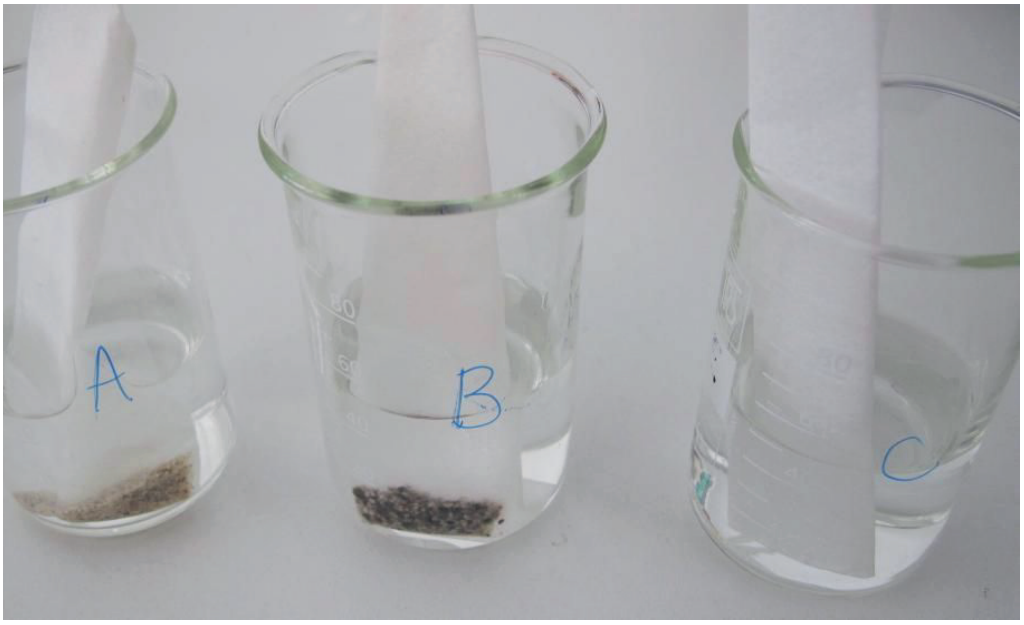


Figure 1. Glasses filled with standard water and sachet bags containing: 1 gram of Coral-Mine (A), 1 gram of regular sand (B), and empty bags (C).

1. BIONEVAPO® METHOD

The BionEvapo® method is a standardized scientific method for observing and analyzing changes in water structure caused by various external factors.

A thoughtful combination of methods and procedures allows the long-term effects of these factors on water and its dynamic structure to be studied, which is difficult to determine using conventional procedures. The technique consists of creating drops of various samples on clean glass slides and drying them under certain conditions. Subsequently, the analysis of dry residues of the samples, which remained on the microscope slide after the evaporation of water, is carried out. The structures of dry residues formed under various test conditions are studied using dark-field microscopy, and photographs (evapo-images) are evaluated by visual inspection and special computer programs for structural analysis of photographs (Figure 2).

The dry residue is one of the main criteria for determining the quality of water, as it reveals the degree of its mineralization. Computer processing of evapo-images shows the structural changes taking place in water samples exposed to various influences.

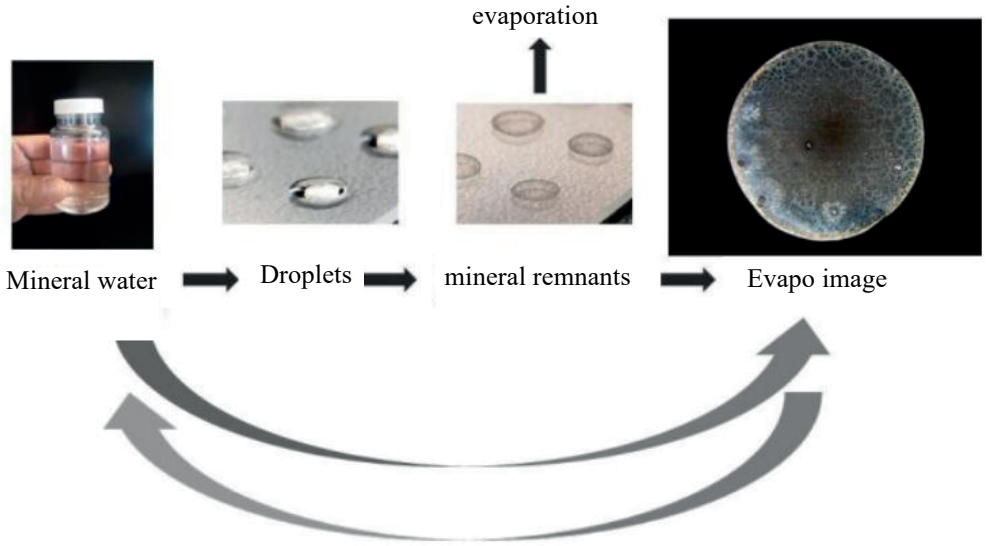


Figure 2: Schematic representation of the BionEvapo® method

The purpose of this pilot study was to evaluate the effect of direct Coral-Mine contact on water. We compared it with the effect of ordinary sand with a similar particle size (hereinafter referred to as control sand), and with standard water, which we always use for testing (hereinafter referred to as control water). First, 1 gram of Coral-Mine and control sand were weighed and placed in sachets. Then, three glasses were filled with control water and sachets with sand samples were dropped into them: a bag with Coral-Mine into the first glass, with control sand into the second glass, and an empty bag into the third glass. Samples of drops were taken from the glasses for research (time 0 = T0). After 30 minutes, all the bags were removed and the drops were reconstituted (time 1 = T1). After the next 30 minutes, a third set of drops was prepared from each beaker (time 2 = T2).

We examined the dry residues of evaporated water droplets under a microscope, photographed them, and analyzed them using two computer programs:

- Using a program for frequency analysis of distances between inorganic residues, where the important parameters are the shape of the curve and the number of distances (frequency) for each of 200 segments (designated as consecutive distances);

- Using a program to determine the number of structures after sequential blurring of the image. The results of this procedure can tell us about the complexity of the structure of inorganic residues;

- Final analysis is a layer analysis in which a computer program divides the images into 120 concentric layers and determines the average luminosity of each layer from the edge (layer 0) to the center of the droplet (layer 120).

2. RESULTS

3.1 VISUAL ASSESSMENT

Figures 3-7 show the most typical photographs of inorganic dry residues of evaporated droplets at points T0, T1, and T2. Figure 3 shows the inorganic residues of Coral-Mine droplets. It can be seen with the naked eye that the drops before and after the test are different from each other. At point T0, the structures of all samples have typical features of standard water: the edge is clearly defined and inorganic residues cover almost the entire surface of the drops, occasionally forming various fractal patterns.

At time T1, the droplets look completely different. Although partly the structure resembles typical standard water (see Figure 5), the presence of additional minerals is also evident, as the edge becomes thicker and the entire surface of the droplets is more densely covered. At time T2, the typical standard structure of water is lost, mineral particles are directed to the edge, while the centers of most drops are empty.

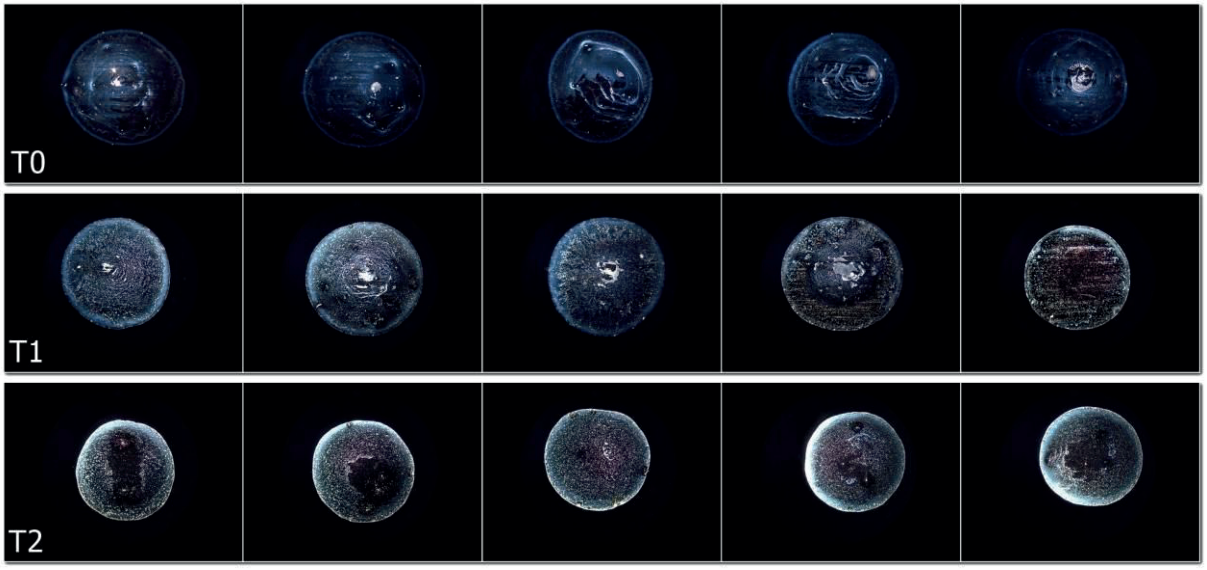


Figure 3: Coral-Mine - Evaporated images of typical inorganic structures of a water drop at point (T0), after 30 minutes (T1), and after an additional 30 minutes (T2) (40x magnification).

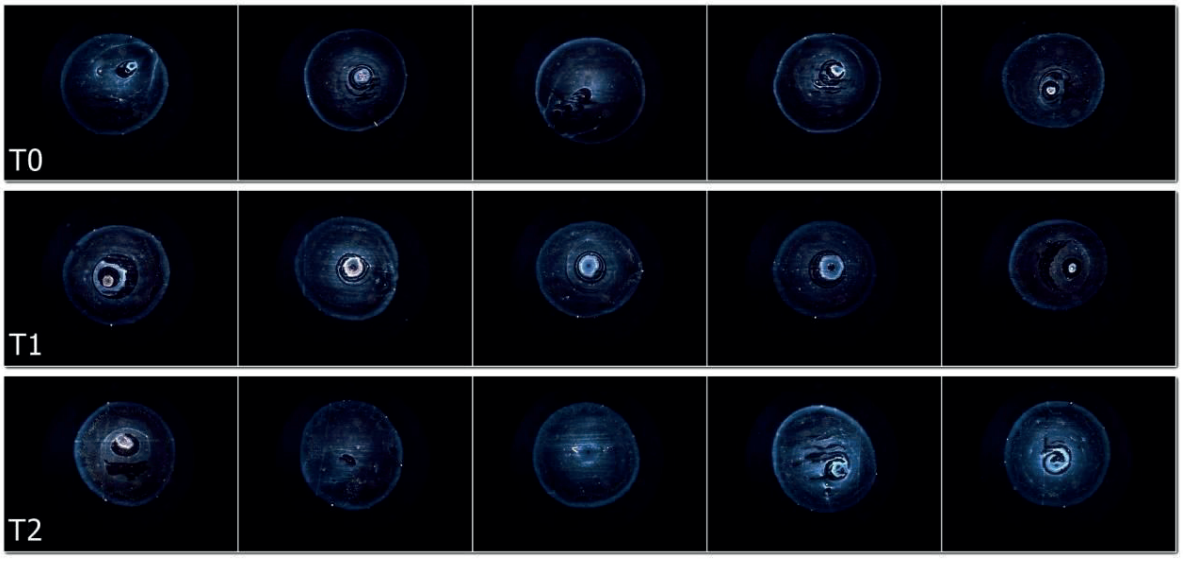


Figure 4: Control (K-sand) - Evaporated images of typical inorganic textures of a water droplet before test (T0), after 30 minutes (T1), and after an additional 30 minutes (T2) (40x magnification).

Figure 4 shows the inorganic residues of water droplets into which a sachet with ordinary sand was dipped, and Figure 5 shows the inorganic residues of the control water without sand.

At all points in time, the drops have well-defined edges and most of the surface covered with mineral residues, except for the centers where the typical structure of a regular hole in the ring, the so-called “eye,” is present in most drops, especially at time T1.

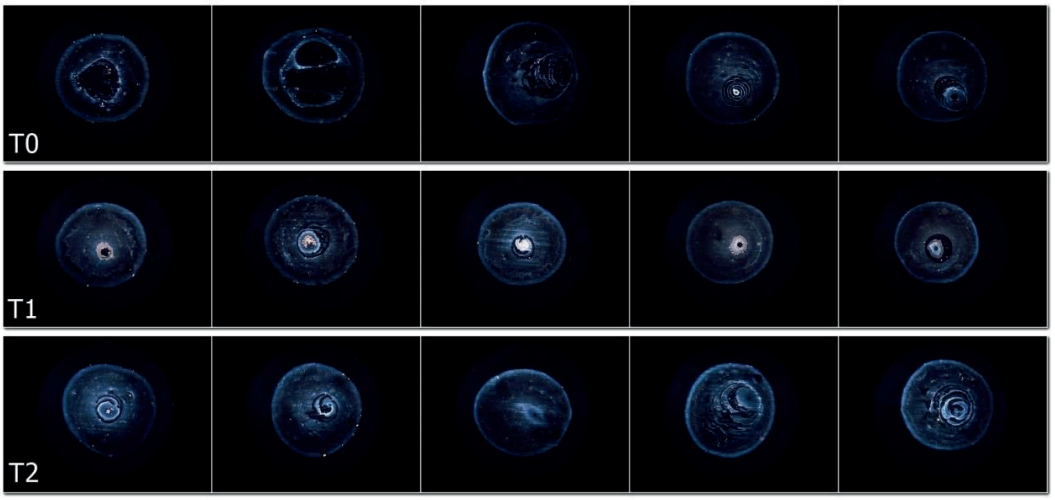


Figure 5: Test water (K-water) - Evaporated images of typical inorganic structures of a water droplet before testing (T0), after 30 minutes (T1), and after an additional 30 minutes (T2) (40x magnification).

Figure 6 shows typical drops in T1, that is, 30 minutes after lowering the sachet with sand into the water. It is clearly seen that it is practically impossible to distinguish the structures of control water drops and drops with control sand, while water drops from Coral-Mine have a significantly different structure.

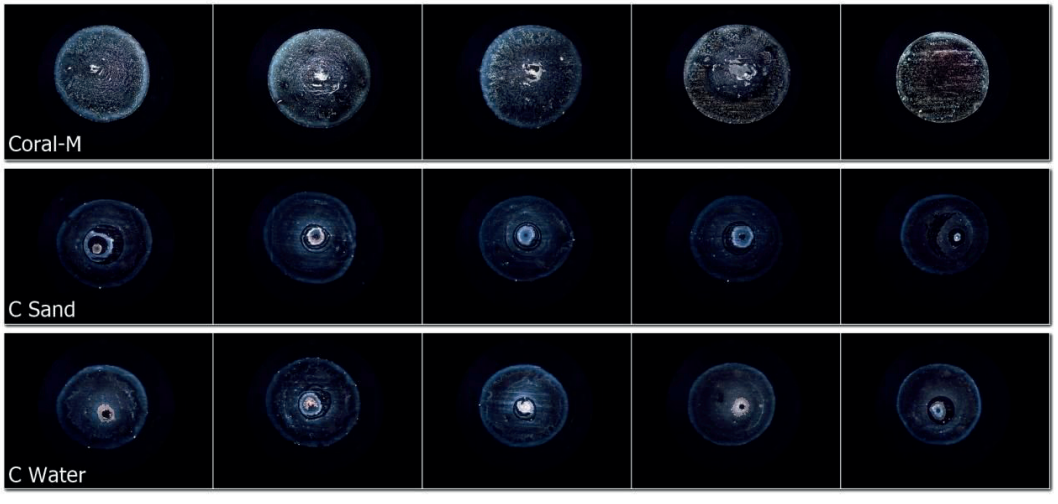
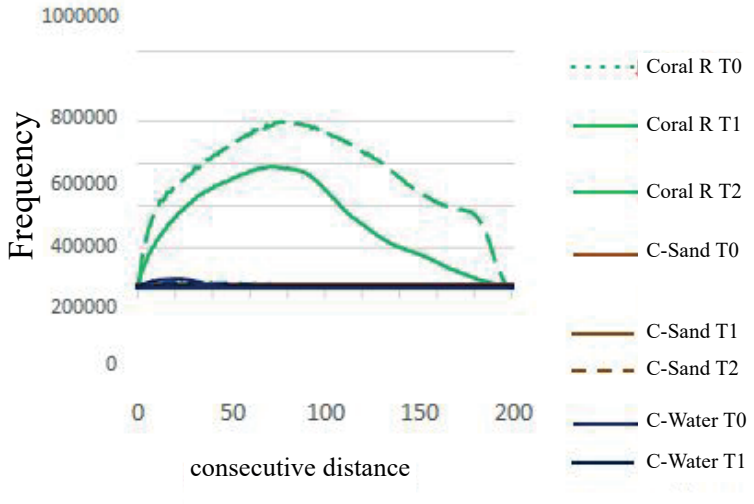


Figure 6: Evaporated images of the inorganic structures of a Coral-Mine water droplet with control sand and control water at point (T1) (magnification 40x).

3.2 ANALYSIS OF FREQUENCY DISTRIBUTION

When analyzing the frequency distribution of distances between pixels, the important parameters are the shape of the curve, the position of the peak, and the absolute values. Figure 7 shows the analysis of the frequency curves of the evapo-image structures of Coral-Mine, control sand, and control water at times T0, T1, and T2. We can observe significantly higher absolute values of the Coral-Mine curves at points T1 and T2 as compared to point T0. In addition, the peak of the curve is shifted to the right, from the 22nd consecutive distance to the 74th in T1, and to the 81st consecutive distance in T2. The increased distance can be attributed to the presence of additional minerals in the water with Coral-Mine at point (T1). With an increased concentration of particles, the number of distances between them also increases. The number of particles at points T1 and T2 was the same, while the number of distances was even higher at T2, which indicates that the structure of the water continues to change even after Coral-Mine is removed from it.

In the control sand and control water, a shift of the peak to the right and more distances were also observed after the test compared to the T0 point. However, these changes were much smaller compared to Coral-Mine. Changes in peak positions over time are shown in Figure 8.



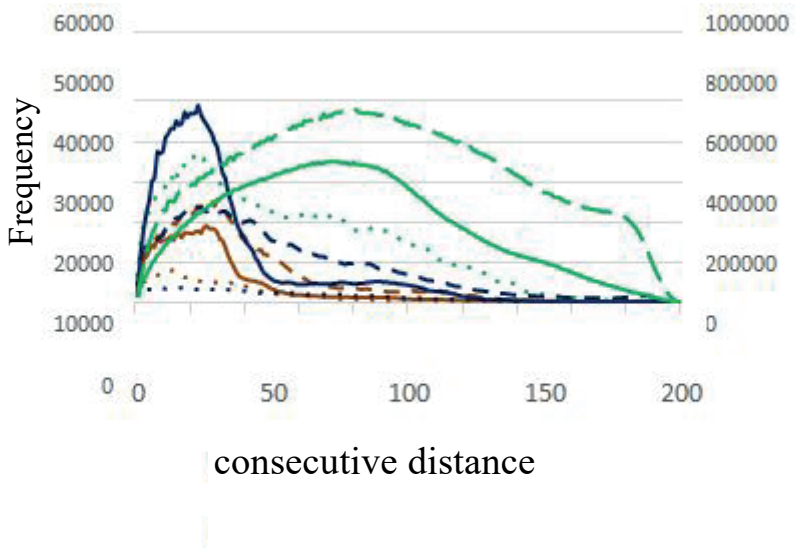


Figure 7: Plots of mean frequency distribution of distances for inorganic residues of Coral-Mine droplets, control sand and control water before the test (T0), immediately after the test (T1), and after an additional 30 minutes after the test (T2).

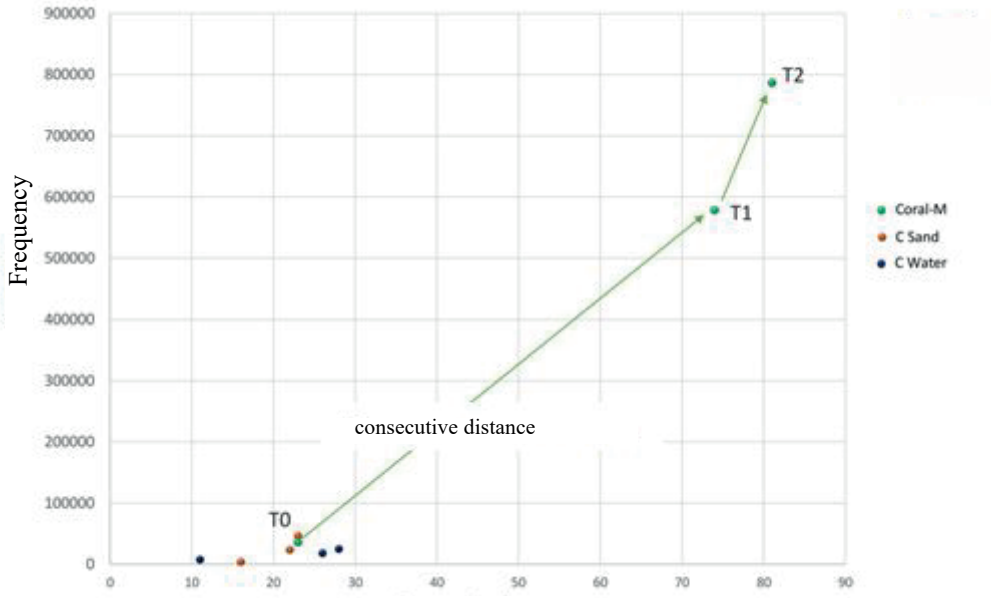


Figure 8: Position of the peaks of the frequency distribution curves. Highlighted the peak values and positions of water from Coral-Mine (green dots) at point T0, 30 minutes after the sachet was immersed in water (T1), and after an additional 30 minutes (T2)

3.3 ANALYSIS OF CONSEQUENTIAL DECREASE IN QUANTITY STRUCTURE (BLUR)

Analysis of the successive decrease in the number of structures during the blurring of evapo-images of water droplets gives some idea of the complexity of the structure of inorganic residues. The shape of the curve depends on the water. For our standard water, the most characteristic is the initial rapid drop in the curve (from a blur factor of 0 to 0.625). The individual curves differ from each other in the slope of the decline to the first (local) peak of about 3.0. For ease of comparison, standardized values are provided. As can be seen in Figure 9, at time T0 all curves are the same, but after T1 they have changed. The most significant change was observed in water with Coral-Mine at T1 and remained unchanged at T2. The shape of the curve indicates a significant decrease in the complexity of the evapo-images. This is understandable because there are many more solid residues present, with the result that the program recognizes them as a single structure faster than in other samples, where the residues are more scattered.

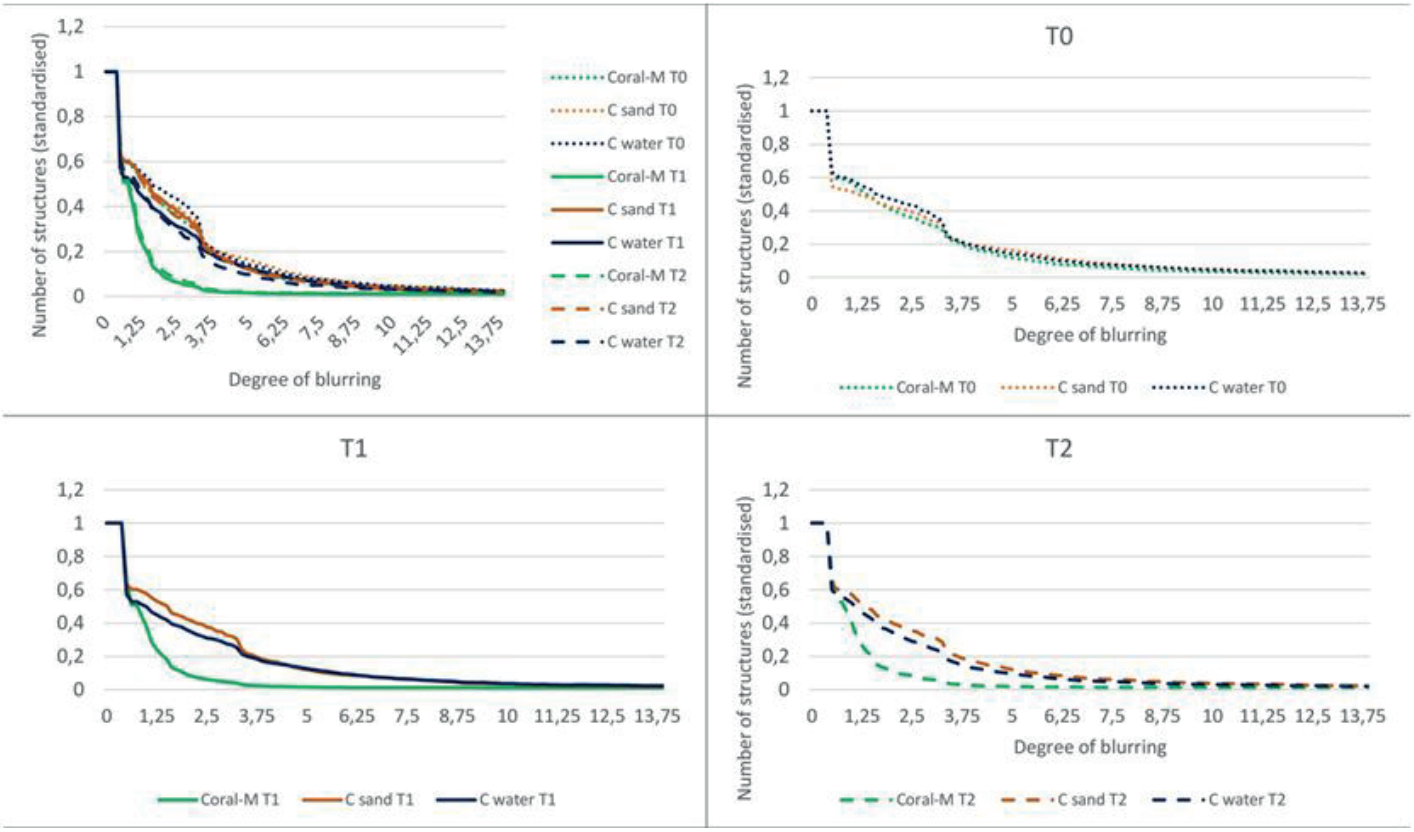


Figure 9: Decrease in the number of structures (standardized values) for successive blur levels of evapo-images of water droplets at points T0, T1, and T2.

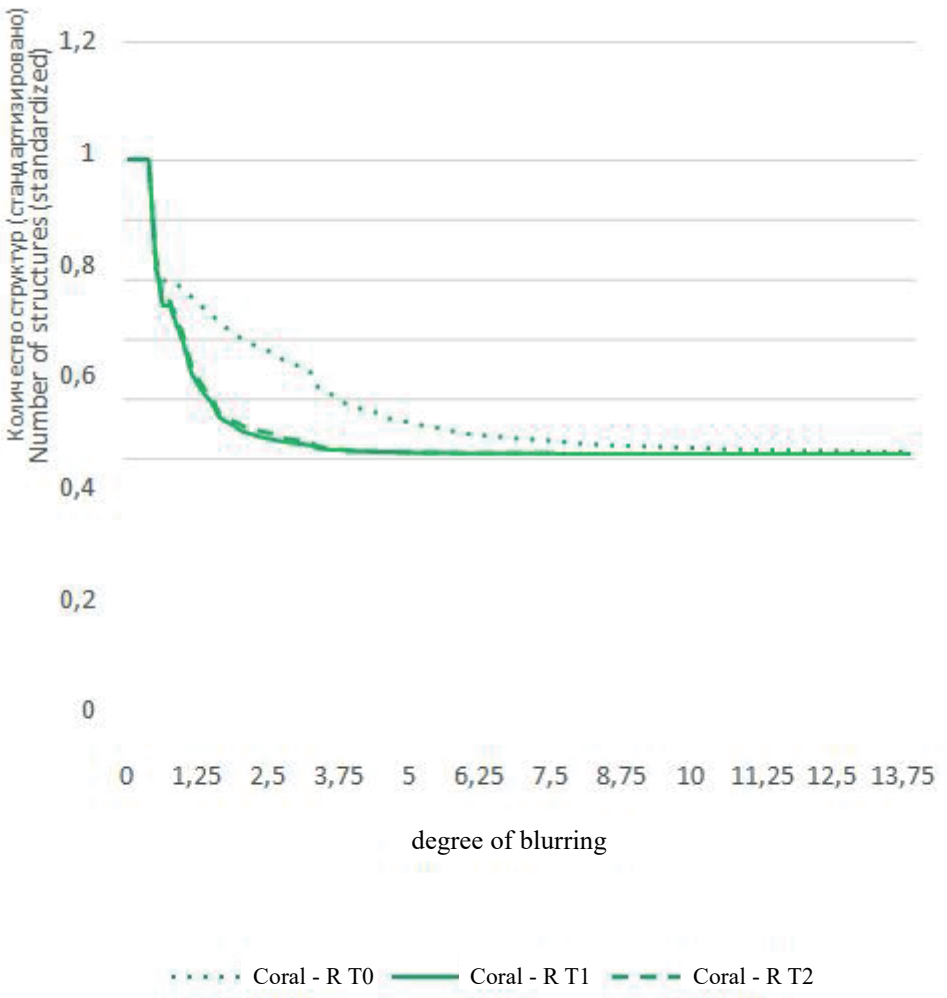


Figure 10: Decrease in the number of structures (standardized values) for successive levels of evaporation of evapo-images of water droplets with Coral-Mine at points T0, T1, and T2.

3.4 LAYER-BY-LAYER ANALYSIS

To perform a layer-by-layer analysis, the application divides the evapo-images into 120 concentric layers (rings) and determines the average luminosity of each from the edge to the center of the droplets. Figure 11 shows that the shapes of the curves of the control sand and curves of the control water are the same at all points in time. At the edge of the droplets, there is a tendency for a lower luminosity and a peak in brightness between the 95th and 110th layers. He curves of Coral-Mine differ significantly in shape and meaning. The average luminosity of the layers is higher compared to the control sand or control water (see Figure 12), but also more evenly distributed between the 10th and 90th layers. Arrows indicate the offset of the local peaks between T1 and T2. The highest luminosity at time T1 was determined at the 90th successive layer, but at time T2 the most light-emitting part of the droplets was between the 30th and 45th layers. There was only a slight correlation between

brightness and an increase in total dissolved solids (TDS), namely TDS measurements showed that the Coral-Mine water received only 33% TDS compared to the sample containing the control sand. The increase in the total luminosity in the layer-by-layer analysis and in comparison with the samples without Coral-Mine was more than 300%.

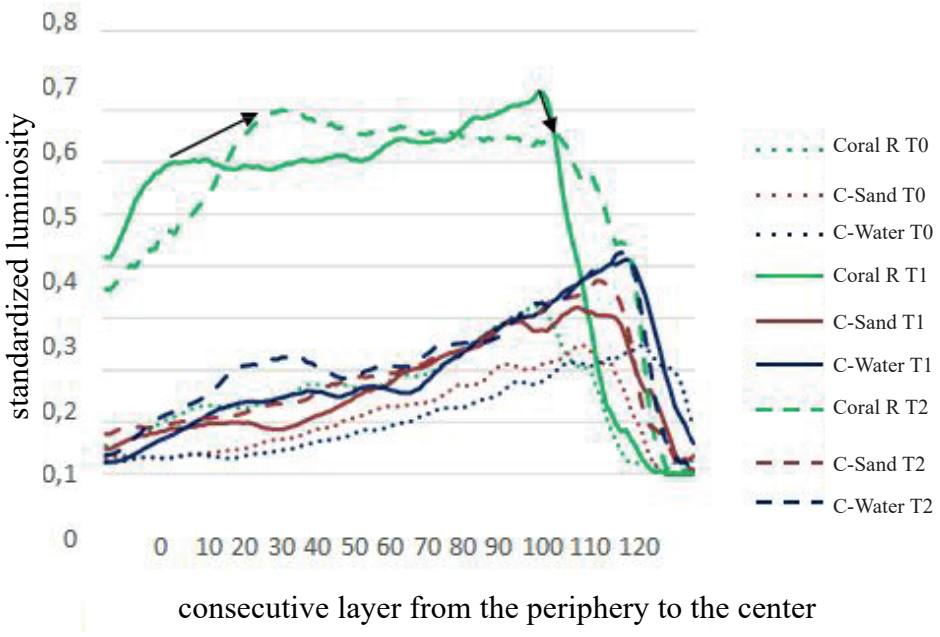


Figure 11: Standardized luminosity of 120 consecutive evapo-image layers before testing (T0), immediately after testing (T1) and an additional 30 minutes after testing (T2). Arrows indicate displacement of local peaks.

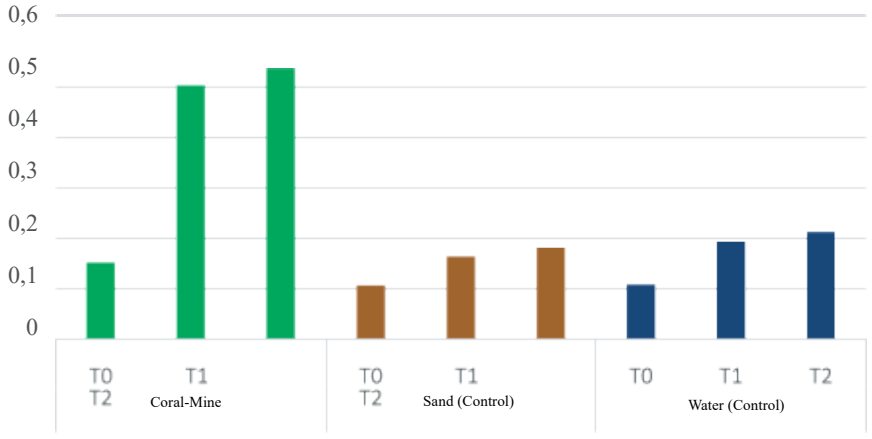


Figure 12: Average standardized luminosity of evapo images before testing (T0), immediately after testing (T1), and an additional 30 minutes after testing (T2).

The luminosity of Coral-Mine at points T1 and T2 was about 3 times higher than that of the rest of the samples. Since the ORTV content was only 33% higher, it was concluded that this difference was due to the different sedimentation of the residues, which indicates a different structuring of the water. In photometry, luminosity is a luminous quantity representing the luminous flux of radiation emitted from a small area of the luminous surface of a unit area. It is equal to the ratio of the luminous flux emanating from the considered small area of the surface to the area of this area.

4. DISCUSSION OF RESULTS

The effect of Coral-Mine on the structure of water was assessed by the BionEvapo® method. The structures of dry inorganic water residues were assessed visually and using three types of computer analysis. Both visual assessment and computer analysis confirmed the impact of Coral-Mine on water. It can be seen with the naked eye that the structures of the dry residue of Coral-Mine differ from the other evapo-images (control sand and control water). The structure of the water changed in the first 30 minutes after dipping the sachet into the water and during the next 30 minutes, although the bag with Coral-Mine was removed from the glass. The analysis of the frequency distribution showed a greater number of distances between particles, as well as a shift of the peak of the curve to the right (compared to the control sand and control water). Sequential structure decrease analysis (blurring) showed a rapid decrease in the number of structures in the water with Coral-Mine, indicating smaller structures/particles that can also be seen with the naked eye. Layer-by-layer analysis showed that most of these particles were located at the edge of the droplets, while most of the particles in the control sand or control water were distributed in the center of the droplets.

Although some changes in droplet structure can be attributed to an increase in total dissolved solids (TDS, 99 ppm to 132 ppm), we observed additional changes between times T1 and T2 where the Coral-Mine sachet was removed, which indicates changes in the structuring of water which led to a change in solid residues that settle on drying.

5. CONCLUSION

We can conclude that Coral-Mine, immersed in water, affects the latter partly through some particles that dissolve and pass from the coral into the water, and partly through changes in the structure of the water (ordering).